An investigation of the perception of chance events of adolescents in an independent school in regional Victoria

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AN INVESTIGATION OF THE PERCEPTION OF CHANCE EVENTS OF ADOLESCENTS IN AN INDEPENDENT SCHOOL IN REGIONAL VICTORIA

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Statement of Authorship and Sources

This thesis contains no material that has been extracted in whole or in part from a thesis that I have submitted towards the award of any other degree or diploma in any other tertiary institution.

No other person's work has been used without due acknowledgment in the main text of the thesis.

All research procedures reported in the thesis received the approval of the relevant Ethics Committee (Appendix A, C and D).

Signed:_____Date: 01/11/2023

Trenton Ian Loader

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Abstract

Many students who attended for counselling presented with issues that had arisen in their life due to the presence of one of more chance events that had recently occurred to them. It has been the author's experience that those adolescents have viewed the 'chance events' negatively and not recognised the possible opportunities that could arise. The present research recognised adolescent perceptions of chance events and document how their perceptions of chance events related to their awareness of potential opportunity.

The purpose of the overall research investigation was to, firstly, gauge adolescents' personal experience of chance events in their lives and personal perception of what constitutes chance events; secondly, to expand on the work of Bright et al. (2009), and investigate whether adolescents consider/process chance events in terms of their controllability and desirability; and finally, addressing question "How do adolescents' perceptions of chance events influence/relate to their Luck Readiness Profile?" The overall research investigation is therefore an examination of adolescent perceptions of chance events and their relation to opportunity awareness. The major research question for this study is: How do young people characterise chance events?

To answer the major research question, an extensive review of the existing literature on the topics was conducted, and a synthesis thereof generated four key concepts. Each concept then developed to focus and refine the study and subsequently generated the research questions:

Q1. How do adolescents construe the nature and structure of a chance event?

Q2. Is there a meaningful taxonomy of adolescent chance events?

Q3. How do adolescent perceptions of chance events relate to their opportunity awareness?

This research used a Mixed Methods design as it produced both quantitative and qualitative data from both questionaries and focus groups. The participants in the overall research investigation were students who were enrolled in both the middle and senior school, which includes Years 6 through

to Year 12, conducted in a single campus school, locate in the 3rd largest city in Victoria.

Within an Objectivist epistemology, positivism was chosen as the theoretical perspective through which the overall research investigation was conducted, and data examination inferred.

The study found that students reported both positive and negative experiences, but negativity and lower controllability biased their reporting. Female students reported more chance events overall, with this negativity bias lessening with age. Career-related chance events were the least recognised. While students often saw chance events as more likely to happen to others, they acknowledged both opportunities and challenges within them. Religious beliefs, particularly Christian viewpoints, also impacted students' perceptions. They interpreted events, even negative ones, as part of a larger plan, reducing the role of luck and emphasising a "reason for everything" perspective.

These findings point to the importance of considering gender and age and, religious and cultural contexts when investigating chance and luck in young people, revealing a complex interplay between optimism, chance identification, and religious beliefs warranting further research.

Data garnered from the research could inform the development of career education programs within schools to better prepare adolescents for careers in the 21st century. A better understanding of how young people perceive chance events may also inform counselling practice in general, not just vocationally.

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Glossary of Terms

Career/s   Careers are dynamic, unique to each person, and involve balancing paid and unpaid work, learning, and personal life roles across the lifespan (National Careers Institute, 2022).

Career Counselling

Offers a supportive space to help people navigate the complex and ever-changing world of work, enabling people to find their own solutions to a variety of job challenges (Brown, 2021).

Career Development

Career development is the process of managing life, learning, and work over the lifespan. It applies to everyone:

~ children think about what they want to do as adults and start to form ideas about work and adult life during their early childhood development.

~ Adolescents make decisions about subjects and a course of study, they juggle school, part-time work, family, and social interests.

~ Adults work in the home, in paid employment, as volunteers, they work part and full time, have casual jobs, and manage family life and social interests. They participate in a range of ongoing learning experiences throughout their adult lives. They may change several jobs, occupations and locations across their lifetime and will experience periods of unemployment, overemployment, and underemployment. How they respond to these life challenges are all part of their career development. (Career Education Association of Victoria, 2018)

Career Education

The development of knowledge, skills, and attitudes through a planned program of learning experiences in education and

training settings. This will assist students make informed decisions about their life, learning and work options, and enable their effective participation in working life. (National Careers Institute, 2022)

Labour Market

The market in which employers look and compete for workers and in which workers look and compete for employment (National Careers Institute, 2022).

Middle School Student

Students enrolled in Grade 6, Year 7, Year 8, and Year 9. This can encompass the age bracket of 10 years of age to 15 years of age.

Senior School Student

Students in Year 10, Year 11, and Year 12. This can encompass the age bracket of 15 years of age to 20 years of age.

Work   A set of activities such as paid employment, parenting, care work, or volunteering from which it is hoped a person will derive personal satisfaction (National Careers Institute, 2022).

List of Abbreviations

ABCD   Australian Blueprint for Career Development

ACARA   Australian Curriculum, Assessment and Reporting Authority

AITSL   Australian Institute for Teaching and School Leadership

ATAR   Australian Tertiary Admission Rank

CDAA   Career Development Association of Australia

CEAV   Career Education Association of Victoria

CICA   Career Industry Council of Australia

COAG   Council of Australian Governments

CTC   Chaos Theory of Careers

KLA   Key Learning Area

LRI   Luck Readiness Index

OECD   Organisation for Economic Co-operation and Development

RTO   Registered Training Organisation

SES   Socio-economic Status

TAFE   Technical and Further Education

VCAL   Victorian Certificate of Applied Learning

VCE   Victorian Certificate of Education

VET   Vocational Education and Training

VETDSS   Vocational Education and Training Delivered to Secondary
          Students

CHAPTER 1: RESEARCH PROBLEM IDENTIFIED

"Complexity/chaos offers the possibility of an engaged science not founded in pride, in the assentation of an absolute knowledge . . . but rather in a humility about the complexity of the world coupled with a hopeful belief in the potential of human beings doing something about it" (Byrne, 1998, p. 45).

1.1 Introduction and Global Context

Over the past three years, which has included the COVID-19 pandemic, the world has undergone significant transformations characterised by a confluence of health, economic, and geopolitical challenges, along with mounting social and environmental pressures. COVID-19 was an acute shock, and its ongoing impacts have placed persistent stress on individuals, institutions and businesses globally (Trimboli, 2023). These changes have profoundly impacted labour markets worldwide, reshaping the demand for future jobs and required skills, leading to divergent economic trajectories in both developing and developed economies (OECD, 2021). The Fourth Industrial Revolution, evolving worker and consumer expectations, and the urgent need for sustainable practices are further reconfiguring the workforce's sectoral composition and driving demand for novel occupations and skills. Moreover, global supply chains must swiftly adapt to cope with increasing geopolitical volatility, economic uncertainty, rising inflation, and higher commodity prices (World Economic Forum, 2023).

These transformations point to a pressing need and responsibility for educators to prepare young people to be adaptable, agile and open to emerging occupations and skills. This research investigation addresses the importance for educators when working with young people to keep these contextual factors of emerging occupations and required skills at the forefront of career education.

Chapter 1 firstly explains the research problem and the policy context in which it exists. Secondly, the major research question is presented, addressing the research problem. Thirdly, the research objectives, the guiding subsidiary questions, as well as the limitations and significance of the overall research investigation are described. Finally, Chapter 1 provides a detailed

outline of the thesis, along with presenting an overview of the content of each Chapter.

The current discourse on the future of work is that technological change is an immediate reality, not a distant possibility. Globalisation, technology, and automation are changing work and occupations, and creating new jobs. Various occupations are adapting to utilise innovation (OECD, 2023). For example, construction workers use drones, visualisation software, and satellite imagery instead of manual tools and measurement techniques. This shift demonstrates how medium-skilled occupations are expanding to include higher-skilled tasks due to the augmentative effects of technology, as well as improved safety and productivity (National Skills Commission, 2021).

According to forecasts, Australian workers are expected to undergo about 2.4 career changes in the upcoming two decades. In addition, even those who remain in their current positions will need to regularly update their skills to adapt effectively to evolving job requirements. It is estimated that the nature of tasks within Australian jobs will be changed by an average of 18% per decade. As a result, people in Australia are expected to devote 33% more time to education and training throughout their lives by 2040, resulting in an additional 8,000 hours, or an average of three hours a week, until retirement (AlphaBeta, 2020).

The five major education trends predicted in 2023 and beyond are:

- artificial intelligence (AI)
- remote, online and hybrid learning
- a shift from colleges/universities towards Vocational Education & Training (VET)
- virtual and augmented reality
- soft skills and Science, Technology, Engineering & Mathematics (STEM)
  (Marr, 2023).

These predictions are already beginning to come to fruition with, for example, the advent of ChatGPT and other AI. Similar to how switching to online training in response to COVID-19 forced a paradigm shift in how vocational education is approached in 2020, the controversy surrounding

ChatGPT and similar chatbots, as well as the implications of AI for training and assessment, feels like one of those moments that could force a change in how vocational education is approached (Trimboli, 2023).

Within the existing body of literature, there are various scholarly works which advocate for strategic actions in response to the future of work (Cassells et al., 2018; Acemoglu & Pascual, 2019; AlphaBeta, 2020). These measures are primarily aimed at companies exploiting technological advances to maintain their competitive advantage, while highlighting the importance for individuals to proactively engage in lifelong reskilling and retraining efforts to effectively meet evolving skills requirements (National Skills Commission, 2021).

As businesses embrace frontier technologies, tasks such as data processing are becoming more automated, leading to changes in labour markets and the required skill sets. The shifting frontier between human-performed work tasks and those handled by machines and algorithms has been previously documented in The Future of Jobs Report (World Economic Forum, 2020), and this trend continues in the present year. In contrast to expectations during the COVID-19 lockdowns and remote work surge in 2020, the human-machine frontier has shifted at a slower pace, with a smaller increase in the fraction of automated tasks than anticipated. The horizon for future automation has extended further into the future compared to what surveyed businesses had previously predicted. Presently, organisations estimate that 34% of business-related tasks are performed by machines, while humans handle the remaining 66%, representing a mere 1% increase in automation since the 2020 edition of the Future of Jobs Survey (World Economic Forum, 2023). However, the future is foreseeable; if a task can be automated, it likely will be. "Automation has varying effects within occupations and industries. It can replace labour in some jobs and tasks humans used to perform as well as creating new tasks and demand for labour" (National Skills Commission, 2021, p. 154).

The British Council believes that:

65 per cent of today's students will be employed in jobs that don't yet exist, which means preparing our young people for the future world of work has never been more challenging. While qualifications and knowledge remain important, the students of today need the opportunity to grow into creative and critical citizens, ready to shape the future for themselves. (British Council, 2023, para 1)

The Foundation for Young Australians "New Work Order report series highlights the increasing dynamism and complexity of our working lives, where today's 15-year-olds will likely navigate 17 changes in employer across 5 different careers" (Foundation for Young Australians, 2018, p. 8). To ensure the readiness and success of young Australians in facing the challenges of the future, action is required. It is crucial to equip young people with the career management skills necessary to navigate the ever-changing job landscape effectively. In preparing young people promoting the pursuit of pathways which foster entrepreneurial skills, are essential for seamless transitions across different future employment opportunities. Another important aspect is exploring innovative models for work-integrated learning (WIL). "WIL encompasses any arrangement where students undertake learning in a work context as part of their course requirements. WIL can be undertaken as part of coursework or research training" (Tertiary Education Quality and Standards Agency, 2023, para 1), allowing students to gain vital work experience alongside their education. Also, establishing robust support systems to prioritise the well-being of young people during this critical phase of transition is vital. The competencies we instil today will have a profound impact on Australia's youth for generations to come (Foundation for Young Australians, 2018). A global demonstration of the importance of career resilience came prevalent in the form of a pandemic (COVID-19).

During the 2020 pandemic, we and our students have been witnesses to unprecedented changes and surprising behaviours:
- The need to live with complexity, exceptionally rapid change, uncertainty, fear, and vulnerability.

- The remarkable human capacity for resilience in responding to the overnight disruption of long-established patterns of working, living, and social.

  (Talanquer et al., 2020, p. 2697)

The modern workplace is marked by constant change. To perform optimally in the global market, people need to comply with changes (Tien & Wang, 2017), and to flourish amidst constant change, young people must cultivate a state of being 'Luck Ready'. Luck Readiness can be defined as "recognising, creating, using, and adapting to opportunities and outcomes that occur by chance" (Pryor & Bright, 2005b, p. 2), with the intention of indicating an openness to change to identify and use the positive and negative potential outcomes of future events. In summary, individuals are best placed to be open to opportunity. The relevance of this research points to the importance of young people engaging with positive and negative chance events as leverages for their self-development.

1.2   The Research Issue

1.2.1   Background to the overall research investigation

The motivation for this study emerged out of the researcher's work as a secondary school teacher assigned the responsibility of all things Vocational Education and Training, which included being the Careers Teacher/Advisor within the research site hereafter referred to as the College.

The Site of the Research

The College is a low-fee, co-educational Evangelical Protestant institution offering a Christian education centred on the Bible's truths for students aged approximately 5 - 20 years of age, Years Preparatory to 12 (Australian Curriculum, Assessment and Reporting Authority, 2023). The College is located within a lower socio-economic suburb of a major regional city in Victoria, Australia. Being the only non-denominational Christian college in the region, the College attracts students that are representative of the whole socio-economic spectrum. Students from low-income families through to students from high-income families, with all of the associated social and

cultural issues of these social classes, e.g., students with strong family support at home to students with no home, living in supported accommodation.

The Researcher

This researcher is a professional career development practitioner fully registered with the Career Industry Council of Australia (CICA) and a professional member of the Career Development Association of Australia (CDAA). In addition to working at the College, this researcher also engaged in private counselling, specialising in adolescent career development. As there are colleges within the region that offer little or no careers education and counselling, the researcher continued to counsel students and adults who have come from many other colleges, elite private institutions, and Government schools alike. As such, over many years the researcher has counseled many young people and witnessed the effect that poor, or little to no career's education, and little to no career resilience, has had on the overall wellbeing of adolescents after they have left secondary school.

The Nature of Adolescence

The concept of adolescence is socially constructed. Children were considered adults when they reached physical maturity in pre-industrial society; however, today we have an extended time between childhood and adulthood known as adolescence (National Academies of Sciences, 2019), puberty generally marks the beginning of adolescence, which lasts until early adulthood or emerging adulthood. Adolescence typically lasts from 12 to 18 years, and it has predictable developmental milestones (Lazzara, 2023).

A major part of this researcher's role working with students from multiple schools in the region was spent counselling young people. Many of whom have been former Year 12 students returning in December for assistance with the Victorian Tertiary Admissions Centre (VTAC) change of preference option, once they had realised that they did not obtain the Australian Tertiary Entrance Rank (ATAR) they required for the course into which they had aspired entry. The ATAR is used by tertiary institutions as a

student recruiting tool and is a number between 0.00 and 99.95 that represents a student's academic achievement in relation to all other students in their state and age group (University Admissions Centre, 2023).

Many young people sought the support from me in my role as counsellor at the school in January shortly after first round offers had been released, at which time they had either not been offered a place at university or been offered a place in a course they did not actuality wish to undertake. This sort of occurrence is common and certainly not localised to the public or private education sector. However, it is this sort of happenstance that students should have been prepared for as part of their respective school career education programs. These factors of careers' programs, such as, disruption, impact, traditional approaches, and successors are explored in the following section.

1.2.2 Career Education

According to the Victorian Curriculum and Assessment Authority, Career Education:

> …is a carefully planned program of learning experiences – in education, training and workplace settings. It helps students make informed decisions about courses and careers, see the connection between school and future careers and gives them skills and knowledge to effectively navigate multiple and complex careers throughout life. (Victorian Curriculum and Assessment Authority, 2023, para 1)

Disruptive Change to Career Education

The COVID-19 pandemic has significantly altered a lot of things in our environment, including how we teach. Our recovery from the epidemic offers a chance for in-depth contemplation and deliberate action about what we teach and why, as well as demonstrating how we support student learning. (Talanquer et al., 2020).

Governments and, subsequently, schools have been compelled to take action in response to challenging labour market conditions, a rise in youth

unemployment, and evolving perspectives on well-being and positive education. This has resulted in a growing political push towards career education and development (Keele et al., 2020).

Influences on Career Education

There are numerous terms and definitions that influence the scope and nature of career education in schools. To avoid ambiguity, this overall research investigation refers to 'career education' (Groves et al., 2023) as:

> "The development of knowledge, skills and attitudes through a planned program of learning experiences in education and training settings. This will assist students make informed decisions about their life, learning and work options and enable their effective participation in working life" (National Careers Institute, 2022, p. 32).

With the changing landscape of work, new demands will be placed on employees in the future workplace. Today's preschoolers will interact with a different world, one that they have not even begun to imagine. They will be expected to perform tasks that have not yet been invented, make use of undiscovered technologies, and deal with unanticipated social, economic, and environmental difficulties (Australian Government, 2019). As such, a nuanced career education, one that is adaptable, agile, and responsive to the unanticipated social, economic, and climatic changes, has never been more important.

"Reviews of practice have found that career education is typically introduced too late in schooling" (Keele et al., 2020, p. 63), often not beginning until Year 10, and typically concentrated around the period of time that the school dedicated to allowing students to attend a Work Experience placement, "much of the research on the effectiveness of career education focuses on the outcomes of career advice, information or counselling" (Ithaca Group, 2019, p. 6). The minimal research undertaken before Year 10 hence informed the participant selection for this investigation. Similarly, the dearth of research with younger adolescents research into traditional approaches to career development, has limitations due to the evolving nature of the

contemporary work force. Research studies into the traditional approaches of career development are understandably no longer are 'fit for purpose'.

Traditional Approaches

Traditional approaches to career development (and by extension career education) seek to match a person to a job based on their preferences, likes/dislikes, a person-environment typology through tools such as psychometric testing e.g., The Self–Directed Search (Holland, 1985), and a more Australian variation on the same theme, the Occupational Search Inventory (Pryor, 2001). There are many such psycho-metric tests, most of which are online and offer a printable report at the end. Examples of such online tests are favoured by schools due to their ease of use and the subsequent generation of a tangible report to take home to parents/carers include myfuture's 'My Career Profile' (myfuture.edu.au) as a free service funded by Australian State and Territory Governments, and Morrisby (https://www.morrisby.com) an example of a commercially available product.

Trait-matching career counselling involves matching the interests of the individual to various occupations based on inventory-measures (McKay et al., 2005). However, the validity of this sort of assessment relies on the predictability of individuals and environments (McKay et al., 2005), which is not representative of life in today's society. There have been issues identified with such typology type assessments. Arnold (2004), for instance, has identified congruence issues with Holland's theory of vocational choice stating that the "measures of people and environments partially neglect some important constructs … that environments have not been conceptualised or measured entirely appropriately … the data that is used in the calculation of congruence indices are insufficiently precise or comprehensive" (Arnold, 2004, p. 95).

The theories behind such typologies have been criticised by Savickas (2005), McMahon and Patton (2002), and Pryor (2006) as "insufficient", "limited and oversimplified" and Borg et al. (2006) as "simple-minded". Traditional secondary school career education tends to overuse these types of careers assessments due to their accessibility, simplicity and tangible

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qualities. Programs such as Career Compass (JIIG-CAL, 2023) use such person-environment typology questions. These questions are used to generate a report with suggestions of possible occupations that suit the student, based on how they answered questions such as 'I prefer to work indoors rather than outdoors'. This type of program represents just one of many such online or networked psychometric-testing platforms available in the market. Once purchased, be placed onto the school network, and used for a class. For some schools, this, in conjunction with work experience, comprises their entire career education program. In the context of career education, these programs serve as the foundation for the successors of career education.

Successors of Career Education

Research has revealed that when career development, and by extension career education, is incorporated into the curriculum, it has the greatest meaning (Hooley et al., 2011, 2021; McCowan et al., 2023). The incorporation of career education into the regular curriculum is not a new philosophy, as the Australian Education Council (1992) report into *Career education in Australian schools* suggested the same; however, the practice thereof does not resemble what happens in the majority of Australian schools. Possibly due to the lack of qualified specialist career educators and time constraints in what has been described by many teachers (the researcher included) as a *crowded curriculum*, " career education and development varies in quality and quantity, generally starts too late in schools, and frequently does not meet needs" (Keele et al., 2020, p. 55). In addition to the "crowded curriculum," the quality and quantity of career education vary depending on the interests and experiences of the individual teacher delivering the lessons, "Teachers benefit from acknowledging what they don't know and accepting that they—like everyone—have biases they may not be aware of" (Hutchison, 2019, p. 2).

Career education and "counselling has traditionally been made based on matching a client's traits to a linear career path. This approach ignores or underestimates the relationship between chance and planning in careers"

(Borg, 2015, p. 12). As a result, these traditional approaches inadequately prepare young people to recognise opportunities and deal with ongoing changes that are necessary for thriving in the complex and constantly changing workplace of the twenty-first century. As such, careers educators may well profit in underpinning their practices with a theoretical perspective. In response to these limitations, a theory which takes into account the role that complexity, ongoing change, and chance play in career decision-making is explained in the following section.

1.2.3 Chaos Theory of Careers

The theory was developed in 2003 by Robert Pryor and Jim Bright, who adapted their theory from the scientific field of physics: Chaos Theory. The Chaos Theory of Careers (Pryor & Bright, 2003a, 2003b, 2011) seeks to incorporate unplanned or chance events into career development. Authors such as Krumboltz (1998), Mitchell et al., (1999) and Krumboltz and Levin (2004) have highlighted the importance of chance events with their *Planned Happenstance formulation*. More recently, however, the Chaos Theory of Careers (Pryor & Bright, 2003a, 2003b, 2007, 2009) has "provided a theoretical conceptionalisation of the relationship between pattern, order and instability, organisation and chance" (Borg et al., 2006).

The Chaos Theory of Careers conceptualises the individual as a complex, dynamical system interacting with other similarly complex systems, which can be other individuals, right through to political events and global disasters, which influence the individual in varied ways. There are various career influences according to Patton and McMahon (1999), including interests, parents, abilities, physical environment/geography, age, sex, and social and environmental contexts. Bright and Pryor (2005) use Ping-Pong Balls and Puppies as an abductive illustration of the Chaos Theory of Careers, to explain the different influences on the individual. They contrast a ping-pong ball being dropped from waist height in a room with nothing in it, as an individual using a person-environment typology, e.g., The Self–Directed Search career assessment (Holland, 1985). The ping pong ball is likely to fall in the same position each time if it is dropped in an empty room; however,

when fans, open windows or puppies are added, then the chance that these balls will fall in the same position each time is slim. This example of 'ping pong balls and puppies' is reminiscent of the influence placed on an individual as described by Patton and McMahon (1999), as well as the significant influence of chance events described by Bright (2003a), Bright et al. (2005a) and Mitchell et al. (1999).

Chance events can be any event that was not planned for or expected. For example, a student who wanted to be a police officer until a chance event occurred, where the family was in an accident, requiring an ambulance. After the event and having had contact with a charismatic ambulance officer, the student changed their preferences and went on to study Nursing with the aim to become an ambulance officer. There are many examples of chance events that influence an individual, such as going through a personal crisis that causes you to reevaluate your priorities, or a change in technological or industry trends that opens new job opportunities or makes obsolete current skills. Events such as these, highlight the limitations of such person-environment typology career assessments such as 'The Self–Directed Search' (Holland, 1985), as they simply do not account for all of the influences or chance events experienced by an individual. In light of the limitations of person-environment typology career assessments, which fail to encompass the full spectrum of influences and chance events in an individual's career trajectory, the concept of *Career Resilience* and how it empowers individuals to navigate and excel in the face of such uncertainties.

1.2.4 Career Resilience

Another common chance event scenario aligned to the original research problem, is a student who desperately wishes to do a course of study at university that requires a high ATAR score. There can be many influences on the student as to why they did not receive the ATAR score they required. For example, significant events in the student's life such as a death in the family or an event within the young person's circle of friends. Alternatively, the student simply may not have had the academic aptitude or study regime required to achieve a high score. When a student has put their

highly intense focus over two years into gaining admission into a particular course of study, and does not receive a tertiary course entry offer, the student (depending on their situation) may potentially experience a state of profound emotional distress as a result. A student's resilience is very important as is their career self-efficacy. By the time the student receives their ATAR score, they have already left school and require the skill set/abilities to self-reassess and plan. Self-efficacy refers to an individual's belief in their ability to successfully accomplish tasks, meet challenges, and achieve desired goals based on his or her perceived competence, experience, and mastery of skills (American Psychological Association, 2023). Resilience is a key factor in career education from the perspective that it teaches students to manage life's disappointments. To maintain a healthy level of career self-efficacy it is important for individuals to be able to reframe an experience from a negative to a positive and to reset goals that reflect the new situation (Walker, 2006).

Most people will need to adjust to several career changes throughout their lifetime, work for a number of organisations, and experience times of unemployment and underemployment (Ellyard, 1993; Handy, 2007, 2012). "Research shows most people will change careers at least once in their lives. In fact, the average person tends to go through 3-7 careers before they retire, and this number may be more like 5-7 for the current and upcoming generations of workers" (The University of Queensland, 2023). Given the potential for multiple career changes, career education needs to include teaching about the ability to cope with change; to understand that change is neither positive nor negative – it is just change. Students need to become *Career Resilient* and have the ability to reframe perceived negative change as an opportunity - they need to become *Opportunity Aware* or *Luck Ready*. The ability to recognise and identify potential opportunities in one's environment is referred to as opportunity awareness. It is a cognitive process that entails being aware of one's surroundings, understanding the needs and desires of others, and recognising how one's skills and resources can be used to create value, as well as "the ability of students to know about work opportunities and their requirements" (Pitan, 2023, p. 77).

It is desirable for individuals to build capacity in resilience, which is the "…happy knack of being able to bungy jump through the pitfalls of life. It is the ability to rebound or spring back after adversity or hard times" (Fuller, 2004, p. 3). Resilience itself has certain characteristics. "Empirical evidence indicates that resilience is dynamic, developmental in nature, and interactive with one's environment" (Ahern et al., 2008, p. 32). There are many definitions of resilience, which could be indicative of the complexity of the topic. It has Latin origins, '*resiliens*', meaning pliable or elastic feature of material. One of the most succinct definitions found is "positive adaptation despite adversity" (Masten, 2001; Werner, 1989).

Charles-Henri Amherdt (2005) suggests that career resilience is linked to an ability to have a clear view of what lies ahead (Canadian Career Development Foundation, 2007). There are many references to career resilience that can be found throughout the literature. Borgen et al., (2004) describe it as the outcome of careers interventions, and we can also find tools that access our levels of career resilience in the media, and online (Borgen et al., 2004). Mishra and McDonald (2017), define Career Resilience as "a developmental process of persisting, adapting, and/or flourishing in one's career despite challenges, changing events, and disruptions over time" (p. 10).

There is a positive correlation between resilience research and outcomes for career development. This is particularly valid for individuals who experience limited exposure to diverse experiences, the lack of positive role models, or experience inadequate financial resources (Srivastava & Madan, 2020). Resilience can be used as a framework in a career education curriculum, which would focus on students being taught skills, attitudes and strategies to face "transition, unexpected disappointments and adversity" (CCDF, 2007).

Given the likely continuation of the current chaotic and turbulent career environment, there is a need for the development of career resilience in people. Initiatives for training and development as well as career counselling can help with this task (Mishra & McDonald, 2017).

To prepare students to be aware of and identify opportunities – or be "Luck Ready" - this overall research investigation aims to refocus attention away from the widely researched concept of resilience and toward the exploration of students' understanding and comprehension of the dimensions of opportunity awareness as measured by administering the *Luck Readiness Index* (Pryor & Bright, 2005b) by Pryor and Bright (2011) as curiosity, flexibility, luckiness, optimism, persistence, risk, self-efficacy and strategy.

The term Luck Readiness was penned by Nealt (2002) to indicate an "openness to change in order to identify and use the positive and negative potential outcomes of future events" (Pryor, 2010). It is defined "as recognising, creating, utilising, and adapting to opportunities and outcomes occasioned by chance" (Pryor & Bright, 2005b). Having now identified the research issue, the following section defines the research problem, articulating the specific challenges and questions which guide the overall research investigation.

1.3   The Research Problem Defined

In this researcher's experience students tended to turn to career counselling post graduation from secondary school. The reason for this timing appeared to be linked to students experiencing a previously unexpected event in their lives. Their responses to such unexpected events raised a sense of curiosity within this researcher, causing a questioning of whether the students viewed such unexpected events as an opportunity or perceived them in a negative light. Those who viewed the event negatively did not appear to have identified their 'chance event' as an opportunity and, as such, were not 'Luck Ready. Their career resilience, such as understanding the dynamics of their environment (Ahern et al., 2008), revealed their inability to reframe their chance event. Hence, the problem is that it is not known exactly how younger adolescents view chance events in their life and career trajectories, and potential ramifications for their futures.

The problem poses a significant concern for several reasons. Those who neglect to recognise chance events as opportunities may face challenges in adapting to unexpected changes in their lives and careers. Potential neglect

could lead to missed chances for growth and success. Additionally, lacking the ability to reframe these events may hinder their overall career resilience and ability to navigate their environments effectively. Consequently, young people seizing opportunities, or not, have far-reaching implications for the future well-being and success of these individuals. The research problem, explained and justified, informed the purpose of this investigation presented in the next section.

1.4   The Research Purpose

The purpose of this research is to explore how students perceive unplanned events and if their perception of such events influence or relate to their Luck Readiness Profile. This research seeks to identify how adolescents perceive chance events and if that perception relates to their opportunity awareness.

1.5   The Major Research Question

In identifying how adolescents perceive chance events and opportunity may inform their career decision making and self-efficacy. Hence, the current overall research investigation examines how adolescents view occurrences that happen by chance and if that view relates to their awareness of opportunities. As such the major research question is:

How do young people characterise career-related chance events?

1.6   Subsidiary Research Questions

To answer the major research question, an extensive review of the existing literature on the topics was conducted, and a synthesis thereof generated three key concepts. Each concept then developed to focus and refine the overall research investigation and subsequently generated the following research questions pertinent to career education programs:

Q1. How do adolescents construe the nature and structure of a chance event?

Q2. Is there a meaningful taxonomy of adolescent perceptions of chance events?

Q3. How do adolescent perceptions of chance events relate to their opportunity awareness?

1.7   Significance of the Research

Careers education studies over the last 20 years have argued that the preparation for students is problematic because the future of jobs is unknown. "According to former United States Secretary of Education, Richard Riley, the top 10 in-demand jobs in 2010 did not exist in 2004" (Gunderson et al., 2004, p. 15). Underscoring the rapid pace of change in the job market and the evolving nature of the skills required, highlighting the critical importance of adaptable and forward-thinking education systems. "We are currently preparing students for jobs that don't exist yet, using technologies that haven't been invented, in order to solve problems, we don't even know are problems yet" (Banks & Barlex, 2021, p. 133). The vast changes taking place in the workforce today hinges on an array of issues, such as the number of job roles and/or positions an individual may have in a lifetime, the importance of ongoing education and learning that must take place, and the value of generalist work skills. These changes in the nature of work have meant "a rise in the importance of and necessity for the provision of career services across the lifespan" (McMahon et al., 2003, p. 3), and that it has an economic value to the nation, not just the individual (McMahon et al., 2003).

Many studies have a common thread: young people are likely to live a life full of ongoing transitions in their personal, social, academic, and professional futures given the ongoing and accelerating rate of change and uncertainty in many countries (Borgen & Hiebert, 2006; Patton & McMahon, 2021).

Chance events happen to us all, but how we choose to view them is what dictates the ultimate outcome each time. Theoretical perspectives in sociology, vocational and career psychology, and other fields have long acknowledged the influence of chance on people's working lives. Moreover, we frequently experience the phenomenon of chance occurrence in our intrapersonal, interpersonal, familial, communal, organisational, professional, leisure, and other spheres of life (Chen, 2002).

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Research into chance events has increased recently (Borg, 2015; Hirschi & Valero, 2017; Kim et al., 2019; Kim & Baek, 2020; Kindsiko & Baruch, 2019; Torpy, 2017), however in previous years the studies were limited in their scope and mostly surveyed older participants. Notable research that originated from the Chaos Theory of Careers include: "The role of chance events in career decision making" (Bright et al., 2005), and "Chance events in career development: Influence, control and multiplicity" (Bright et al., 2009). However, despite their additions to the overall repository of knowledge, these research papers were limited in their field of research by age. Both studies focused mostly on university students and other mature aged respondents, with only a small part of one of these studies (Bright et al., 2005) using 105 high school students.

Empirical research has primarily concentrated on the career chance experiences of young adults instead of older adults and professionals (Kim, 2021). Most quantitative studies have collected data from university students, making them the most widely studied group. However, no qualitative research has been conducted on younger students. Since the perceptions and experiences of these younger individuals regarding career chance events could offer valuable insights into career education and vocational guidance, exploring their viewpoints becomes crucial (Kim, 2021).

The overall research investigation is unique from others on this subject in that it exclusively focuses on students between the ages of 10 and 20. This will be accomplished by attempting to comprehend adolescents' perceptions of chance events and their opportunity awareness in greater depth. Study 3 incorporates the Luck Readiness Index (LRI). As such LRI's efficacy as a tool for adolescent career education and counselling should also be understood.

Insights gained from the overall research investigation could inform the design of learning interventions both curriculum-based and practical. Such interventions could be beneficial in both mainstream and career education, that encourage a positive and confident response in the light of unexpected career change, chance and opportunity. And therefore, enhance students' capacities to confront and thrive on changes in their careers by becoming

more adaptable and resilient to change in their careers (see Chapter 8, Section 8.6, Recommendations).

1.8   Limitations of the overall research investigation

To ensure the overall integrity of the overall research investigation, it is important to point out the limitations and delimitations therein. Limitations are the elements over which the researcher has no control and delimitations are those elements the researcher can control (Creswell, 2008).

Limitations of the research investigation provide a manner in which to recognise possible errors or problems in the interpretation of results thus determining how widely the results can be generalised.

In the present research investigation, the researcher acknowledges that he has no control over the size of the sample, location of the college, demographic of the sample, reliability of data collection, how seriously the students consider their answers to the questionnaires and participate in the focus group discussion. Or the specific cultural or religious beliefs on participating students.

1.9   Delimitations of the overall research investigation

Delimitations are influences in which the researcher usually can control, that define the boundaries and/or limit the scope of the overall research investigation and can impact the external validity or generalisability of the results (Theofanidis & Fountouki, 2019).

In the present research investigation, the researcher acknowledges that there is no control over the location of the research site or which of the senior students participate in the focus group. Also, the time frame of the overall research investigation was a consideration. The data were collected when students completed the questionnaires and focus group interviews. The location and timing of the focus groups needed to acknowledge an optimum time to minimise any impact on student study. The delimitations described here are necessary to understand the boundaries of the research, as outlined in Chapter 3.

1.10   Outline of the Thesis

Chapter 1 introduced the thesis and offered a background to understanding the research problem and elucidated the research purpose including the major and subsidiary research questions. The Chapter explained the significance of the research, the limitations and delimitations of the overall research investigation, and concluded with this outline of the thesis.

Chapter 2 presents a comprehensive review of relevant literature, expanding on the research problem, and develops research questions to direct the overall research investigation's execution. The literature review is grouped into four concepts as they pertain to chance events and opportunity awareness:

1. Career Development Theory
2. Chaos Theory of Careers
3. Chance Events
4. Luck Readiness

Chapter 3 provides a detailed and justified account of the research design and methodology used in the overall research investigation. The Chapter explains the theoretical framework of the overall research investigation, including the research paradigm, theoretical perspective, research methodology, data collection and analysis methods, including study verifications, and how research participants were selected.

Chapter 4 presents the context and findings of Study 1. This study engaged students in Grade 6 through to Year 12 inclusively, examining students' perceptions of chance events by asking them to generate words which they relate to chance events. Students were also tasked with creating narratives about potential chance events that could occur while looking for work. In addition, students' personal experience of a chance event was captured.

Chapter 5 outlines the context and findings of Study 2. The scope of this study involved students spanning from Year 8 through Year 12, inclusively. Study 2 explores students' ability to correctly identify chance events which are presented to them in a realistic scenario, identifying the

attributions of students by measuring the degree to which they consider chance events to be personally relevant to their own lives.

Chapter 6 presents the context and findings of Study 3. The study's purview was restricted to students in Years 10 through 12 exclusively. Study 3 explores students' understanding and comprehension of the eight dimensions of Opportunity Awareness (Pryor & Bright, 2011): curiosity, flexibility, luckiness, optimism, persistence, risk, self-efficacy, and strategy. Also investigated were students' abilities to identify chance events presented to them in contextually relevant vignettes. Their thinking and reasoning about chance events was explored by asking them to identify a category to which the chance event should be assigned, with the goal of gaining a better understanding of how young people interpret, evaluate, and categorise chance events.

Chapter 7 presents the context and findings of Study 4. The parameters of this study encompassed solely students in Years 10, 11, and 12. The study used focus groups to better understand how young people perceive chance events and opportunity awareness. Three separate focus groups were facilitated, one for each year-level, to allow for a thorough examination of the differences in students' perceptions across the years.

Chapter 8 affords a thorough conclusion to the overall research investigation. It presents an overview of the research, the methodological approach used, and an acknowledgement of the overall research investigation's inherent limitations. A comprehensive analysis of the overall research investigation's findings is presented by way of a detailed examination of the research questions. Also presented in Chapter 8 are recommendations for future research and educational interventions derived from the findings of the research.

1.11 Conclusion

The underlying assumption which guides this research is that students seem to appear to have a negative perception of chance events and do not recognise the associated potential opportunities, as they are possibly not 'Luck Ready'. This is evident in the conceptual framework, which further

organises the elements into four concepts as they pertain to chance events and opportunity awareness. This framework is influenced by Chaos Theory and subsequently the Chaos Theory of Careers.

The following Chapter (Chapter 2) provides a synthesis of the literature relevant to the overall research investigation's goals, a critical synthesis of the academic literature on career development theory, and relevant principles of the Chaos Theory of Careers, which serve as the thesis's foundation, and demonstration of how the subsidiary research questions were derived.

CHAPTER 2: LITERATURE REVIEW

2.1 Introduction

The purpose of this study is to explore students' perceptions of chance events and how they may relate to their Opportunity Awareness.

This chapter presents: an overview of the literature pertinent to the purpose of the research investigation; a critical synthesis of the scholarly literature on career development theory; and an account of the tenets of the Chaos Theory of Careers (CTC) (Pryor & Bright, 2003a, 2003b, 2011), which underpins the thesis. The researcher's professional experience working with Australian high school students suggests that they perceive chance events in their lives in a negative manner. This negativity implies a lack of preparedness for unforeseen circumstances, indicating that they are not 'Luck Ready'. The research aims to explore how adolescents perceive chance events and whether this perception correlates with their awareness of opportunities. The synthesis of the career development theory literature is necessarily constrained due to its abundance and will serve to illuminate both the problem and purpose of the research within the scholarly dialogue centring on the perception of chance events.

It is important to recognise the extensive breadth and depth of the existing literature on career development, which is attributable to its multidisciplinary and interdisciplinary nature. In light of this, a selective approach has been taken in this research investigation to include solely the literature that directly aligns with the specific research objectives that elucidate adolescent perception of chance events. By concentrating on the most relevant and appropriate sources, the intention is to establish a solid foundation for analysis, firmly rooted in the latest and most applicable scholarly contributions within the field of study.

According to the Career Industry Council of Australia (2020), Career Development is defined as "The process of managing life, learning, work, leisure, and transitions across the lifespan in order to move towards a personally determined future" (p. 5). Therefore, effective career development requires active participation by the individual, where the responsibilities lie

with the individual student to educate themselves and work towards setting appropriate goals for themselves in what Poehnell and Amundson (2002) have termed "career craft" (Amundson, 2003, p. 3). Also, acknowledging the probability of and planning for chance events in their lives will likely affect the goals that they have set for themselves. McMahon and Tatham (2008) articulate it succinctly: "the goal of career development work is to assist individuals to develop the skills and knowledge to effectively manage their careers" (p. 11). It is the development of these skills and knowledge that should be the charge of careers education in at least this part of the 21st century.

This chapter begins with an explanation of the Conceptual Framework of the study (see Section 2.2), followed by a focused review of Career Development Theory, beginning with an historical context followed by a deeper look at theories which have shaped the industry, including Trait and Factor Methodology, Developmental, Constructivist, and Psychodynamic Theories (see Section 2.3). The following section explores the world of Chaos Theory, including the Chaos Theory of Careers and three seminal concepts from therein: Complexity of Influences, Chance, and Chance Events (see Section 2.4). This is where the generation of the subsidiary research questions one and two were developed and are stated.

The final section of this chapter focuses on Opportunity Awareness – which is where the generation of the third and final subsidiary research question was developed and is stated (see Section 2.5) – and Luck Readiness (see Section 2.6). The chapter ends with the conclusion summarising the chapter and informing the focus of chapter three (see Section 2.7).

2.2   Conceptual Framework

The underlying assumption that guides this literature review is that students seem to appear to have a negative perception of chance events and an inability to recognise possible opportunities, suggesting they are possibly not 'Luck Ready'. This is evident in the conceptual framework, which further organises the elements into four concepts as they pertain to chance events

and opportunity awareness. This framework is influenced by Chaos Theory and subsequently the Chaos Theory of Careers.

The following four themes are particularly germane for the comprehension of adolescent perceptions of chance events and opportunity awareness:

1. Career Development Theory
2. Chaos Theory of Careers
3. Chance Events
4. Luck Readiness

The conceptual framework diagram (Figure 2.1) symbolises the three pillars on which Chaos Theory of Careers is based: Complexity, Chance, and Change. The triangular base supports the flow of concepts derived from the research purpose: how do adolescent perceptions of chance events affect their opportunity awareness? With the Chaos Theory of Careers underpinning the conceptual framework diagram, research literature can be focused on what knowledge currently exists on these themes and inform the generation of appropriate research questions.

Figure 2. 1

Conceptual framework diagram
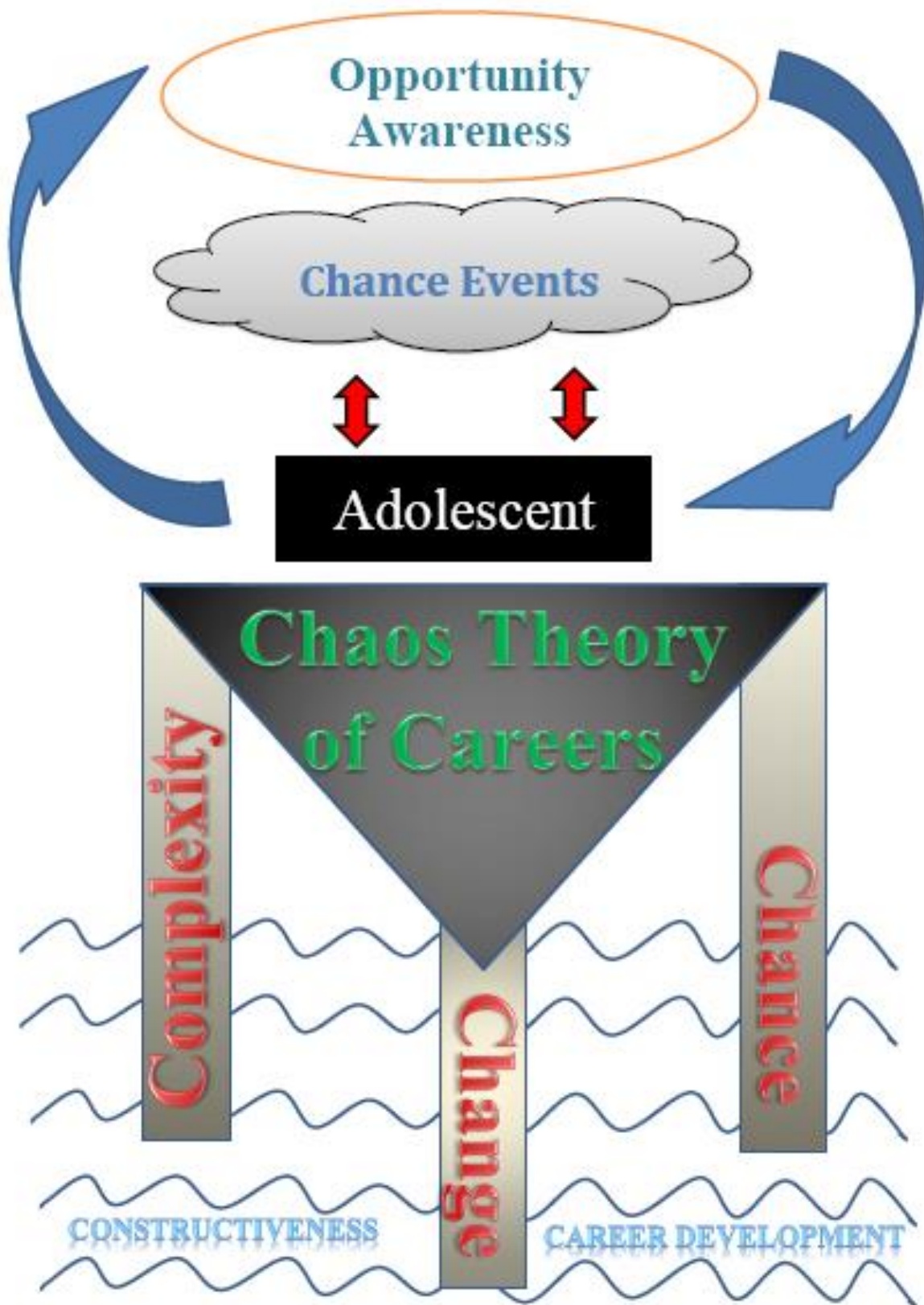
2.3 Career Development Theory

"Theories and research describing career behaviour provide the "conceptual glue" …as [to] describe where, when and for what purpose career counselling, career education, career guidance and other career interventions should be implemented" (Faheem, 2017, p. 139). The following section presents an historical account of career development theory, focussing upon the foundational theories that have developed and informed industry practice to date.

2.3.1 Historical context

There is, in the field of career theory, "a plethora of theories, philosophical positions, and research camps" (Savickas & Lent, 1994, p. 1). "The science of vocational psychology was born with the publication of Frank Parsons' (1909) book, Choosing a Vocation" (McIlveen & Patton, 2006, p. 16). Emphasising career choice, Parsons identified three elements: knowledge of self, knowledge about the world of work, and "true reasoning" (Parsons, 1909, p. 5), specifically the relationships between work and self-knowledge. Parsons argued that True reasoning (that which is possessed by experts) was applied to match a person's attributes to appropriate occupations. It was this original work which provided a foundation for the most universally used career theory, the 'trait and factor' methodology.

At about the same time that Parsons was developing his ideas, differential psychology – "An area of psychology concerned with behavioural differences between individuals and groups of individuals—including, among others, sex, race, nationality, cultural and socioeconomic differences" (Sam, 2018, para. 1) – became better known and gained a reasonable following (Murphy et al., 2009). Differential Psychology as a branch of psychology was pivotal in the development of using assessment in career practice (and research), focusing on the difference between individuals and measuring the individual attributes and characteristic differences quantitatively. Using this research as a basis, a range of assessment methods was developed. These assessment methods measured individual differences and matched them to various occupations. Following was the development of an essential element

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in modern 'trait and factor' type assessments: the classification of occupations (Miles Morgan, 2005).

In the mid-1900s, spurred by the behavioural sciences, was the growth of developmental psychology and the person-environment fit approach. Perhaps the most renowned and impactful theory stemming from the matching paradigm came from John Holland's work (Holland, 1959, 1997), as acknowledged by Pryor and Bright (2011). Holland's theory was based on the trait and factor convention and incorporated fundamentals of the person-environment fit methodology. Dawis and Lofquist (1984) proposed the theory of work adjustment, which incorporated the person and their environment, and introduced the concept of adjustment over time (Miles Morgan, 2005).

The occupational choice theory of Ginzberg, Ginsburg, Axelrad and Herma (1951) was one of the earliest deviations from the trait and factor approach. Their focus included occupational choice as a developmental process rather than a static phenomenon. They suggested there were three stages of development that led to the making of an occupational choice in early adulthood – fantasy, tentative, and realistic stages. Ginzberg et al. also acknowledged factors outside of the individual as influential in the decision-making process, thus bringing a contextual aspect to career development (Ginzberg et al., 1951).

The Life Span, Life Space approach (Super, 1953; Ginzberg et al., 1951) are attributed as having changed the "focus of career development from occupations to careers, from a static process to a dynamic process, and from the individual to the individual and his/her situation or context" (Miles Morgan, 2005, p. 39).

Another branch of psychology accredited for having a great influence on the development of career theory is cognitive psychology, or – to be more precise – social learning theory, also known as social cognitive theory. Perhaps the best known in pure psychology is Bandura (1977, 1986). "Most human behaviour is learned observationally through modelling: from observing others, one forms an idea of how new behaviours are performed, and on later occasions this coded information serves as a guide for action" (Bandura, 1977, p. 48). Building on Bandura's ideas, Krumboltz et al., (1976)

devised the Social Learning Theory of Career Decision Making, followed by the development of Social Cognitive Career Theory (Lent & Brown, 1996). "The significance of these theories lies in their recognition of a broader range of influences on an individual's career decisions and the active role played by the individual" (Miles Morgan, 2005, p. 38).

In the late 20th century, the concepts of constructivism and, to perhaps a lesser degree, contextualism emerged into the career development theory literature. The notion being that an individual is the active participant within their own unique environmental context of constructing their own career development. The most recent of the constructivist theories to be developed, released and then redeveloped is the systems theory framework (Patton & McMahon, 1999, 2006). The successor to the theory of career construction (Savickas, 2003), which in turn succeeded the original: action theory (Young, Valach & Collin, 1996). Chaos Theory of Careers (Pryor & Bright, 2003) can also be considered constructivist, and finally ecological career theory (Conyne & Cook, 2004).

The search for comprehensive and coherent career development theories amidst competing perspectives has been a long-standing focus in the literature. Referring to Savickas (1995b) Sharf (1997) and Zunker (2002), Chen (2003) notes that "Convergence of theoretical perspectives has been a recurring topic in the career literature for quite some time" (p. 203). According to Patton and McMahon (2021), the field of career theory has been criticised for being incomplete, segmented, and having deficiency in comprehensiveness and coherence" (p. 13), and the old, current and developing career theory literature can be regarded as "competing theories searching for the truth in career development" (p. 167).

It is essential to have an understanding of the historical and development of the field in order to truly comprehend the role chance plays within career development literature. Understanding the theoretical underpinnings of the field can greatly enhance the comprehension of the role chance plays in career development literature. It provides a contextual understanding, conceptual clarity, and facilitates the integration of research findings. Moreover, it allows for practical applications and interventions that

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consider the influence of chance events on individuals' careers. While not essential to delve into every theoretical aspect, a solid grasp of foundational theories and concepts enables a more comprehensive understanding of chance's impact on career development processes (Kraus. et al., 2022).

From the inception of the career development field there have been three important theoretical premises, all adding differing perspectives and levels of understanding. They are Trait and Factor, Developmental, and Social Learning (Guidon & Hanna, 2002). Super (1980) categorised theories and approaches to career development into three distinct categories. The initial category centres around the idea of aligning individuals with suitable occupations, while the second category involves a developmental approach that ultimately leads to a compatible match. The third category pertains to the process of making career decisions. These explicitly assembled theories of practice that are substantially influential to current practice will now be explained. Specifically, they are Trait and Factor Methodology, Developmental Theories, and Constructivist Theories.

2.3.2 Trait and Factor Methodology

With its genesis in differential psychology and the work of Parsons (1909), who is "credited with founding the career counselling and related fields of vocational psychology and counselling psychology" (Pope & Sveinsdottir, 2005, p. 105), the Trait and Factor approach is by far the oldest, best known, and widely used of all career development methodologies. Within this methodology traits are individual characteristics that can have a quantitative measure attached. According to Sharf (1997), "The terms trait and factor refer to the assessment of characteristics of the person and the job" (p. 17), and implies a matching between individuals and jobs, and career selection occurs as a result of understanding the relationship between knowledge about self and knowledge about occupations (Chartrand, 1991). The trait and factor as well as the person-environment fit methodologies stem from the logical positivist perspective, which places emphasis on quantifiable and objective information. This data is then analysed by a skilled professional who uses it to formulate predictions (Patton & McMahon, 2021).

This theory had a significant impact on the examination of job specifications and qualifications, aiming to forecast future job performance based on the assessment of traits relevant to the job (Zunker, 1994). Out of the 1950s competing approaches started to develop as the faults in the theory became more apparent. As Chartrand (1991) notes, "Rogerian psychotherapy permeated the counselling field, and developmental (Super, 1957) and social learning approaches (Krumboltz et al., 1976) to career counselling matured" (p. 519).

The first psychometric test specifically designed for vocational guidance was the Strong Vocational Interest Blank (SVIB), developed by Dr. E. K. Strong Jr. in 1927. The SVIB assessed an individual's interests and preferences to help guide career choices. It was one of the earliest and most influential career assessment tools of its time (Lent & Brown, 2012).

Despite being the predominant method employed by guidance and vocational counsellors, the trait and factor theory has faced substantial critique. Detractors argue that the theory overlooks the evolution of individuals and their surroundings throughout their lives, neglects gender disparities, lacks a unified foundation connecting personality to career choices, disregards the impact of multicultural factors, sexual orientation, and relies on a Western-centric assumption that one's profession should solely depend on personal interests (Giobbi, 2018).

Arnold (2004), suggests issues of congruence with Hollands' (1997) theory. The connection between congruence and results has been challenging to establish. This difficulty primarily stems from certain aspects of an individual's persona, crucial in making vocational decisions, not being adequately captured by Holland's theory and assessments. Additionally, accurately defining and evaluating an individual's environmental experiences poses a challenge. Furthermore, congruence measurements both omit pertinent information and treat the included information as more precise than it truly is. While real-world conditions do play a role, they are not the primary factors contributing to the limited correlation between congruence and outcomes (Arnold, 2004).

Expanding upon the initial contributions made by pioneers like Strong and Kuder in interest inventories, contemporary research (e.g., Holland, 1957, 1997) suggests that enhancing the predictive accuracy of vocational interests can be achieved by aligning these interests with particular work settings (Craigen, 2013).

Career Typology theory is steeped in, "modal personal orientation" (Holland, 1959, p. 36) and can be described as a developmental process which is established through heredity and life experience within the individual's own context. Career Typology theory has four suppositions:

1. In our culture, persons can be categorised as one of the following: Realistic, Investigative, Artistic, Social, Enterprising or Conventional.

2. There are six modal environments: realistic, investigative, artistic, social, enterprising and conventional.

3. "People search for environments that will let them exercise their skills and abilities, express their attitudes and values, and take on agreeable problems and roles" (Holland, 1985, p. 4).

4. Behaviour is determined by an interaction between personality and environment.

(Holland, 1985).

There is a great deal of research supporting Holland's typology (Nauta, 2010). Holland created a hexagonal framework that explains how the work environment and personality are interconnected. This typology has faced criticism for resembling a trait and factor theory, and has also been accused of gender bias. This bias arises from the fact that females often score higher in three particular personality types (artistic, social, and conventional), which Holland attributes to societal pressures that steer women towards female-dominated professions (Savickas & Lent,1994). However, the 21st century has seen initiatives to increase female participation in Science Technology Engineering Mathematics (STEM), such as the Girls in STEM Toolkit (The GiST) was created with support from the Australian Government Department of Industry, Innovation, and Science, and was developed by Education Services Australia (The GiST, 2023), which focuses on addressing the under-representation of girls and women in STEM at school, university, and the

workplace. It aims to build female students' confidence around STEM subjects, and support teachers, as well as encouraging families to engage meaningfully with girls about pursuing careers in STEM (The GiST, 2023). Attitudes and social support also play a role in girls' engagement in STEM. Chiang et al. (2023) found that boys tend to have more positive attitudes towards STEM, while girls may have negative attitudes. Social support, including access to role models and gender-responsive pedagogy, is important in boosting girls' self-efficacy in STEM (Chan, 2022).

The trait and factor approach has been criticised for a number of reasons. Firstly, the uncomplicatedness of the approach. Consideration was needed of the range of "influences that can impact on an individual's career choice and the complexity of the interaction between and among these influences and the individual" (Miles Morgan, 2005, p. 41).

Secondly, the development and changes in personality traits over time acknowledges that career growth is a continuous and dynamic process. As such, the model needed to reflect the nature of career growth. Lastly, the trait and factor approach may overlook the contemporary reality of the modern workforce, where individuals undergo multiple career transitions and must regularly reassess their career decisions (Miles Morgan, 2005). In a world where individuals are likely to endure a "succession of jobs in a number of industries during their working lives" (Jarvis, 2003, p. 1), this last criticism is an important consideration.

2.3.3 Developmental Theories

Developmental theories and matching theories are not viewed as conflicting; instead, they work in harmony and mutually enhance one another. This is echoed by Super's (1992) belief that it's inappropriate to compare the superiority of these two groups of theories, as neither can stand alone without the support of the other (Patton & McMahon, 2021).

Post World War Two, a prevailing theme in career development theories was to "focus less on the choice process and more on career as [a] developmental process" (Pryor & Bright, 2011, p. 22). Ginzberg, Ginzberg, Axelrad and Herma (1951) are credited with being the first career theorists

whose work deviates from the trait and factor approach, focusing more on occupational choice from a developmental position (Patton & McMahon, 2021).

Ginzberg et al., (1951) posed that occupational choice is influenced by four factors: the reality factor, the educational process, the interaction between individuals and their environment (work satisfaction was considered an emotional factor), and, finally, personal values and the need for career choice to satisfy them. Commencing in early adolescence and concluding in young adulthood, Ginzberg et al. (1951) contend that there exist three distinct stages: The Fantasy Period (4-12 years), The Tentative Period (12-18 years), and The Realistic Period (19-22 years) (Osipow, 1983).

In 1953, Donald Super published his Theory of Vocational Development, which has six life and career development stages. "The six stages include:

a) crystallisation/exploratory stage (ages 14-18),

b) specification stage (ages 18-21),

c) implementation stage (ages 21-24),

d) stabilisation stage (ages 24-35),

e) consolidation (age 35), and

f) readiness for retirement (age 55)" (Williams et al., 2010, p. 2).

Super (1953) emphasises the role self-concept development plays within an individual's career development, recognising that self-concept changes as a result of life experience. As such, over time, individuals may continuously refine their self-concept(s) and, as they apply this to their world of work, can create variation in their career choice (Baloch, 2016).

One of the traits of developmental theories is the recognition that career development is neither a linear nor static process, but evolves with an individual's experience and comprises many decisions made over a lifetime. Super (1980) defined a career as "the combination and sequence of roles played by a person during the course of a lifetime" (p. 282), Evolving his original theory, it became the Life-Career Rainbow (Super, 1980), which conceptualises "multidimensional careers, the temporal involvement in, and the emotional commitment to, each role" (Super, 1980, p. 282).

These roles include those of child, pupil or student, leisurite, citizen, worker, spouse, homemaker, parent, and pensioner, positions with associated expectations that are occupied at some time by most people, and other less common roles such as those of criminal, reformer, and lover (Super, 1980, p. 282).

In addition to the Life-Career Rainbow, Super (1992) also established "The Arch of Career Determinants" (p. 39) and "determinants choice model" (p. 40). Contained within his theories are 14 propositions, demonstrating the breadth and depth of his life's work "taken from developmental, differential, social, personality and phenomenological psychology and held together by self-concept and learning theory" (Super, 1990, p. 199). His theory acknowledges that a job is only one life role that we take on, and that conflict can arise when one life role interferes and takes away from another more important role, e.g., spouse/parent.

Gottfredson (1981, 1996, 2002, 2005) is responsible for introducing the theory of Circumscription and Compromise. Her theory is "concerned with both the content of career aspirations and their course of development" (Gottfredson, 1996, p. 181).

> The Circumscription and Compromise Theory suggests that four developmental processes are especially important in the matching process: age-related growth in cognitive ability (cognitive growth), increasingly self-directed development of self (self-creation), progressive elimination of least favoured vocational alternatives (circumscription), and recognition of and accommodation to external constraints on vocational choice (compromise).
>
> (Gottfredson, 2005, p. 72)

Criticism of both trait-factor and developmental approaches hinges on a set of assumptions surrounding decision making and career development. These include:
- Everything is fixed – stable and unchanging.
- Choice is a matter of rationality.

- Logic is the best decision-making style.
- All the relevant information that is needed for a decision can be known.
- There is only one best decision.
- The process of career development is an orderly pattern of progression.
- Indecision is bad and decidedness is good.
- Making a decision does not affect the context in which the decision is made.
- Choice is about a long-term goal such as "the career."
- Choice implementation must be practical - grounded in reality.
- Commitment is necessary to overcome obstacles in the way of realising one's choice.
- Other possibilities are dangerous distractions from the achievement of the original goal.

(Pryor & Bright, 2011, p. 24).

Career development theory has, for the majority of its history, had a logical positivist worldview. A constructivist influence has emerged more recently; however, they should not be regarded as in opposition to one another, as have both made significant contributions to the field (Patton & McMahon, 2021).

2.3.4 Constructivist Theories

Constructivism is a view of learning based on the belief that knowledge is not a thing that can be simply given by the teacher at the front of the room to students at their desks. Rather, knowledge is constructed by learners through an active, mental process of development; learners are the builders and creators of meaning and knowledge (Mcleod, 2023). Constructivism draws on the developmental work of Piaget (1977) and Kelly (1991).

Piaget (1977) asserts that learning occurs by an active construction of meaning, rather than by being a passive recipient. He explains that when we, as learners, encounter an experience or a situation that conflicts with our

current way of thinking, a state of disequilibrium or imbalance is created. We must then alter our thinking to restore equilibrium or balance (Gray, 1997).

Savickas (1989) developed the career-style assessment, an Adlerian approach using concepts such as "lifestyle and career style, encouragement and the use of private logic that emanates from childhood experience" (Scharf, 1997, p. 290). His approach uses two phases: assessment and counselling. The assessment phase entails a careers interview which gathers information about the client's 'life' (role models, favourite activities, subjects etc.). The second phase focuses on the development of a list of occupations for further exploration and on making observations about the client and giving them that feedback (Scharf, 1997).

Mark Savickas (2001, 2002, 2005) has furthered the work of Super (1957) – as a colleague and as the man that inherited Donald Super's entire library – with Savickas publishing his theory of career construction in 2001, which could be considered the "first theory of career development proposed in the 21st century" (Patton & McMahon, 2021, p. 62). Career construction theory according to Savickas (2005) "asserts that individuals construct their careers by imposing meaning on their vocational behaviour and occupational experiences" (p. 43). He asserts that career construction theory via three fundamental components: vocational personality, career adaptability, and life themes, and presents the how, what and why of career development (Savickas, 2005). At the heart of career construction theory (Savickas, 2005) there are 16 propositions reflecting influences of personal and social constructivism from a contextualist perspective. According to Patton and McMahon (2021), these themes represent an extension and advance of the 14 propositions from Super (1990).

Patton and McMahon (2001) state that "Career development learning needs to include both content learning and process learning. The content ranges from self-knowledge and self-assessment to highly detailed information about courses, career options and appropriate pathways" (p. 12). As such, have devised the Systems Theory Framework (1999), which can serve as a comprehensive framework encompassing all the pertinent areas to be taken into account by individuals during their career decision-making

process (see Figure 2.2). At the center of this model is the individual and all of the influences that are intrinsic and make up a person's individuality such as sex, ability, interests, experience, physical attributes, and racial origins. The middle circle directly influences the center (individual system) and is the broader social/environmental system which includes influences such as family, socioeconomic status, peers, geographic location, community groups, globalisation, etc. The outer circle encompasses the whole model and represents past, present, and future. It suggests that "career development is a dynamic process, depicted through its process influences, recursiveness, change over time and chance" (Patton & McMahon, 2006, p. 2).

Figure 2. 2

Systems Theory Framework of career development (Patton and McMahon, 2021, p. 272)
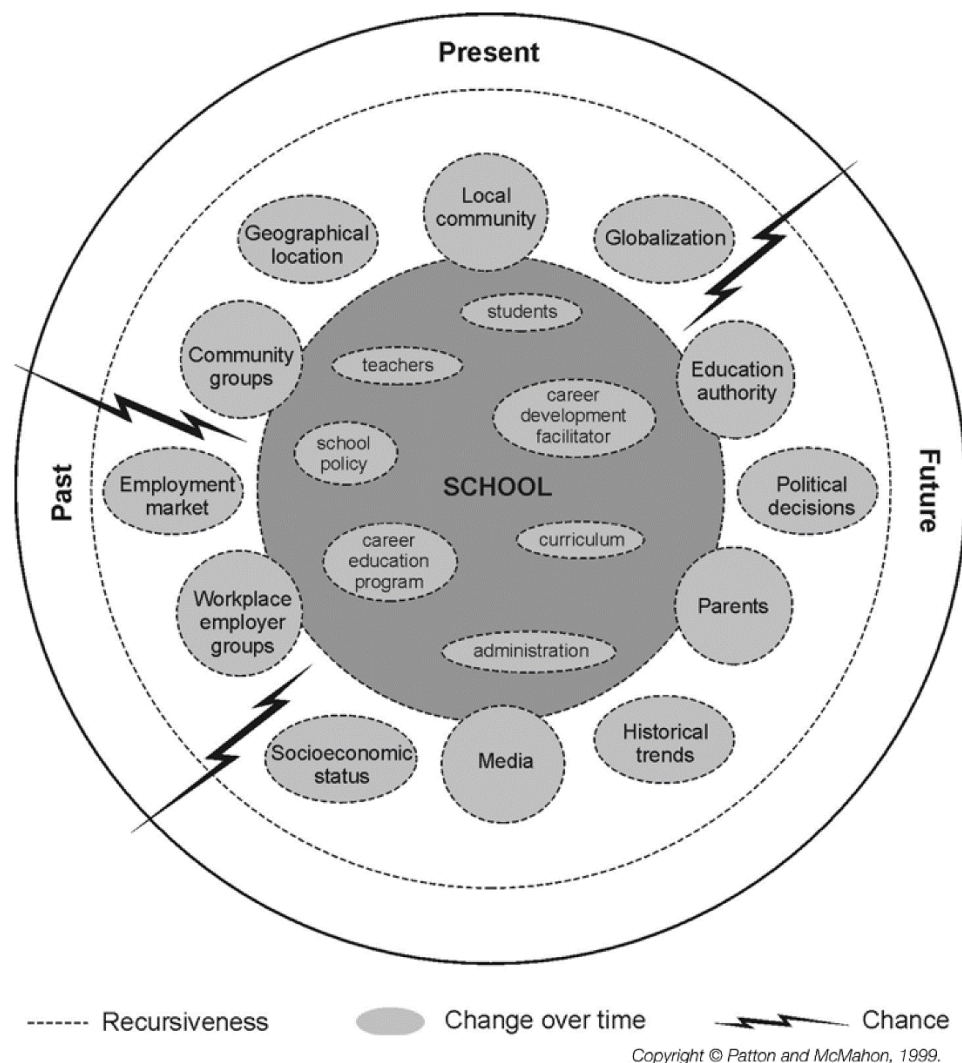
Planned happenstance, also known as Happenstance Learning Theory (HLT), is an approach to career development which recognises that people can be indecisive and that outside factors influence our work. It leaves behind the notion of mapping-out a textbook career pathway and instead views a career as something that will increasingly develop and emboldens the individual to maximise on opportunities as they arise. John Krumboltz is best known for introducing the *Planned Happenstance* theory. This theory proposes that indecision is desirable and sensible, allowing the opportunity to benefit from unplanned events.

> Planned happenstance theory is a conceptual framework extending career counselling to include the creating and transforming of unplanned events into opportunities for learning. The goal of a planned happenstance intervention is to assist clients to generate, recognise, and incorporate chance events into career development.
>
> (Mitchell et al., 1999, p. 116)

Krumboltz and Levin (2004) propose that, in addition to the traditional four stage model of career development pathway planning, individuals must develop 5 key skills so that they may identify, generate and make productive use of chance career occasions. The 5 key skills are:

- Curiosity: Exploring new opportunities.
- Persistence: Exerting effort despite setbacks.
- Flexibility: Changing attitudes and circumstances.
- Optimism: Viewing new opportunities as possible and attainable.
- Risk Taking: Taking career decisions in the fact of uncertain outcomes (Krumboltz & Levin, 2004).

Serendipity is more than just passively awaiting a lucky event. It demands proactive involvement from the individual - taking steps to generate advantageous conditions, being able to identify opportunities as they emerge, and seizing unanticipated events promptly and effectively (Krumboltz, 1998).

Rice (2014) argues however, that "A limitation of HLT in relation to chance events is that it does not address the unique quality of chance events as unpredictable and unplanned" (p. 451).

Career development has often been conceptualised as a logical, organised, controlled and sequential activity (Amundson, 2003), and this would be logical using a classical definition of how a career was defined. According to Webster's dictionary, a career is defined as "A field for a pursuit of consecutive progressive achievement especially in public, professional, or business life." (Merriam-Webster, 2023), or "the traditional concept of career has been concerned with progression up an ordered hierarchy within an organisation or profession" (Watts, 1999, p. 1). These definitions do not take into account how careers are defined today.

The Australian Government offers a contemporary interpretation of a career, emphasising that it is a dynamic and individualized journey that encompasses paid and unpaid work, learning, and personal life roles throughout one's life (National Careers Institute, 2022). According to Page Academy (2023), the traditional notion of a career, focused solely on paid employment in a single occupation, has evolved in today's work landscape to signify an ongoing process of learning and growth.

The notion of "career" holds significant importance in comprehending societies and the lives of individuals within them. It encompasses the trajectory individuals follow in their journey through life, learning, and work. Moreover, it encompasses the interactions individuals have with various social institutions such as the education system, employers, civil society, and the state (Hagaseth et al., 2020).

This notion of "career" is not a new concept, a Watts (1999) suggests that the word 'career' is ambiguous and needs to be redefined as it can suggest an ordered hierarchical movement, but also refer to 'careering about'. A career is a progression in a person's lifelong learning and work, and learning is the key to this progression (Watts,1999), and "our task is to help all individuals to interweave the two, on a lifelong basis" (Watts,1999, p. 2).

Considering current labour market conditions, Mitchell and Krumboltz (1996) have criticised the worth of 'person environment fit' theories, as matching a person to a particular environment has to make an assumption on the degree of stability within that labour market.

The volatility of many occupational environments, together with the increased pressure on individuals to change and adapt to their circumstances, makes trying to place an evolving person into the changing work environment … is like trying to hit a butterfly with a boomerang. (Mitchell & Krumboltz,1996, p. 263)

The next theoretical field that should be considered is psychodynamic theories. This field contributes to understandings about the motives and intentions for individuals' behaviours.

2.3.5 Psychodynamic Theories

Psychodynamic theories are influenced by efforts to comprehend, derive significance from, and harness individual motivations, intentions, and impulses to facilitate career development (Institute for Employment Research, 2023).

The term psychodynamic pertains to systems that utilise motives, drives, and related hidden factors to elucidate behaviour. Psychodynamic career counselling involves counselling methods that aim to comprehend, give significance to, and utilise individual motives, purposes, and drives to facilitate the process of career exploration (Watkins & Savickas, 1990).

Psychodynamic counselling in the realm of career development involves techniques focused on understanding and harnessing an individual's inner motivations, intentions, and drives to aid in exploring career options (Watkins & Savickas, 1990). This field owes much of its development to two key figures, Anne Roe and Mark Savikas, who contributed to psychodynamic theories with their distinct approaches, despite their work being separated by decades.

Roe (1957) was a great follower of Maslow's Hierarchy of needs (1954) and believed in two crucial propositions. Firstly, occupation is possibly the "most powerful source of individual satisfaction at all levels of need. Secondly, that social and economic status depend more on the occupation of an individual than upon anything else" (Roe, 1957, p. 213). Roe also believed that none of the occupational classification systems to date were logical and, as such, developed her own (Roe, 1957). However, there are vital

weaknesses in Roe's (1957) theory in that there were no direct links between parent-child relations and occupational choice (Roe & Lunneborg, 1990), and there was a lack of longitudinal research data which would have given an ability to test crucial proposals. It fails to adequately explain how socio-demographic variables may interact with career choice, and lacks vision in the career-decision making process (Brown, 1990).

Psychodynamic theories denote an idiosyncratic approach to careers development. The real value of psychodynamic career counselling is that it complements the objective perspective with the subjective perspective (Watkins & Savickas, 1990; Matthews, 2017).

Section 3 discussed the evolution of career development theory, which serves as the foundational framework for the subsequent section (Section 4, Chaos Theory). This section not only contributes to the field but also applies directly to the ongoing research investigation. Gothard (2001), argues that numerous theories in the field of career guidance have evolved over time, adapting to changing circumstances, and their applicability to today's clients varies. What is evident is that no individual theory can comprehensively capture the intricate dynamics of occupational decision-making and career advancement occurring in our rapidly evolving contemporary world (Gothard et al., 2001). While limitations of applying a theory in rapidly changing contexts, such as careers education, are understandable, this investigation through the lens of Chaos Theory of Careers, is suitable for contextual factors of this decade, as explained in Chapter 1.

2.4   Chaos Theory

The Chaos Theory of Careers is essentially a continuation of the theory that bears the same name. In order to provide context, a brief summary of the history of the original theory is given. "Chaos does not mean disorder but rather implies order and may occur in an orderly manner" (Tien et al., 2022).

With its origins in the pure scientific field of mathematics and theoretical physics, Chaos Theory was articulated during the 1960s. The name *chaos* was devised by Jim Yorke, an applied mathematician at the University of Maryland (Ruelle, 1991).

Nonlinear dynamical systems theory, often referred to as 'chaos theory' due to its popularization in mainstream media and blockbuster films like Jurassic Park, Sliding Doors, and Source Code, has been labelled the "new science" by science writer James Gleick (1987). He contends that Chaos Theory has emerged as a significant element in the late twentieth century worldview, influencing not only literature but "other discipline or site in western culture" (Gleick, 1987, p. 4).

"Chaos theory understands reality in terms of complex dynamical systems" (Pryor & Bright, 2022). Edward Lorentz was an American mathematician and meteorologist who, in 1961, while attempting to forecast the weather, discovered what he later called the 'butterfly effect'. He discovered that long-distance (more than about 4-7 days) weather forecasts are literally unpredictable due to minute differences in weather conditions, on any one day, resulting in dramatic differences over a short time and are entirely unpredictable (Pryor & Bright, 2011). Though Lorentz's discovery was an accident, ironically a 'chance event', it did lay a foundation for the 'new science' chaos theory.

Australian scientist Robert May made significant contributions to the study of nonlinear dynamics and chaos theory. In 1976, he published a seminal paper titled 'Simple Mathematical Models with Very Complicated Dynamics', in which he examined the dynamics of simple mathematical models describing population interactions. This research demonstrated how seemingly simple deterministic models can exhibit complex and unpredictable behaviour, a phenomenon known as 'chaotic behaviour' (The University of Sydney, 2023).

Benoit Mandelbrot (1982) working on a home computer forged the idea of *fractals,* which pictorially present the movements of chaos. From this point on it was possible to present how chaos moves in a visually awe-inspiring way. The principle he revealed was "many of the irregular shapes that make up the natural world, although seemingly random and chaotic in form, have a simple organising principle" (Stwertka, 1987, p. 73).

Ruelle and Takens (1971) described a phenomena they named a *strange attractor,* which they proposed "to reside in a phase space" (p. 169).

According to Kellert (1993), phase space allows for the mapping of information from complex systems in order to style a representation of their moving parts, allowing acumen into the possibilities of a dynamic systems (Kellert, 1993).

Chaos Theory was revolutionary in the scientific world and, as such, not popular. Interested scientists were advised that, should they choose to undertake research into Chaos Theory, it could be a career inhibitor (Gleick, 1987). In fact, many were warned by their supervisors (and peers) that such research could cost them their integrity and possibly their careers (Gleick, 1987). The theory and – in this case – the strange attractor was so ground-breaking that Ruelle (1991) could not publish his paper, and in the end published himself in a less-than-academic best practice approach. "Actually, I was an editor of the journal, and I accepted the paper for publication. This is not a recommended procedure in general, but I felt that it was justified in this particular case" (p. 63). Similarly, the work of Mitchell Feigenbaum in the late 1970s was also so ground-breaking that his work took some time to get to publication due to many rejections, as they were considered so unique as to be irreverent (Gleick, 1987). However, Feigenbaum is best known for noticing order in disorder and looking in-depth into strange attractors and seeing universality. He also found a structure embedded in nonlinear systems and developed a process to measure turbulence.

The nature of the changes in science that Chaos Theory has either reflected and/or spawned can be summarised as:

- From simplicity to complexity (Gell-Mann, 1994)
- From certainty to uncertainty (Peat, 2002)
- From reductionism to emergence (Morowitze, 2002)
- From segmentation to interconnection (Barabasi, 2003)
- From linearity to non-linearity (Strogatz, 2003)
- From causality to contingency (Prigogine, 1997)
- From determinism to agentism (Butz, 1997)
- From analysis to synchrony (Strogatz, 2003)
- From order to turbulence (Kaufman, 1995)
- From predictability to chance (Peat, 2002).

The roots of chaos theory lie in mathematics and the physical sciences (Kauffman, 1995) where the notion of attraction is employed to explain the functioning of natural systems. Pryor and Bright (2007a) assert that attraction refers to the self-organising process through which a system achieves coherence, adapts to changes from internal or external factors, and sustains or recreates order. This distinct pattern of the process is known as an "attractor." Kellert (2003) states that various explanations of the attractor concept can be found in the broader literature on chaos theory.

According to Tien et al. (2022), "The key to the study of chaos is to discover the internal ordered structure hidden in unpredictable, disorderly phenomena, which allows scholars to further explore phenomena" (p. 15). Tien & Wang (2017) – using the principles of career chaos theory – has created the Career Chaos Attitude Scale, designed to assess individuals' perceptions of career chaos by incorporating their views on perceived chaos, constancy, and order within chaos. This scale serves as a valuable tool for individuals to recognise the uncertainty in their careers, gain insights into the concept of chaos, explore their ability to adapt to chaotic situations, explore their true passions, and evaluate their outlook on life's meaning (Tien et al., 2022).

Schaffer and Kott (1985) proposed a classification of motion in dynamic systems, associating it with various types of attractors. Within this context, chaos theorists have identified four essential types of attractors that explain the behaviour of all systems. In the realm of career development, Bright and Pryor (2005a) have endeavoured to apply these attractors—point, pendulum, torus, and strange—to better understand vocational pathways (Pryor & Bright, 2007b).

Pryor and Bright (2007a), define the four attractors as follows:

- Point Attractor: Systems aiming for a single outcome, showing goal-driven or fear-based behaviour. Examples include workaholic executives and professionals fixated on specific goals.

- Pendulum Attractor: Systems oscillating between two points, exhibiting indecision and dichotomous thinking. It relates to role conflict and vocational stress.

- Torus Attractor: Systems functioning in predictable patterns, displaying routine and organised behaviour. It represents consistent, trait-like reactions in similar situations.

- Strange Attractor: Complex, unpredictable systems with self-organising emergent patterns. It's the "edge of chaos" where adaptation and creativity coexist in decision-making, confronting uncertainties, and opportunities (Pryor & Bright, 2007a).

The following Section (2.4.1) will elucidate the strategic placement of these Attractors within the framework of career development according to the Chaos Theory of Careers. It will also underscore how recognizing these pivotal elements can greatly enhance the effectiveness of career counsellors in their interactions with clients.

2.4.1 Chaos Theory of Careers

The Chaos Theory of Careers was originally developed in 2003 by Robert Pryor and Jim Bright. This was achieved by adapting Chaos Theory from the scientific field, into a theory of career development. The Chaos Theory of Careers (Pryor & Bright, 2003a, 2003b, 2007a, 2007b, 2011; Bright & Pryor, 2005, 2007) seeks to incorporate unplanned or chance events into career development. This relatively new theory has, according to Borg, Bright and Pryor (2006), "provided a theoretical conceptionalisation of the relationship between pattern, order and instability, organisation and chance" (p. 55).

The Chaos Theory of Careers hypothesises that the individual is a complex dynamical system interacting with other similarly complex systems, which can be other individuals through to political events and global disasters, that influence the individual in many varied ways. There are various careers influences according to Patton and McMahon (1999). Such influences include interests, parents, abilities, physical environment/geography, age, sex, and social and environmental contexts. As explained in Chapter One, Bright and Pryor (2005) use Ping-Pong Balls and Puppies as an abductive illustration of

the Chaos Theory of Careers, to explain the different influences on the individual. They demonstrate the Chaos Theory of Careers by dropping a Ping-Pong ball from waist height in two contrasting situations: one in a room with nothing in it, and the other in a room with fans, open windows, and puppies. The former demonstrates an individual using a person-environment typology, such as The Self-Directed Search career assessment (Holland, 1985). When the ball is dropped, it is likely to fall in the same position each time in this empty room. The second room, however - with the open windows, fans, and puppies added - the chance the balls will fall in the same position each time is slim. This is reminiscent of the influence placed on an individual as described by Patton and McMahon (1999), as well as the significant influence of chance events, as demonstrated by Bright et al. (2005), Bright et al. (2009).

Attractors are key concept in Chaos Theory (see Section 2.4) and also in the Chaos Theory of Careers (Pryor & Bright, 2003a, 2003b, Bright & Pryor, 2005, 2007). "Attractors are descriptions of the constraints on the functioning of a system" (Bright & Pryor, 2005, p. 299). They are the most important contribution of Chaos Theory (Williams, 1997). As noted in Section 2.4, there are generally four types of attractors 1. The Point Attractor, 2. The Pendulum Attractor, 3. The Torus Attractor and 4. The Strange Attractor (Bright & Pryor, 2005). Strange attractors are the most complex; they seem to have no logic, no laws governing them; they are the essence of chaos. When observed from a distance and from an entirely different perspective however, a pattern of incredible complexity can be identified (Ramalingam et al., 2019). It is by the tuition of identifying the different attractors within an individual's behaviour that can assist in the development of resilience. This can be achieved by introducing chance events to hypothetical scenarios which can begin to develop in students both their consequential thinking and resilience (Loader, 2011).

The Chaos Theory of Careers is an excellent adjunct to careers education, using metaphors to identify different types of attractors and the 'Butterfly Model' (Borg et al., 2006) to introduce the concept of the effect of chance on events. The model seeks to develop in students the skills of

planning (the likely) and coping (preferably thriving) on the unplanned (the contingent) (Borg et al., 2006; Borg 2015).

Most people will need to adjust to several career changes throughout their lifetime, work for a number of organisations, and experience times of unemployment and underemployment (Ellyard, 1993; Handy, 2007, 2012; Sullivan & Ariss, 2021). Indeed today's "15-year-olds will likely navigate 17 changes in employer across 5 different careers" (Foundation for Young Australians, 2018, p. 3). As such, change, along with complexity of influences and chance events, are three crucial foundations within career development that the Chaos Theory of Careers (CTC) strives to account for. Hutchison (2015) asserts that:

> postmodern approaches such as career construction (Savickas, 2005) and chaos theory of career (Bright & Pryor, 2005) value context and diversity of experience but potentially risk sociopolitical withdrawal or disengagement, thus affecting the very social fabric within which one must work and exist". (p. 239)

This is an important point to acknowledge as a complex influence, a concept which will be further explored in the subsequent section. This acknowledgment highlights the significance of understanding the intricate factors that shape adolescents' perceptions and decision-making processes.

2.4.2 Complexity of Influences

Unlike the CTC itself, the identification of complexity and the multitude of influences which affect adolescent career decision making is not a new concept. There are a plethora of studies on the topic and a review of the career development literature (e.g., Patton & McIlveen, 2009) will illuminate many studies demonstrating influences on career development such as "parents; the media; gender-role stereotyping; the economy; education; injury; illness; globalisation; unemployment; geography; [and] family structure…" (Pryor & Bright, 2011, p. 68) on career development. Systems theory presents such influences within a taxonomy. It is an important aspect of career counselling to connect clients to their own system of influences (Patton & McMahon, 2021).

Pryor and Bright (2011) highlight the need for more research as the focus has been on expanding perspectives beyond the individual and creating detailed taxonomies of contextual factors (Lent et al., 1994; Patton & McMahon, 1999, 2006; Szymanski & Hershenson, 1998). However, when it comes to career decision-making, the development of contextual variables is relatively lacking compared to the extensive research available on personal factors like occupational interests and intellectual ability.

In terms of relevant research, six categories influencing career choice were identified by Lent et al. (2002), by considering the perceived influences of 31 university students (both under and postgraduate). These categories were interests; direct exposure to work-related happenings; vicarious exposure to work-relevant activities; work conditions or reinforcers; thinking one is good at an activity; and leisure experiences. Other influences mentioned around positive/negative choices were teachers, friends and family. Lent et. al., (2002) "concluded that choice barriers and supports include generic factors and others that differ as a function of an individual's circumstances and experiences" (Pryor & Bright, 2011, p. 70). Circumstantial variables, such as the educational resources available, the educational attainment by parents, physical/emotional support, socio-economic status, and parents in general considerably sway occupational choice (Poole et al., 1991; Poole & Langan-Fox, 1992; Poole et al.,1993).

Environmental factors can definitely be complex influences as is evidenced by many years of research (Bronfenbrenner, 1979, 1989; Collin, 1990; Ford, 1987; Krause et al., 2006; Leong, 1996; Patton & McMahon, 1999; Sears, 1982; Vondracek et al., 1986). A lot of this research has however, been narrowly focused on a range of variables, done in isolation, rather than endeavouring to measure a broader range of influencing factors at the same time (Pryor & Bright, 2011). Measuring a wide range of influences concurrently, Bright, Pryor, Wilkenfeld and Earl (2005b) quantitatively measured the impact of environmental influences on career decision making of 651 students, including 546 university students and 105 high school students, by asking them about their career intentions, current enrolments, perceptions of influence of family, friends, teachers and the media, the role of

serendipitous events, the education and current work of their family members. From this Bright et al. (2005b), concluding that students perceived family and teachers to be significant influences. Results confirmed a wide range of influences on career decision making. These ranged from a personal or work relationship to a major change of residence over which students had little or no control.

There are two types of influences that impact people's lives: structural and personal environmental influences. The personal category includes the influence of parents, family members, friends, teachers, trainers, employers, colleagues, and chance meetings with important people. The structural category includes opportunities for participating in various activities or professions, socio-economic factors such as personal finances, the state of the economy, job stereotypes, geographic factors, and educational opportunities (Pryor & Bright, 2011).

Bright et al. (2005b), discovered four major factors of influence discovered: Media; Teachers and Lecturers; Family and Friends; and Unplanned Events. There were also indications of the changing nature of influences over time, e.g., the influence of family reduced across the sample as the student became more educated. A correlation was also able to be made linking Holland's taxonomy of occupational stereotypes between the jobs that fathers were doing and the courses studied by the students. So, for this example at least, career decision making is influenced by multiple factors which, in the end, altered over time.

2.4.3 Change

"Across the globe, career changes have become a normality" (Nalis et al., 2021, p. 3). Career change is a reality of participating in the 21st century labour market. As such, students need to develop the ability to cope with change, and to understand that change is neither positive nor negative, "it is just change" (Loader, 2011, p. 47; Milevsky, 2015, p. 2). Significant changes in the Labour market caused by technological advancements, particularly the rise of generative artificial intelligence (AI), are further exacerbated by

economic and geopolitical disruptions, alongside increasing social and environmental pressures (World Economic Forum, 2023).

The modern concept of career and trajectory thereof has at its core, the concept of change as an accepted and necessary aspect of being an active participant within the labour market (Hall & Moss, 1998; Louis, 1980). The notion that a student can leave school and walk straight into the same job that he/she will retire from 40+ years later, the notion of "one life–one career", is not relevant (Arthur & Rousseau, 1996; Claxton, 1999).

Career change can be defined as "a transition from one work position to another in a different field that is largely unrelated to previous work skills or responsibilities" (Ahn et al., 2017). Arnup (2011), states "where previous skills and responsibilities are largely irrelevant and new training is undertaken. Career change can be distinguished from job change which is movement to a similar job or a job that is part of a normal career path" (p. 80). Career change would characteristically involve a great deal of cost monetarily due to the lost time and income involved in training and personal development (Blau, 2007).

The vast majority of people participating in today's workforce will need to adjust to several career changes throughout their lifetime, work for a number of organisations and experience times of unemployment and underemployment (Ellyard, 1993; Handy, 2007, 2012). Employment in the 21st century is increasingly being characterised by precariousness, insecurity, intermittence and chaos (Riverin-Simard, 2000; Parliament of Australia, 2022).

The modern interpretation of what a career is requires an alteration in the old-style assessment of occupational choice as a decision that was made once and was then considered unalterable. Changes in jobs today is considered normal and take place frequently; change is merely considered a characteristic of career development. Doyle (2020) suggests that people are likely to change jobs 10 to 15 times over the course of their careers, with an average of 12 job changes.

The reasons behind workforce turnover and job transitions within organizations have been extensively studied and documented. However, it is noteworthy that career changes, which occur less frequently, have not

received the same level of comprehensive examination and understanding in the existing research literature (Ornstein & Isabella, 1993; Sullivan, 1999). "Understanding the determinants and consequences of career change is relevant to individuals considering a career change, for organisations that are downsizing or restructuring, and for career theory and counselling" (Arnup, 2011, p80).

The Australian labour market has witnessed notable constraints, indicated by the 2022 Skills Priority List report, which highlights a considerable scarcity of various occupations. The lingering impacts of COVID-19 and shifts in the economic landscape have led to numerous challenges across professions, notably affecting Health Professionals and Teachers. Moreover, persistent shortages of Technicians and Trades Workers continue to pose ongoing issues in the labour market (National Skills Commission, 2022).

With the exception of chance events which require a change in career, such as a car accident robbing a professional athlete of their ability to compete, career changes are usually initiated. This is done with an anticipation of improvement in facets of work life such as the number of working hours, job satisfaction, security and salary. Research would seem to support this, as people who make a career change report greater job satisfaction (Breeden, 1993; Neapolitan, 1980; Smart & Peterson, 1997; Carless & Arnup, 2011).

Research on career change was limited until the 1980s when there was a significant surge of interest, which continues to this day. This indicates that the understanding of career change as a highly probable expectation is relatively recent. This could be due to the worldwide occurrences of the past few decades, such as globalisation, technological advances such as the internet, economic, political and social unrest, and the enormous increase of western society/culture around the globe (Pryor & Bright, 2011).

There is much research anecdotally but little empirically available due to the limited career change literature pre-1980. This is especially true when it comes to longitudinal research. The most notable longitudinal study found however, reported on 170 high school students in a rural area over 25 years.

The results revealed that around two thirds of the sample changed jobs (Jepsen & Choudhuri, 2001). Betz (1984) reported a similar statistical conclusion within a decade study focused on women.

An investigation involving 55 high school graduates, conducted 18 months after their graduation, revealed that a significant portion of the students experienced both planned and unplanned changes in their early career paths. The reasons for these changes were found to be multifaceted (Borg et al., 2014). According to the authors (Borg et al., 2014), this discovery emphasises the importance of equipping students with skills not only related to planning their career paths but also in adapting to changes, delaying or accelerating their plans, repeating actions, or even discarding previous plans when necessary (Turner, 2017).

The past few years has seen resurgence of research on the topic – particularly around the COVID 19 Pandemic – journal articles such as, "The Covid-19 crisis as a career shock" (Akkermans et al., 2020) and "Losing talent due to COVID-19: The roles of anger and fear on industry turnover intentions" (Popa et al., 2023), just to name a couple, all of which "confirms the CTC's claim that we all live on the edge of chaos" (Pryor & Bright, 2022, p. 201).

2.4.4 Chance Events

Chance events such as the COVID-19 pandemic and the New Zealand Earthquake have had substantial impacts on individuals' career trajectories (Akkermans et al., 2020; Wordsworth & Nilakant, 2021; Osei et al., 2022). These trajectories shed light on this current investigation in how young people respond to such impacts.

Research in chance events in career development has occurred to a limited degree and labels have differed, however, those theories that have acknowledged both the presence and influence of chance events on career decision making are accident theory (Crites', 1969), chance theory of vocational selection (Osipow, 1983), and the Chaos Theory of Careers (Pryor & Bright, 2003a, 2003b, 2011). Other than the role of happenstance (Miller, 1983), understanding career chance (Chen, 2002: 2005) and planned

happenstance (Mitchell et al., 1999) the influence of chance events on an individual's career has been completely undervalued (Bright et al., 2009).

"Although chance events have been included in the career development literature for some time, there has been comparatively limited empirical research in this area" (Bright et al., 2005a, p. 1). A literature review on Career Chance Experience published by Kim (2021) found that approximately 83% of the articles (32 articles) were published after the year 2000, with a particular surge in interest since 2010. This growing interest is attributed to the impact of turbulent environmental forces, such as rapid technological advancements and shifts in work dynamics (Dobbs et al., 2016). Most of these articles were published in journals focused on career/vocational behaviour (25 articles), followed by psychology/counselling (four articles), management/HRM (four articles), and education (three articles). The prevailing approach to career chance experiences in the literature has been from an individual perspective rather than an organisational one. In terms of study types, quantitative studies (22 articles) were more prevalent than qualitative studies (14 articles). The most important point about these research studies is that none investigated younger adolescents perceptions of chance events and opportunity awareness, now critical given the rapidly changing global context impacting on career education and decision making, as justified in Chapter 1, Section 1.

A more comprehensive approach has emerged in the study of career events, drawing on various theoretical frameworks such as Image Theory (Beach, 1990), Event System Theory (Morgeson et al., 2015), Conservation of Resources Theory (Hobfoll, 2001), and Affective Events Theory (Weiss & Cropanzano, 1996). Building upon these theories, Akkermans et al. (2018) introduced the concept of career shocks, which highlights the role of context and chance events in shaping individuals' careers. Career shocks are characterised by uncontrollable occurrences, varying levels of predictability, and can be either positive or negative in nature (Kim & Baek, 2020).

"Chance events are exceedingly difficult to define and study with a high degree of intersubjective agreement" (Shanahan & Porfeli, 2006, p. 115). Research into career decision making confirms that chance plays a

substantial role (Betsworth & Hansen, 1996; Scott & Hatalla, 1990). Statisticians suggest that dealing with large numbers of chance events within a substantial population ought to be normal, and in fact their prevalence can be projected with exactness (Diaconis & Mosteller, 1989). "The qualities of a chance event are difficult to identify because the concept is infrequently discussed and rarely defined" (Shanahan & Porfeli, 2006, p. 99).

Chance events are prevalent in the social sciences literature, and similar concepts can also be found in related contexts, such as, "non-normative events in life-span psychology (Baltes, 1987), life-events in the stress paradigm (e.g., Brown & Harris, 1989), turning points in life course sociology (Hareven & Masaoka, 1988), fortuity or serendipity in counselling psychology (Williams et al., 1998), accidents in organisational sociology and engineering (Perrow, 1984), coincidence in statistics (Diaconis & Mosteller, 1989), and the dated ''acts of God'' in actuarial science" (Shanahan & Porfeli, 2006, p. 99). Behaviourists such as Bandura (1982) and Munn (1983) uphold the inherently interpersonal nature of chance events.

Shanahan and Porfeli (2006), in their discussion of the anatomy of a chance event contend that – for a chance event to be identified as causal or influential – there are four defining features that need to be present:

Criterion 1: Chance Events are Unlikely, in that the term ''chance event'' actually denotes a ''low chance event,'' or an apparently accidental incident, that was highly unlikely. "The terms ''fortuitous,'' ''fortune,'' and ''serendipity'' have also been used to reference events with a low probability of occurring, although these connote events with positive outcomes" (Shanahan & Porfeli, 2006, p. 100).

Criterion 2: Chance Events are Causal.

Criterion 3: Chance Events are Unintended. Bandura (1982) defines chance encounters as the ''unintended meeting of persons unfamiliar to each other'' (p. 748).

Criterion 4: Chance Events are Occasions that Warrant Explanation. "... the concept of chance events has been applied by both researchers and their subjects to occasions that are significant and worthy of explanation" (Shanahan & Porfeli, 2006, p. 106).

In addition to the difficulty of actually defining a chance event there have been different terms used to explain the principal concept, i.e., chance (Roe & Baruch,1967), serendipity (Betsworth & Hanson, 1996), happenstance (Miller, 1983: Krumboltz, 2009), and synchronicity (Guindon & Hanna, 2002). Definitions vary with the theorist; however, the concept is generally the same and they each communicate chance events as "unplanned, accidental, or otherwise situational, unpredictable, or unintentional events or encounters that have an impact on career development and behaviour" (Rojewski, 1999, p. 269).

In terms of career decision making the influence and perception of chance has developed into a common subject and been noted (if not comprehensively) since 1951 by Miller and Form, who identified that "many occupational choices are made accidentally" (p. 451). Caplow (1954) also mentioned that chance is commonly accepted by the lay person to explain vocational choices. A number of academics and practitioners have attested to chance playing a role in their career decision making (Caplow, 1954; Brayfield, 1964; Crites, 1969).

Research to date has generally focused on investigating just how an individual perceives chance events as affecting their career decision making. There is limited empirical research available around reporting by what means an individual differs in ways such as their age, socio-economic status and personality, which might affect their perception of chance events. Hirschi (2010) reported factors that significantly affect the perception of chance events were found to be socio-demographic variables and personality characteristics such as openness and locus of control. The "general perception of chance events related negatively to the reported correspondence of one's current vocational education to one's original wish, indicating a perceived negative effect of chance events preventing them from pursuing their original vocational/educational wish" (Hirschi, 2010, p. 46).

In a 2019 study on the role of chance events and the careers of PhD graduates, Kindsiko and Baruch found that underestimating the significance of chance events would be a mistake. The study demonstrated that approximately 30% of the academic sample was affected by chance events.

These events were categorised into three levels: national, institutional, and individual. Individuals can capitalise on chance events by identifying opportunities, anticipating potential outcomes, and making decisions based on expected career advancements (Kindsiko & Baruch, 2019).

In terms of chance events, children do not recognise the fortuitous nature of random events and therefore habitually perceive the outcome of chance events as conditional on differences in behaviour (Piaget & Inhelder, 1975). This leads to the generation of the first research question: **How do adolescents construe the nature and structure of a chance event?**

According to Bright et al. (2009), research to date on chance events in career development has focused on a variety of topics, including incidence (Roe & Baruch, 1967; Hart et al.,1971; Salomone & Slaney, 1981; Scott & Hatalla, 1990; Bright et al., 2005b) attribution (Ross & Nisbett, 1991; Bright., 2005a; Gelatt, 1991), diverse populations (Williams et al., 1998; Bright et al., 2005a), event categories (Bright et al., 2009; Betsworth & Hanson, 1996), multiplicity effects (Guindon & Hanna, 2002; Williams et al., 1998; Wiseman, 2003) and dimensionality (Betsworth & Hanson, 1996; Bright et al., 2005b).

Kim et al. (2022) reports on various groups that have been studied including adolescents (Bright et al., 2005a; Hirschi & Valero, 2017; Hirschi, 2010), young adults (Baruch & Lavi-Steiner, 2015; Bright et al., 2005a, 2005b, 2009; Chien et al., 2006; Jung et al., 2016; Kim et al., 2014a, 2014b, 2015, 2016; Lee et al., 2017; Lengelle et al., 2016; Rhee et al., 2016; Tien et al., 2005; Valickas et al., 2019; Yang et al., 2017), and older adults (Hancock, 2009; Grimland et al., 2012; Kim et al., 2019; Peake & McDowall, 2012). The participants' backgrounds also varied, ranging from unskilled workers (Baruch et al., 2016; Salomone & Slaney, 1981) to professionals (Blanco & Golik, 2015; Bornat et al., 2011; Diaz de Chumaceiro, 2004; Hu et al., 2015; Kindsiko & Baruch, 2019; Regan & Graham, 2018; Schlosser et al., 2017).

One way to consider chance events is to investigate different categories. As far back as 1979, Krumboltz developed four categories that influence career decision making. The pertinent one here is environmental conditions and events. This category included unplanned factors which were due to social, cultural, political, economic, or natural forces. Bright et al.

(2009) conducted three separate studies. The first one involved 43 university students consisting of 15 men and 28 women between the ages of 18 and 40 who had up to 17 years of work experience. Participants completed two questionnaires: one describing the effect of different chance events on careers with the aim to assess recall of chance events; and the second where 32 "sets of statements [that] were constructed to assess the extent to which the level of influence and the level of control of chance events can be independently identified" (Bright et al., 2009, p. 16). The four chance events categories and results for this study were:

- Low influence, low control M = .37 (SD = .33);
- Low influence, high control M = .58 (SD = .36);
- High influence, low control M = .81 (SD = .27);
- High influence, high control M = .55 (SD = .38).

(Bright et al., 2009)

"Among the four chance events categories, highly influential chance events that were low in level of control were better remembered by participants whereas mildly influential chance encounters that were low in level of control had the lowest recall rate" (Bright et al., 2009, p. 16). Remembering chance events which are considered low levels of control was a consideration when forming the subsidiary question 1, in the present research investigation.

The second study involved 62 individuals who were university students and working professionals with diverse professional experiences. These participants were given a questionnaire package that included a personality assessment and a survey to recall chance events. The objective of the study was to examine six distinct groups of chance events: "single positive (SP) and negative (SN), multiple-related (concatenated) positive (MCP) and negative (MCN), and multiple independent positive (MIP) and negative (MIN) chance events" (Bright et al., 2009, p. 18).

In each category, participants provided answers to questions aimed at recalling significant chance events they had encountered individually. These questions also included four inquiries designed to obtain personal

assessments regarding the presence, frequency, impact, and future probability of each category of chance events (Bright et al., 2009).

Results show:

More participants in general reported experiencing single chance events (SP = 82.3%; SN = 66.1%) and multiple concatenated chance events (MCP = 64.5%; MCN = 58.1%) than multiple independent chance events (MIP = 54.8%; MIN = 46.8%) regardless of whether these events produced positive or negative career outcomes.

(Bright et al., 2009, p. 18).

The third study used the same design as the second, where participants were asked to read scenarios which presented multiple chance events and then rate them according to their perceived controllability. It contained eight scenarios that described the six different categories of chance events. Results show that:

Single and multiple concatenated chance events that produced both positive and negative career outcomes in the scenarios were perceived by participants as having significantly more influence than multiple independent chance events. This effect was especially profound for chance events that produced negative career outcomes. When negative chance events were portrayed as existing independently in the scenarios, they were perceived to be much less influential on career outcomes than when they were portrayed as connected.

(Bright et al., 2009, p. 20)

Betsworth and Hansen (1996) conducted a study of serendipitous career development events. They defined serendipity as "events that were not planned or predictable, but that had a significant influence on an individual's career" (p. 93). As a part of this study, they developed categories in which to describe the events that participants stated as serendipitous. Participants were solicited from a large midwestern university class reunion which included older adults. A variation of the critical incident technique (Flanagan, 1954; Kirchner & Dunnette, 1957) was used to attain pertinent data.

Naturalistic inquiry (Lincoln & Guba, 1985) describes procedures for both the analysis for naturalistically obtained data and the steps necessary for categorising the data. These steps are:

(a) Initially, the categories were established by identifying critical incidents that exhibited comparable content.

(b) Each category was assigned a provisional title to serve as a working label.

(c) Implicit guidelines or descriptions were provided to outline the content of each category.

Through the process of categorising critical incidents, a total of 11 categories were derived. The categories, along with the corresponding number of critical incidents within each category, are as follows:

(a) Professional or personal connections (N = 23);

(b) Unexpected advancement (N = 19);

(c) Right place/right time (N = 15);

(d) Influences of marriage and family (N = 13);

(e) Encouragement of others (N = 11);

(f) Influence of previous work/volunteer experiences (N = 11);

(g) Military experiences (N = 9);

(h) Temporary position became permanent (N = 9);

(i) Obstacles in original career path (N = 9);

(j) Influence of historical events (N = 8); and

(k) Unexpected exposure to interest area (N = 5).

(Betsworth & Hansen, 1996, p. 95)

Whilst there does not appear to be any universally accepted taxonomy of adolescent perceptions of chance events, there have been various attempts to classify different types of beliefs and attitudes that adolescents may hold about chance events.

One prominent approach to categorising is the concept of "locus of control" (Rotter 1966), which refers to the extent to which individuals believe that their life outcomes are determined by internal factors (such as their own abilities and efforts) versus external factors (such as luck or fate). According to this approach, some adolescents may have an internal locus of control and believe that their actions and decisions can strongly influence their outcomes, while others may have an external locus of control and feel that their outcomes are largely determined by factors beyond their control (Pryor & Bright, 2011).

Another approach to categorising is the concept of "attributional style," which refers to the way individuals explain the causes of positive and negative events in their lives (Houston, 2019). Some adolescents may have an optimistic attributional style and attribute positive events to their own abilities and efforts, while attributing negative events to external factors or situational factors that are temporary and changeable. Others may have a pessimistic attributional style and attribute negative events to internal factors or stable factors that are unlikely to change (Houston, 2019).

Other possible dimensions of adolescent perceptions of chance events might include beliefs about the randomness of events, the role of luck or fate in shaping outcomes, and the degree of control that individuals feel they have over their own lives (Chopik, 2023). Overall, while there is no single taxonomy that is widely accepted, there are many different factors that may shape adolescents' beliefs and attitudes about chance events. The current research study on adolescent perception of chance events will seek to address this deficit by introducing an 11-item taxonomy (See Study 3) specifically designed for this research. Developing a taxonomy addressing beliefs and attitudes of chance events informed the second research question: **Is there a meaningful taxonomy of adolescent perceptions of chance events?**

The COVID-19 pandemic significantly disrupted the global workforce, highlighting the need for adaptable career education and fostering career resilience. Several studies emphasise the importance of revamping career education to equip individuals with skills to navigate unforeseen circumstances. Ithaca Group (2019), proposed a framework for career

education that fosters adaptability and future-proofing careers. This framework stresses the need for developing transferable skills, self-awareness, and lifelong learning mindsets. Similarly, Chen et al., (2020) advocated for integrating career adaptability training into educational programs, enabling individuals to adjust their career goals and paths in response to disruptions.

Certain studies delve into the impact of chance events like COVID-19 on career trajectories. A study by Wang et al., (2023) explored the psychological effects of the pandemic on career decision-making, highlighting increased anxiety and uncertainty. They suggest embedding career counselling to address these anxieties and guide individuals in navigating career changes.

The importance of career resilience, the ability to bounce back from career setbacks, careers' studies is widespread. Schultheiss et al., (2023) examined the factors influencing subjective career success including the role of career resilience and self-efficacy. They found that even moderately committed individuals with high self-efficacy reported higher success. This suggests self-efficacy motivates goal pursuit and reinforces commitment. While resilience was linked to higher subjective success, it did not strengthen the impact of commitment. Their study indicates that career commitment and self-efficacy are crucial for subjective career resilience and subsequent success.

The COVID-19 pandemic has underscored the need for a revamped approach to career education, one that equips individuals with adaptability and career resilience. By integrating strategies that foster transferable skills, self-awareness, and career self-efficacy, career education can empower individuals to navigate an increasingly unpredictable job market (Brass et al., 2023).

2.5 Opportunity Awareness

Opportunity Awareness refers to the ability to recognise and identify potential opportunities in one's environment. It is a cognitive process that involves being aware of one's surroundings, understanding the needs and wants of

others, and recognising how one's skills and resources can be used to create value and "the ability of students to know about work opportunities and their requirements" (Pitan, 2023, p. 77).

Opportunity awareness refers to the support provided to students in order for them to gain exposure and understanding of the overall structure of the professional world they are about to enter. This includes knowledge of the various opportunities that exist within it, the potential demands different areas may impose on them, and the rewards and satisfactions associated with these fields. Furthermore, it encompasses exploring different paths and strategies available to individuals for accessing these opportunities. At an individual level, opportunity awareness relates to finding the right combination of demands, offers, and strategies that align with a person's specific characteristics. Law & Watts (1977, 1996) have advocated that careers education should not solely focus on educational and occupational prospects, but should also encompass leisure, community, and family opportunities, recognising the significance of both occupational and non-occupational roles in an individual's life.

The topic of Opportunity Awareness remains largely under-researched and lacking in substantial literature and academic inquiry. However, specific to the university sector, Pitan (2023) discusses the significance of "opportunity awareness" within Career Guidance Activities (CGA) for university students. CGA aims to foster self-awareness, opportunity awareness, decision learning, and transition learning, which are crucial skills for successful employment. However, the study reveals that Nigerian universities are not adequately exposing students to CGA, leading to deficiencies in essential presentation skills required for job applications and interviews. One major reason for this lack of exposure is the absence of professional career counsellors in university career units, which are often staffed by non-specialists (Pitan, 2023). As a result, graduates may be unaware of market demands and struggle to convince potential employers of their qualifications. Pitan (2023) suggests fostering collaboration between universities, industries, and alumni to enhance students' understanding of the job market, curriculum alignment, work experience opportunities, and exposure to real-life projects, ultimately

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leading to better-prepared graduates and improved industry recruitment practices.

Hambly and Bomford (2018) view the concept of "opportunity awareness" as concerning career coaching and decision-making. Traditionally, career choices relied on matching an individual's self-knowledge with available opportunities. However, the twenty-first century's rapid changes in the job market, driven by automation and shifts in management practices, require a new approach. Hambly and Bomford indicate that, in order to thrive in this dynamic environment, individuals must stay informed about labour market trends, including job details, supply and demand, and future predictions. Career coaches play a vital role in enhancing clients' information management skills and expanding their awareness of diverse career options. Guided visualisations and work tasters are suggested techniques to help clients explore potential career paths effectively. By fostering curiosity, clients can become more adaptable and open to embracing new opportunities throughout their career journey. Ultimately, the goal is to empower individuals to make well-informed decisions in an ever-evolving job market.

The term "Opportunity" has been a recurring topic in entrepreneurship studies, gaining significant attention after several influential articles highlighted its crucial role in comprehending entrepreneurship (Hansen et al., 2011). Much of the literature that exists on opportunity awareness is steeped within the business/management field and focuses on the education and development of entrepreneurial skills and traits. Career development research has been traditionally focused on "an individual's relationship to an employing organisation" (Sullivan & Baruch, 2009, p. 1542) and typically from a linear, solitary viewpoint. However, the dynamic and ever-changing landscape of the modern world of work, "such as changing employment relationships, downsizing, threats of lay-offs and advancements in technology have spurred the need for a much broader perspective for our understanding of careers" (Sardeshmukh & Smith-Nelson, 2011, p. 48).

Sardeshmukh & Smith-Nelson (2011) suggest, that due to the increasing casualisation of the workforce and the diminished job security, coupled with the growing emphasis on entrepreneurial opportunities (Sullivan

& Baruch, 2009), there has been a surge of interest in careers that are boundaryless, protean (Inkson, Furbish & Parker, 2002), self-directed, and geared towards seizing opportunities (Tams & Arthur, 2010).

Recognising opportunities hinges on an individual's ability to discern them amidst shifting conditions. As Baron (2006) asserts, these opportunities stem from a complex interplay of evolving factors including technological, economic, political, social, and demographic changes (p. 107). In peripheral settings, opportunities often arise in response to fluctuations in information communication technology (ICT) stability, shifts in market supply and demand, and alterations in government policy (Baron, 2006). This process can be succinctly described as the endeavor to interpret signals of change, such as new information about altered conditions, with the aim of determining whether pursuing a particular course of action in response to these changes could ultimately lead to net benefits (Gregoire et al., 2010, p. 415).

Opportunity recognition can be further defined as having two sub-phases:

- a phase when the opportunity exists, and an individual recognises it as such, regardless of one's ability to pursue it
- a phase when the opportunity is evaluated in relationship to one's self, determining whether or not one has the abilities and motivation to pursue it.

<div align="right">(Sardeshmukh & Smith-Nelson, 2011, p. 49).</div>

Presupposing that opportunities are generated by external environmental changes, it poses questions about why not everyone recognises them. What is it about some individuals that they are able to identify an opportunity when it arises while others are not? Research to date in this area proposes the ability to recognise an opportunity may be attributed to an individual's 'human capital'. An individual's human capital is comprised of aspects of their background, such as their level of education, what relevant prior knowledge they may possess, and their unique demographics and their experiences. These are all closely connected with opportunity recognition (Shane, 2000, 2003, 2008; Shane & Venkataraman, 2000).

All aspects of human capital are not of equal influence. For example, not all of an individual's education or experience add to their abilities (Chandler & Hanks, 1994; Chandler & Jansen, 1992; Haynes, 2003; Sardeshmukh & Corbett, 2011; Stuart & Abetti, 1990). It is relevant experience which is more important to have. More recently the influence of cognitive skills and abilities has been a focus on the identification of traits that influence how an individual recognises opportunity (Mitchell et al., 2007). For example, Sardeshmukh & Smith-Nelson (2011) tell us that

> entrepreneurial self-efficacy or the individual's confidence in their ability to pursue entrepreneurial endeavours (Chen, Greene & Crick, 1998; Zhao, Seibert & Hills, 2005), pattern recognition (Baron, 2006; Baron & Ensley, 2006), the ability or tendency to think using heuristics and shortcuts (Busenitz & Barney, 1997), intuition (Mitchell, Friga & Mitchell, 2005), structural alignment to prior knowledge (Gregoire et al., 2010) and creativity (Corbett, 2005; Lumpkin & Lichtenstein, 2005). (p. 50)

Some of these cognitive skills may be enhanced through relevant experience. However, it is still uncertain which of these skills/abilities influence the process of opportunity recognition the most: an individual's human capital or their cognitive skills and abilities. Ronstadt (1988) named these unique combinations 'information corridors' enabling opportunities to be recognised (Venkataraman, 1997).

The connection between cognitive abilities and the ability to identify opportunities is widely acknowledged in the research literature (DeTienne & Chandler, 2004). Research to date has examined many different factors that play a role in the recognition of opportunities. However, three have been identified as particularly significant: engaging in an active search for opportunities, alertness to opportunities (capacity to identify them when they appear), and prior knowledge. The research literature suggests that all three are important. However, alertness underscores the idea that individuals who may not be actively seeking opportunities can still recognise them, provided they possess a specific readiness to identify them when they arise.

Kirzner characterised it as being attuned to altered circumstances or overlooked potentials (Baron, 2006).

Alertness, at least in part, is reliant on an individual's cognitive capacities, such as creativity and intelligence (Baron, 2006). Other personal characteristics may play a role in stimulating alertness, such as optimism and the perceptions of risk. There is a large amount of research literature on prior knowledge that indicates that information assimilated through life experience can be very advantageous in recognising an opportunity (Baron, 2006).

A proposed model connects the concept of opportunity recognition with pattern recognition, which involves individuals perceiving meaningful patterns among seemingly unrelated stimuli or events. This model posits that people with distinct knowledge structures, such as prototypes and exemplars, have the ability to discern patterns in emerging technological advancements, market trends, demographic shifts, and other factors that go unnoticed by others (Baron, 2006). These individuals then compare these patterns with their pre-existing notion of a "business opportunity." If there is a significant resemblance, they may choose to pursue a new entrepreneurial venture. The implications of this model are thoroughly investigated (Baron, 2006).

A concept that is key to both the Chaos Theory of Careers and Opportunity Awareness is that of Pattern Recognition. "Pattern recognition is the process through which specific persons perceive complex and seemingly unrelated events as constituting identifiable patterns" (Matlin, 2002, p. 42). It is the recognition of links between apparently unrelated movements and changes with links which are suggestive of patterns connecting them together. "The patterns suggested by these links or connections then become figures instead of undifferentiated (and often overlooked) ground. In essence, then, pattern recognition, as applied to opportunity recognition, involves instances in which specific individuals "connect the dots"—perceive links between seemingly unrelated events and changes" (Baron, 2006, p. 106)

To apply models of pattern recognition to the process of opportunity recognition, two basic assumptions are required:

1. Opportunities emerge from a complex pattern of changing conditions—changes in technology, economic, political, social,

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and demographic conditions. They come into existence at a
given point in time because of a juxtaposition or confluence of
conditions which did not exist previously, but is now present
(Baron 2006, p. 107).

2. Recognition of opportunities depends, in part, on cognitive
structures possessed by individuals—frameworks developed
through their previous life experience. These frameworks, which
serve to organise information stored in memory in ways useful
for the persons who possess them, serve as "templates" that
enable specific individuals to perceive connections between
seemingly unrelated changes or events. In other words, they
provide the cognitive basis for "connecting the dots" into
patterns suggestive of new business opportunities (Baron 2006,
p. 108).

These models of pattern recognition propose that the ability to identify
connections between events or changes that appear unrelated is rooted in
cognitive frameworks. These frameworks enable certain individuals, but not
others, to perceive such patterns. On the other hand, individuals who do not
recognise these patterns either lack this cognitive ability or possess less well-
developed frameworks for it (Baron, 2006).

Opportunity awareness as a concept within the career development
field is by no means new. However, specific literature on opportunity
awareness as a subject is scant at best. Opportunity awareness as part of
another theory is more common, such as the DOTS model (Law & Watts,
1977) also known as "Openness to experience" (McCrae & John, 1992), and
Luck Readiness (Pryor & Bright, 2007a).

Opportunity awareness refers to an individual's knowledge of
opportunities within the world of work (McIlveen et al., 2011). Broadly,
opportunity awareness can also refer to the help which is given to students to
experience and gain some understanding of:

• the general structure of the working world they are going to enter,
• the range of opportunities which exist within it,
• the demands that different parts of it may make upon them, and

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- the rewards and satisfactions that these different parts can offer.

Additionally, it can denote the investigation of various avenues and approaches available (or unavailable) to specific individuals for accessing those opportunities. On an individual level, we interpret it as the alignment of requirements, opportunities, and tactics that align (or at least do not conflict) with a particular individual's attributes (Law & Watts, 1977).

The DOTS model (Law & Watts, 1977; Law, 1999) is widely in use the world over as a model for careers education. DOTS is an acronym for:

decision learning (D);

opportunity awareness (O);

transition learning (T);

self awareness (S).

Additionally, it serves as an analytical tool for assessing and refining learning objectives within careers education and guidance (Law, 1999). The model espouses four careers education tasks to be accomplished by students: facilitating the development of opportunity awareness, self-awareness, decision learning, and transition learning (Law & Watts, 1977). Designed originally for secondary schools, it has also been adapted for diagnostic/evaluative use within the higher education sector (e.g., McIlveen et al., 2011).

Resulting from a change in focus from linear career development, it was agreed upon that there exists "a continuing tension between leveraging past experience and positioning for future opportunity" (Amundson et al., 2002, p. 27). The emphasis is on the imperative for individuals to learn to intentionally act on environments of change, drawing on an understanding of the individual as a self-organising, active system (Patton & McMahon, 2021). Chaos Theory emphasises that meaning, insight, inspiration, creativity and opportunity awareness are emergent properties from human experience (Pryor & Bright, 2003a). This leads to the generation of the third research question: **How do adolescent perceptions of chance events relate to their opportunity awareness?**

2.6   Luck Readiness

Luck is something that people talk about a lot these days. It has sparked an interest in various areas of study. You can find books and research on luck in fields like mathematics, philosophy, economics, psychology, anthropology, history, astronomy, quantum physics and more. These works come in a variety of styles and approaches – some are academic and complex, while others are like self-help guides or even children's books (Gordon, 2023).

Luck exerts a dramatic influence over our lives. A few seconds of bad fortune can unravel years of striving, while a moment of good luck can lead to success and happiness. Luck has the power to transform the improbable into the possible – to make the difference between life and death, reward and ruin, happiness and despair (Wiseman, 2003, p. 3).

There have been many attempts made at identifying just what physiognomies make one person luckier than another (e.g., Gunther, 1976; Wiseman, 2003; Krumboltz & Levin, 2004). Much of the aforementioned research is anecdotal, however, there are some dimensions of definite generality which relates to 'Luck Readiness' that are emerging (Nealt, 2002). There are many definitions for 'Luck', however it is most commonly defined as "The chance occurrence of situations or events either favourable or unfavourable to a person's interests; the sum of chance events affecting (favourably or unfavourably) a person's interests or circumstances; a person's apparent tendency to have good or ill fortune" (Oxford English Dictionary, 2023). What is obvious in this definition is "that chance, fortune and luck are inextricably tangled up with each other, as well as branching out from each other" (Gordon, 2023, p. 19).

Research that used a broad demographic of both age and sex found that 50% of people indicated that they had been consistently lucky, 14% said they had been consistently unlucky, so it could be said that 64% of respondents indicated that they had been consistently lucky or unlucky in life. (Wiseman et al., 1994)

Principles derived from research into Luck as a phenomenon, espouse four principles of Luck, which are:

- Lucky people create, notice, and act upon the chance opportunities in their lives.
- Lucky people make successful decisions by using their intuition and gut feelings.
- Lucky people's expectations about the future help them fulfil their dreams and ambitions.
- Lucky people are able to transform their bad luck into good fortune.   (Wiseman, 2003, p. 161-162)

"Good luck tends to "happen" to people who are engaged in constructive activities. Good luck seldom happens to those who wait passively for the telephone to ring" (Krumboltz & Levin, 2004, p. 89).

Austin (2003) proposed that there are four types of luck: Blind Luck, Luck from Motion, Luck from Awareness, and Luck from Uniqueness. He proposes that Blind Luck is that which is completely out of your control, such as where you are born and to whom. Luck from Motion is when individuals create motion and collisions through hustle and energy that you are inserting into an ecosystem. By constantly moving and engaging in activities, we increase the likelihood of collisions with opportunities and lucky events. Luck from Awareness refers to an individual's depth of knowledge within a given subject area. Finally, Luck from Uniqueness "favours those with distinctive, if not eccentric hobbies, personal lifestyles, and motor behaviours" (Austin, 2003, p. 53). Austin (2003), contends that "chance" is an insufficient term to embrace the reasons for encountering key events or scientific findings.

Luck Readiness can be defined as "recognising, creating, utilising and adapting to opportunities and outcomes occasioned by chance" (Pryor & Bright, 2011, p.119). The term 'Luck Readiness' was created by Nealt (2002) with the intent to indicate an openness to change in order to identify and use the positive and negative potential outcomes of future events, or, in other words, to be open to opportunity. Luck Readiness emphasises fostering skills and mindsets to create and capitalise on opportunities. Guidance programs, including career education, could be integrated by:

- Developing self-awareness through activities like journaling and personality assessments, helping individuals identify opportunities aligning with their aspirations (Pryor & Bright, 2005a).
- Nurturing an open mindset by exposing individuals to diverse experiences and challenging limiting beliefs, broadening their perspective and opening them to unexpected opportunities (Pryor & Bright, 2005a).
- Building networking skills through mentorship programs and workshops, providing guidance, insights, connections, and the ability to build relationships that can open doors (Pryor & Bright, 2005a).
- Cultivating resilience by developing coping mechanisms, allowing individuals to persist and bounce back from setbacks, potentially leading to new opportunities (Pryor & Bright, 2005a).

While external factors still play a role, fostering "luck readiness" empowers individuals to be more proactive in shaping their destinies (Pryor & Bright, 2005a; Lengelle el al., 2015).

Building on the work of Mitchell et al., (1999), and Nealt (2002), Pryor and Bright (2005) recognised and developed the Luck Readiness Index (LRI), made up of 8 elements in the current version, including flexibility, optimism, risk, curiosity, persistence, self-efficacy, strategy, and luckiness. These measures have been referred to as the "21st-century skills in the field of career development" (Lengelle et al., 2016, p. 35). The aim of assessing these 8 elements is to identify strengths and limitations in these measurements through assessment (Bright & Pryor, 2007). This process helps in highlighting various ways to establish and enhance skills and understandings, enabling students to better recognise and utilise chance/ luck as an opportunity for personal advancement.

2.7   Conclusion

This Chapter has reviewed literature relating to how young people characterise chance events. Themes important to this study such as career education, complexity, change, chance, opportunity and luck, have been evidenced through the literature review. This literature review chapter attends

to highlight the place of the present research in its deriving of original research questions in which to focus the research.

The literature review has identified a gap in research pertaining to adolescents' perceptions of their career opportunities and how these perceptions influence their decision-making processes. Further investigation was warranted to better understand how adolescents shape their career choices based on their perceptions of chance events, luck, and opportunity. Adolescents' decisions are often impulsive rather than planned (Dekkers et al., 2022).

In light of the fact that there was no qualitative study of the perceptions and experiences of younger students concerning career chance events, it was useful to explore their perceptions to gain insight on career education and vocational guidance (Kim, 2021). The gap in the research resulted in the major research question 'how do adolescents perceive chance events and how do those perceptions relate to their opportunity awareness?

The literature review is organised into five sections. It commences with an elucidation of the conceptual framework followed by: Career Development Theory, Chaos Theory of Careers, Chance Events, Opportunity Awareness, and Luck.
Within these main themes, the exploration delved further into two sub-themes: Complexity of Influences and Change. These explorations were instrumental in formulating three specific research sub-questions.

The research study was therefore driven by the investigation of three sub-research questions. First, it sought to understand how adolescents construe the nature and structure of a chance event (addressed in Chapters 4, 5, 6 and 7 by Studies 1, 2, 3 and 4). Second, it aimed to determine whether there existed a meaningful taxonomy of adolescent perceptions regarding chance events (addressed in Chapters 5, 6 and 7 by Studies 2, 3 and 4). Finally, the study explored the potential relationship between adolescent perceptions of chance events and their awareness of opportunities (addressed in Chapters 6 and 7 by Studies 3 and 4).

The following Chapter (Chapter 3) stipulates the design of the research study, which includes outlining the ontology, epistemology, theoretical perspective, methodology, and the specific methods that will be used to gather and analyse data in order to address the research questions. Furthermore, the analysis design and ethical considerations are introduced and supported with justifications.

CHAPTER 3: RESEARCH DESIGN

3.1　Introduction

The review of literature presented in Chapter 2 focused on exploring the current body of knowledge that exists to date on career development and the role chance events can play throughout the lifespan of an individual's career. The aim of this literature review was to contextualise the present research investigation within the relevant literature, showing links to key theoretical and practical frameworks and evidence. In turn, this provides a way of understanding the relevance and contribution of the present study, and to identify gaps in the present body of knowledge, thereby justifying the research questions presented for this study. The literature presented primarily examined two distinct areas of inquiry. Firstly, adolescent perceptions of chance events, and secondly, opportunity awareness. Specifically, the literature addressed the question of 'how do young people characterise chance events?'

The research process in this Chapter engaged the four elements method (Crotty, 1998). They are:

- Epistemology: the theory of knowledge embedded in the theoretical perspective and thereby in the methodology.

- Theoretical perspective: the philosophical stance informing the methodology, and thus providing a context for the process and grounding its logic and criteria.

- Methodology: the strategy, plan of action, process or design lying behind the choice and use of particular methods, and linking the choice and use of methods to the desired outcomes.

- Methods: the techniques or procedures used to gather and analyse data related to a research question or hypothesis

(Crotty, 1998, p. 3).

This Chapter elucidates the design for the overall research investigation and begins with the Theoretical Framework (see Section 3.2), comprised of an account of the ontology (Section 3.2.1), epistemology (Section 3.2.2), and the theoretical perspective (Section 3.2.3). The Chapter

then moves into a justification of the research methodology (Section 3.3), including the methods employed to answer the research questions. Additionally, the analysis design (Section 3.6), verifications (Section 3.7) and ethical considerations (Section 3.8) are presented and justified. The Chapter concludes with an overview of the research design (Section 3.9).

The subsidiary research questions that direct the design of the overall research investigation are:

1) How do adolescents construe the nature and structure of a chance event?

2) Is there a meaningful taxonomy of adolescent chance events?

3) How do adolescent perceptions of chance events relate to their opportunity awareness?

3.2   Theoretical Framework

The main objective of the theoretical framework is to elucidate and provide rationale for the researcher's underlying beliefs guiding the study (Creswell, 2007). Accordingly, the aim of this research is to interpret adolescent perceptions of chance/unplanned events in relation to their ability to recognise a career opportunity. The epistemology which pervades the scholarship is objectivism.

Ontology is the study of being (Crotty, 2003). Congruent with the ontology of realism, objectivism as an epistemology "holds that a meaningful reality exists independently of consciousness and experience, that entities carry intrinsic meaning within them as objects and that we can discover this 'objective truth' if we carefully go about it in the right way" (Feast & Melles, 2010, p. 3).

Much like the Chaos Theory of Careers, objectivism adopts a stance that emphasises meaning and objectivity. The methodology is informed by a positivist theoretical perspective, employing survey research as the stratagem for the attainment of knowledge surrounding the aim of the research. Survey research methodology should provide the platform necessary to understand just how adolescents construct meaning around chance events and how those chance events influence their ability to recognise an opportunity. The

survey research methodology is harmonious with both the proposed research epistemology and theoretical perspective, as it sheds light on a choice or series of choices: the reasons behind them, the manner of their execution, and the outcomes achieved (Schramm, 1971). As such, the survey research of adolescent perceptions of chance events in relation to their opportunity awareness within a 'real-life context' can be empirically investigated through employing the methods of questionnaires and measurement and scaling of the respondents (Taherdoost, 2022).

Table 3. 1

Elements of the theoretical framework, addressed in this Chapter.

3.2.1 Ontology	Realism
3.2.2 Epistemology	Objectivism
3.2.3 Theoretical Perspective	Positivism
3.3 Research Methodology	Mixed Methods
3.4 Participants	Convenience sample
3.5 Data Gathering Strategies	Survey Questionnaire
	Focus Groups

3.2.1   Ontology: Realism

Ontology serves as the perspective through which we explore the fundamental question of the nature of existence, encompassing the 'study of being' itself (Crotty, 2003). It is the lens through which the epistemology is viewed, which in turn informs the theoretical perspective, as "each theoretical perspective embodies a certain way of understanding what is (ontology) as well as a certain way of understanding what it means to know (epistemology)" (Crotty, 2003, p. 10). Ontology as the 'study of being' communicates the nature of reality, i.e., what things, if any, have existence, or if reality is "the product of one's mind" (Burrell & Morgan, 1979, p. 1). This investigation studied adolescents way of being in their reality when they were exposed to chance events.

Realism at its core is that which our senses "show us as reality is the truth: that objects have an existence independent of the human mind"

(Saunders et al., 2012, p. 6). Realism poses that there is a reality that is quite independent of the mind. Realism is similar to positivism in that it assumes a scientific approach to the development of knowledge and this supposition underpins the collection and interpretation of data (Singh, 2019). As such the methods of this investigation acknowledged that the adolescent participants' objects were their perceptions of chance events.

There are two types of realism: direct and critical. "Direct realism states that what you see is what you get" (Agarwal, 2013, p. 40), whereas critical realism asserts that there are two steps to experiencing the world.

First there is the thing itself and the sensations it conveys. Second, there is the mental processing that goes on sometime after that sensation meets our senses. Direct realism says that the first step is enough. To pursue [a] cricket (or rugby) example, the umpire who is the critical realist would say about his umpiring decisions: 'I give them as I see them!' The umpire who is a direct realist would say 'I give them as they are!' (Saunders et al., 2012, p. 7).

Direct realism as a source of truth for the adolescent participants occurred given they were provided with scenarios of chance events and were required only to respond to the event itself and the sensations they experienced.

Chance events can be viewed as constructions of the mind, in that the attribution of chance to those events is a product of mind. However, the events themselves are best captured in a Realist Ontology.

Somebody who is injured when another person falls from a building and lands upon the, has experienced a tangible event with tangible consequences, such as permanent injury. This is not a construction any more than the other person who believed they could fly when they stepped off the building in the first place, irrespective of their epistemology; both of their ontologies were very real indeed. In the present research investigation on adolescent perceptions of chance events in relation to their opportunity awareness, the lens that is most congruent would be that of the direct realist, and to expand on the sports metaphor, 'I'll call it how it is, not merely how I

see it.' It was anticipated that the participants would report how they see it, not necessarily how it is.

3.2.2 Epistemology: Objectivism

It is the epistemology which advances assumptions that underpin the research (Creswell, 2002). It investigates the nature of knowledge, i.e., "How is it possible, if it is, for us to gain knowledge of the world?" (Hughes & Sharrock, 1997, p. 5) and with "the nature, validity, and limits of inquiry" (Rosenau, 1992, p. 109).

> The Chaos Theory of Career is embedded in both a realist and a phenomenalist epistemology…this illustrates the dichotomy of career development theorising [to date]. The matching or positivist tradition is based on a realist epistemology which assumes that what is being discussed as content of such theories, including abilities, values, traits, demands of an occupation…exists in the world as entities.
>
> (Pryor & Bright, 2011, p. 29)

While Pryor and Bright's Chaos Theory of Careers is embedded in realist and phenomenalist epistemology, this overall research investigation employed an objectivist epistemology due to the anticipated participants' experience of not significantly influencing their world. In this investigation the adolescent participants were provided with scenarios as opposed to their personal experiences of chance events. "Observers get their knowledge about the world by experiencing it. It is possible for humans to investigate the world without influencing it" (Guba & Lincoln, 1994, p. 110). An objectivistic worldview would perceive a mountain is a mountain for everyone, an artefact is an artefact for everyone, and an employment procedure is an employment procedure for everyone. As such, the significance of a spectacle is inherent to the spectacle and can be experienced by interacting with it. The distinguishing feature of the objectivist in terms of their worldview is merely the existence of objective, absolute and unconditional truths (Lakoff & Johnson, 1980). Making sense from an objectivist point of view is considered as a rational analysis of "data in a mental problem space and construction of deductive arguments of cause-and-effect" (Boland & Tenkasi, 1995, p. 353). Hence in the present

overall research investigation on adolescent perceptions of chance events in relation to their opportunity awareness, an objectivist epistemology was adopted. Adolescent participants created reasonable arguments of cause and effect from the chance events presented, in which to advance suppositions that underpinned this research.

3.2.3 Theoretical Perspective: Positivism

August Comte, who is regarded as the founding father of sociology, is also credited with the advent of Positivism. "Positivism offers assurances of unambiguous and accurate knowledge of the world" (Crotty, 1998, p. 18). Like most ideologies there are differing brands, and Positivism is no different. It is also known as logical empiricism, naturalism, post positivism, the covering law model, the accepted or conventional view, and behaviourism (Neuman, 2000). Behaviourism favours the operation of concepts, so behaviourists are positivists, but not all positivists are behaviourists since positivists believe that you can do research on things that are not observable so long as they are quantifiable and measurable (Mclaughlin, 2012). As such, this research method provided quantifiable and measurable data.

Researchers who favour Positivism generally "prefer precise quantitative data and often use experiments, surveys, and statistics. They seek rigorous, exact measures and "objective" research" (Neuman, 2000, p. 82). Traditionally, the positivist perspective assumes that there is a reality that exists and can be measured (Denzin & Lincoln, 1998). The methods of analyses in this investigation were quantitative (rigorous measures) with experiential scenarios and surveys.

In the present overall research investigation on adolescent perceptions of chance events in relation to their opportunity awareness, a Positivist theoretical perspective or research paradigm was employed. The most suitable lens for which to objectively study this phenomenon by employing a research methodology congruent with both the epistemology of objectivism and a theoretical perspective of positivism, that being survey research.

3.3 Research Methodology

A researcher's choice of methodology should complement and develop the tone of the overall research investigation, aligning with the most suitable theoretical perspective. The adoption of the objectivist epistemology investigating cause and effect informed the methodology.

Appropriate methodology is the cornerstone of any research inquiry and should provide a foundation to organise the use of any research method, i.e., a case study methodology using survey research and focus groups to gather data. Sarantakos (1998) defines methodology as "a model, which entails theoretical principles as well as a framework that provides guidelines about how research is done in the context of a particular paradigm" (p. 6).

In the present research investigation on adolescent perceptions of chance events in relation to their opportunity awareness, a Mixed Methods design was employed. A mixed method research design can be defined as a procedure for collecting, analysing, and "mixing" both quantitative and qualitative research and methods in a single study to understand a research problem (Creswell & Plano Clark, 2007). There are several reasons for conducting research using a mixed methods design, but – simply stated – this design is used when the proposed research will be producing both quantitative and qualitative data, as both the quantitative and qualitative data together provide a better understanding of the research problem (Creswell & Guetterman, 2020).

In the present overall research investigation on adolescent perceptions of chance events in relation to their opportunity awareness, qualitative data was collected following a quantitative phase, i.e., a focus group was convened following the questionnaire phase of data collection. This type of mixed methods design is called an 'explanatory mixed methods design', and has also been called a two-phase model (Creswell & Plano Clark, 2007). An explanatory mixed methods design firstly collects quantitative data and, secondly, collects qualitative data to elaborate or help explain the quantitative results (Creswell & Guetterman, 2020).

A mixed methods research design aligns with the ontology of realism as it assumes that there is an objective reality concerning adolescent

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perceptions of chance events and their awareness of opportunities. The objective reality of adolescent perceptions implies that the study acknowledges the existence of an independent reality that can be investigated. From an epistemological perspective, the method adheres to objectivism by emphasising the collection of empirical, observable data. The initial quantitative phase, conducted through structured questionnaires, aimed to gather objective information about adolescent perceptions. Subsequently, the qualitative phase, involving focus groups, added a systematic approach to understanding subjective experiences. This methodological choice reflected an objectivist approach, valuing tangible evidence. In terms of theoretical perspective, the study adopted a positivist stance. The explanatory mixed methods design aligns with positivism's emphasis on empirical evidence and scientific methods. By first collecting quantitative data and then supplementing it with qualitative insights, the approach provided a comprehensive and nuanced understanding of the phenomenon under investigation, in line with the positivist belief in the value of systematic data collection and analysis.

3.3.1 Survey Research

Survey research can certainly be considered among the primary domains of measurement in applied social research and has been particularly popular amongst researchers in education. Such popularity may be due to the survey's ability to collect qualitative and quantitative data, depending on the types of questions and how participants are asked to respond, and also to elicit individual stories or reasons for why the participant may perceive events the way that they do, i.e., chance events in unique ways. The expansive area of survey research can include any measurement procedures which involve asking questions of participants. A survey can be anything from a short paper-and-pencil feedback form to a web-based questionnaire employing Likert-type scales, multiple-choice along with opportunities to make comments, or an intensive face to face interview (Harris & Brown, 2019).

Survey research designs are used to study a sample or an entire population, aiming to describe such things as behaviours, attitudes, opinions, or other such characteristics of the population. Once data are collected they

are statistically analysed, which enables the researcher(s) to describe trends drawn from the responses given to the survey questions and also answer research questions or test emerging propositions and hypotheses. Survey research designs share commonalities with correlational designs, as part of the data analysis includes the correlation of variables (Creswell & Guetterman, 2020).

It is generally recognised that there are two basic types of surveys: cross-sectional and longitudinal. The type most favoured in education today is the cross-sectional one (Creswell & Guetterman, 2020). Unlike the longitudinal research using a survey design, which captures data at several given points over a protracted period of time, i.e., months or years – the cross-sectional survey is used to capture data at one point in time. Thus, they are often cheaper and used for recording data regarding a current issue, i.e., bullying in the junior school. A cross sectional survey can be used to examine current attitudes, beliefs, opinions, or practices, compare two or more educational groups, measure community needs, and evaluate a program or do large-scale state or country wide assessments (Creswell & Guetterman, 2020).

Whether using a survey design that is cross-sectional or longitudinal, there are key characteristics of survey research. These key characteristics are:

- Sampling from a population
- Collecting data through questionnaires or interviews
- Designing instruments for data collection
- Obtaining a high response rate

  Survey researchers typically select and study a sample from a population and generalise results from the sample to the population.

(Creswell, 2012, p. 380)

The current research investigation did not generalise results from a sample of the population, but rather, surveyed the majority of the population of middle and senior school students of an independent college based in regional western Victoria, which contains a relatively even distribution of

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socio-demographics. This positivist study verified the socio demographics for homogeneity and normal distribution.

There are many differing forms of surveys currently in use, however, the basic types are questionnaires and interviews. Typically, the response rate is far greater with interviews, however, a greater number can be achieved more time efficiently with the use of questionnaires. Naturally, there are also a number of mediums for questionnaires, such as those mailed out and those in electronic form. Being mailed out and those in electronic form is a very convenient way to distribute to a geographically diverse population, as well as target a sample group or en masse to an entire post code, for example. However, there are disadvantages also, in that the response rate is generally poor, and the researcher does not have the ability to explain questions, leaving the possibility of misinterpretation of the question, particularly for those with poor literacy or other such language barriers (Creswell, 2012).

The electronic questionnaire has similar advantages and disadvantages as the mailed-out version (Howard, 2021).The major difference being that the response rate is far greater due to the convenience of being able to complete online and submit instantly, as opposed to placing in a return envelope and actually getting to a mailbox to return it. It is more difficult however, to target a large group of people without their email address (except for an educational institution who have their students' emails as a matter of record). Participants in an electronic questionnaire can log into a website with the questionnaire pre-loaded on it (Creswell & Guetterman, 2020). With this type of electronic questionnaire participants can be taken directly onto the website or enter via a hyperlinked invite emailed to them, complete the questionnaire, and submit the response, which can be automatically correlated, graphed, etc. for the researcher to access. There are many variations, and this type of electronic questionnaire could also be considered computer-assisted self-interviewing (Babbie, 2020). The current research employed the use of a secure, commercially available website commonly used for market research purposes for the distribution of an electronic survey (Study 1, 2, and 3).

The creation of survey instruments is a crucial aspect of survey research, and it presents substantial complexities and challenges. It is recommended to explore existing instruments in use or modify them as a first step before attempting to create a completely new one. Nevertheless, there may be situations where designing a new instrument is necessary and cannot be avoided (Creswell, 2012). When designing an instrument, researchers generally follow these steps:

1. They write diverse types of questions. These include personal, attitudinal, and behavioural questions; sensitive questions; and closed-and open-ended questions.

2. They use strategies for good question construction. This includes using unambiguous language, making sure the answer options do not overlap, and posing questions that are applicable to all participants.

3. They perform a pilot test of the questions. This consists of administering the instrument to a small number of individuals and making changes based on their feedback.

(Creswell, 2012, p. 385)

The response rate is a challenge for any form of research, but especially for survey questionnaires. A high response rate from participants is always sought, to enable the researcher to make generalisations about the population being studied (Wu et al., 2022). Generally, interviewing participants gains the highest response, as participant would usually have consented in advance. The mailed out and electronic responses typically vary. There are many differing methods for researchers to use to encourage a higher response rate, such as to pre-notify participants and good follow-up procedures (Creswell & Guetterman, 2020). For the present research investigation, however, the supervising teachers at the research site escorted participating students in class groups into the computer laboratory and assisted them with the process of logging onto the online survey website to complete the questionnaire. This strategy eliminated the risk factors associated with poor response rates typical in survey research. It also minimised issues associated with low response rates, such as 'response

bias', which occurs "when the responses do not accurately reflect the views of the sample and the population" (Creswell, 2008, p. 403).

3.3.2 Focus Groups

The origins of focus groups as a social science methodology can be traced to Paul Lazarsfeld and Robert Merton's early 1940s study examining the effects of media on attitudes towards World War II. Originally used in market research, focus groups have evolved into a widely applicable tool across social sciences. Initially employed to gauge reactions towards products, this method now delves into diverse aspects of human behaviour and experience (Okoko et al.,2023).

Qualitative research goes beyond the surface of real-world problems, uncovering deeper meaning and perspectives to shed light on the "why" behind the "what." (Moser & Korstjens, 2017). Unlike quantitative methods, which focus on numerical data and statistical analysis, qualitative research investigates the subjective realm, seeking to comprehend lived experiences, perspectives, and meanings attributed to the world by individuals and communities (Denzin & Lincoln, 1998).

A focus group is a research method that employs group discussion to explore a predefined topic chosen by the researcher (Creswell & Guetterman, 2020; Morgan, 1997). Focus groups are used to gather collective insights and individual perspectives on a defined topic. The resulting data are shaped by group dynamics, highlighting the interactions between participants. This method relies on the assumption that group members have valuable information and can express their thoughts and experiences, benefiting from the guidance of a moderator and the group environment. Participants often share similar social, cultural, or interest-based backgrounds (Okoko et al.,2023).

Study 4 (Chapter 7) utilised focus groups, a qualitative methodology, to explore how students' perceptions differed across year levels (10, 11, and 12). The participants in the Focus Groups had valuable insights about their experiences of chance events. Conducted directly following the completion of

questionnaire-based surveys (Studies 1, 2, and 3), these focus groups aimed to provide deeper insights into the research questions.

3.4 Participants: Convenience sample

The present overall research investigation employed participants using a Convenience sample – a sampling method in which the subjects of the research or participants are selected solely based on their ease of access or availability. Naturally, with any sampling method, this has disadvantages. For example, just because the participants are easy to acquire does not mean they representative of the whole population. This is known as Accidental Sampling, e.g., people who answer their phone when market researchers call may not be representative of the entire population, such as those who do not answer or refuse to talk with market researchers. Convenience sampling typically involves minimal efforts to guarantee the sample's representativeness of the population and is best suited for specific, constrained populations and exploratory research endeavours (Stevens 1996).

The site in which the research was conducted on is a single campus independent private school, located in a large regional city in Victoria. The city's population has risen by approximately 38,000 in the past 10 years, bringing with it a variety of social issues. This is due to the fast train to Melbourne, making commuting an easy option, as well as the affordable housing compared with the cost of housing in the metropolitan area.

On the geographically large single campus there were three distinctly separate sub-schools, employing a typically American model comprising of a junior, a middle, and a senior school. As such, there is a limited population, as Stevens (1996) puts it, however, the demographics of the College is unique in its even representation of the socio-economic spectrum across the population. This is possible due to the College being the only non-denominational Christian college within a large radius. As such the College has a catchment area of around 50 kilometres from the campus.

In this particular research on adolescent perceptions of chance events and opportunity awareness, a convenience sample was deemed the most

practical approach for participant selection. This decision stemmed from the fact that the researcher was an employee at the same college where the participants were enrolled. This proximity and accessibility made it convenient to gather data from this specific group, despite the sample not being selected for its representativeness but rather for its accessibility within the researcher's immediate environment.

All participants in this study were students enrolled in the middle and senior schools at the College. Spanning from Grade 6 to Year 12, and encompassing an age range of approximately 10 to 20 years. Each student obtained both parental/carer consent (Appendix D) and provided their own assent to participate. This approach was facilitated by the College's relatively small population, comprising only 370 students from Preparatory to Year 12. By involving the majority of students in both school levels, the research was able to achieve a substantial sample size, ensuring statistical significance (Nayak, 2010). Additionally, this inclusive approach allowed for a comparative analysis, revealing how the perceptions of chance events in younger adolescents could vary from those of their older counterparts.

3.5   Data Gathering Strategies: Questionnaires and Focus Groups

In the present research investigation on adolescent perceptions of chance events in relation to their opportunity awareness, data were collected via four separate studies conducted in two stages. Stage 1 consisted of Studies 1, 2, and 3. These were conducted via survey research. A questionnaire was completed entirely electronically (online) by students in the middle and senior school (Grades 6 - Year 12) of the college in which the researcher was employed. In stage 2, volunteers were sought from the senior school (Years 10 - 12) to participate in three separate year-level-specific focus groups interviews.

3.5.1 Questionnaire

Three separate questionnaires were developed specifically for Studies 1, 2, and 3, accounting for the age and developmental level of the participants of each study. Study 1 was completed by all participants in Years 6 through to

12 inclusively. Study 2 was completed by participants in Years 8 through to 12 inclusively, and study 3 was completed by participants in Years 10 - 12 only. Table 3.2 lists the particular year-level, to the survey completed and the study it is associated with.

Table 3.2

Survey instrument completed by year-level.

Year Level	Age Range	Survey Instrument Questionnaire Study:			Psychometric test: Luck Readiness Index (Pryor & Bright, 2005b).
		1	2	3	
6	11-12	✓			
7	12-13	✓			
8	13-14	✓	✓		
9	14-15	✓	✓		
10	15-16	✓	✓	✓	✓
11	16-17	✓	✓	✓	✓
12	17-18	✓	✓	✓	✓

The senior school participants in Years 10 - 12 also completed the Luck Readiness Index (LRI) – a psychometric test that assesses eight dimensions: Flexibility, Optimism, Risk, Curiosity, Persistence, Strategy, Efficacy, and Luckiness. The LRI contains 52 items and would typically take ten minutes or less to complete (Pryor & Bright, 2005b).

All three studies and the associated questionnaires were distributed electronically, employing the use of an online proprietary survey website. The LRI was also distributed electronically and was administered to participants following the completion of the Study 3 questionnaire. As a natural part of Study 3, this was seamless as participants were not aware of any change in questionnaires.

Participants identified themselves only by year-level, age, and sex. There was deliberately no time limit placed on the completion of the

questionnaires and there were regular opportunities for participants to evaluate and modify their responses before submitting their completed questionnaire.

3.5.1.1   Measurement Tools

There were three categories of information gathered for analysis through the survey process. These were: basic demographic information, perception of chance events, and an opportunity awareness measure.

      The adolescent perception of chance events questionnaire was developed specifically for this research investigation. A psychometric scale entitled *The Luck Readiness Index* (Pryor & Bright, 2005b), was used to measure Opportunity awareness against the adolescence perception of chance events. Each category of data collected is defined below.

3.5.1.2   Basic demographic information

The initial segment of each study involved gathering demographic information. This basic data set included age, year-level, and sex; however, it did not provide an option for non-binary participants to indicate their identity (see Appendix I).

3.5.1.3   Study 1, 2, and 3 survey questionnaires

At the time of the research proposal there was no measurement tool in existence that would adequately measure an adolescent's perception of chance events. Consequently, the questionnaires were developed specifically for use in this overall research investigation.

      Each survey questionnaire was constructed exclusively for the particular study, i.e., with adolescent development in mind, and with each study delving deeper as was age appropriate (Steinberg, 2017). All studies began by collecting basic demographic information.

      Study 1, completed by all participants in Grade 6 through to Year 12, asked only four questions (see Appendix F). Firstly, without supplying a definition of a chance event, requested participants to type 4 or 5 words that

spring to mind when they think of chance events. Secondly, participants were asked if they have experienced any chance events that have made a significant impact on their life and if so, how many events like this they have experienced. Thirdly, participants were asked to provide three examples of different chance events that could happen when they are working or looking for work.

Study 2 was completed by participants in Years 8 to 12 (see Appendix G). Participants were asked to carefully read a story and then answer the eight related questions that followed. Question 1 and 2 asked participants if the story contained any chance events and, if so, how many chance events they believed were present. As the story contained within it six chance events of varying nature and severity, how participants responded determined what they consider to be a chance event specifically in terms of positive and negative, high, and low control chance events. Question 3 asked participants to briefly describe what they believed was the most obvious chance event. Question 4 then required participants to respond using a five-point anchored scaling method on how likely it was that the events in the story could happen to them. Question 5, asked how likely it was that the events in the story could happen to other people, ranging from 1 = Very Unlikely to 5 = Very Likely. This type of scale is also known as a Likert-type scale or the Likert method, Bertram (2023) defined a Likert scale as a commonly employed psychometric tool in surveys to gauge participant preferences or the extent of their agreement with a statement or series of statements. It belongs to the category of non-comparative scaling techniques and focuses on measuring a single trait. Participants are tasked with expressing their level of agreement with a provided statement using an ordinal scale. The self-report Likert scale is one of the most used measuring techniques today (Baumeister et al., 2007; Clark and Watson, 2019). Likert scales offer a convenient technique to assess unobservable characteristics (Jebb et al., 2021).

Question 6 asked participants to briefly describe what they believed was the least obvious chance event. Question 7 then required participants to respond using the same five-point anchored scaling method on how likely it

was that the events in the story could happen to them, and Question 8 asking how likely it was that the events in the story could happen to other people.

Study 3 was completed by the participants in the senior school exclusively (Years 10 - 12) (see Appendix H). The Study 3 questionnaire was the largest of all the studies, containing within it four distinctly different subsections. The first subsection employed the eight dimensions of the Luck Readiness Index: Flexibility, Optimism, Risk, Curiosity, Persistence, Strategy, Efficacy, and Luckiness. It firstly asked participants to rank them in order of their perceived importance to have a successful career, from 1 being most important, to 8 being least important. Then to indicate on a scale of 1 - 7 (1 = Totally Unimportant to 7 = Very Important), how important they believe each of the eight dimensions to be in terms of having a successful career, then to scale that response by using a 1 - 5 scale on how confident they were that they understand each of the terms (1 = Unconfident to 5 = Confident).

To increase the sensitivity of the measure a 7-point scale was adopted when requesting participants to rate the level of importance (as they perceived it) of each of the 8 Luck Readiness Index elements, in terms of you having a successful career. A 7-point scale offers a modest benefit in this regard (Colmen et al., 1997). A few researchers have, however, reported higher reliabilities for five-point scales (Jenkins & Taber, 1977; Lissitz & Green, 1975; McKelvie, 1978; Remmers & Ewart, 1941). As such, since the survey was requiring participants to rate the same 8 elements, and to engage students with different response requirement, a 5-point scale was utilised when requesting participants to rate their confidence level in the comprehension of each element of the Luck Readiness Index. There was little evidence of benefit of using an extended scale.

The second subsection contained three separate vignettes, each containing two chance events linked to the following subsequent categories of chance events: Physical, Health, Family, Educational, Environmental, Relational, Spiritual, Social, Travel, and Employment. Each vignette was followed by three questions asking participants if thought any chance events had occurred and, if so, how many chance events they believed had occurred.

Participants were then requested to relate the chance events that they identified to one or more of the categories of chance events listed.

The third subsection had two parts. The first part asked participants to initially describe a chance event that had occurred to them personally, and then to relate that particular chance event to one or more of the 11 chance event categories listed. In the second part, participants were asked to describe a chance event that had occurred to someone else, and then to relate that particular chance event to one or more of the 11 chance event categories listed.

The fourth subsection asked participants to provide an example of a chance event for each of the 11 listed categories of chance events. There existed no universal category of chance events at the time of the research proposal. As such, the 11 categories of chance events (Physical, Health, Family, Educational, Environmental, Relational, Spiritual, Social, Travel, and Employment), were developed by a panel specifically formed for the purpose of their development. The Panel consisted of 6 professionals, the researcher, two Academic professors experts in the field of career development, two subject matter experts and a registered professional career development practitioner.

3.5.1.4   Luck Readiness Index

A participant's opportunity awareness was measured by administering the Luck Readiness Index (LRI), a psychometric test which assesses "eight dimensions: Flexibility, Optimism, Risk, Curiosity, Persistence, Strategy, Efficacy, and Luckiness" (Pryor & Bright, 2005b). This then produces a Luck Readiness Profile (LRP).

The LRI can be utilised in various ways. It can first serve to pinpoint both the strong points and areas for improvement in an individual's ability to harness luck. Additionally, for individuals who may feel stagnant in their current employment situation, the LRI can stimulate creative strategies for career progression. Moreover, it can instil a constructive outlook towards change for those who perceive themselves as being at a disadvantage due to unexpected circumstances. Lastly, the LRI can furnish valuable guidance to

individuals striving to bolster their preparedness for favourable opportunities, especially as they formulate an entrepreneurial blueprint for their future (Pryor & Bright, 2005).

The Luck Readiness Index (LRI) is a commercially available psychometric test developed by Professor Robert Pryor and Professor Jim Bright (2005b), that has been 'widely' used over its 18-year history, both domestically (e.g., Borg et al., 2014; Borg, 2015) and internationally (e.g., Lengelle et al., 2016). The LRI can be administered by hand (paper based) or electronically (online). For the purpose of this research the LRI was administered electronically. The LRI contains 52 items and would typically take around ten minutes to complete (Pryor & Bright, 2005b). As an outcome it measures the eight dimensions which the senior school participants are asked to rank in the order participants believe to be of importance to career development, and then to scale how confident they believe they are at understanding the terms: Flexibility, Optimism, Risk, Curiosity, Persistence, Strategy, Efficacy, and Luckiness. These eight dimensions, which the field of career development refers to as '21st-century skills', are considered essential for succeeding in modern careers (Lengelle et al., 2016).

3.5.2   Focus Groups Interviews

The convergence of focus groups and surveys stands as a prominent approach for integrating qualitative and quantitative methodologies (Nyumba et al., 2018). Morgan (1996) presented four ways of combining qualitative and quantitative methods in focus groups and surveys in particular. "The four ways of combining the methods are based on which method received the primary attention and whether the secondary method served as a preliminary or follow-up study" (Morgan, 1996, p. 134). It is this third way of combining the methods which was used in the present research investigation, where surveys were the primary method, and the focus group served as a subsequent step that aided in understanding of the survey outcomes. An increasingly prevalent practice for qualitative follow-up approaches, such as focus groups, involves reaching out to survey participants again to obtain illustrative content that can be incorporated alongside quantitative discoveries (Morgan, 1996).

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Focus Group Interviews as a research method is quite common and has a reasonably long history, particularly within the social sciences (Morgan, 2003). While focus groups have likely been utilised by sociologists for as long as they have been gathering data, such as Bogardus (1926), the recent years have witnessed a notable and substantial increase in enthusiasm for groups in general, and specifically for focus groups (Morgan, 1996).

Focus groups, frequently linked with market research and psychology (Creswell, 2008), offer an effective method for gathering genuine and detailed data. This is achieved by eliciting participants' perceptions through open-ended questions. Participants are encouraged to share their thoughts and feelings, and even collaborate in generating new knowledge with one another, it is through this process, a collective pool of knowledge is constructed (Gall, Gall & Borg, 2005; Gillham, 2005; Norris, 2017). In survey research, focus groups entail the researcher finding or creating a survey tool, gathering a small group of individuals (usually comprising four to six people) capable of responding to the questions posed in the instrument or via a protocol, and documenting their feedback regarding the questions included in the instrument (Creswell, 2008).

The facilitator of the focus groups adhered to a scripted framework that consisted of a meticulously prepared script with a set of 10 questions (Appendix E). These questions were strategically crafted to prompt responses from all participants in the group and facilitate engaging group discussions. The primary objective was to encourage the expression of individual perspectives and opinions within the group, often by expanding upon each other's answers. Focus Groups emphasise and encourage interaction among group members (Creswell, 2008). The questions are intentionally designed to foster this interaction, aiming to generate a synergistic research approach that relies on the exchange of ideas and experiences between group members, resulting in a diverse range of perspectives (Gillham, 2005; Morgan, 1997). Through this dynamic interaction and discourse among focus group members, numerous aspects can be discerned, including participants' worldviews, attitudes, and cultural beliefs. This interactive environment enables both group members and the focus group facilitator to seek clarifications regarding

statements made, thereby affording participants the chance to introspect and contemplate their experiences by expressing their thoughts and emotions (Creswell, 2008).

Naturally, there are positives and negatives associated with focus groups. Advantages are the unscripted and free flowing discussion that can be generated by functioning groups, which can vicariously elicit discussion that draws out the particular perceptions of group members (Morgan, 1996). "What makes the discussion in focus groups more than the sum of separate individual interviews is the fact that the participants both query each other and explain themselves to each other" (Morgan, 1996, p. 139). A unique strength of focus groups is the ability to discern the extent and nature of group members' agreement and disagreement. "Weaknesses of focus groups, like their strengths, are linked to the process of producing focused interactions, raising issues about both the role of the moderator in generating the data and the impact of the group itself on the data" (Morgan, 1996, p. 139). According to Litoselliti (2003), there are three distinct limits of focus groups which must be addressed. Firstly, bias and manipulation, whereby the facilitator inadvertently or deliberately leads or encourages the group discussion in a particular direction. Secondly, false consensus, where group members with strong personalities can lead and dominate the group discussion in a particular direction. And finally, the difficulty that in distinguishing between an individual and a group view. These three potential limitations can all arise naturally from the interaction of the group members and facilitator (Litoselliti, 2003). In the present overall research investigation, the facilitator was aware of the potential conscious bias and was vigilant in the self-regulation thereof. Where the facilitator suspected stronger personalities were dominating group discussion, a clarification and invitation for other opinions was made to elicit other opinions. This clarification and invitation for other participant opinions also assisted in the facilitator distinguishing between an individual and group view.This researcher's positionality as a career development practitioner informed their research but also necessitated ongoing critical reflection. Their experiences, of over 20 years in both the Social Work and Education industries, provided valuable insights and context, but they acknowledge the

potential biases arising from that same background. Therefore, rigorous reflexivity was employed throughout the research process. Rennie (2004) defined reflexivity as "self-awareness and agency within that self-awareness" (p. 183). Reflexive practices challenge our assumptions and biases of our world views (Bolton and Delderfield, 2018), reflection and reflexivity were utilised through journaling and seeking diverse perspectives from doctoral supervisors, to challenge assumptions and biases. Additionally, triangulation and member checking were utilised to ensure the validity of any findings. By continuously questioning assumptions and maintaining an open, curious mindset, the researcher aimed to produce a nuanced and authentic analysis grounded in the lived experiences of participants, rather than solely on any preconceptions. This commitment to reflexivity ultimately served to enhance the trustworthiness and ethical soundness of the research.

3.5.3 Procedure

Following research ethics clearance being obtained (see Appendix A), formal permission was obtained from the College Principal of the research site via an in-person meeting (see Appendix B), where the intricacies of the intended research – including the research design, aims, methodology and proposed timeline – was outlined in appropriate detail. Permission was then sought from parents and guardians and finally assent/consent from the participants themselves (according to their age) to ensure informed consent/assent was obtained (see Appendices C & D).

The online surveys (Study 1, 2, and 3 questionnaires) were conducted at each year-level by the Year-Level Coordinator or Homeroom teacher. They were provided with a list of participants verified by the College administration office to have permission for participation. The administering staff member then escorted their respective class to their usual classroom for the survey administration. This was in order to minimise disruption to that particular class and other classes in session. This was achieved in no particular order but facilitated with the minimisation of disruption to normal timetabled classes in mind and at the discretion of the Head of School, with respect to the seniority

of the year-levels, i.e., not scheduling the Year 12 too close to SACs (School Assessed Coursework) or examinations.

Study 4 was a Focus Group, which was conducted with a group of year-level-specific volunteers exclusively from the senior school Years 10, 11 and 12 following the completion of Studies 1, 2, and 3. The guiding questions that directed the focus group discussions were crafted based on the findings of the initial three studies. Their purpose was to gain a deeper understanding of the research questions (see Appendix E). Volunteers were sought from each year-level. Each Focus Group was facilitated either after school or during school holidays to minimise the disruption to class time and to limit any college-based distractions such as sport and music.

Participation was voluntary, and there were no incentives, gifts or oblique ancillary benefits to students who participated. For the Year 12 student participants, sessions were conducted after the Victorian Certificate of Education (VCE) state-wide examination period, and as such, there could be no implied benefit to those participants via school results, university entry, or any other coercion benefits for participation.

Standard Australian Catholic University (ACU) mandated Parent/Carer Consent Forms were used, as most participants were under the age of 18 (see Appendix D). These forms were collected and collated before Study 1 (the online surveys) and included parent/carer consent and student assent to participate in the focus groups.

Interested participants volunteered to participate in the focus group through their Homeroom teacher or year-level coordinator. An invitation was extended during a senior school assembly, where the researcher gave a generic and brief explanation of what was involved, including exactly what a focus group is, logistics, and the procedures for volunteering. To mitigate potential biases in student participation, no information was disclosed regarding the identity of the focus group facilitator. This decision aimed to ensure the integrity of the focus group data by minimising the potential impact of factors outside of the research questions on student responses.

All focus groups were facilitated on campus in the research site's boardroom, located in the main administration building, adjacent to the

general lobby. The boardroom was equipped with a standard meeting table and chairs as well as a Smartboard, two whiteboards, computer, data projector, and audio teleconferencing facilities. Apart from the meeting table and chairs, however, none of the other features of the Boardroom were utilised.

It should be noted that none of the participating students had attended any particular classes or any other subject, career education or otherwise, which had a specific focus on chance events at any stage. The College community in general – which included all participating students – were not aware of the researcher's interest in chance events as a topic, or the Chaos Theory of Careers in general as a theory and/or methodology of career development practice.

3.6   Analysis of data

Data analysis is "a complex process that involves moving back and forth between concrete bits of data and abstract concepts, between inductive and deductive reasoning, between description and interpretation" (Merriam, 1998, p. 178). The ontological and epistemological foundations of this research support diverse methods of collecting data. There are challenges with using diverse methods and the subsequent analysis of the data collected can be problematic, necessitating additional deliberation (Bassey, 1999). The analysis of data should occur simultaneously and interactively with data collection and the subsequent writing of any reports (Creswell, 2012; Merriam, 1998).

"Quantitative research is all about quantifying relationships between variables" (Hopkins, 2023, para. 1). Variables include things like age, weight, performance, and time. Variables are measured on a sample of subjects, such as participants in middle and senior school. Relationships between variables are articulated by using effect statistics, such as correlations, relative frequencies, or differences between means (Hopkins, 2000). There are two types of research that aim to quantify relationships: descriptive and experimental. "In a descriptive study, no attempt is made to change behaviour or conditions - you measure things as they are. In an experimental study you

take measurements, try some sort of intervention, then take measurements again to see what happened" (Hopkins, 2000, p. 2). In the present research investigation on adolescent perceptions of chance events in relation to their opportunity awareness, there were no attempts made to change behaviour or conditions – i.e., the adolescent's perceptions were measured as they are. As such, a descriptive study was undertaken.

There were two distinctly different forms of data generated and subsequently, collated and analysed. These forms of data included the quantitative questionnaire data (Study 1, 2 and 3), and the qualitative focus group data (Study 4).

Quantitative Analysis

Studies 1, 2, and 3 were analysed using a number of quantitative methods employing the use of the statistical analysis software: Statistics Package for the Social Sciences (SPSS) version 29. The various types of analysis, such as the t-test, will be explained in this section.

Quantitative methods all employ the use of variables. Demographic information such as student contact details (address, phone numbers, email etc.), characteristics (age, sex, etc.), financial information, and academic progress (subjects studied, reports marks etc.). All of these kinds of information are called variables. Simply defined, a variable is a "characteristic or condition for which each case or subject (here each student) has any of a number of pre-determined values" (Woodley, 2004, p. 56). Quantitative methods further categorise these variables into four data levels: Nominal, Ordinal, Interval and Ratio. Nominal level data is descriptive, e.g., sex or cultural background. Nominal level variables are generally given numerical values. Ordinal level data places items into a rank order. Interval level data measures equal distances (or intervals) between each of the measures on a scale (Woodley, 2004). Ratio level data are similar to interval level data, except it includes absolute zero (Woodley, 2004). Other aspects of quantitative research analysis, such as coding open-ended data; organising the information for analysis; frequency analysis; cross tabulations, assessing

significant differences; and error rates (Wallace, 2023) were also employed in the analysis of data collected in this research investigation.

The questionnaires used in Studies 1, 2, and 3, contain questions with various levels of data, including questions that invited a descriptive experience as a response. Descriptive experience data are known as open-ended data and require the quantitative research analysis method known as coding. As it is not possible to quantitatively analyse verbatim responses, they must be quantified. This essentially means reading through a few of the verbatim responses and reviewing the text, highlighting segments of text pertinent to the research question. These segments were classified by category with a numerical code.

Questions that required categorisation of student responses involving the identification of chance events and categories thereof, such as Study 1, questions 1 "In the space below, write 4 or 5 words that spring to mind when you think of chance events" and 4 "In the space below, give 3 examples of different chance events that <u>could</u> happen when you are working or looking for work" (Appendix F), a group of five adults comprising of senior secondary teachers was convened (henceforth referred to as the panel) for the purpose of identifying and coming to consensus on what actually were 'chance events'. The panel was guided by the definition of a 'chance event' provided to them, which was that generally chance events relate to "unplanned, accidental, or otherwise situational, unpredictable, or unintentional events or encounters that have an impact on career development and behaviour" (Rojewski, 1999, p. 269).

The Panel unanimously arrived at a consensus and proceeded to collectively classify the chance events as either positive or negative, considering their potential impact on a student's life. Subsequently, the panel members were tasked with categorising the chance events according to their perceived level of controllability, using the provided definition, which included three categories: low, intermediate, and high.

The commonly used form of quantitative analysis is called the 'frequency analyses' (Woodley, 2004). The frequency analysis presents the distribution of answers to a question, e.g., if sex is the variable, then a

frequency analysis will display how many answered that they are male and how many answered that they are female. A frequency distribution is described by assigning the responses a percentage, such as 70% of those who responded to the questionnaire were female and 30% male. Like many statistics, a frequency distribution is best displayed in a graph of some sort. Crosstabulations are also a useful way of presenting data for analysis. They are usually structured by rows and columns, and are effective at displaying an overview of the data (Wallace, 2023). This research investigation employed frequency analysis.

Another valuable tool in quantitative analysis is the identification of statistically significant differences. An example of a statistically significant difference is how some types of people differ from others regarding some aspect of the research. For example, how boys categorised chance events compared to how girls categorised chance events. "Statistical significance is the measurement of likelihood that this difference would occur in the "real world," and is not simply a function of sampling error or chance. If differences are not statistically significant, they should not be reported" (Wallace, 2023, p. 10). A variable is said to be of statistical significance if "the level of significance is usually prescribed to be .05 or greater. This means that there is a 95% or greater chance that the difference is real" (Wallace, 2023, p. 10). Commonly 0.05 and it should surely be 0.05 or less, i.e., 0.06 is greater but not significant, whereas 0.01 is less and more significant. Where a statistical significance is discovered from Studies 1, 2, and 3, the significance is reported and explained (see Chapters 4, 5 and 6).

The difference of proportion test, Chi square, and the t-test are the three most commonly used tests to calculate statistical significance in quantitative data analysis. The t-test is generally considered the most common test of statistical significance (within the social sciences at least) and uses means and/or averages to calculate the statistical significance of a difference (Wallace, 2023). The analysis for the present research investigation utilised the t-test. Paired-samples t-tests were utilised in Study 1 (see Chapter 4) and independent sample t-tests in Study 3 (see Chapter 5). Paired-samples

t-tests were appropriate because it provided the calculation to determine statistical significance of difference.

T-tests and ANOVA tests are statistical methods employed to compare means and spreads of distributions across populations, with t-tests focusing on two population comparisons and ANOVA accommodating tests for more than two levels within an independent variable (Simkus, 2023).

The current research investigation also employed the Analysis of Variance test (ANOVA). "An ANOVA test is a statistical test used to determine if there is a statistically significant difference between two or more categorical groups by testing for differences of means using a variance" (Simkus, 2023). The ANOVA features a number of different types of tests, with the most prevalent ones being utilised in the present overall research investigation being the 'One-Way', 'Two-Way', and 'Repeated Measures'. One-Way ANOVA focuses on a single categorical independent factor and a continuous dependent variable that follows a normal distribution. The independent factor categorised cases into exclusive groups or categories. It was employed to compare means across various levels of the independent factor. The One-Way ANOVA (also known as a Univariate ANOVA) was utilised for the analysis of Study 2 and 3.

The Two-Way ANOVA (also known as factorial ANOVA) considers two or more categorical independent factors and a continuous dependent variable with a normal distribution. Similar to One-Way ANOVA, the independent factors categorise cases into distinct groups or categories. The Two-Way ANOVA enabled examination of interaction effects between multiple independent factors on the dependent variable (Simkus, 2023).

The repeated measures ANOVA (also known as a within-subjects ANOVA) extends the dependent t-test to analyse related groups instead of independent ones, serving as the equivalent of a one-way ANOVA in this context (Laerd, 2023). The repeated measures ANOVA was utilised for the analysis of Studies 1, 2, and 3, a Multivariate ANOVA (also known as a MANOVA) was also employed for the analysis of Study 3. These repeated measures provided statical significance of difference.

Both ANOVA test types employ the F statistic as the test statistic. The F value is computed using the formula F = variance attributed to treatment / variance caused by random chance. The ANOVA F value assists in determining significant differences among the levels of the independent factor, being sex and/or year level of participants. If the p-value (probability value) associated with the F statistic is less than 0.05 ($p < .05$), it indicates that the treatment factors have a notable impact on the dependent variable. In simpler terms, a higher F value suggests that the distinctions between the groups hold significance and are not simply due to random chance (Simkus, 2023). The ANOVA test provided the level of statistical significance for the present overall research investigation.

Study 3 utilised both a Mann-Whitney U Test and a Kruskal-Wallis Test when making comparisons of participants' ranking of the elements of the LRI. The Mann-Whitney U Test is employed for comparing distinctions between two separate groups when the reliant variable is either in ordinal or continuous form but lacking a normal distribution. The Kruskal-Wallis Test is a non-parametric test reliant on ranks and can be used to ascertain whether noteworthy statistical differences exist among two or more groups of an independent variable concerning a dependent variable that is either continuous or ordinal in nature (Laerd, 2023), see Chapter 6, Section 6.5.1.

"In quantitative analysis, numbers and what they stand for are the material of analysis. By contrast, qualitative analysis deals in words and is guided by fewer universal rules and standardised procedures than statistical analysis" (National Science Foundation, 2023, para. 2). The process of adhering to guidelines in qualitative research involves the use of both judgment and creativity. Since each qualitative study is distinct, the analytical methodology employed will also be distinctive (Patton, 1990). As qualitative research relies heavily on the researcher's skills, training, insights, and capabilities, the quality of the analysis ultimately depends on the analyst's analytical intellect and style. The human factor is the most significant advantage and, at the same time, the most significant limitation of qualitative research and analysis (Patton, 1990). T-tests and ANOVAs assume that the dependent variable, what is being measured is normally distributed. If all

scores were plotted they would resemble the normal curve also known as parametric tests (Havlicek & Peterson, 1974; Snijders, 2011).

Qualitative Analysis

The focus groups (Study 4) were analysed qualitatively. Qualitative modes of data analysis provide ways of discerning, examining, comparing, contrasting, and interpreting meaningful patterns or themes. Meaning is determined by the particular goals and objectives of the project at hand (National Science Foundation, 2023).

Qualitative research typically generates large amounts of data, so a central aim of data analysis is to reduce the total amount of data (Robson, 1993). As such, qualitative data analysis consists of a number of stages, i.e., examining, categorising and tabulating or otherwise recombining the evidence in order to address the initial goal of a study (Yin, 1989). The purpose should drive the analysis, which "begins by going back to the intention of the study and survival requires a clear fix on the purpose of the study" (Krueger & Casey, 2000, p. 127).

"The process of data analysis begins during the data collection, by skilfully facilitating the discussion and generating rich data from the interview, complementing them with the observational notes and typing the recorded information" (Rabiee, 2004, p. 657). The first step in the analysis of focus group data was to have the entire interview transcribed verbatim. Once transcribed, the focus group data is ready to be analysed, however, the transcript is merely the words that were spoken during the interview and does not contain the essence of the group. Elements such as the group dynamics, the tone and posturing of group members, non-verbal communication gestures and behavioural responses, etc. These forms of data can be collected as observational data obtained during the focus group (Stewart et al., 2007).

In the present research investigation, the qualitative data analysis commenced by transcribing each focus group session verbatim. Initial transcriptions were completed by a research assistant and then the researcher personally reviewed each transcription (i.e., three focus groups

and equal number of transcripts) to ensure accuracy and establish familiarity with the data. To further warrant accuracy, member checks were conducted with six participants, comprising three males and three females, with one representative of each sex in each group. All participants confirmed and/or amended the transcripts which confirmed the reliability and accuracy of the interview.

The second step in the analysis process of focus group data is to develop coding categories. Not all studies require in-depth coding. Small studies, or when multiple sources of data are used, it may suffice to identify key themes/issues (Berkowitz, 1996). Coding enables the organisation of substantial amounts of text to determine patterns and minimises text into categories. Initial coding is achieved by generating numerous category codes, labelling the data that are related without worrying about the number or variety of categories as focused coding is the step to eliminate, combine, or subdivide coding categories. This is also an opportunity to scan for repeating themes that might connect codes (Berkowitz, 1996).

In the present overall research investigation, the researcher followed a systematic process based on Creswell's approach for analysing qualitative data (Creswell, 2008). The initial step required open coding to identify categories or common themes of participant responses within each focus group, specific to the corresponding year-level. Constant comparisons were made between the generated codes and the interview data to develop the categories further and validate relationships. The researcher then proceeded with axial coding of the data obtained from each year-level-specific focus group. At this stage, a memo-writing process was employed to record and analyse themes emerging from the data. According to Charmaz (2014), memo-writing encourages a focused examination of codes and data, facilitating comparisons and the establishment of connections between them. In this investigation the memo writing process occurred as the themes emerged from the data.

Once the coding has been completed, explicit links between the data and the focus group objectives can be made. This includes patterns among participants' responses, confirming or contesting original thoughts,

identification of any distinctive or unusual opinions or viewpoints, etc. (Krueger, 1994).

The questions to be mindful of when interpreting the data are:

- "What was known and then confirmed or contested by the data collected?

- What was suspected and then confirmed or contested by the data collected?

- What was new that wasn't previously suspected by the data collected?" (Muruako, 2014, p. 47).

In the present research investigation, the final stage of data analysis phase involved selective coding, whereby a thematic storyline was constructed to elaborate on or develop emerging themes and relationships within the qualitative data from the focus groups (Creswell, 2007).

There is no one best approach to analysing focus group data (Stewart et al., 2007). In the present research investigation on adolescent perception of chance events, the data was analysed and used to provide a better understanding of the research problem.

Table 3. 3

Interrelatedness of data collection strategies and data analysis

Steps	Data collection strategies	Data analysis
1	Questionnaire – pilot testing	The pilot data were not included in the analyses. The pilot data however modified the survey instrument.
2	Questionnaire – Survey data collected from Studies 1, 2, and 3.	Collation of the data from the tests was analysed which assisted in designing the questions for focus groups together with the research questions.
3	Focus group – pilot	The pilot data were not included in the analyse. The pilot data however modified the focus group script questions. Analyse data collected to modify questions as necessary for step 4.
4	Focus groups	Constant comparative method, open and axial coding of data.
5	Focus groups	Verification of data through member check and feedback, as well as peer debriefing of the research processes and outcomes.

3.7   Verifications

The focus of this research is to understand how adolescents perceive chance events and how their perceptions relate to their ability to identify an opportunity. The verification demonstrates the rigor and legitimacy of the outcomes generated by this overall research investigation.

Quantitative Validity

In the realm of quantitative research designs, verification techniques commonly employed include Internal Validity, External Validity, Reliability, and

Objectivity. Internal validity looks at the degree of certainty that the observed effects in an experiment that are actually a consequence of the experimental treatment or condition (the cause) rather than intervening, extraneous or confounding variables (Johnson et al., 2020). External validity addresses the degree to which research findings can be applied to the real world beyond the controlled setting of the research, i.e., generalisability (Johnson et al., 2020). Reliability is an essential prerequisite for validity and refers to the reliability of the instrument used for data collection and therefore the data collected. "It is possible to have a reliable measure that is not valid, however a valid measure must also be reliable" (Burns & Grove, 2001, p. 23).

The current research investigation also employed reliability analysis as a verification procedure. Reliability analysis enabled the examination of measurement scale properties and its constituent items. By employing the Reliability Analysis procedure, various widely used measures of scale reliability are computed, along with insights into the associations among individual scale items (such as sex and year levels of participants) (Nejati, 2011).

Qualitative Validity

Verification in qualitative approaches to research are Credibility, Transferability, Dependability and Confirmability. Credibility refers to establishing that the results of the research are credible from the perspective of the participant in the research (Johnson et al., 2020). Transferability refers to the degree to which the results can be generalised or transferred, not unlike external validity (Trochim, 2002). Dependability – like reliability – assumes replicability or repeatability, i.e., can the same results be obtained if we replicated the study elsewhere? (Johnson et al., 2020). However, dependability highlights the necessity for the researcher to explain the dynamic context within which research generally occurs, and to depict the transformations transpiring within the context and elucidate their influence on the researcher's approach to the study (Trochim, 2002). Confirmability – not unlike objectivity – refers to the degree to which another person could verify the study results, which can be achieved by documenting the procedures for

checking and rechecking the data throughout the study. A colleague could be a 'critical friend' questioning the results or the researcher can actively search for and describe any negative instances (Patton, 1999; Trochim, 2002; Johnson et al., 2020).

"The trustworthiness of results is the bedrock of high-quality qualitative research" (Birt et al., 2016, p. 1802). Verification methods within qualitative research ensures the accurate comprehension of the information and significance of the subject under investigation. These protocols confirm that the concepts, classifications, rationales, and understandings derived from the study, as well as the phenomenon under scrutiny, are precise (Creswell, 2007).

The current research investigation employed member checking, peer debrief, and triangulation. Member checking (also referred to as participant or respondent validation) is a method used to assess the credibility of findings by sharing data or results with participants to verify their accuracy and alignment with their own experiences (Birt et al., 2016). The researcher provided focus group transcripts and also emerging themes from the analysis with participants to verify the accuracy of the transcripts and alignment with their own experiences.

Peer debriefing involves seeking input from one or more impartial colleagues without vested interests in the project, aiming to improve the research's validity (Delve, 2023). The researcher engaged separately with two peers, one a fellow Career Educator, and the other a senior secondary teacher. Both were impartial colleagues without vested interests in the project who reviewed and assessed the focus group transcripts, methodology, and findings.

Triangulation involves the utilisation of various sets of data, techniques, theories, and/or researchers in the analysis of data in order to address the research question. This triangulating approach serves as a strategic means to augment the credibility and trustworthiness of any discoveries made while mitigating potential research biases (Bhandari, 2022). In the present overall research investigation, triangulation of data collection was achieved through

individual year-levels transcript data, member checking of transcripts, and cross alignment with survey data.

3.7.1 Reliability and Validity of the instruments

Study 1, 2, and 3 Questionnaires

The questionnaires were developed specifically for the individual studies and were used for the first time in this overall research investigation. Test analysis is not the intent of this research and, as such, reliability of the questionnaires has not been established. The most appropriate measure would be Test-retest reliability, which can be defined as "a measure of the consistency of a psychological test or assessment. This kind of reliability is used to determine the consistency of a test across time" (Cherry, 2020).

To ensure content validity, the researcher worked in partnership with the first research investigation's principal supervisor to develop the questionnaires. Additionally, two qualified career development practitioners and both primary and secondary school English teachers were consulted to assess the appropriateness of the questions for the respective age groups.

The pilot of each study's questionnaire was conducted with approximately 10 former students who were now employed or first year tertiary students, which provided face validity from the feedback they provided on the draft survey. Construct validity has not yet been demonstrated due to the difficulty of a survey instrument actually measuring what it purports to measure, i.e., adolescent perceptions of chance events.

3.7.2 Luck Readiness Index (LRI)

The Luck Readiness Index is in its third manifestation. The first version was based on six dimensions containing 30 adjective and 24 sentence items, and was used for 18 months as a counselling tool (Pryor & Bright, 2005b). A basic item analysis and internal reliability contributions were undertaken from the data of 54 test takers. Item-total correlations were used to establish scale homogeneity for each of the six dimensions, ultimately resulting in the creation of version 2.

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Version 2 contained 25 adjective and 10 sentence items. Alpha reliabilities for the six dimensions were: Flexibility (.68), Optimism (.73), Risk Taking (.76), Curiosity (.72), Persistence (.57), and Planfulness (.58). From further analysis two significant issues were identified. Firstly, the smaller number of questions brought about a restriction in the content validity for each of the scales. Secondly, accepted reliability standard of .70 for personality scales makes it obvious that two of the dimensions were much below this and subsequently not suitable for singular counselling (Pryor & Bright, 2005b).

As a consequence, the authors (Pryor & Bright, 2005b) developed a third incarnation, adding two additional dimensions: self-efficacy and luck. Now 52 items in length, the updated version was given to 65 university students. "The items were then subjected to item analysis using corrected item-total correlations and alpha reliability estimates to establish which combination of items yielded the highest alpha reliabilities, item-totals correlations and least overlap with other scales" (Pryor & Bright, 2005b, p. 30).

The Confirmatory Factor Analysis (CFA) was the additional instrument considered to validate the data gained from the LRI. The issue of the sample size guidelines for CFA has itself been subject to rigorous review in White (2022), who analysed 1999 articles published in a SCOPUS-indexed journal in 2021 and concluded that the "suggestion for a sample size range would have to depend on the type of people who will participate in the study. If the study includes patients, a smaller sample size of approximately 250–350 would coincide with the findings of this study, whereas a study which includes students would need a larger sample of approximately 500–600. For studies among a general population (for example, adults from a certain country or city), an overall sample size of around 375–500 would be in keeping with the general trend for articles published in 2021." In this study, based upon the sample size of 62. This is clearly well below the range indicated by the White (2022) by a factor of more than 3. It is also significantly below the absolute minimums based on the other commonly relied upon rules of thumb for a CFA.

Consequently, in the circumstances of a smaller sample size, it is appropriate and justified to calculate the obtained internal consistencies of each LRI scale, and to adapt those scales to maximise reliability. It is important to note, that in so doing, the resultant analyses do not constitute a validation of the existing LRI scales, rather they provide evidence that the adapted scales achieve sufficient reliability for our purposes here while preserving the general meaning conveyed by the names of each scale (e.g. Optimism, Efficacy and Luck).

The Luck Readiness Index is a commercially available psychometric test that the researcher himself has used to assist students and clients via individual counselling for many years.

3.8   Ethical Issues

Our moral obligations as contributing members of humanity place ethical restrictions on how research can be conducted. "First and foremost, the researcher has an obligation to respect the rights, needs, values and desires of the informant(s)" (Creswell, 1994, p. 28). There are many ethical considerations, such as voluntary participation, confidentiality, anonymity, privacy, informed consent, protection from harm, deception, who ultimately owns the data, and attention given to the accuracy in reporting (Babbie, 2020; Creswell, 2008; Gillham, 2005; Miles & Huberman, 1994).

In the present study on adolescent perceptions of chance events in relation to their opportunity awareness, a Triangulation Mixed Method Design was used. Qualitative and quantitative data was collected. This involved the analysis and interpretation of qualitative data directly following a quantitative phase of data collection. As the data was collected across two distinct developmental academic precincts (middle and senior schools), the researcher was cautious in respecting the distinct culture and procedures of each precinct. Ethical procedures were used to obtain the data to be used in this overall research investigation.

Ethical procedures cover the process of application and subsequent permission from the University Human Research Ethics Committee and the procurement of written permission (see Appendix D) before the amassing of

any data as part of the process of the informed consent. Being an independent school there was no overarching department to obtain permission from. As such, initial and final permission was sought from the College principal, followed by the parents or carers of the students in the participating year-levels.

The research was carried out and data were collected in a way that ensured the anonymity of the participating students. This was achieved by the vigilant coding of student's names so that only the statistical demographic quantitative data at the beginning of each study was used for analysis and not student names or specific class groups. Participation was completely voluntary – there was no pressure on students to participate against their will. Participants who did not wish to participate were respected and given alternative work to complete during the time their class undertook the studies.

The mere presence of a researcher/stranger in a school can impact a study's outcome. However, in the present study the spectre of a stranger on campus was not present as the researcher is well known to many of the participants, and less known but still familiar to others, particularly the younger ones. The purpose and an in-depth explanation of the proposed research was clearly stated prior to any activities undertaken on campus. This was achieved via an explanatory letter sent home to parents and carers of all participants in Grade 6 through to Year 12, as well as through information in the college newsletter and a parent information session.

The procedures followed prior to seeking initial permission from the principal began with ethical clearance from the Australian Catholic University. The application to the ethics committee of the Australian Catholic University included the research proposal, a demographic of the school, a copy of the proposed letter to the principal, parents, survey instruments (i.e., a paper copy of each of the studies), a copy of the researcher's current Victorian Institute of Teaching registration card (which proves currency of the National Criminal History Check), and a Research Personnel Code of Conduct Form. Following the Australian Catholic University ethics committee approval (Appendix A), formal consent was sought and approved from the College principal (Appendix B), and a timeline for the research offered. Following this, a briefing

on the study and logistics of data collection was given to staff and information distributed to all potential participating students. Consent was sought for participation from parents/carers and assent from participants via information contained in the permission form and an introduction and encouragement to participate letter from the College principal.

There are university procedural requirements for maintaining ethical conduct of research, which includes respect for the participants and the college community. Proposed research must also comply with the requirements of the National Statement on Ethical Conduct in Human Research (2007). Following these procedural requirements can minimise any potential issues. The proposed research was deemed to be of negligible risk, as defined according to the Guidelines for Applicants to the Human Research Ethics Committee (HREC), as research involving no more than an inconvenience to the participant and in which there is no foreseeable risk of harm or discomfort.

3.9   Overview of Research Design

The rationale for the research design focuses on how adolescents perceive chance events and, for participants in the senior school (Years 10, 11 and 12) at least, how their perception of chance events relates to their opportunity awareness. Strategies that reflect an objectivist epistemology and a positivist paradigm were employed to appraise the collection and analysis of data. Survey research is the methodology that matches the study design with participants selected via a convenience sample to complete a web-based questionnaire. Additionally, the senior school participants (Years 10 - 12) completed a psychometric test (the LRI). This generated rich and robust data, in which a clear strategy guided the analysis of data, to ultimately report and present answers to the research questions and, subsequently, the major research question: 'How do adolescents perceive chance events?' and – for the senior school participants (Years 10 - 12) – 'How does their perception of chance events relate to their opportunity awareness?'

To focus the study, the following research questions were derived from the literature review presented in Chapter 2:

1) How do adolescents construe the nature and structure of a chance event? (addressed in Chapters 4, 5, 6 and 7 by Studies 1, 2, 3 and 4)

2) Is there a meaningful taxonomy of adolescent chance events? (addressed in Chapters 5, 6 and 7 by Studies 2, 3 and 4)

3) How do adolescent perceptions of chance events relate to their opportunity awareness? (addressed in Chapters 6 and 7 by Studies 3 and 4)

Table 3.4 presents a research design summary, illustrating the connection between research questions and sources of information for data collection.

Table 3. 4

Overview of the research design, summary of how and where research questions were addressed.

Research Questions	Study	Data Gathering	Participants
1	1	Questionnaires	Participants in:
	2		Years 6 - 12
	3		
	4	Focus Groups	Years 10 - 12
2	2	Questionnaires	Participants in:
	3		Years 8 - 12
	4	Focus Groups	Years 10 - 12
3	3	Questionnaire	Participants in:
			Years 10 - 12
	4	Focus Groups	Years 10 - 12

3.10   Conclusion

In this Chapter, the overall design of the research investigation, including the methodology and methods employed, have been elucidated and validated in terms of how effectively they align with the research purpose. The purpose of the research is to identify how adolescents perceive chance events and whether that perception relates to their opportunity awareness.

The following Chapter (Chapter 4) investigates how young people perceive chance events, presenting the findings of Study 1. Utilising 165 students from Grade 6 through to Year 12 inclusively. Study 1 explores how participants perceive chance events through an open-ended approach, by initially being prompted to generate words associated with chance events. Participants were also assigned the task of creating narratives about potential chance events during their job search. Study 1 also captures participants' personal experiences of chance events. This study begins to address the first subsidiary research question: 'How do adolescents construe the nature and structure of a chance event?'

CHAPTER 4

STUDY 1: Deciphering the Dice Roll: Examining Student Perceptions of Chance Across Year Groups.

4.1 Introduction

This Chapter (Study 1) addresses the students' perceptions in an open-ended way to understand, without prompting, how they think about chance events. Comparisons are made across year groups to see whether these perceptions vary as a function. Gaining a deep understanding of students' prevailing thought patterns is of utmost importance in order to formulate impactful classroom interventions for their educational advancement (Galindo & Newton, 2017) regarding chance events and about the role of chance events in career development. This Chapter will present evidence which builds on previous research into chance events in career development more generally, but from the perspective of students in a regional independent school.

The purpose of Study 1 was to explore, through open-ended questioning and narrative generation, how high school students in an independent school perceived chance events, particularly in the context of their future career development. By comparing perceptions across different year groups, the study aimed to identify any potential developmental trends in their understanding. This investigation aimed to contribute to the development of targeted classroom interventions that could have helped students develop a more informed and nuanced perspective on the role of chance in their lives.

Chapter 2 reviews the existing literature that indicated that, whilst there is an existing body of research into chance events, it has been largely within the academic discipline of Sociology (Chen, 2002, 2005). International research employing Swiss, American (United States) or Korean populations within their contexts has been published; however, Borg (2015) argues that "there are very few studies on high school students" (p. 78).

The research most germane to this study has been contextualised within the Chaos Theory of Careers, from studies which have been conducted within the past two decades. It is considered the most relevant to the purposes of this investigation, as it has been undertaken within a completely

Australian context and directly considers chance events with young Australians (Bright, Pryor & Harpham, 2005; Bright et al., 2009). Both of these studies focused primarily on university students and other mature aged respondents, with only a small part of these studies using high school students Bright, Pryor and Harpham (2005) and Bright, Pryor, Wilkenfeld and Earl (2005). There is very little information regarding high school students and chance events conducted anywhere in the world (Hirschi, 2010). These research papers focus narrowly on university students, and therefore the extent to which they generalise to other populations including the sample population in the present study, i.e., students in middle and senior school, is a question Study 1 will seek to clarify.

The first part of Study 1 collected basic non identifiable demographic information which consisted of sex, age and year-level.

This study examined high school students' perceptions of chance events by asking them to generate words which they relate to chance events. Students were also tasked with generating narratives about possible chance events that could happen when they were looking for work, and to reflect and analyse their narratives. Additionally, the students' personal experience of a chance event was captured. This approach helps to address the first subsidiary research question: "How do adolescents construe the nature and structure of a chance event?"

4.2 Participants

The participants were students currently enrolled in and attending the Middle and Senior Schools, Years 6 through to 12 of a Preparatory to Year 12 (ages approximately 4 - 20 years) co-educational independent school, with a total enrolment of 370 students, geographically located in regional Western Victoria, Australia.

Study 1 was completed by all participants in Years 6 through to 12, and in addition to basic demographic data (age, sex, and year-level) consisted of four questions (Appendix J).

There were in total 69 male and 96 female students (N = 165) who participated in Study 1. With a total enrolment in the college in Years 6

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through to 12 of 248 students. This gives an overall participation rate of 66.5%.

An important element of any pragmatic study, in which the goal is to make inferences about a population from a sample, is the size of the sample population (Nayak, 2010). In order to obtain statistically significant results for this specific population (N = 248), the minimum number of participants required is 151. Given an overall participation rate of 165 students out of a population of 248 students and assuming a 5% margin of error, this sample gives a confidence level of 95% that the results obtained in this study are statistically significant (Dancey & Reidy, 2020) in order to make inferences of the sample population as a whole. See Appendix M for complete participant demographics.

4.3 Method and Material

At the time of the research proposal, a survey of the literature of chance events failed to reveal any surveys designed specifically to measure adolescents' perception of chance events. Consequently, the researcher undertook the task of developing three separate surveys tailored specifically for implementation in this study. One for each study was constructed, with adolescent development in mind, each survey becoming progressively more sophisticated in its questioning as was age appropriate.

As noted earlier, the questions were constructed in consultation with subject matter experts, who assured relevance of the questions in terms of comprehension and career development suitability at each year-level. In addition, limited piloting of the questions was undertaken with students from each year-level who did not participate in the main study. The limited piloting of the questions consisted of a randomly selected student from each year-level, who were given the questions and asked by their English teacher to answer them as best as they could. Follow up questions upon reading of student responses consisted of clarifying questions only, e.g., reading comprehension of the student. Any suggestions for changes to wording and other elements were offered as deemed appropriate by the teacher. The selected questions are as follows:

1. In the space below, type 4 or 5 words that spring to mind when you think of chance events.

2. Have you experienced any chance events that have made a big impact on your life? Yes/No

3. If Yes, how many chance events can you remember that have made a big impact on your life?

4. In the space below, give 3 examples of different chance events that could happen when you are working or looking for work.

The survey was conducted online and overseen by the respective Year Level Coordinator or Homeroom teacher at each year-level. Participation was limited to participants who had obtained verified permission from the College administration office, which was responsible for collecting and organising all completed consent forms (Appendix D).

No time limit was set on the completion of the study. Participants were free to take their time and answer in a considered manner, free of the perceived pressure a time limit can impose.

A link to the online survey system was emailed directly to participants through their college email accounts. All participants were supervised directly by their year-level coordinator or homeroom teacher and asked to observe examination conditions for the duration of the survey session. Participants with recognised special/additional needs, who would normally have an educational support staff member (also referred to as an 'aide', teachers aide or integration aide) assigned to them for Humanities based subjects had this same level of support to complete the survey. The educational support staff member was instructed to give the same level of support they would for any humanities-based class, in that they could assist the participant in reading and comprehension of the survey questions in their entirety when required. There were approximately seven participants who were in this category for Study 1 and availed themselves of support from an education support staff member. The participants also had the option to complete the study via a paper-based version (Appendix J), if that better catered for their individual needs/learning style.

The school where the research was conducted can be referred to as a 'one to one' device school. All students are issued with a personal laptop. These laptops are replaced on a three-year cycle to ensure currency, reliability, acceptable level of cyber security and relevance.

To ensure confidentiality and the anonymity of participants, at no time were participants asked to record their name or attach it in any way to the questionnaire they completed. The only demographic data they were asked to provide was age, sex and year-level.

Participation was voluntary, there were no incentives, gifts or oblique ancillary benefits to the students who participated. For the Year 12 participants, and those Year 11, who were enrolled in a Year 12 subject, participation was post the Victorian Certificate of Education (VCE) examination period. And as such there could be no implied benefit to those participants' school results, university entry, or any other coerced participation inferred.

It is noted that none of the participating students had attended any particular classes or any other subject, career education or otherwise, which had a specific focus on chance events at any stage. The College community in general – which included all participating students – were not aware of the researcher's interest in chance events as a topic, or the Chaos Theory of Careers in general as a theory and/or methodology of career development practice.

4.4 Results and Discussion

4.4.1 Student perceptions of chance events

At each year-level participants were asked, in a free response format, to type 4 or 5 words that sprung to mind when they thought of chance events. Examples of student responses:

- A train crash or someone dying.
- Car crash, earthquake, black out, robber coming into your house.
- Divorce, percentage, chance, die.
- Fun, meeting new people, not a normal school day, car crashes.
- Suddenly, unexpected, good, bad different.

- A day off school, winning the lottery, being in a car crash.

- Okay, cool, interesting, anxious, happy.

- Chance, Dangerous, Death, Unlucky.

- Unplanned, unexpected, amazing, funny.

- Car crash, being kidnapped, being executed.

- Monopoly, Lotto, Chance to win something and you could have got something.

- Tests, major accidents, unprepared, unorganised.

- Unprepared, influential, accidents, change.

- Lottery, car crash, earth quake, aliens come on earth.

- Exciting, Surprise, Accidents, Unexpected, Unprepared.

- Nothing happens by chance!

- Rolling a dice, winning the lottery, horse race, car crash, gambling.

- Fluke, unplanned, unknown, out of the blue.

- Rain, winning a game, seeing someone unexpected car crash.

- Gambling, competition, extraordinary luck, spontaneous.

The subsequent responses of each participant were recorded and then categorised by the researcher into: the number of instances of unambiguously positive chance events, and the number of unambiguously negative chance events.

This categorisation was crosschecked by an observer drawn from the panel that had assisted in the reviewing of the questions. Discrepancies in attribution to positive and negative chance events were discussed and resolved. A conservative approach to the classification of both negative and positive chance events was taken. For example, participants who stated 'surprise' as an example of a chance event) would be excluded from the analysis, as it is neither unambiguously positive nor negative in nature. For instance, one could be surprised by a vehicle colliding with your car, which would clearly be a negative outcome event. One could be equally surprised by discovering that one has won the work raffle, which would be a positive outcome event. Other common examples were 'illness', which would be

unambiguously negative, and 'winning the lottery', which would be categorised as unambiguously positive.

To ensure consistency and transparency of data categorisation, an independent panel was also convened with the task of classifying the participants' descriptions as being chance events or not. The panel consisted of five secondary school teachers who were naive with respect to the supposition of the research. They were given the Rojewski (1999) definition of a chance event as being "unplanned, accidental, or otherwise situational, unpredictable, or unintentional events or encounters that have an impact on career development and behaviour" (p. 269), as a basis for their decision making when deliberating.

The panel came to a consensus and then categorised those chance events as either positive or negative based on said chance events' potential impact on the participant's life. The panel was then asked to categorise those chance events based on their perceived controllability as low, neutral, or high. The definition of controllability supplied to them was "the degree of control one has in the aftermath of a chance event or how one responds to it" (Bright et al., 2009, p. 16). An example of a high control chance event might be: 'whilst reading the newspaper you came across a job that you were interested in applying for'. An example of a low control chance event is a car accident that was not your fault. As suggested by Bright et al., (2009), "the addition of a "neutral" category for influence" (p. 22) was also added. A neutral control chance event can be classified as neither high nor low in nature, such as a 'bumping into a colleague at the cinema'.

Table 4.1 displays the percentage of chance events generated by participants that were deemed to be positive, negative, low, neutral, and high in terms of their perceived controllability. The aggregated data reinforces what can be seen by year level, that participants generate more chance events which were negative in nature and also those in which one has less than high control i.e., car accidents.

Table 4.1

Percentage of participants giving each response in each year-level.

		Chance events		Level of control		
Year level	Number of participants	Positive	Negative	Low	Neutral	High
6	15	0	100	48	36	16
7	41	56	44	20	59	21
8	31	16	84	45	41	14
9	16	28	72	48	38	14
10	27	25	75	64	23	13
11	19	24	76	57	35	8
12	16	20	80	29	65	6

A paired-samples t-test was conducted across all year-levels to compare the mean difference of reported chance events which were categorised as being either positive or negative in nature. There was a significant difference in the number of negative chance events compared to positive, $t(164) = 5.64$, $p < .001$. These results suggest that, regardless of the year-level of participants, when suggesting examples of chance events, those reported are chance events which are negative in nature.

A repeated measures analysis of variance (ANOVA) was conducted with the between-subjects factor being year-level and the within-subjects' factor being reporting the number of positive chance events and reporting of the number of negative chance events. There was a main effect of reporting of positive versus negative chance events ($F = 43.83$, $p < .001$). The effect size, calculated as eta squared (η^2), was .219, indicating a large effect.

There was also a significant interaction between the reporting of positive and negative chance events at year-level ($F = 4.40$, $p < .001$). The effect size, calculated as eta squared (η^2), was .143, indicating a large effect.

Figure 4.1 illustrated this interaction, demonstrating that in all year-levels, with the exception of the Year 7 group, there were more negative chance events than positive chance events reported.

Figure 4. 1

Graph showing the number of both positive and negative chance events reported across the year-levels in Study 1.
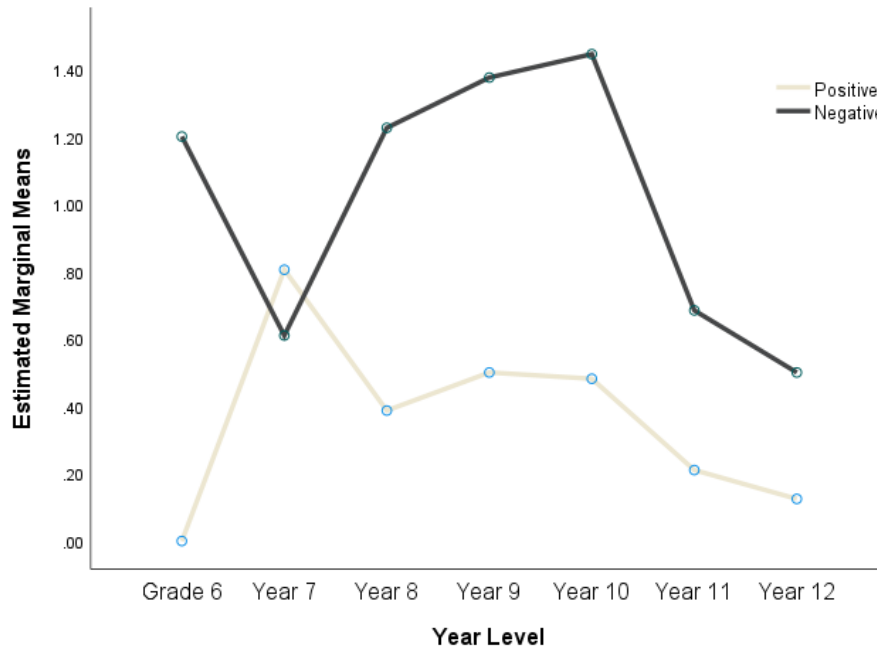
The clear pattern emerging from the data suggests that there was an overwhelming bias of reporting negative chance events, consistent with Bright et al. (2009). The exception to this was with the Year 7 group, which reported more positive events than negative events. A Paired Samples T-Test comparing the reporting of positive and negative chance events by the Year 7 group revealed that there was no significant difference in reporting, $t(40) = 1.24$, p .221. As such, this result can be considered an outlier and further research is required to ascertain if there is a genuine effect or an artifact. For the purpose of the present study, however, the overall result is clear that negative chance events are generally over reported compared to positive chance events.

A paired-samples was conducted to compare the difference of reported chance events that were categorised as being either high or low control in nature. As illustrated in Table 4.2, there was a significant difference in the scores for low control (M=.85, SD=1.00) and high control (M=.08, SD=.27) conditions, $t(163) = 9.53$, p <.001. These findings indicate that regardless of

participants' age and year-level, the reported chance events predominantly consist of chance events which are low control in nature.

Table 4. 2

Paired Samples Statistics of low and high control chance events as reported by Year 6-12 participants.

	Mean	N	Std. Deviation	Std. Error Mean
Low control	.8537	164	1.00455	.07844
High control	.0793	164	.27098	.02116

A repeated measures ANOVA was conducted with the between-subjects' factor being sex and the within-subjects' factor being the reporting of the number of positive chance events and reporting of the number of negative chance events. There was a significant main effect of reporting of positive versus negative chance events by sex ($F = 30.10$, $p < .001$). The effect size, calculated as eta squared (η^2), was .156, indicating a large effect. However, there was no significant interaction between the reporting of positive and negative chance events by sex ($F = .147$, p .702). The effect size, calculated as eta squared (η^2), was .001, indicating a small effect. Figure 4.2 illustrated this interaction. It demonstrates that across all year-levels, female participants were reporting more chance events, both positive and negative in nature, than their male counterparts. They also reported these events in a similar pattern as demonstrated by the parallel lines in Figure 4.2.

Figure 4. 2

Graph showing the mean number of both positive and negative chance events as reported by sex
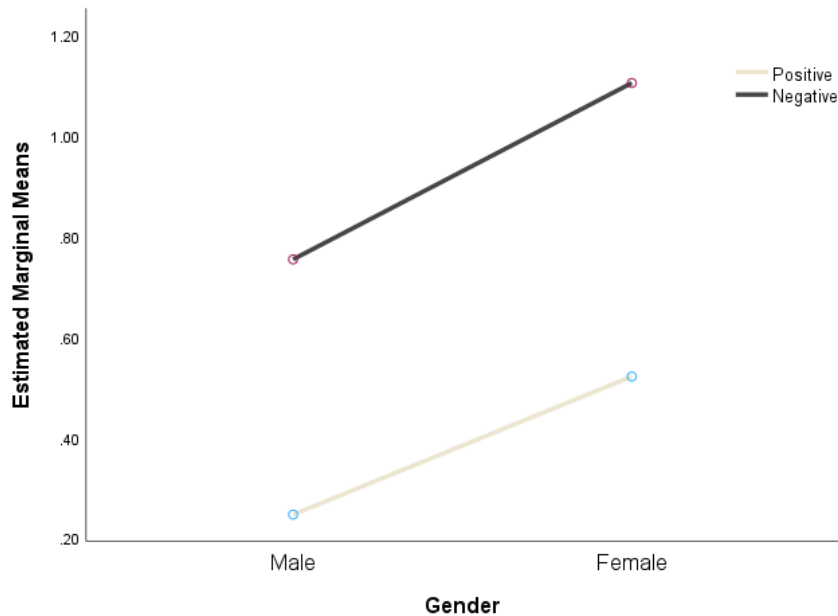
The degree to which males and females bias towards reporting negative chance events is similar; however, females seem to report more of both positive and negative chance events. This is not particularly impactful for the purposes of this particular study, other than to suggest that one group (the males) may be under reporting, or the other group (females) may be slightly over reporting. Although there is research (Kwak & Radler, 2002; Sax et al., 2003; Underwood et al., 2000) to suggest that females are more likely to respond and in greater amounts than males in surveys. More research would be needed in order to make any such correlation to the present sample; however, it is not central to the purposes of this study.

4.4.2 Student experience of impactful chance events

At each year-level participants were asked, in a limited Yes/No response format, whether they had experienced any chance events that have made a big impact on their life. A total of 165 participants answered this question, which is a participation rate of 100%. With 54.5% (N = 90) of participants indicating that they had experienced a chance event that made a

big impact on their life so far and 45.4% (N=75) indicating that they had not experienced such a chance event in their life as yet. Results are displayed in Table 4.3 and Figure 4.3 below.

Table 4. 3

Numbers and percentages of total Yes/No responses.

Year level	Yes	%	No	%
Grade 6	5	33.33	10	66.66
Year 7	21	51.21	20	48.78
Year 8	14	45.16	17	53.12
Year 9	10	62.5	6	37.5
Year 10	19	70.37	8	29.62
Year 11	14	73.68	5	26.31
Year 12	7	43.75	9	56.25

Figure 4. 3

Graph depicting the percentages of Yes/No responses by year-level.
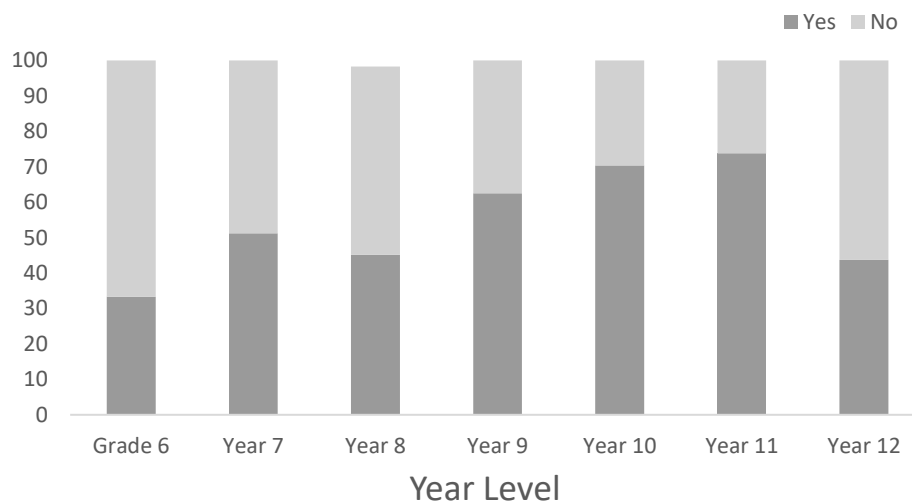
Due to the small sample size, making any definitive statements about trends across the year-levels is problematic. Using the aggregated data across the sample as a whole, however, it can be seen that the majority of

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participants experienced an impactful chance event in their life so far. As can be seen in Figure 4.3, it is noticeable that even at Grade 6, approximately one third of participants had experience such an event. That figure seems to vary across the sample from a third, to half, to three quarters of the sample stating that they have experienced an impactful chance event. The implication of this result may indicate that if this result replicates more broadly into the wider population, it would suggest that discussions of chance events and their comprehension thereof is possible with participants as young as those in Year 6. However, some explanation of what a chance event is and examples may be required with that younger cohort. With regard to the remainder of the sample, however, results are not markedly dissimilar to that of Swiss high school students (Hirschi, 2010), or university and other adult populations as reported by Bright, Pryor and Harpham (2005), Betsworth and Hansen (1996), Scott and Hatalla (1990), and Hart and Rayner (1971).

Table 4.4 presents participants' mean average responses regarding the impact of chance events on their lives, categorised by year level. Grade 6 participants exhibited the highest mean response at 1.6667, indicating a strong perception of significant life impacts due to chance events, with relatively low variability (SD = 0.48795). Year 7 participants followed closely with a mean of 1.4878, showing slightly lower perceived impact, and moderate variability (SD = 0.50606). This trend continues with slight fluctuations in mean responses across subsequent year levels. Generally, participants across all year levels perceived chance events as having a notable impact on their lives, with slight variations in their mean responses and levels of variability, culminating in a total mean response of 1.454.

Table 4. 4

Participants' responses to life impacting Chance Events.

In which year level are you?	Mean	Std. Deviation	N
Grade 6	1.66	.48	15
Year 7	1.48	.50	41
Year 8	1.54	.50	31
Year 9	1.37	.50	16
Year 10	1.29	.46	27
Year 11	1.26	.45	19
Year 12	1.56	.51	16
Total	1.45	.49	165

Note. Data coded pertinent to the Mean as 1.00 = Yes and 2.00 = No.

A univariate test of between-subjects effects ANOVA was performed to compare the responses between year-levels, with participant responses to 'have you experienced any chance events that have made a big impact on your life?' as the dependent variable and the year-level of participants as the fixed factor. Results $F(6,158) = 1.83$, p .097 effect size, calculated as eta squared (η^2), was .065, indicating a medium effect, indicated that there is no significant difference in the tendency of participants to report chance events as a function of age or between the year-levels (educational stage). Results are not significant based on this comparison. This does however suggest, that within this population, there is a consistent pattern of individuals across different age groups and year levels reporting chance events that have impacted their lives up to this point, and this pattern does not show significant variation with age. As chance events are experienced regularly by most participants in each year-level, it would seem evident that chance events are a ubiquitous aspect of experience.

This result is consistent with the findings of Bright, Pryor and Harpham (2005), where 69% of their participants identified an unplanned event as being influential on their career decisions. Also, in an Australian context, Borg (2015) reported his findings on "unexpected change is a perceived experience of high school students in their career transition" (p. 168). These results also echo the figures reported in other studies on adult college students in terms of the influence of unexpected change on career path (Betsworth & Hansen,

1996; Hart & Rayner, 1971; Scott & Hatalla, 1990). While there are very few studies on high school students, the result of this question is consistent with Hirschi's (2010) study of the school to work transition of Swiss high school students. Hirschi (2010) reported that 64.7% of respondents stated that chance events had "some" or "great influence" on their career, from a Likert-type scale, all consistently reported the influence of chance events on career paths of at least two thirds of participants.

Figure 4.4 displays the number of chance events, both positive and negative, reported across the year-levels in Study 1. The Grade and Year 12 groups reported the highest numbers of chance events overall. With the Year 11 cohort reporting the least. No definitive conclusion can be drawn from this result alone.

Figure 4. 4

Chance Events Distribution by Year-Levels in Study 1.
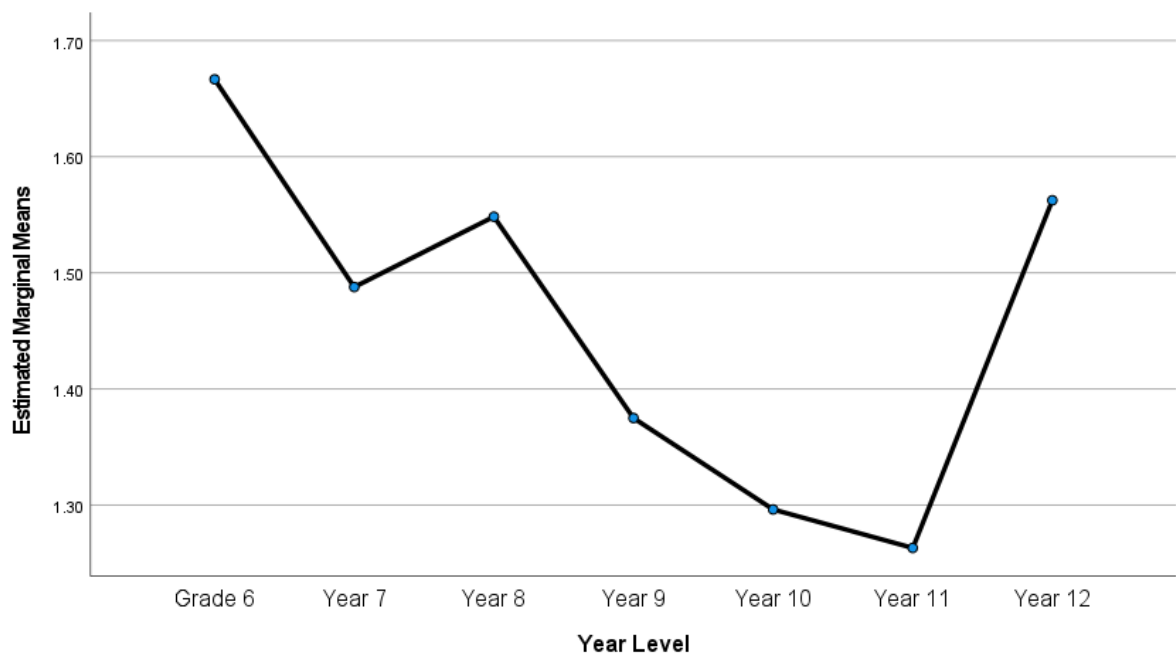
4.4.3 Student recall of impactful chance events.

At each year-level participants were asked, in a free response format, to type how many chance events they could remember that had made a big impact on their life.

There was a 100% response rate for this question. 75 participants stated in the previous question that they had not experienced any chance events that had made a big impact on their life thus far. However, of the 90 participants who responded to that same question in the affirmative, approximately 13 (14%) of the overall cohort were unable to adequately answer the question. They struggled to articulate a number of actual examples of chance events that had made a big impact on their life so far, rather responding with statements such as 'too many to count' and 'I can't remember', or just leaving the field blank. In the case where participants answered with a non-committal 'only one or two', the results have been recorded as the greater number, i.e., in the case of 'only one or two', it has been recorded as 2. In the case of stating 'more than 5' a score of 1 more was recorded, in this case 6.

Table 4.5 and Figure 4.5 display the number of chance events reported in Study 1. 27 participants reported experiencing one chance event, making it the most frequently reported. Notably, the majority of participants reported experiencing one to three chance events, with diminishing frequencies as the number of events increased.

Table 4. 5

Number of chance events reported

	Number	Frequency	Percent	Valid Percent	Cumulative Percent
Valid	0	26	25.5	25.5	25.5
	1	27	26.5	26.5	52.0
	2	17	16.7	16.7	68.6
	3	16	15.7	15.7	84.3
	4	5	4.9	4.9	89.2
	5	7	6.9	6.9	96.1
	6	2	2.0	2.0	98.0
	10	1	1.0	1.0	99.0
	13	1	1.0	1.0	100.0
	Total	102	100.0	100.0	

A between-subjects ANOVA was performed to compare the responses between year-levels. The dependent variable was the number of chance

events reported, and the fixed factor was the year-level of the participants, $F(6, 97) = .893$, p .503. The effect size, calculated as eta squared (η^2), was .052, indicating a small effect, Results indicated that there is no significant difference in the tendency of participants to report chance events as a function of age or between the year-levels (educational stage).

74.5% of participants reported at least one chance event, with a quarter (25.5%) of the group reporting that they could remember no chance events at all that have made a big impact on their life. This is consistent with the research reported by Torpy (2017) and Borg (2015) that, when asked to recall a chance event, around two thirds of any sample will report at least one chance event.

Figure 4. 5

Combined total big impact chance events reported.
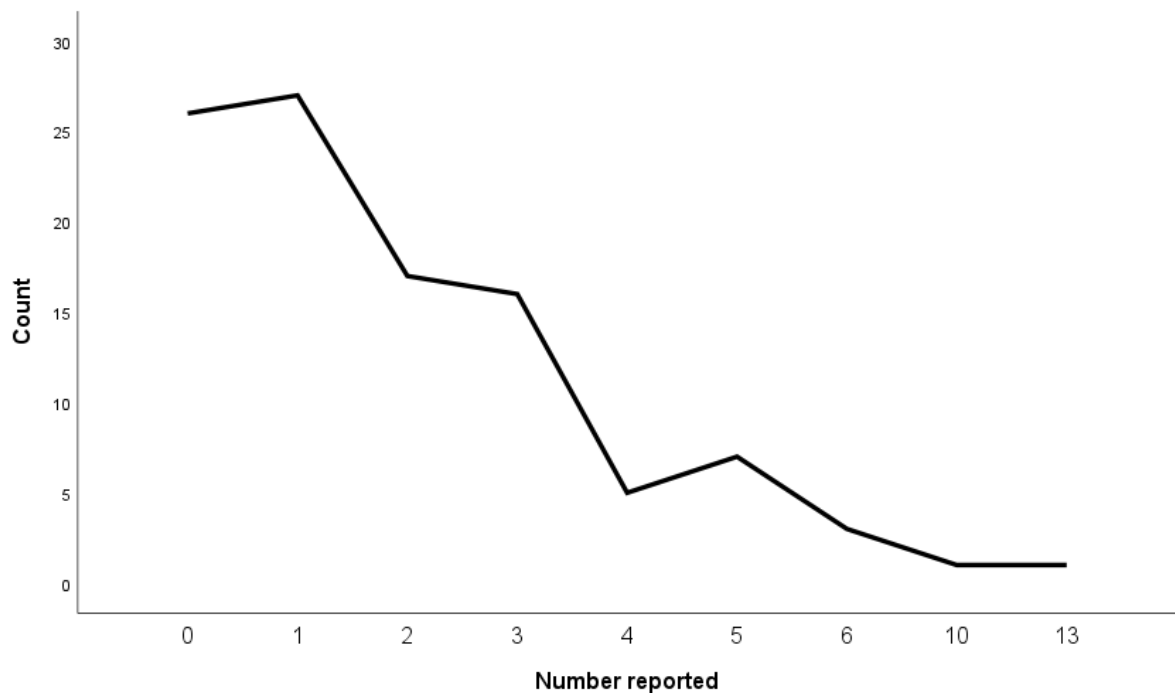
4.4.4 Student perceptions of career related chance events

At each year-level participants were asked, in a free response format, to give three examples of different chance events that could happen to them when they were working or looking for work.

The following are examples of student responses:

- You lose your job, computer doesn't work, something gets stolen.
- Get ran over, get fired, die.
- Fired, quit or run.
- Printer blows up, get fired, run out of paper.
- Losing your work, failing, be rejected when applying for work.
- You could be robbed, beaten and raped.
- Your pen could break, you could get the job, you could die of a heart attack.
- You could get fired, you could be working in an area where you could get hurt, you could die.
- No one accepts you, everyone accepts you, everything is deleted.
- You could see an advertisement in a window, you could get sent an email, you can get chosen to do a job instead of someone else.
- There could be an ad in the paper for workers needed and it could be a job you are interested in.
- Get your arm cut off, get fired, get a job.
- Someone I know might know the boss of some place and they might get me a job. Might find one in a newspaper that I like and go for it. Search online and look for a job.
- You get a call asking if you want a job. You don't get a job. You get all the jobs and u have to choose what one you take.
- Finding something you now love. You get accepted straight away. You die.
- You could have a work accident. You could get lost on the way to work, or you could have a car accident on the way to work.
- Hospitalisation, economy crash, bankruptcy.
- Job transfer, injury, lottery win

The subsequent responses were categorised into the number of instances of unambiguously positive chance events for each participant and was recorded, as was the number of unambiguously negative chance events mentioned.

A paired-samples t-test (see Table 4.6) was conducted across all year-levels to compare the difference of reported chance events, which were categorised as being either positive or negative in nature. There was a significant difference in the scores for positive mention (M=.58, SD=.77) and negative mention (M = 1.24, SD = 1.03) conditions, t(163) = 5.74, p <.001. These results suggest that, irrespective of age or the year-level of participants, when suggesting examples of chance events, those reported are overwhelmingly chance events which are negative in nature. Participants were more than twice as likely to suggest a negative chance event (M = 1.23) as opposed to a positive one (M = .58) when solicited to provide an example of a chance event.

Table 4. 6

Paired Samples Statistics

	Mean	N	Std. Deviation	Std. Error Mean
Positive Mention	.5854	164	.77462	.06049
Negative Mention	1.2378	164	1.02642	.08015

This is an important finding and suggests just how young people perceive chance events and the potential challenges educators may have in encouraging people to embrace chance. After all, why would anyone embrace a concept in which they may be subconsciously biased toward being negative in nature. These results further suggest that educators face a challenge in order to educate people to be 'Luck Ready', to embrace chance and generate more chance events in a person's life, such as through networking. As such, education should include how to overcome the perception that chance or uncertainty is bad. This is in order to encourage people to become comfortable with and embrace uncertainty, and to see the potential as opposed to any drawbacks of uncertainty or chance.

A mixed model within-subjects ANOVA (see Table 4.7) was performed to compare the responses between year-levels to positive and negative chance events. The within-subjects variable was the nature of chance events

being either positive or negative, and the between-subjects factor was the participants' year-level.

Table 4. 7

Tests of Within-Subjects Contrasts

Source	Positive Negative	Type III Sum of Squares	df	Mean Square	F	Sig.
Positive Negative	Linear	36.783	1	36.783	37.155	<.001
Positive Negative * Year-Level	Linear	17.168	6	2.861	2.890	.011
Error (Positive Negative)	Linear	155.426	157	.990		

Results indicate that there was a significant main effect of the within-subjects variable (F=37.155, p <.001). The effect size, calculated as eta squared (η^2), was .191, indicating a large effect. There was also a significant interaction between the generation of positive and negative chance events and year-level of participants (F=2.890, p .011). The effect size, calculated as eta squared (η^2), was .099, indicating a medium effect. The data reveals a significant main effect, showing a distinction in how participants recall positive and negative chance events. The interaction indicates that the recollection of these events varies among participants based on their year-level.

Across the sample, there is a tendency to report more chance events which are negative in nature as opposed to positive and the intensity of that trend varies across years. As can be seen in Figure 4.6, once the sample is broken into year-levels on this statistic, the variation may simply be a function of the small sample sizes rather than any underlying trend, and no immediate trend or explanation is forthcoming to explain the variation.

Figure 4. 6

Line graph displaying the means of reported positive and negative career related chance events across the year-levels.
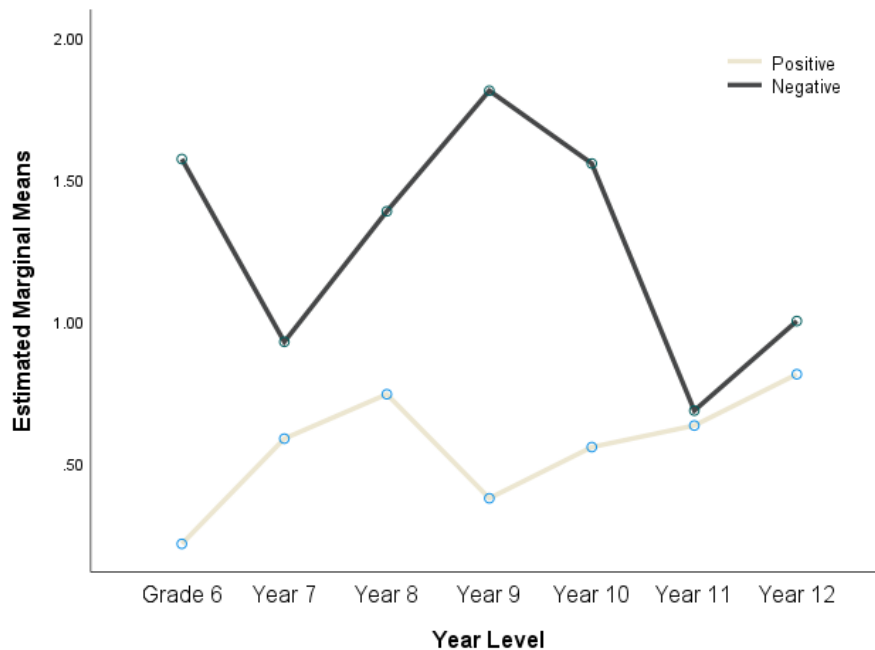
Consequently, at this stage and employing a conservative interpretative approach, it appears that the variations amongst the year-levels, most obvious at Years 7, 9 and 11 (see Figure 4.6), are artifacts rather than any genuine effect, and more research is required. There does, however, seem to exist a genuine and consistent upward trend in the reporting of positive chance events, this could be attributed to differences in life experience and maturity level, as young people increase their understanding of chance and consequences from the end of primary school through to the end of secondary school.

A mixed model of within subjects effects ANOVA (see Table 4.8) was performed to compare the responses between year-levels, with high and low control chance events as the within-subjects variables, and the year-level of participants as the between-subjects factor, $F(1,6) = 24.06$, $p < .001$. The effect size, calculated as eta squared (η^2), was .132, indicating a large effect.

Table 4. 8

Tests of Within-Subjects Contrasts

Source	Control	Type III Sum of Squares	df	Mean Square	F	Sig.
Control	Linear	16.790	1	16.790	24.064	<.001
Control * Year Level	Linear	14.380	6	2.397	3.435	.003
Error (Control)	Linear	110.239	158	.698		

Results indicated that there is a significant effect of high and low control chance events (F = 24.064) and a significant interaction at the second variable, the year-level (F = 3.435). Results indicated that there is also a significant main effect of the participants' reporting of high and low control chance events and a significant difference of – and an interaction between – the generation of participants' reporting of high and low control chance events at year-level. This indicates that participants in those year-levels reported high and low control chance events differently.

As displayed in Figure 4.7, the reporting of low control chance event appears to drop off dramatically from Year 10 to Year 11, following the higher reporting of low control chance event within the Years 6 to 10 cohorts, with only a slight resumption thereof in the Year 12 group. The results are mixed and subsequently the story is less clear in relation to participants' perception of low control chance events: nevertheless, the reporting volume does decrease from Grade 6 to Year 12 overall.

Figure 4. 7

Line graph displaying the means of reported low and high control chance events across the year-levels.
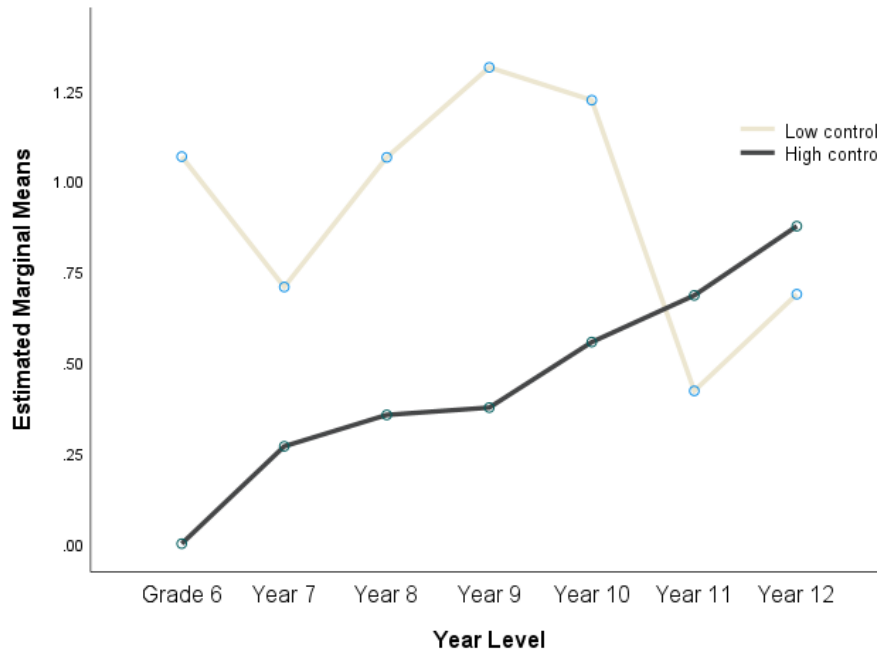
However, there appears to be a stable pattern in the reporting of high control chance events. It would seem that as participants increase in age and maturity, as a result of undergoing an increasing variety of experiences both structured and unstructured, they appear to be recognising their increasing decision-making discretion even in unplanned events.

4.5 Conclusion

Chapter 4 presented the results obtained from data collected from Study 1. 165 participants completed the study, which, in addition to basic demographic data, consisted of four questions designed to explore the first two research questions: "How do adolescents perceive chance events?" and "How do adolescents construe the nature and structure of a chance event?"

Study 1 established that participants were able to recognise that chance events do exist within careers, evidenced by their ability to both identify chance events and give relevant examples thereof. Across year-levels it appears that there is a significant and consistent increase in the generation of the reporting of high control chance events; this is an encouraging trend as

it may reflect participants' increasing self-efficacy in their understanding of having increased agency. There is a consistent, across year-levels reporting of chance events that have influenced participants' lives to date, and it does not vary with age. There is, however, no significant difference in the tendency of participants to report chance events as a function of educational stage. Three quarters of participants reported at least one chance event, with a quarter of them reporting that they can remember no chance events, that have made a big impact on their life.

A comparison responding by sex was conducted via a univariate ANOVA for all questions in this study. In response to question 1, females were significantly more likely to report both positive and negative chance events than their male counterparts. However, there were no significant effects of sex in responding across questions 2, 3 and 4.

These results extend the work on chance events of Bright, Pryor and Harpham (2005), Bright, Pryor, Wilkenfeld et al. (2005), and Bright, Pryor, Chan et al. (2009), in "providing further evidence that chance events in career development not only need to be considered more carefully, but that any consideration of chance must take into account the nature of such events" (Bright, Pryor, Chan et al., 2009, p. 17).

The following Chapter (5) will present the findings of Study 2 (Appendix K). Study 2 will seek to better understand the default bias of negativity that seems to exist within the thinking of young people when it comes to chance events, through an exploration of participants' ability to identify chance events presented in a plausible scenario.

CHAPTER 5

STUDY 2: Decoding the Negativity Bias and its Impact on Openness to Unexpected Opportunities: Exploring Students' Perception of Chance Events.

5.1 Introduction

Study 1, presented in the previous Chapter, established that participants were able to recognise that chance events do exist within careers. Investigation of participants' perceptions of chance events showed that, with the exception of the Year 7 group, a bias of reporting negative chance events exists, and when asked to recall a chance event, around two thirds of any sample reported at least one chance event. However, there are further questions to answer in relation to participants' perceptions of chance events. These are addressed in Study 2 presented in this Chapter.

The purpose of Study 2 was to investigate students' ability to identify chance events presented in realistic scenarios. It explored their thought processes and potential attributions towards these events. Additionally, the study aimed to evaluate the effectiveness of using rich narratives as a research methodology for studying chance event understanding. By achieving these objectives, this research sought to provide a deeper understanding of young people's cognitive processes surrounding unplanned events and contribute to the refinement of future research methods.

Study 2 also sought to better understand the apparent default bias of negativity and impact that seems to exist with the thinking of young people when it comes to chance events (e.g., Bright et al., 2005, 2009; Chen, 2005). The bias of negativity was apparent in participants who were found to have better recall of chance events that had a negative impact – for instance, losing some money or being injured – than for positive events – for instance, finding some money. In terms of impact, it has been shown that events that have a greater impact, such as being injured as opposed to finding a small sum of money on the pavement, are better recalled.

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This is important to understand because, if the default mindset of people is negative when it comes to chance events, then they are less likely to embrace chance events (Moore, 2019), or even deliberately increase their chances of having one. Given that approaches to career exploration and decision-making such as those advocated by Chaos Theory of Careers (Bright & Pryor, 2005; Pryor & Bright, 2003a, 2003b, 2011) and Happenstance Learning Theory (Krumboltz, 2009) informed practitioners recommends embracing chance, this bias is potentially a threat to the efficacy of such approaches. This reported bias could potentially result in participants missing out on an opportunity that such a chance event may potentially present.

Chapter 5 describes an exploration of participants' ability to identify chance events presented in a plausible scenario (Study 2). It explores their thinking and reasoning about chance events, the aim being to get a deeper understanding of how unplanned events are construed and considered by young people. Study 2 investigates the ability of participants to accurately identify chance events in realistic scenarios and explores participants' attributions by measuring the degree to which they see chance events as being personally relevant to their own lives.

A stimulus of a rich narrative was provided to participants (Appendix G). This narrative provided to participants aimed to elicit possible differences in their ability to identify chance events as a function of the nature and impact of those events. Further, the narratives could identify whether chance events had a negative positive impact.

Eliciting participants responses to this part of the inquiry were important against a context of a generalised bias towards the identification of negative impactful chance events when asked to recall a chance event as is reported in the literature (e.g., Bright et al. 2005, 2009). This is important because any approach to career development that encourages exploration, trial and error and embracing uncertainty, such as The Happenstance Learning Theory (Krumboltz, 2009) and the Chaos Theory of Career (Bright & Pryor, 2005; Pryor & Bright, 2003a, 2003b, 2011), is based on getting people to embrace the possibility of uncertainty and unexpected events. If they have a strong bias toward conceiving of these events as being negative and very impactful,

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then this is likely to be a major barrier to any intervention which would aim and encourage them to bring on any such events, i.e., to be 'Luck Ready'.

Given the nature of the research methodology, which involved embedding chance events within a scenario, it was deemed most suitable for participant in the later years of education (Years 8 to 12), given the relative sophistication of the scenario presented to them and the significant reading and comprehension demands required to answer adequately the question which followed.

This study will also seek to clarify the effectiveness of this research methodology. If participants struggle to identify chance events which are contained within scenarios presented to them, then this has potential implications for any further research using such methodologies. As such, this may not be the most sensitive way of investigating the notion of chance with young people of this age (ranging from 13 to 20 years).

5.2 Participants

The participants were current students in the Middle and Senior Schools – Years 8 through to Year 12 inclusively (age ranging from 13 to 20 years) – of a Preparatory to Year 12 coeducational independent school in regional Western Victoria. The school had an approximate enrolment of 370 students at the time of conducting the research. The total number of students enrolled at the College in Years 8 through to 12 inclusively at that time was 172. A total of 109 students returned their permission forms and participated in the study, giving an overall participation rate for Study 2 of 63.3% of the population.

The central task contained in Study 2 was to have participants read a contextually relevant and realistic scenario, which was designed to be relatable to participants. This would give them the best chance of identifying chance events from the realistic scenario. Given the reading constraints, complexity, relatability, and sufficient realism of the scenario presented, it was determined by a senior English teacher, that this was an appropriate task for participants in Year 8 and above. As such, only students in Year 8 through to Year 12 were invited to complete Study 2.

5.3 Method and Material

Participants were presented with a scenario that contained six chance events. The scenario presented the story which described a young person's trials and tribulations in pursuing a career goal and making career decisions when presented with serendipitous events. The scenario was constructed to contain three positive chance events of varying levels of impact from trivial, to moderate to significant, and three negative chance events also of varying levels of impact from trivial, to moderate and significant. Participants were instructed to read the scenario carefully and to answer the eight questions which followed.

The presentation of scenarios or vignettes to research subjects is a valid way of measuring their dispositions as "a scenario is a story with plausible cause and effect links that connects a future condition with the present, while illustrating key decisions, events, and consequences throughout the narrative" (Glenn, 2011, p. 52). Hughes and Huby (2004) suggest that "vignettes are more likely to be effective when they engage participants' interest, are relevant to people's lives, and appear real" (p. 40). As such, the scenario presented in this study was constructed to maximise the participant's ability to relate to/empathise with the protagonist.

The scenario was constructed in consultation with subject matter experts, being the English teachers of Years 8 to 12 and a career practitioner. In addition, limited piloting of the scenario was undertaken with at least one participant from each year-level who did not participate in the main study.

No time limit was set on the reading of the scenario. On completion of reading the scenario there were eight questions (see Appendix K for the paper-based version) participants were requested to answer, incorporating a blend of questions containing a simple Yes/No format, as well as questions requiring participants to indicate their response on a Likert-type scale ranging from one to five and labelled as 1. Very Unlikely, 2. Unlikely, 3. Neither Likely or Unlikely, 4. Likely and 5. Very Likely.

Questions were designed to interrogate participants understanding of the scenario, in particular their ability to identify chance events contained within it. The following questions comprise the eight:

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1. Does this story contain any chance events? Yes/No
2. If you answered yes to the last question, how many chance events do you believe are present in the story?
3. If you answered yes to question 1, briefly describe what you believe is the most obvious chance event.
4. How likely is it that this event could happen to you?
5. How likely is it that this could happen to other people?
6. If you answered yes to question 1, briefly describe what you believe is the least obvious chance event.
7. How likely is it that this event could happen to you?
8. How likely is it that this could happen to other people?

An independent panel was also convened in order to ensure consistency and transparency of data categorisation. The panel consisted of five secondary school teachers, all naive with respect to the hypotheses of the research. They were tasked with the classification of participant responses as being chance events or not chance events. They were given the Rojewski (1999) definition of a career related chance event, "unplanned, accidental, or otherwise situational, unpredictable, or unintentional events or encounters that have an impact on career development and behaviour" (p. 269).

The panel came to an agreed consensus that the scenario itself (see Appendix K) contained within it six incidents which could be considered 'chance events', which are listed in order below, reflecting the chronology in which they were presented within the scenario (affecting William our protagonist), and not in order of severity or perceived importance as indicated by the panel:

- A financial crisis hit.
- He 'bumped' into a defence force recruiter.
- His dad [who] was going to pick him up, was called away unexpectedly.
- His neighbour…was also there at the time, offered him a ride home.
- Whilst driving home, he was involved in a car accident.
- He was awarded $200, 000 compensation (for his injuries as a result of said car accident).

The panel also agreed that of the six occurrences identified as 'chance events' and in the context of the scenario presented, that the most obvious chance event was that 'a financial crisis hit' and the least obvious chance event was being 'awarded $200 000 compensation' for his injuries as a result of the car accident.

Participation was voluntary, there were no incentives, gifts or oblique ancillary benefits for participation. For the Year 12 participants, and those Year 11 participating students who were enrolled in a Year 12 (VCE units 3 & 4) subject, their participation was post the Victorian Certificate of Education (VCE) examination period, and as such there could be no implied benefit to those participants' school results, university entry or other coerced participation.

It should be noted that none of the participating students had covered any career education classes or any other subject which had a specific focus on chance events at any stage. The College community in general, which included all participating students, were not aware of the researcher's interest in chance events as a topic or the Chaos Theory of Careers in general as a theory and/or methodology of career development practice.

Study 2 was administered online. Participants with recognised special/additional needs, who would normally have an education support staff member (also referred to as an 'aide', teacher's aide, or integration aide) assigned to them for Humanities based subjects were also afforded this support as they completed the study. The education support staff member was instructed to give the same level of support they would for any humanities-based class, in that they could assist the participant in reading and comprehension of the questionnaire in its entirety when required. There were approximately four participants who were in this category for Study 2 and who availed themselves of support from an education support staff member. Participants also had the option to complete the study via a paper-based version (Appendix K), if that catered better for their individual needs/learning style.

A link to the online survey system was emailed directly to participants through their college email accounts.

On the designated day and time, all participants completed the study at the same time so as to avoid participants talking to each other about the contents of the questionnaire and subsequently attending with an influenced mind.

The survey was distributed electronically, employing the use of an online survey website, for all participants. The online surveys were administered at each year-level by the relevant Year Level Coordinator or Homeroom teacher. Only those, who had verified permission to participate from the College administration, who had collected and collated all of the returned and fully completed permission forms (Appendix D), took part in the study. The study was conducted under examination conditions for the duration of the survey session.

5.4 Results and discussion.

5.4.1   Identification of chance events contained within a scenario

At each year-level participants were asked, in a limited Yes/No response format whether, after reading the scenario, they believed that the scenario contained any chance events.

Of the participants from Years 8 and 9, 47 participants answered the question, a 100% rate of response. 45 participants agreed, answering 'Yes', that the scenario contained chance events, with only two participants answering 'No', indicating that they did not believe that the scenario contained any chance events. The two participants who did not believe there to be any chance events in the scenario were both male and in the youngest year-level in the present study.

As is presented in Figure 5.1, all but 2 Year 8 participants that responded answering 'Yes' to the question 'Does this scenario contain any chance events?', which is 94% of the year-level. Of that 94%, only 3% stated that they believed there were five chance events contained within the scenario, but were subsequently unable to articulate any examples from it. 100% of Year nines responded with 'Yes'.

Figure 5. 1

Graph depicting the percentage of responses by year-level.
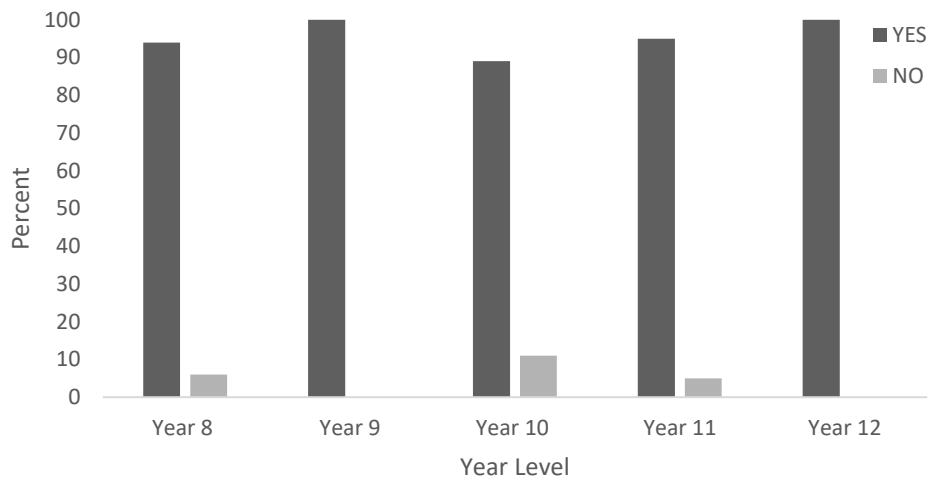
Of the group consisting of only Year 10, 11 and 12 participants, 62 participants answered the question, with a 100% response rate. 58 participants agreed that the scenario contained chance events, only four participants stating that the scenario did not contain any chance events. Of the four participants who did not believe there to be any chance events in the scenario, two were male – one in Year 10 and the other in Year 11 – and two were female participants in Year 10.

Figure 5. 2

Graph depicting the responses by year-level.
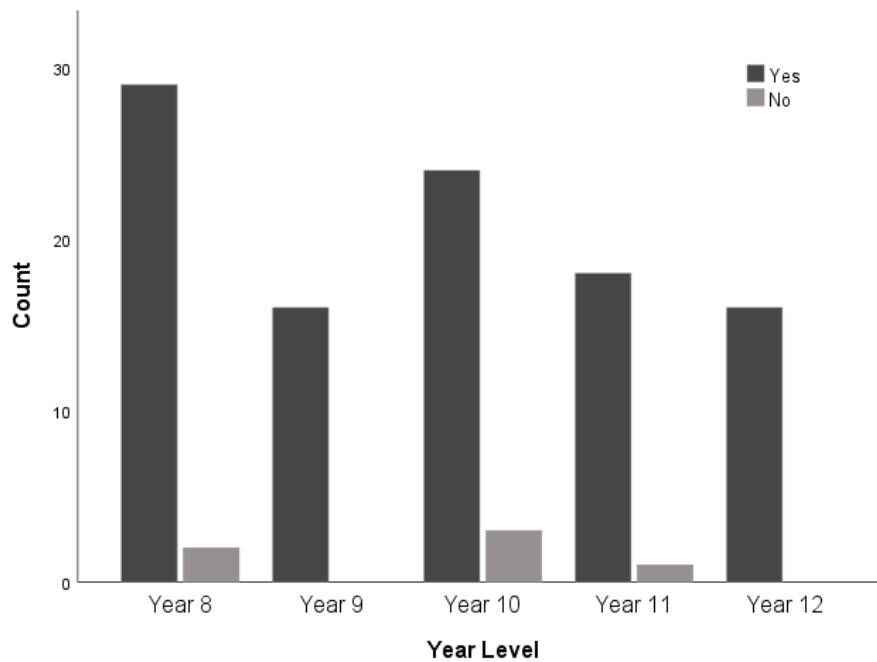
Note. *As displayed, the majority of participants were able to identify and state that there was at least one chance event present within the scenario. With zero participants in Year 9 and 12 indicating to the contrary.*

A between subjects ANOVA was performed to compare the responses between year-levels, with participant responses to 'does this scenario contain any chance events?' as the dependent variable and the year-level of participants as the fixed factor, $F(4,104) = 0.88$, p .481. The effect size, calculated as eta squared (η^2), was .033, indicating a small effect. Results indicated that there is no significant difference in participants' ability to identify a chance event from a scenario as a function of educational stage (between the year-levels). Participants' ability to identify chance events in the scenario presented does not vary as a function of year-level.

Figure 5. 3

Graph depicting the responses by sex.
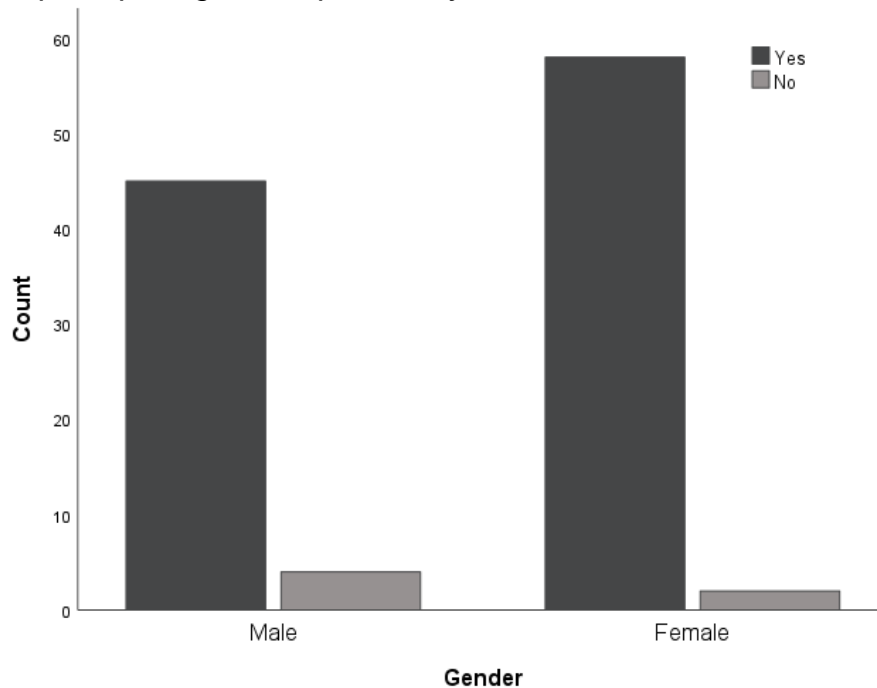
Note. *As displayed, the majority of participant were able to identify and state that there was at least one chance event present within the scenario.*

A between subjects ANOVA was performed to compare the responses between year-levels and sex, with participant responses to 'does this scenario contain any chance events?' as the dependent variable and the sex and year-level of participants as the fixed factors, $F_{(9,4)} = 0.68$, p .721. The effect size, calculated as eta squared (η^2), was .059, indicating a small effect.

Results indicated that there is no significant difference in participants' ability to identify a chance event from a scenario as a function of sex or between the year-levels (educational stage). Participants' ability to identify chance events in the scenario presented does not vary as a function of year-level or sex and the mean score suggests that 94% (N=103) of the sample reported that they identified a chance event present within the scenario presented.

The researcher had no a priori reason to believe that sex would play a role in the perception of chance events. However, in order to substantiate this assumption, a test of between subjects' effects univariate ANOVA was conducted on the results of every question. These analyses confirmed that

there were no significant effect or interaction of sex present. As such, the focus of the majority of comparisons is between age and stage of participants, i.e., their year-level. This result is consistent with Betsworth and Hansen (1996); Bright, Pryor, Wilkenfeld et al. (2005); and Hirschi (2010).

5.4.2 Number of chance events identified

At each year-level participants were asked, in a free response format, how many chance events they believed were present in the scenario they had just read.

100% of the participants answered the question (N = 109), 94% (N =103) responded by answering yes to believing that there were indeed chance events present in the scenario presented. Only 6% (N = 6) of participants stated in the previous question that the scenario contained no chance events, however, four out of the six of them still answered this question, stating that the scenario contained a number of chance events. This may indicate that those participants simply did not understand the question or how the question related to the previous question. However, no definitive conclusions can be drawn at this time from this data alone and further research would be needed to so do.

Figure 5. 4

Graph displaying the frequency of participant responses to the volume of chance events they believed were contained within the scenario.
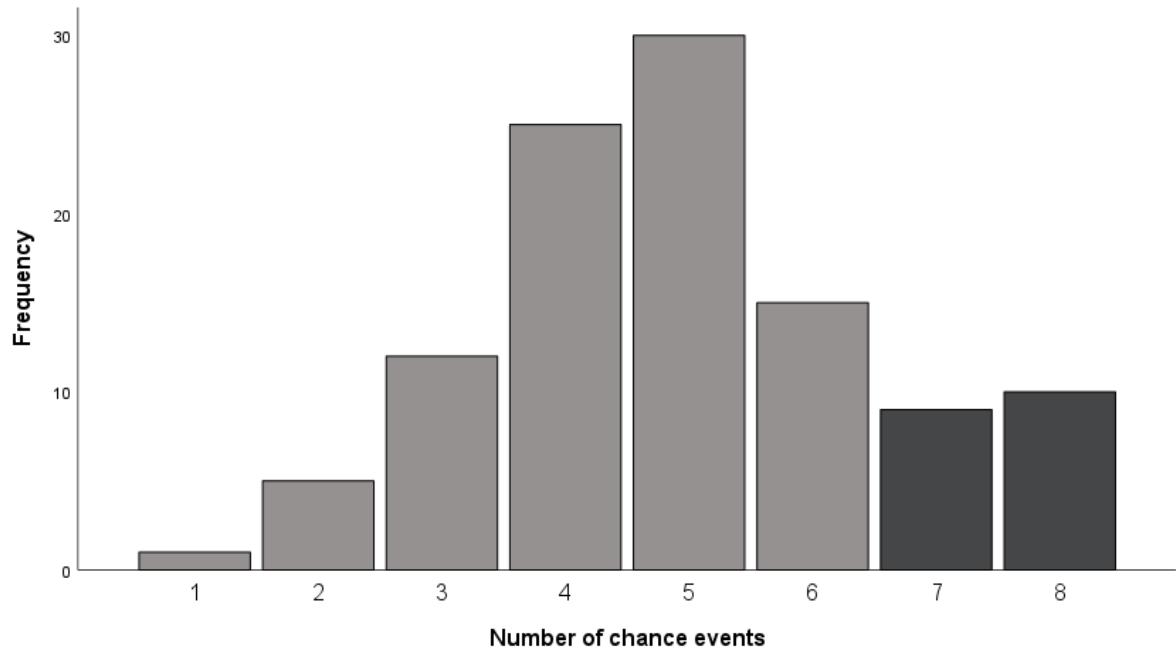
As is presented in Figure 5.4, the highest frequency of the sample, 28% (N = 30), indicated that that there were five chance events present in the scenario. As indicated by the panel, there were six chance events identified as contained within the scenario, meaning that 14% (N = 15) of participants responded with the actual number present.

Figure 5. 5

Graph displaying the estimated marginal means of participant responses between year-levels and sex.
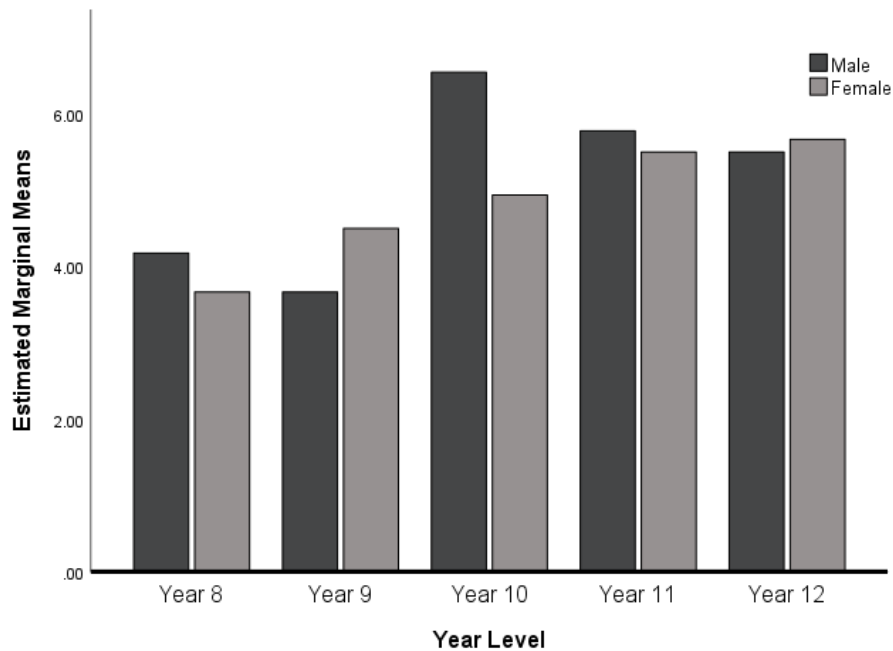
A between-subjects ANOVA was performed to compare the responses between year-levels and sex, with participant responses to 'how many chance events do you believe are present in the scenario?' as the dependent variable and both the sex and year-level of participants as the fixed factors. As can be seen in figure 5.5, results indicate that the identification of the number of chance events did not differ by sex, $F = .906$, p .343, the effect size, calculated as eta squared (η^2), was .009, indicating a small effect. And there was also no significant interaction between year-level and sex, $F = 2.087$, p .088. The effect size, calculated as eta squared (η^2), was .079, indicating a medium effect. However, there is a main effect at year-level of participants' identification of the number of chance events, $F = 4.94$, p $<.001$. The effect size, calculated as eta squared (η^2), was .314, indicating a large effect. This suggests that, as participants progress throughout the year-levels, increasing in age and maturity, they seem to become better at identifying the number of chance events.

5.4.3 Identification of most obvious chance event

At each year-level participants were asked, in a free response format, to briefly describe what they believed to be the most obvious chance event contained within the scenario.

Consensus from the panel was that of the six incidents they identified as 'chance events' in the context of the scenario, that the most obvious chance event was that 'a financial crisis hit'. The panel consisted of educated adults who discussed the scenario thoroughly. They considered the impact of the financial crisis consequentially, through lived experience with some having children of similar age and stage to our protagonist in the scenario, which likely added an empathic element to their consensus decision.

A total of 94% (N = 103) were able to give a response to this question. Of that 94% of participants, 10% gave answers which were not deemed as chance events contained within the scenario. This gave a valid participation rate of 86% (N = 94).

Figure 5. 6

Frequency of participant responses
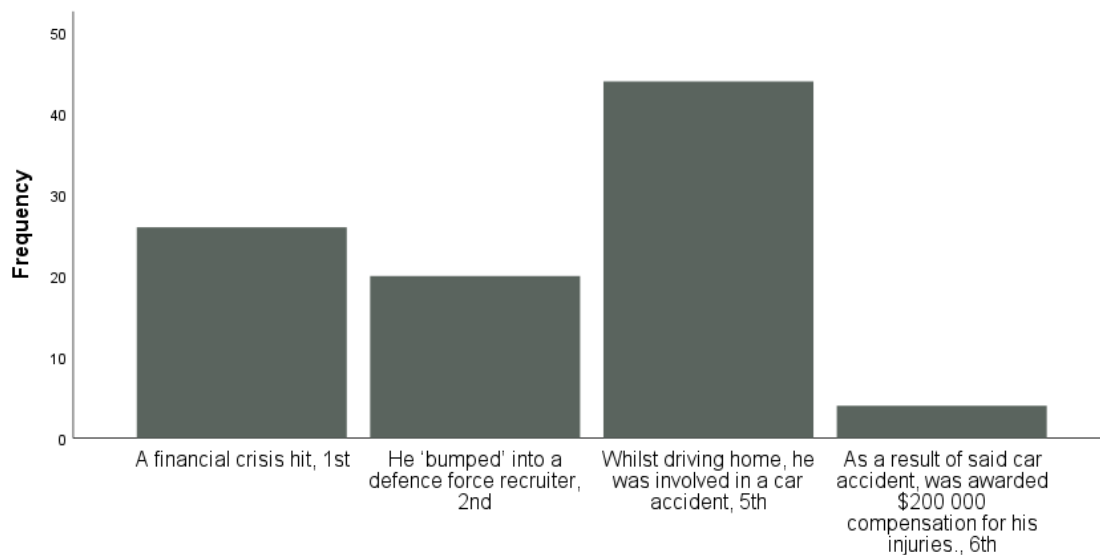
Note. This figure displays the frequency of participant responses to the most obvious chance event in sequence of presentation within the scenario. The third and fourth chance events contained within the scenario (His dad [who] was going to pick him up, was called away unexpectedly; and His neighbour…was also there at the time, offered him a ride home) were not identified by any student as most obvious.

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As illustrated in Figure 5.6, the most obvious chance event chosen by the greatest number of participants, 40% (N = 44), was the 'car accident', followed by the 'financial crisis', 24% (N = 26), and 'bumping into the defence force recruiter', 18% (N = 20). The chance event chosen by the least number of participants was the 'awarding of the $200 000', where only 4% (N = 4) of participants believed that was the most obvious chance event contained within the scenario.

Whilst the 'car accident' was chosen by the greatest number of participants, it was also the fifth actual chance event in the sequence of six chance events contained within the scenario. The possibility also exists that the relative importance of chance events may vary as a function of the perceiver's personal experience and context. It is plausible, possibly likely, that most participants in the age range of this study would not necessarily appreciate the importance of a financial crisis, which is a more abstract and less immediate event than a car crash. No definitive conclusions can be drawn from this result, as order or sequence of chance event recollection was not the focus of the study, only the identification thereof, and further study is warranted.

A between-subjects ANOVA was performed to compare the responses between year-levels as to which of the chance events presented they thought was the most obvious. The chance events identified as such in the scenario were coded from one through to six in order of their occurrence in the scenario. Results indicate that there is a main effect as a function of year-level, F = 3.38, p .013. The effect size, calculated as eta squared ($\eta 2$), was .033, indicating a small effect.

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Table 5. 1

Recall obvious Positive Negative

Respondent year level	Mean	Std. Deviation	N
Year 8	1.04	.19	27
Year 9	1.30	.46	15
Year 10	1.43	.51	21
Year 11	1.41	.51	17
Year 12	1.21	.42	14
Total	1.25	.43	94

Note. This table exhibits both the mean and standard deviation of participant responses to their recall of what they believe to be the most obvious chance event. *Data coded responses as either positive (1.00) or negative (2.00).

It appears that a bias exists towards recalling negative events over positive events for all year-levels, as can been seen in Table 5.1. There is some variation in the reporting across the year-levels in exactly the degree to which that bias is exhibited, which has caused the interaction effect. For reasons which may simply be an artifact of sample size, it appears in this instance that it is particularly the case for Year 8. However, any attempt to draw any further conclusions about the recall of negative events as a function of year-level is hazardous from this data, as no clear pattern is present and further research with a greater sample size would be needed. This implies that when investigating how participants remember chance events, they report the chance events which are negative (74.5%) in nature as opposed to ones that are positive in nature (25.5%) as the most obvious chance events contained within the scenario presented.

Results raised a number of questions that could be pursued in further research. One such question is that, of the six chance events contained within the scenario, two of them were not identified at all by any of the sample. These two unidentified chance events were:

- His dad [who] was going to pick him up, was called away unexpectedly; and

- His neighbour…was also there at the time, offered him a ride home.

Of the six chance events contained within the scenario, these two particular chance events happen to be incidents that participants are most likely to have personally experienced. It is plausible that the familiarity of these events may have led them to be discounted as being identified as an unexpected or chance event. Accordingly, further studies could address whether events which are deemed to be familiar and within personal experience of the participants could be perhaps subsequently rationalised away and therefore perceived by participants as not being a chance event.

5.4.4 Perception of the possibility of the most obvious chance event occurring to themselves

At each year-level participants were asked to indicate on a five-point Likert-type scale – ranging from 'very unlikely' through to 'very likely' – how likely it is that the event they described as being the most obvious contained within the scenario could happen to them.

A between-subjects ANOVA was performed to compare the responses between year-levels, with participant responses to 'How likely is it that this event could happen to you?' as the dependent variable and the year-level of participants as the fixed factor. Results indicated that there was no main effect at year-level, $F = 2.25$, p .069. The effect size, calculated as eta squared (η^2), was .080, indicating a medium effect. This suggests that participant responses to this question did not differ as a result of age and stage. As can been seen in Figure 5.4, the means range between unlikely and neutral, neither likely nor unlikely. There appears to be a slight overall bias towards the reporting of chance events, which they named in the previous question, as unlikely to happen to them. There is an exception at Year 9, with that group most obviously reporting 'neither likely nor unlikely'. The exception in this case is relatively minor and could be the uniqueness of the sample group due to age, size, and composition. As such, no conclusions can be made from this result, further research would be required in order to do so.

Figure 5. 7

Estimated marginal means by year-level.
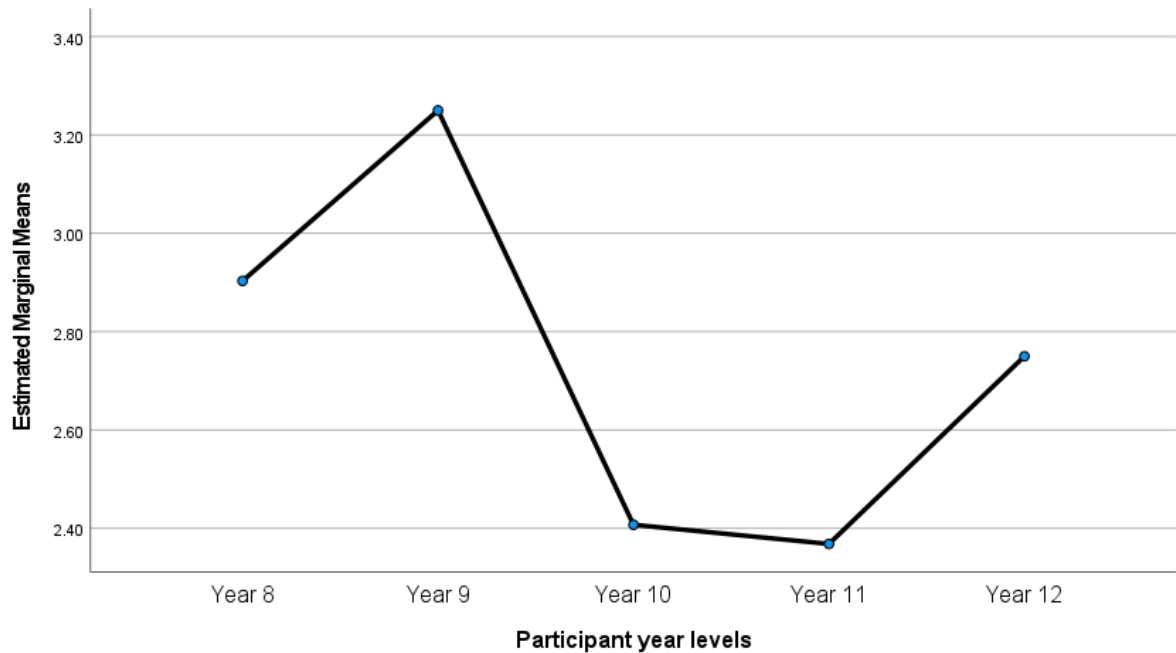
Note. This figure displays the estimated marginal means of responses to 'How likely is it that this event could happen to you?'.
*Data coded pertinent to the y-axis labels, using a Likert-type scale 1.00 = Very Unlikely, 3.00 = Neither Likely nor Unlikely, 5.00 = Very Likely.

5.4.5 Perception of the possibility of the most obvious chance event occurring to someone else

At each year-level participants were asked to indicate on a five-point Likert-type scale – ranging from 'very unlikely' through to 'very likely' – how likely it is that the event they described as being the most obvious contained within the scenario could happen to other people.

A univariate ANOVA was performed to compare the responses between year-levels, with participant responses to 'How likely is it that this event could happen to other people?' as the dependent variable and the year-level of participants as the fixed factor. Results indicated that there was no main effect at year-level, $F = 2.12$, p .078. The effect size, calculated as eta squared ($\eta2$), was .078, indicating a medium effect. This suggests that participant responses to this question did not differ as a result of age or educational stage. As can been seen in Figure 5.8, the means range only within the neutral, neither likely nor unlikely area. There appears to be an overall

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predisposition towards the reporting of chance events, which they named in question 4 as neither likely nor unlikely, to happen to other people. There is only a very slight exception at Year 8, with that group the closest to reporting likely.

Figure 5. 8

Graph displaying the estimated marginal means by year-level.
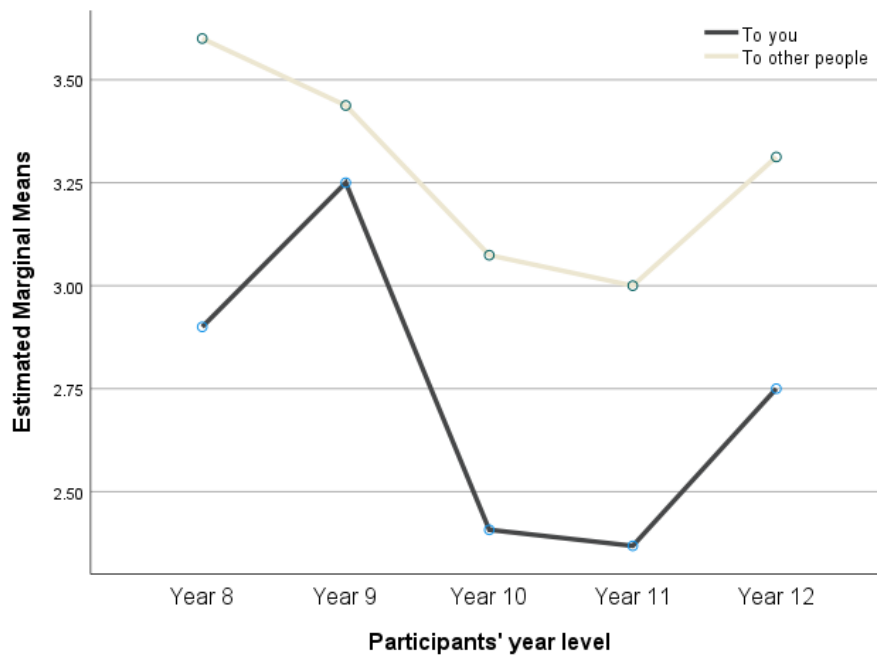
Note. This figure displays the estimated marginal means of participant responses to the most obvious chance event happening to themselves or to other people by year-level.
*Data coded pertinent to the y-axis labels, using a Likert-type scale 1.00 = Very Unlikely, 3.00 = Neither Likely nor Unlikely, 5.00 = Very Likely.

As can be seen in Figure 5.8, it would seem consistent across year-levels that participants believe that the chance event, which they thought to be the most obvious contained within the scenario, is more likely to happen other people rather than themselves.

A repeated measures ANOVA was performed to compare the responses between year-levels, with participant responses to 'How likely is it that this event could happen to you or to other people?' as the dependent variable and the participants recall of positive or negative chance events as the fixed factor. Results indicate that there was no significant interaction (F = .979, p .325).The effect size, calculated as eta squared (η^2), was .011,

indicating a medium effect. This means that differences in ratings of how likely an event would happen to self or others does not differ as a function of year-level. However, there was a significant main effect of participant responses to how likely is it that this event could happen to you or to other people, $F(1) = 35.43$, $p < .001$. The effect size, calculated as eta squared (η^2), was .280, indicating a large effect. This suggests that (as illustrated in Figure 5.9), those who recall a negative chance event tend to perceive it as being more likely to occur to others. Participants that recalled a positive chance event as the most prominent also believe that it is more likely to happen to someone else and not to themselves. Therefore, irrespective of whether participants recall a negative or positive chance event as being the most obvious chance event, they still believe that it is more likely to happen to someone else other than themselves.

Figure 5. 9

Estimated marginal means by chance event type.
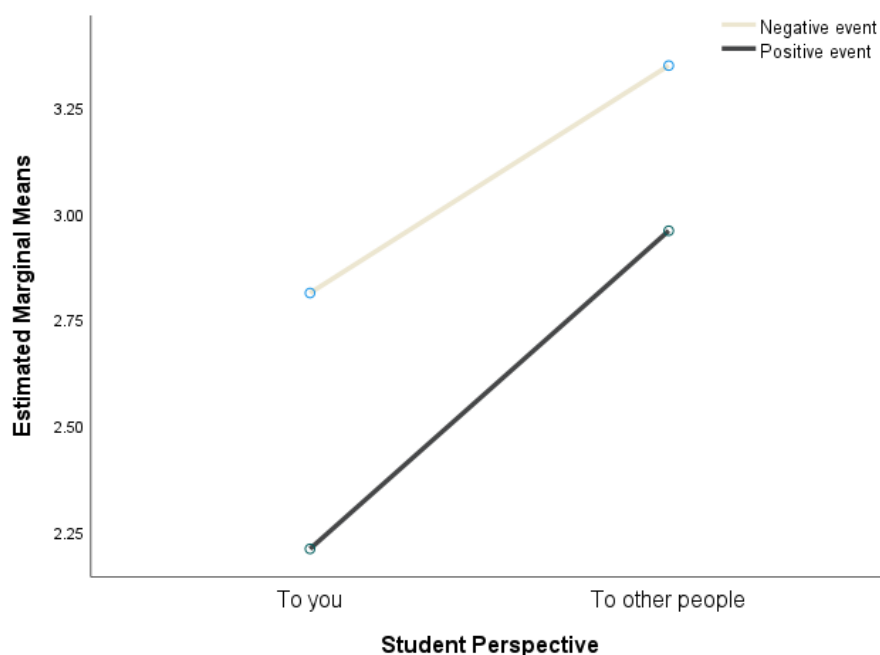
Note. This figure displays the estimated marginal means of participant responses to the most obvious chance event happening to themselves or to other people, by type of chance event either positive or negative in nature.
*Data coded pertinent to the y-axis labels, using a Likert-type scale 1.00 = Very Unlikely, 3.00 = Neither Likely nor Unlikely, 5.00 = Very Likely.

Overall, this result suggests that in general, young people are relatively less good at identifying chance events. When they are able to identify them they have a tendency to view them in negative terms. On the whole, data suggests – irrespective of the nature of the chance event – that participants believe that they are more likely to happen to someone else and not to themselves. This is an educational challenge and an opportunity for career educators to address as early on as possible, preferably in primary school. This could be achieved by designing an evidence-based program incorporating a chaos/happenstance informed approach in order to systematically introduce the concept of chance contextually at the appropriate educational age and stage. Younger people need to be taught to:

- Identify chance (what are the signs/elements of a chance event?).
- Recognise the difference between positive and negative chance events.
- Appreciate the role chance can play in their own lives personally.
- Recognise the personal relevance of such an event, i.e., not just something that just happens to other people.

5.4.6 Identification of least obvious chance event

At each year-level participants were asked, in a free response format, to briefly describe what they believed to be the least obvious chance event contained within the scenario.

The reference panel determined that the least obvious chance event was that 'as a result of the car accident, [William] was awarded $200 000 compensation for his injuries'.

A total of 89% (N = 97) of participants identified what they believed to be the least obvious chance event. Of that 89% of participants, 32% of them gave answers which were deemed as not one of the six chance events contained within the scenario. This gave a valid participation rate of 61% (N = 66).

Figure 5. 10

Position of least obvious chance event in scenario.

Position of selected least obvious in sequence of presentation in scenario.
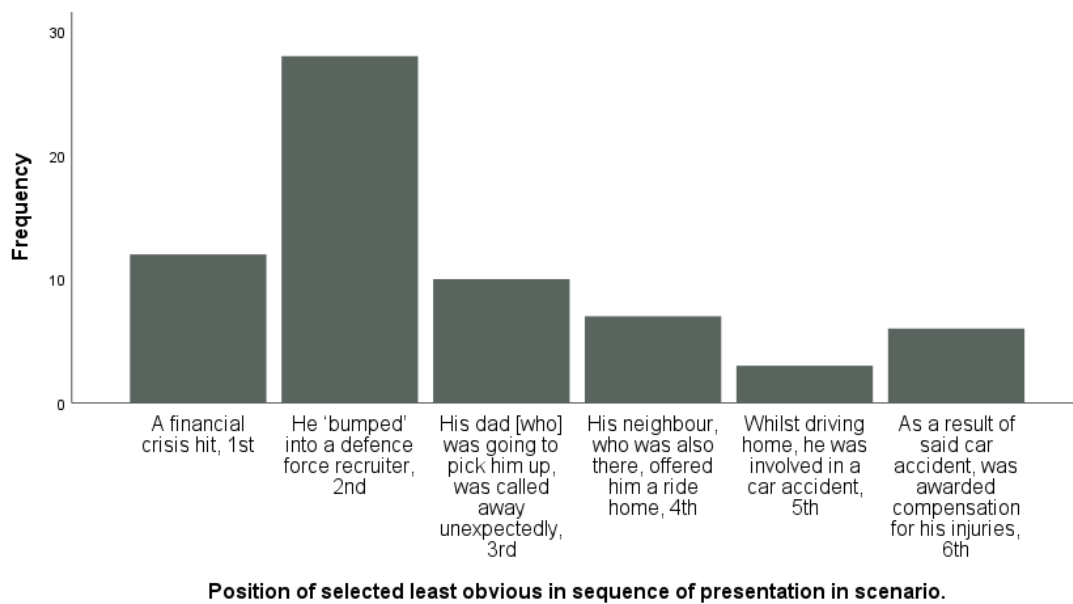
Note. This figure displays the position of least obvious chance event as selected by participants in sequence of their presentation within the scenario.

Figure 5.6 shows that the event in the scenario identified most frequently as the least obvious was 'bumping into a defence force recruiter' as identified by 26% of participants (N = 28). From the perspective of career education, this may be the most relevant result in this particular study, because the only event described in explicit career terms was the one that was identified as being the least obvious chance event. It is plausible that the students are reasonably good at identifying chance events such as motor vehicle accidents that have little or no immediate connection to careers events. However, the results presented in Figure 5.10 suggest that they may have greater difficulty in identifying serendipitous events which are immediately impactful in terms of careers. This is an intriguing possibility that is worthy of further exploration, though not in the scope of the present study.

Overall, it suggests that while chance events generally are readily understood and recognised, there may still be a relative lack of recognition of the importance of career-related chance events.

Studies 1 and 2 have shown that there is a general bias towards the recollection of negative chance events compared to positive chance events,

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which may have implications in career education in terms of how events are presented. More effort may be required in order to make positive career chance events memorable to participants so that they will have a similar impact in terms of their thinking and career planning as being exposed to negative career chance events.

5.4.7 Perception of the possibility of the least obvious chance event occurring to themselves

At each year-level participants were asked to indicate on a five-point Likert-type scale – ranging from 'very unlikely' through to 'very likely' – how likely it is that the event they described as being the least obvious contained within the scenario could happen to them.

A univariate ANOVA was performed to compare the responses between year-levels, with participant responses to 'How likely is it that this event could happen to you?' as the dependent variable and the year-level of participants as the fixed factor. Results indicated that there was no main effect at year-level, $F = .65$, p .626. The effect size, calculated as eta squared ($\eta2$), was .025, indicating a large effect. This suggests that participant responses to this question did not differ as a result of age or educational stage. As can be seen in Figure 5.11, the range of the mean is contained only within the unlikely area. There appears to be an overall predisposition towards the reporting of chance events, which they named in the previous question as unlikely to happen to themselves.

5.4.8 Perception of the possibility of the least obvious chance event occurring to someone else

At each year-level participants were asked to indicate on a five-point Likert-type scale – ranging from 'very unlikely' through to 'very likely' – how likely it is that the event they described as being the least obvious contained within the scenario could happen to other people.

A univariate ANOVA was performed to compare the responses between year-levels, with participant responses to 'How likely is it that this event could happen to other people?' as the dependent variable and the year-level of participants as the fixed factor. Results indicate that there was no

main effect at year-level, F = 1.20, p .314. The effect size, calculated as eta squared (η^2), was .045, indicating a large effect. This suggests that participant responses to this question did not differ as a result of age or academic stage. As can been seen in Figure 5.11, the means range only within the neutral and neither likely or unlikely area, which on the Likert scale was 2 and 3 respectively. There appears to be an overall predisposition towards the reporting of chance events, which they named in the corresponding question as neither likely nor unlikely, to happen to other people.

Figure 5. 11

Estimated marginal means by year-level
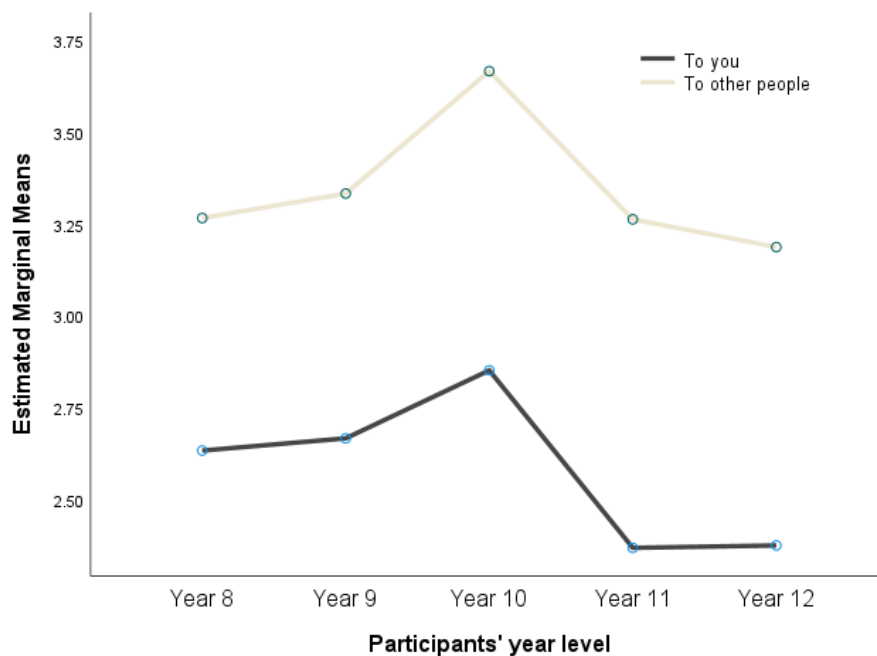
Note. This figure displays the estimated marginal means of participant responses to the least obvious chance event happening to themselves or to other people by year-level.
*Data coded pertinent to the y-axis labels, using a Likert-type scale 1.00 = Very Unlikely, 3.00 = Neither Likely nor Unlikely, 5.00 = Very Likely.

A repeated measures ANOVA was performed to compare the responses to 'How likely is it that this event could happen to you or to other people?' as the within-subjects variable and the participants recall of positive or negative chance events as the between-subjects factor. Results indicate

that there was no significant interaction (F = .545, p .463). The effect size, calculated as eta squared (η^2), was .048, indicating a large effect.

This means that differences in ratings of how likely an event would happen to self or others does not differ as a function of year-level. However, there was a significant main effect of participant responses to how likely is it that this event could happen to you or to other people, F(1) = 29.94, p <.001. The effect size, calculated as eta squared (η^2), was .349, indicating a large effect. This suggests that (as illustrated in Figure 5.12), for those who have recalled a negative chance event as the least obvious, they believe it is more likely to happen to someone else. Participants that recalled a positive chance event as the least obvious also believe that it is more likely to happen to someone else and not to themselves. So, irrespective of whether participants recall a negative or positive chance event as being the least obvious chance event, they still believe that it is more likely to happen to someone else other than themselves.

Figure 5. 12

Estimated marginal means by chance event type.
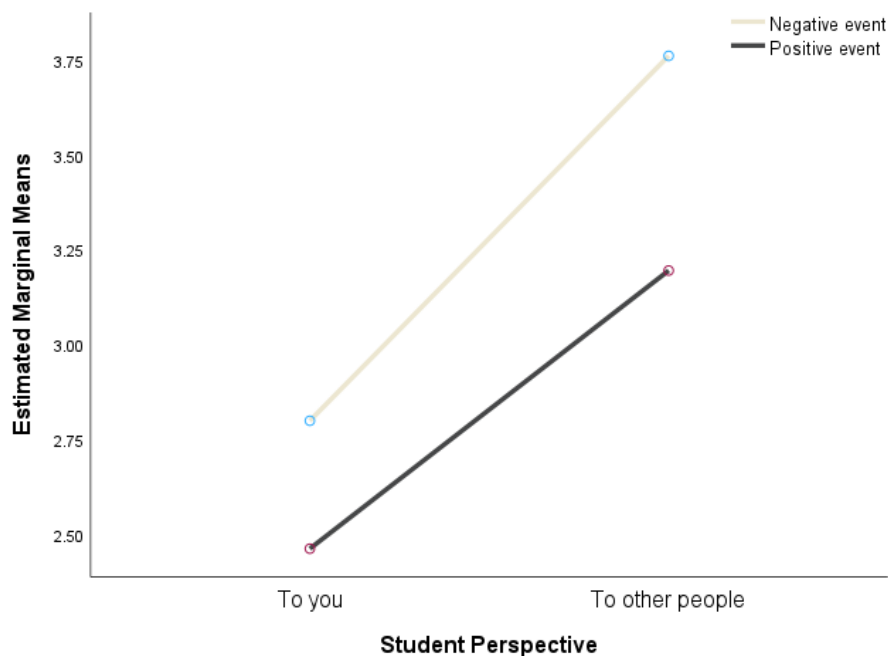
Note. This figure displays the estimated marginal means of participant responses to the least obvious chance event happening to themselves or to other people by type of chance event either positive or negative in nature.

*Data coded pertinent to the y-axis labels, using a Likert-type scale 1.00 = Very Unlikely, 3.00 = Neither Likely nor Unlikely, 5.00 = Very Likely.

Consistent across year-levels, it would seem that participants believe that the chance event they believed to be the least obvious contained within the scenario, is more likely to happen other people rather than themselves.

This finding is consistent with the concept of Comparative optimism. Reviewing other research studies, Sweldens et al. (2014) indicate this well-researched phenomenon; "has been the focus of hundreds of articles and is one of the most prominent findings in the social judgment and decision-making literatures (Chambers & Windschitl, 2004; Harris et al., 2008; Helweg-Larsen & Shepperd, 2001)" (p. 229). The concept of unrealistic optimism, originating from Weinstein's (1980) seminal work, remains a well-established phenomenon. "A Web of Knowledge database count, focusing on five common related terms (unrealistic optimism, comparative optimism, optimistic bias, optimism bias, and illusion of invulnerability), reveals 984 published papers" (Shepperd et al., 2013, p. 394). This extensive body of research underscores the enduring significance and widespread interest in the topic, however, this is not the focus of the present investigation, and no definitive conclusions can be drawn from this result without further research.

5.5 Conclusion

Study 2 consisted of a total of eight questions and was designed to further explore the major research question: "How do adolescents perceive chance events?". More specifically, it presents data exploring participants' ability to identify chance events contained within a contextually relevant scenario, delving deeper into participants' perception of which chance events they believed to be the most and least obvious and whether such incidents were likely to happen to themselves or other people.

Results clearly demonstrate that the majority of participants in Years 8 to 12 possess the ability to identify chance events when presented in relatable and contextually relevant scenarios. There also seems to exist a bias towards the recalling of negative events over positive events for all year-levels, consistent with the findings of Bright et al., 2004, 2005, 2009. Regardless of whether a chance event is positive or negative in nature, the majority of

participants believe that they are more likely to happen to other people rather than themselves, consistent with the work of Harris et al, 2008.

Although not the focus of the study, it would seem that there is no evidence to suggest that the order of the chance events contained within the scenario, i.e., the first chance event contained within the scenario was the financial crisis, followed by the chance encounter with a defence force recruiter, etc., had any bearing on participants recall of what they believed to be the least obvious chance event contained within the scenario. This was evidenced by 25.7% of the participants choosing 'he bumped into a defence force recruiter' (which was the second chance event chronologically within the scenario) as what they believed to be the least obvious chance contained within the scenario.

Results suggest that a very small percentage of participants may simply have been confused about what a chance event is. This was evidenced by them listing events contained within the scenario that would not be considered a chance event. Rather, participants were simply picking events of the scenario. Also, there were instances where participants had previously stated that there were no chance events contained with the scenario, but who still went on to identify them.

The results demonstrate that the ability to recognise chance events presented within scenarios improved as a function of the educational level of the participants. What remains an open question is how participants become better at identifying chance events as they progress through year levels. One possibility is that younger participants are conceptually unable to fully understand the nature of chance events. Alternatively, it could simply be that through greater life experience the older participants may have a better appreciation of chance events as they likely have a greater knowledge and subsequent range of experiences. If the former is correct, then this has significant implications as to the nature of career education interventions with younger participants. It may be futile to attempt to teach younger participants about chance events if they do not have the conceptual frameworks to understand them. Alternatively, if it is merely a matter of exposure, then almost the opposite is true and early career education interventions that place

an emphasis on chance events may be highly beneficial in attuning younger minds to the potential prevalence of chance and happenstance in the world of work.

The following Chapter (Chapter 6) continues to explore how young people perceive chance events, presenting the findings of Study 3. It will take a closer look at participants' perceptions of chance events and their attitude toward them. This investigation may shed light on how these perceptions relate to participants' ability to recognise an opportunity or be 'Luck Ready'. How does their own tendency to seek out opportunity influence their perception of a chance event? Focusing on older participants, those in years 10 - 12 only, Study 3 seeks to examine participants' Luck Readiness as well as their ability to categorise a chance event.

CHAPTER 6

STUDY 3: Navigating Chance: Exploring Students' Categorisation of Chance Events and the Implications for Opportunity Awareness

6.1 Introduction

Study 2, in the previous Chapter (Chapter 5), presented data exploring participants' ability to identify chance events contained within a contextually relevant scenario. It further explored participants' perception of which chance events from the scenario presented they perceived to be the most and least obvious, and whether such incidents were likely to happen to themselves or other people.

Study 2 established that the majority of participants in Years 8 to 12 are capable of identifying chance events presented within a relatable and contextually relevant scenario. The results indicated a bias towards the recalling of negative events over positive events for all year-levels. Importantly, regardless of whether a chance event was positive or negative, the majority of participants reported that they are more likely to happen other people rather than themselves.

The purpose of Study 3 was to examine how young people perceive chance events, from a multi-faceted perspective. The investigation aimed to achieve two key objectives: first, to identify a meaningful way to categorise chance events from an adolescent perspective (taxonomy), and second, to explore how their perceptions of these events relate to their understanding of the eight dimensions of opportunity awareness (flexibility, persistence, etc.). Building on previous research suggesting a negativity bias in young people's chance event perceptions (Bright et al., 2005, 2009; Chen, 2005), the current study investigated their grasp of these opportunity awareness dimensions (Pryor & Bright, 2005b), crucial for developing a comprehensive career education program. And to continue to answer the major research question: 'How do young people perceive chance events?' This Chapter addresses the questions of: 'is there a meaningful taxonomy of adolescent chance events?'

and 'How do adolescent perceptions of chance events relate to their opportunity awareness?' Study 3 was distributed and facilitated entirely electronically, employing the use an online proprietary survey website.

Study 3 continued to explore this apparent default bias of negativity that seems to exist within the perception of young people when it comes to chance events (e.g., Bright et al., 2005, 2009; Chen, 2005).

Study 3 explored participants' understanding and comprehension of the eight dimensions of opportunity awareness, defined by Pryor and Bright (2011) as flexibility, persistence, self-efficacy, curiosity, optimism, strategy, risk, and luckiness. This was pertinent in the development of a wholistic career education program as a good understanding of these eight elements assists in comprehending the extent to which individuals are optimistic and proactive in dealing with unpredictability (Pryor & Bright, 2005b).

An exploration of participants' ability to identify chance events, presented in plausible and contextually relevant Vignettes. This study delves into their thinking and reasoning about these events, prompting them to attach a category to each chance event. The aim is to gain a deeper understanding of how young people construe, consider, and categorize unplanned events. Categories can be defined by using a set of criteria or guidelines that determine whether an object or element belongs within a particular category. Categories can be based on various factors, such as physical attributes, behaviours, functions, or relationships.

Study 3 was completed by participants in Years 10, 11 and 12 only. This cohort of participants was the only group to complete all three studies. Study 3 (Appendix H) consisted of 93 questions in total, which included the 52 items of the Luck Readiness Index.

6.2 Participants

Differing from Study 1 and Study 2 participants in Study 3 were current students in the Senior School exclusively – Years 10, 11 and 12 (age ranging from 14 to 20 years). The total number of students enrolled at the College in Years 10, 11 and 12 at the time the research was conducted was 87. A total

of 62 participants returned their permission forms and participated in Study 3, giving an overall participation rate for Study 3 of 71.3% of the population.

Tasks contained within Study 3 not only required participants to read, but to also demonstrate their comprehension of the terms by firstly rating them in order of perceived importance, and to also assign a rating and provide an example thereof. Participants were also asked to read contextually relevant and realistic Vignettes, which were designed to be completely relatable to participants. Being contextually relatable would give them the best chance of identifying chance events from the realistic scenario. Given the reading constraints, complexity, relatability, and sufficient realism of the tasks described, it was determined by a subject matter expert, that these were appropriate tasks for participants in the Senior Secondary School, Years 10 and above. As such, only participants in Years 10, 11 and 12 were invited to complete Study 3.

Participation was voluntary, there were no incentives, gifts or oblique ancillary benefits to the participants who participated. For the Year 12 participants, and those Year 11 participants who were enrolled in a Year 12 (VCE units 3 & 4) subject, participation was post the Victorian Certificate of Education (VCE) examination period, and as such there could be no implied benefit to those participants' school results, university entry or coerced participation as related to their studies.

It should be reiterated that none of the participating students had attended any career education classes or any other subject which had a specific focus on chance events at any stage. The College community in general, which included all participating students, were not aware of the researcher's interest in chance events or the Chaos Theory of Careers.

6.3 Method and Material

Study 3 contained within it four sub-sectional foci. The first one focused on the eight elements of the Luck Readiness Index (Bright & Pryor, 2005). Participants were asked to rank in order – from one being most important, to eight being least important – the following elements in terms of importance to

having a successful career: Curiosity, Efficacy, Flexibility, Luckiness, Optimism, Persistence, Risk, and Strategy.

The first cluster of eight questions asked participants to indicate on a seven-point Likert-type scale – from one being 'totally unimportant' to seven being 'very important' – how important each element is (asked individually, one element per question) in terms of them having a successful career. See example below:

Question 2. How important is Flexibility in terms of you having a successful career? (Circle only one)

1	2	3	4	5	6	7
Totally Unimportant	Quite Unimportant	Somewhat Unimportant	Neither Unimportant	Somewhat Important	Quite Important	Very Important

Following the first cluster of questions, the second cluster of eight questions similarly asked participants to indicate on a five-point Likert-type scale – from one being 'unconfident' to five being 'confident' – how confident they were that they understood each element as a term (asked individually one element per question). See example below:

Question 10. How confident are you that you understand the term Flexibility? (Circle only one)

1	2	3	4	5
Unconfident	Somewhat Unconfident	Neither Confident or Unconfident	Somewhat Confident	Confident

The second sub-section of Study 3 focused on the identification and then classification of chance events from three Vignettes. "Short Vignettes are valuable, for example, in helping to maximise response rates…also help to save time during research" (Hughes & Huby, 2004, p. 40). A Vignette "is a short scene that captures a single moment or a defining detail about a character, idea, or other element of a story. Vignettes are mostly descriptive; in fact, they often include little or no plot detail" (Literary Terms, 2023).

Participants were asked to read the Vignettes and then circle their answers to:

- Are there any chance events that occurred in the above story? Yes/No

- If you answered Yes in the last question, how many chance events do you believe have occurred? (If you answered No, circle 0) 0 1 2 3 4 5 6 7

- If you answered Yes to question 33, did any of them relate to any of the following factors: (circle as many as you think apply)

    1. Educational (Related to school, college, university or any type of learning)
    2. Employment (Related to work at a job)
    3. Environmental (Related to things in the environment or your surroundings)
    4. Family (Related to a person's family)
    5. Financial (Related to money)
    6. Health (Something that affects a person's health)
    7. Physical (Something that affects a person's body)
    8. Relational (Related to relationships with other people)
    9. Social (Related to interactions with other people)
    10. Spiritual (Related to a higher power)
    11. Travel (Related to time spent away from home, i.e., on a journey)

As with this investigation's Study 1 and Study 2, a Panel of five adults comprising of senior secondary teachers and parents was convened for the purpose of identifying and coming to consensus on the actual 'chance events' contained within each of the three Vignettes based on the definition of a 'chance event' supplied to them, which was that – generally – chance events relate to "unplanned, accidental, or otherwise situational, unpredictable, or unintentional events or encounters that have an impact on career development and behaviour" (Rojewski, 1999, p. 269).

The Panel's consensus for all three Vignettes, was that they each contained two incidents which could be considered 'chance events'. All Vignettes' identified chance events are presented chronologically within the Vignettes affecting the protagonist and not in order of any severity as perceived by the Panel.

The 2 chance events contained within Vignette 1 (see Appendix H, p. 3):

- '…we came across some participants from the local Australian Maritime College', which related to Educational factors; and
- '…I recognised one of the participants was my cousin', which related to Family factors

The 2 chance events contained within Vignette 2 (see Appendix H, p. 4):

- '…an executive from McDonald's head office visited the store unannounced', which related to Employment factors; and
- '…on sick leave as there was a bad flu virus going around', which related to Health factors.

The 2 chance events contained within Vignette 3 (Appendix L, pages 4 & 5):

- 'The worst drought in memory occurred…', which related to Environmental factors; and
- 'One of my older friends…was studying agronomy…always talking about sustainability and the environment', which related to Relational factors.

The third sub-sectional focus of Study 3 focused on the participants themselves and their experiences. They were asked to think of a chance event that had occurred to themselves personally and then to articulate it, in a free response format, by typing into a supplied space of the online survey. Participants were then asked to select which category or categories (participants were advised to select as many categories as they believed would relate) they believed their own experienced chance event would relate to from the list given below:

1. Educational (Related to school, college, university or any type of learning)
2. Employment (Related to work at a job)
3. Environmental (Related to things in the environment or your surroundings)
4. Family (Related to a person's family)
5. Financial (Related to money)

6. Health (Something that affects a person's health)
7. Physical (Something that affects a person's body)
8. Relational (Related to relationships with other people)
9. Social (Related to interactions with other people)
10. Spiritual (Related to a higher power)
11. Travel (Related to time spent away from home, i.e., on a journey)

Participants were asked to do the same again, except this time they were asked to think of a chance event that has occurred to someone else, followed by articulating it, in a free response format, by typing into a supplied space of the online survey. Subsequently, participants were prompted to choose which category or categories (participants advised to select as many categories as they believed would relate) they perceived that chance event would relate to from the list.

The Panel were asked to go through the responses to this section, and the responses given to questions 27, 'Can you think of a chance event that has occurred to you?', and question 29, 'Can you think of a chance event that has occurred to someone else?'. The next step involved coming to consensus on what qualified as 'chance events'. Once determined, then to categorise those chance events as either positive, negative or neutral chance events. The Panel also came to an agreed consensus on responses that were not answering the question correctly in respect to whether the chance event was experienced by themselves or someone else.

Questions 31 to 41 asked participant to give an example of a chance event which might relate to each of the 11 categories: Physical, Relational, Health, Spiritual, Family, Social, Educational, Travel, Environmental, Employment, and Financial. For example, question 31 asked "In the box below, give an example of a Physically related chance event?" The Panel were again asked to go through the responses to these questions, coming to consensus on which were 'chance events' and then to categorise those as either positive, negative or neutral chance events. The Panel also reached a consensus on responses that were not answering the question correctly in respect to whether the chance event related to that category.

The fourth and final sub-sectional focus of Study 3 was the Luck Readiness Index (LRI). Directly following question 41, participants completed the LRI. The LRI consists of a set of 52 statements and questions. Participants were to answer each question by indicating the degree to which they agreed or thought that it applied to them or not. All 52 statements and questions required participants to indicate their level of agreement on a five-point Likert-type scale - ranging from 'completely agree' through to 'completely disagree'. See example below:

1. Are you "set in your ways"?

Completely Agree	Agree	Neither Agree nor Disagree	Disagree	Completely Disagree

6.4 Procedure

The online surveys were administered at each year-level by the relevant Year Level Coordinator or Homeroom teacher. They were provided with a list of students who had verified permission to participate by the College administration, who had collated all of the returned and fully completed permission forms (Appendix D).

6.5 Results and discussion

6.5.1 Participant ranking of their perceived importance of each element of the Luck Readiness Index

At each year-level participants were asked to rank in order – from one being most important, to eight being least important – the elements of Flexibility, Optimism, Risk, Curiosity, Persistence, Strategy, Efficacy, and Luckiness in terms of importance for them to have a successful career.

A Mann–Whitney U test comparisons of rankings of the LRI factors (Flexibility, Optimism, Risk, Curiosity, Persistence, Strategy, Efficacy, and Luckiness) as a function of sex and educational stage (year-level) indicated that there was no significant difference in how the items were ranked. Consequently, participants' rankings of the relative importance of these factors were considered across educational stage and sex. It is interesting that participants' ratings of the relative importance of LRI factors do not

change across year-levels. This could be because participants are relatively unsure of the importance of these various factors and their relationship to career development. If accurate, this in turn, suggests the need for better careers education to demonstrate the links between these factors because they are deemed to be critically important in future career development. On the other hand, it may be that these items are self-evidently relatively important; however, due to the age and year level of participants this seems less plausible. These results have led to the development of specific recommendations which are reported in Chapter 8, sections 8.7.4, 8.7.5, 8.7.7, and 8.7.5 specifically.

Overwhelmingly, participants both overall and across year-levels and sexes, rated Optimism (32.8%) and Persistence (32.8%) as being equally the most important elements in terms of the importance to have a successful career. These were followed by Efficacy (14%), Flexibility (10.2%), Risk (5.6%), and Strategy and Luckiness (3.6%). Curiosity (1.9%) was ranked as the least important element in terms of importance to have a successful career.

To illustrate using a rating scale, a higher mean score indicates a higher level of importance.

1. Overwhelmingly Important (32.8%): Optimism, Persistence
2. Very Important (14%): Efficacy
3. Important (10.2%): Flexibility
4. Moderately Important (5.6%): Risk
5. Somewhat Important (3.6%): Strategy, Luckiness
6. Less Important (1.9%): Curiosity

Since Optimism and Persistence received an equal rating and are ranked as the most important elements, they share the top position. Efficacy follows as the next important element, followed by Flexibility, Risk, Strategy and Luckiness, and Curiosity ranked as the least important element. The percentage values represent the proportion of participants who rated each element, providing an indication of the collective perspective.

Tables 6.1 – 6.4, report the mean responses to LRI factors of importance in terms of having a successful career. These results indicate that

Persistence is never out of the top two and ranked as the most important element overall, as evidenced in Table 6.1 (M = 2.26). When considered by year-levels, however, the Year 11 group ranked it as the second most important element. Optimism and Flexibility are never ranked as the least important. As can been seen in Table 6.1, Curiosity, Risk and Luckiness are ranked as the least important, with mean rankings of 5.3, 6.0, and 6.6 respectively.

Table 6. 1

Table displaying the mean responses to LRI factors of importance in terms of having a successful career.

	N	Minimum	Maximum	Mean	Std. Deviation
Persistence	58	1.00	5.00	2.2586	1.22203
Optimism	58	1.00	7.00	2.6034	1.58877
Flexibility	59	1.00	7.00	3.9322	1.69038
Strategy	55	1.00	8.00	4.0000	1.66667
Efficacy	58	1.00	8.00	4.6034	2.22379
Curiosity	55	1.00	8.00	5.2909	1.95005
Risk	55	1.00	8.00	5.9273	1.79355
Luckiness	56	1.00	8.00	6.6071	2.03317
Valid N (listwise)	51				

Note. The Table displays aggregated data for all participants in Years 10, 11 and 12.

Table 6. 2

Table displaying the mean responses of Year 10 participants to the LRI factors of perceived importance in terms of having a successful career.

	N	Minimum	Maximum	Mean	Std. Deviation
Persistence	24	1.00	5.00	2.1667	1.16718
Optimism	25	1.00	7.00	2.8400	1.84120
Flexibility	25	1.00	6.00	3.8800	1.81016
Strategy	23	1.00	8.00	4.1739	1.92241
Curiosity	22	1.00	7.00	4.3182	1.93677
Efficacy	24	1.00	8.00	4.4583	2.04257
Risk	22	1.00	8.00	6.0000	1.92725
Luckiness	22	2.00	8.00	6.8636	1.78073
Valid N (listwise)	20				

Note. Table displays data for all participants in Year 10 only.

Table 6. 3

Table displaying the mean responses of Year 11 participants to the LRI factors of perceived importance in terms of having a successful career.

	N	Minimum	Maximum	Mean	Std. Deviation
Optimism	17	1.00	5.00	2.0588	1.29762
Persistence	18	1.00	5.00	2.3889	1.09216
Strategy	18	2.00	7.00	4.1667	1.42457
Flexibility	18	1.00	7.00	4.1667	1.91741
Efficacy	18	1.00	8.00	4.5000	2.28164
Curiosity	17	2.00	8.00	5.7059	2.02376
Risk	18	1.00	8.00	6.0000	1.84710
Luckiness	18	2.00	8.00	6.6111	1.71974
Valid N (listwise)	17				

Note. Table displays data for all participants in Year 11 only.

Table 6. 4

Table displaying the mean responses of Year 12 participants to the LRI factors of perceived importance in terms of having a successful career.

	N	Minimum	Maximum	Mean	Std. Deviation
Persistence	16	1.00	5.00	2.2500	1.48324
Optimism	16	1.00	5.00	2.8125	1.37689
Strategy	14	2.00	7.00	3.5000	1.50640
Flexibility	16	2.00	6.00	3.7500	1.23828
Efficacy	16	1.00	8.00	4.9375	2.51578
Risk	15	1.00	8.00	5.7333	1.62422
Curiosity	16	4.00	8.00	6.1875	1.27639
Luckiness	16	1.00	8.00	6.2500	2.67083
Valid N (listwise)	14				

Note. Table displays data for all participants in Year 12 only.

Table 6.1 demonstrates that, each time and at all year-levels (see Tables 6.2 - 6.4), Luck was reported as the least important element for having a successful career. This educational opportunity holds particular significance within a school that emphasises religious teachings. Within the context of faith, some participants asserted that luck was a non-existent concept, while

acknowledging the presence of factors that appear to be under personal control in daily life. Furthermore, for those participants committed to their religious beliefs, the concept of luck stands in opposition to the notion of a meticulously designed universe (Bartholomew, 2016).

Consequently, in such settings where there is a heavy religious element present and a genuine faith subscribed to, then a discussion or clear explanation of the concept of 'Luck' which is not incompatible with faith may be helpful. However, no definitive conclusions can be drawn from this result. The exploration of any individual element of the LRI was not the focus of Study 3, only the ranking thereof in terms of their importance to have a successful career as perceived by the individual participants. As such, further research would be required, which has led to the development of a specific recommendations, see Chapter 8, sections 8.7.4 and 8.7.7 specifically.

As displayed in Table 6.5, a Kruskal-Wallis comparison of rankings of the elements of the LRI by year-level of participants was performed and indicates that the rankings were relatively stable across year-levels. The exception to this was with Curiosity, which showed a decline from Year 10 to Year 11 and then remained in the lower rankings. This indicates that Year 10 participants ranked Curiosity as more important than the Year 11 and 12 participants. Year 10s' ranking of Curiosity higher than where other year levels ranked it could be due to the particular time of the academic year when Study 3 was undertaken. Year 10 participants were heavily immersed in vocational education, and around the time of senior secondary course and subject selections. Participants may have had their curiosity piqued whilst exploring possible vocations to study towards.

Table 6. 5

Table displaying the Kruskal-Wallis Test ranking of the LRI factors of perceived importance in terms of having a successful career.

	Flexibility	Optimism	Risk	Curiosity	Persistence	Strategy	Efficacy	Luckiness
Kruskal-Wallis H	.495	2.950	.754	9.008	.782	2.123	.770	.336
df	2	2	2	2	2	2	2	2
Asymp. Sig.	.781	.229	.686	.011	.677	.346	.681	.845

Note. *Grouping variable was the year-level of participants.*

Curiosity's ranking may reflect the Year 10 participants' experiences surrounding course and subject choices, which was being undertaken at the time of participation in Study 3. Once participants are in Year 11 and Year 12, fewer changes to selected subjects tend to be made, with a decreased emphasis on careers exploration compared to the heavier emphasis at Year 10 level, which may be why Curiosity is ranked lower by those participants. This result raises tensions about being focused and being flexible and adaptable. Year 10 participants could be focused on their choices and may not see this as a time to be focused beyond their current undertakings of working towards those choices made in the previous year. Although Study 3 did not have Curiosity's ranking with Year 10 participants' experiences surrounding course and subject choices, as its primary objective, it would still be necessary to conduct additional research to draw any firm conclusions from this result. This has led to the development of specific recommendations, see Chapter 8, section 8.7.4.

The researcher approached Study 3 with a neutral stance regarding the potential influence of sex on the perception of chance events, and this aspect did not constitute a central focus of the investigation. However, to verify this assumption, the researcher conducted a between-subjects effects univariate ANOVA test on the results of each question. The results of the conducted analyses consistently demonstrated a lack of significant influence or interaction associated with sex. As such, the focal point of the majority of the comparative assessments centred on examining potential associations between the participants' age and stage, specifically pertaining to their year-level. This finding is in concurrence with the results of the preceding two

studies (i.e., Chapters 4 and 5) and the outcomes of studies conducted by Betsworth and Hansen (1996); Bright, Pryor, Wilkenfeld et al. (2005); and Hirschi (2010).

6.5.2 Participant perception of the importance of Flexibility, Optimism, Risk, Curiosity, Persistence, Strategy, Efficacy, and Luckiness

At each year-level participants were asked to indicate on a seven-point Likert-type scale – ranging from 'totally unimportant' through to 'very important' – just how important they believed Flexibility, Optimism, Risk, Curiosity, Persistence, Strategy, Efficacy, and Luckiness are for them to have a successful career.

A between-subjects ANOVA was performed to compare the responses between year-levels, with participant responses to 'How important is each of the 8 LRI elements in terms of you having a successful career?' as the within-subjects variable and the year-level of participants as the between-subjects variable, $F(7) = 17.54$, $p < .001$. The effect size, calculated as eta squared (η^2), was .229, indicating a large effect. As can be seen in Figure 6.1, results indicated that there is a significant effect of Importance. This effect means that participants do not rate all of the elements as equally important for them to have a successful career. There is no significant interaction by year-level; however, there is a significant main effect of Year level, $F(2) = 3.50$, p .038, in that there is a difference in the rating of importance between the year-levels.

As a combined group, they rate all the elements of the LRI as important and at no stage do they rate any of the LRI element as unimportant for them to have a successful career. The exception to this was with the Year 11 group whose mean rating of Risk ($M = 3.63$) is low compared to the rest of the group as a whole. There is no statistical explanation for this result and is likely to be an artifact of that cohort of participants in Year 11 who may be particularly cynical or disengaged. However, the overall pattern of the participants' responses is similar.

Figure 6. 1

Graph displaying the estimated marginal means of perceived importance *by year-level.*
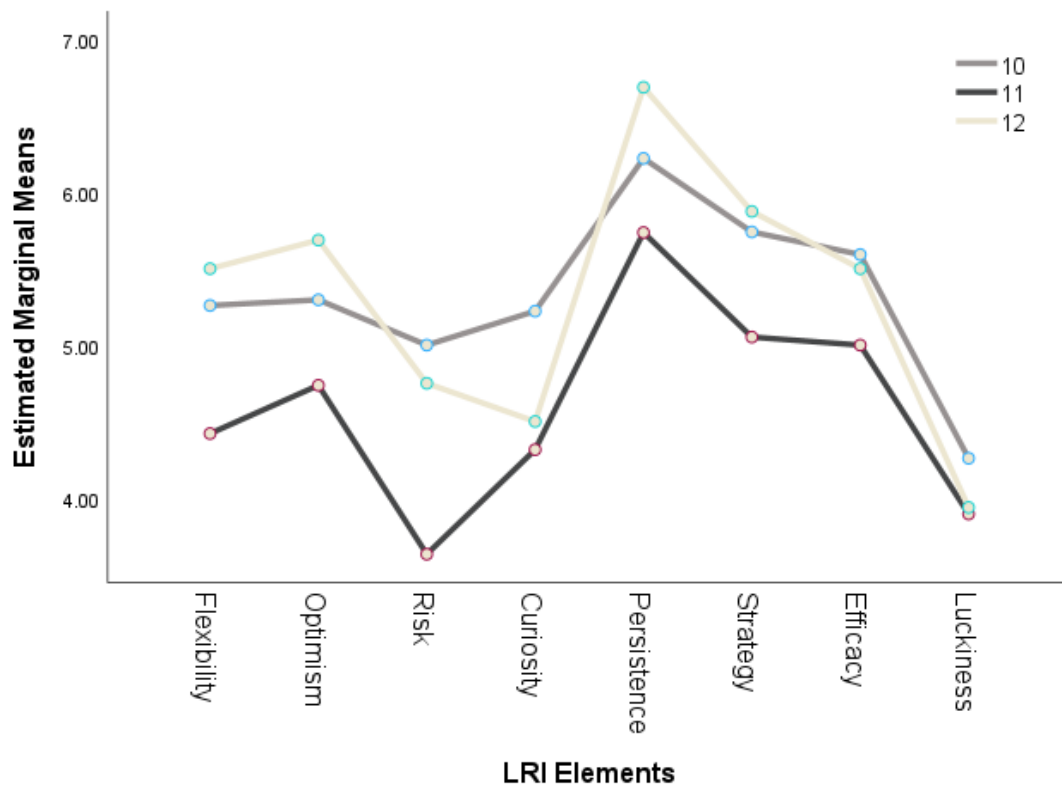
Note. This figure displays the estimated marginal means of each element of the LRI in terms of perceived importance in terms of having a successful career.
Data coded pertinent to the y-axis labels, using a Likert-type scale 1.00 = Totally Unimportant, 4.00 = Neither Unimportant nor Important, 7.00 = Very Important.

6.5.3 Participants' perception of confidence in comprehension of the concepts of Flexibility, Optimism, Risk, Curiosity, Persistence, Strategy, Efficacy, and Luckiness

This section of Study 3 investigates the extent to which participants perceive their confidence in comprehending the concepts of Flexibility, Optimism, Risk, Curiosity, Persistence, Strategy, Efficacy, and Luckiness. At each year-level participants were asked to indicate, on a five-point Likert-type scale – ranging from 'Unconfident' through to 'Confident' – just how confident were they in understanding the terms Flexibility, Optimism, Risk, Curiosity, Persistence, Strategy, Efficacy, and Luckiness.

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A between-subjects ANOVA was performed to compare the responses between year-levels, with participant responses to 'How confident are you that you understand each of the 8 LRI elements?' as the within-subjects variable and the year-level of participants as the between-subjects variable, $F(7) = 17.11$, $p < .001$. The effect size, calculated as eta squared (η^2), was .225, indicating a large effect. As can be seen in Figure 6.2, results indicated that there was a significant effect of Importance, meaning participants did not rate themselves as being equally confident in understanding all of the elements of the LRI. However, there is no significant interaction between the year-levels, $F(14) = 1.15$, p .317, effect size, calculated as eta squared (η^2), was .037, indicating a small effect. meaning that there is no significant difference in the rating of confidence between the Year levels.

Participants generally express moderate levels of confidence in their abilities across the elements of the LRI, with the notable exception of Strategy (see Figure 6.2).

Figure 6. 2

Graph displaying the estimated marginal means by year-level of confidence of comprehension of each LRI Element.
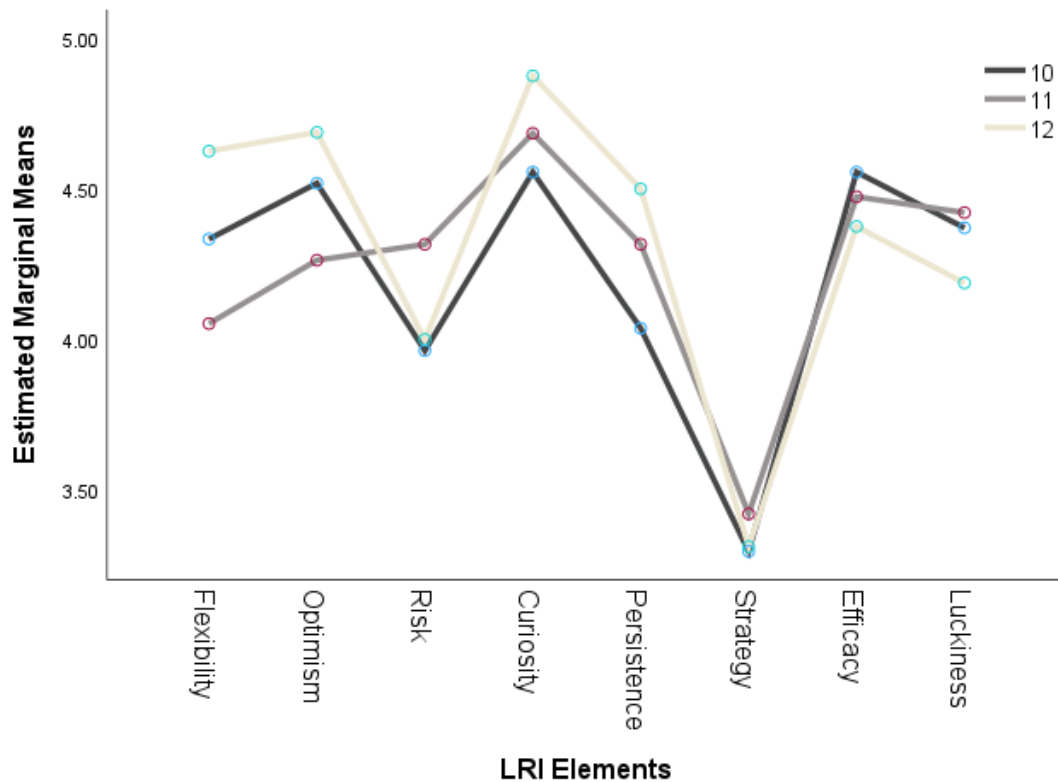
Note. This figure displays the estimated marginal means of each element of the LRI in terms of perceived confidence of comprehension of each element. Data coded pertinent to the y-axis labels, using a Likert-type scale 1.00 = Unconfident, 3.00 = Neither Confident nor Unconfident, 5.00 = Confident.

This moderate level of confidence suggests that there is an opportunity to introduce an educational intervention in terms of assisting participants with career planning. Based on this result alone, an entire unit of career education (or a the very least a single lesson) should be devoted to Strategy and its importance contextually to careers and broader life. This has led to the development of a specific recommendation, see Chapter 8, section 8.7.5.

6.5.4 Participant identification of chance events contained within a Vignette

At each year-level participants were asked in a limited Yes/No response format whether, after reading the scenario, they perceived that it contained

any chance events. This section reports the results pertaining to each Vignette.

Vignette 1.

62 participants answered the question 'Are there any chance events that occurred in the above story' as it pertained to Vignette 1, a 100% response rate for this question. 96% of participants responded by stating that there were chance events contained within the story, with only 3% stating 'No' or reporting that there were no chance events contained within the story. As indicated in Figure 6.3, only Year 10 participants stated to the contrary, which is 8% of the Year 10 group, leaving 92% of Year 10s, and 100% of both Year 11 and Year 12 participants, correctly stating that there were chance events present within the story.

Figure 6. 3

Graph depicting the percentage of responses by year-level to Vignette 1.
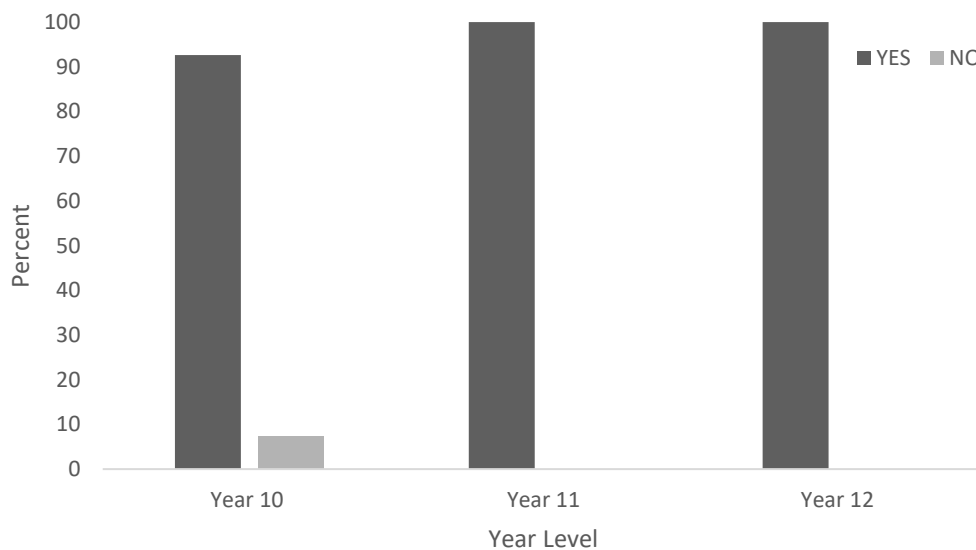
Vignette 2.

62 participants answered the question 'Are there any chance events that occurred in the above story' as it pertained to Vignette 2, which is a 100% response rate for this question. 89% of participants (N = 55) responded by stating 'Yes', that there were chance events contained within the story, with only 11% (N = 7) stating 'No', that there were no chance events contained

within the story. In this case it was 3 female Year 10 participants stating to the contrary, which is 11% of the Year 10 group. As can be seen in Figure 6.4, only two Year 11 participants stated to the contrary, which is 11% of the Year 11 group. Only two Year 12 participants incorrectly stated that there were no chance events present within the story, which for this group is a slightly larger percentage at 12.5%.

Figure 6. 4

Graph depicting the percentage of responses by year-level to Vignette 2.
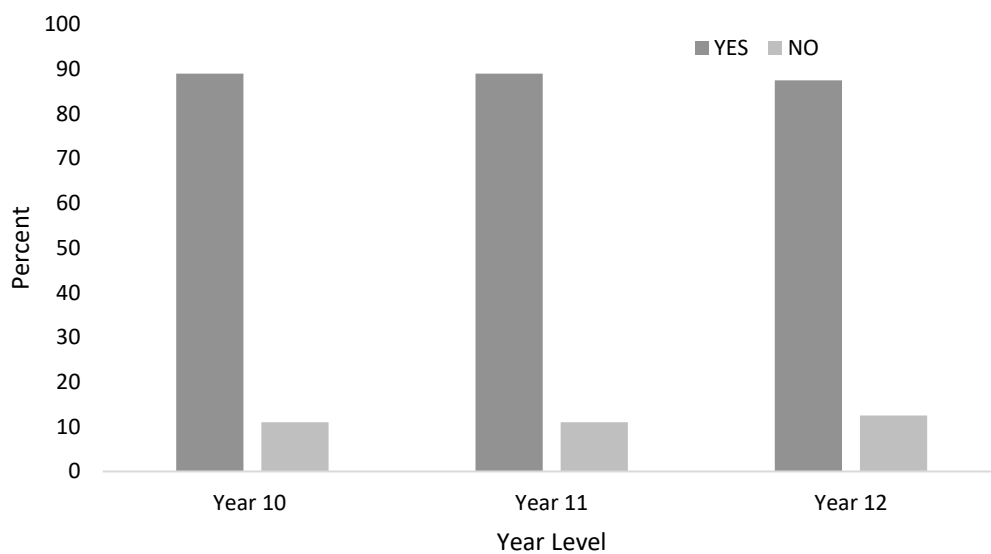
Vignette 3.

62 participants answered the question 'Are there any chance events that occurred in the above story' as it pertained to Vignette 3, which is a 100% response rate for this question. 89% of participants responded by stating that there were chance events contained within the story, with 11% stating 'No', that there were no chance events contained within the story. Figure 6.5 demonstrates that Year 12 had the highest percent of respondents correctly stating 'Yes', at 87.5% (N = 14) and only 12.5% (N = 2) stating 'No'. Year 10s followed with 78% (N = 21) stating 'Yes' and 22% (N = 6) 'No'. Lastly, the Year 11 group, with around one third of participants stating that there were no chance events present, with 37% (N = 7) stating 'No' and 63% (N = 12) stating 'Yes'.

Figure 6. 5

Graph depicting the percentage of responses by year-level to Vignette 3.
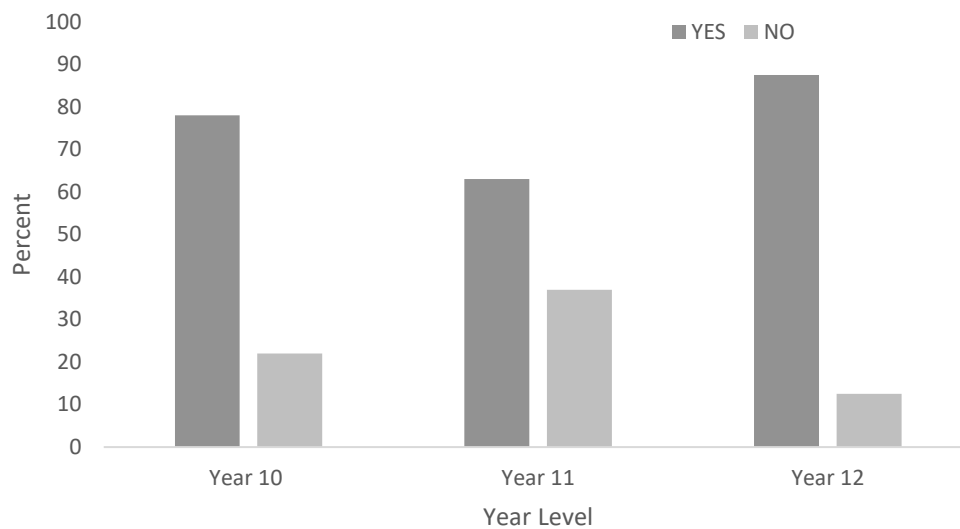
Overall, combined results for all three Vignettes, 87% (N = 162) of participants reported that there were indeed chance events contained with the Vignettes and only 13% (N = 24) stating to the contrary. Results indicate that most participants, when asked to identify a chance event contained within a contextually relevant scenario, were able to do so with some accuracy.

6.5.5 Participant identification of the number of chance events contained within a Vignette

At each year-level participants were asked, in a limited numerical only response format, how many chance events they believed were contained within each of the stories. Results for each vignette are reported below.

Vignette 1.

62 participants answered the question, which is a 100% response rate for this question. A significant portion of the sample (35%) stated that there were three chance events present. As displayed in Figure 6.6, only 23% (N = 14) of participants correctly stated that there were two chance events present, comprising 22% (N = 6) of the Year 10s, 26% (N = 5) of Year 11s, and 19%

(N = 3) of Year 12s. The mean number of chance events identified was 3.72
(SD = 1.8).

Figure 6. 6

*Graph depicting the number of chance events identified in Vignette 1, by all
year-levels combined.*
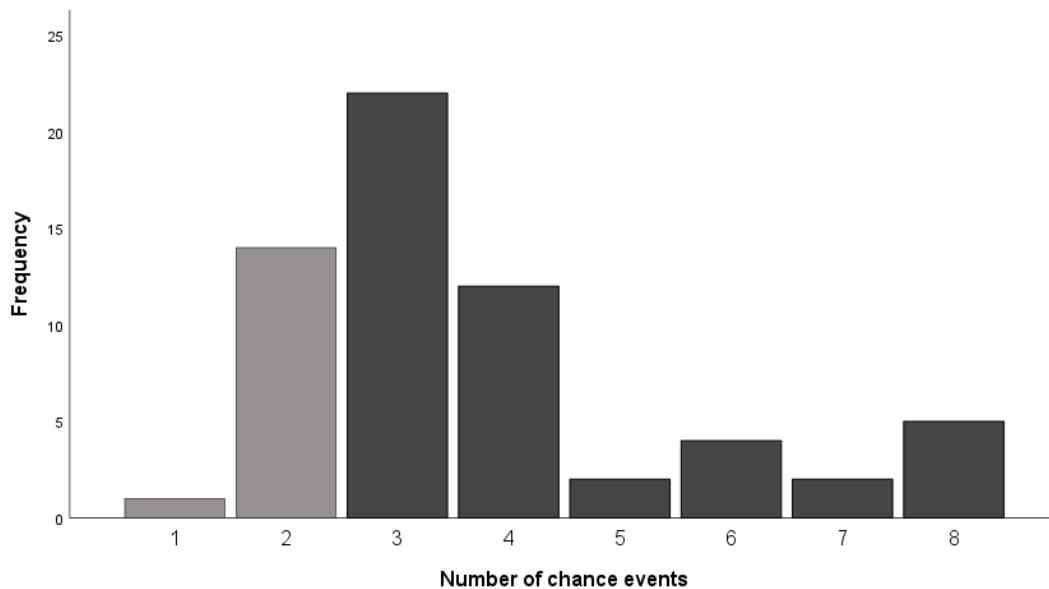
6.5.5.2 Vignette 2.

62 participants answered the question 'how many chance events do you
believe have occurred?', which is a 100% response rate for this question. As
displayed in Figure 6.7, only a minority or 13% of participants (N = 8) correctly
stated that there were two chance events present, 62% female (N = 5) and
37% male (N = 3), comprising 40% of the Year 10s (N = 11), 36% of Year 11s
(N = 7), and 56% of Year 12s (N = 9). The mean number of chance events
identified was 3.41 (SD = 1.48).

Figure 6. 7

Graph depicting the number of chance events identified in Vignette 2, by all year-levels combined.
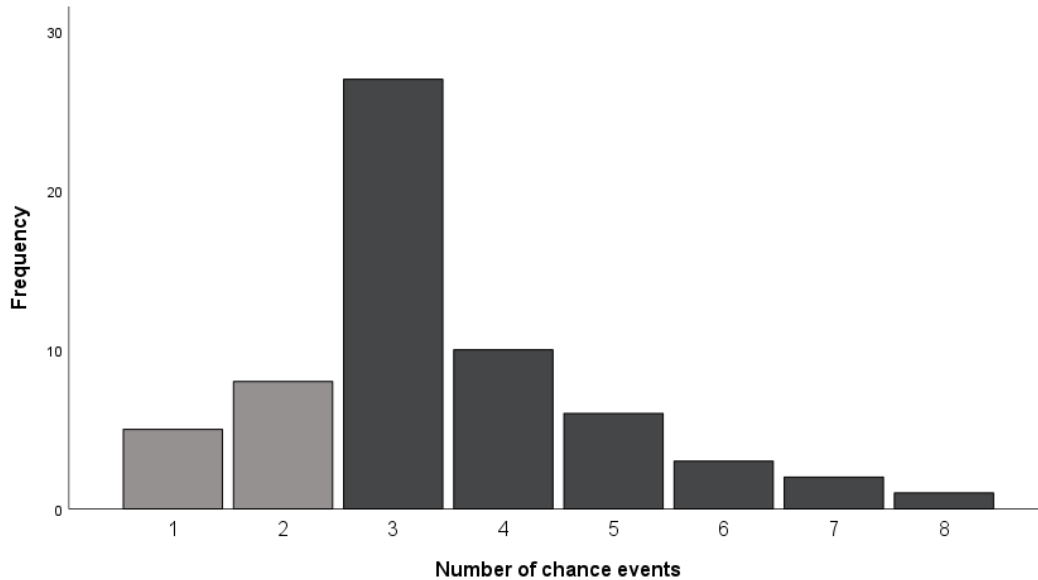
6.5.5.3 Vignette 3.

62 participants answered the question, how many chance events do you believe have occurred?' giving a 100% response rate for this question. As displayed in Figure 6.8, 26% of participants (N = 16) correctly stated that there were two chance events present, 47% female and 52% male, comprising 29% of the Year 10s, 26% of Year 11s, and 25% of Year 12s. The mean number of chance events identified was 2.85 (SD = 1.6).

Figure 6. 8

Graph depicting the number of chance events identified in Vignette 3, by all year-levels combined.
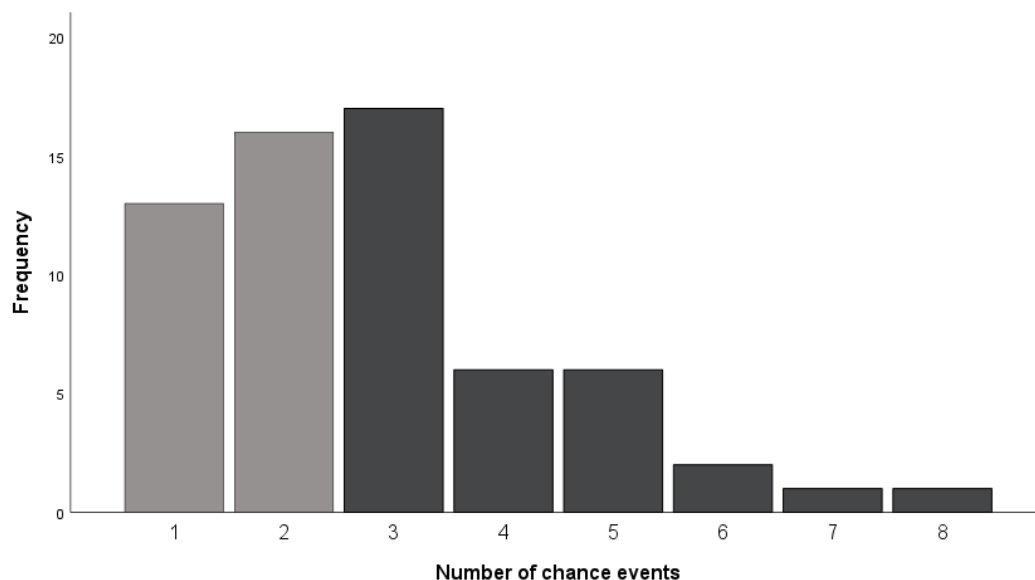
Figures 6.6, 6.7 and 6.8 demonstrate that, while no number of events beyond three were identified more frequently, only approximately one third of participants in each Year-level identified correctly that there were two chance events present in each Vignette. A shortcoming of the present Study was that there is no way to identify which two chance events participants identified as being the correct two chance events present in the Vignette. Future research could ask participants to describe the chance event they believe to be present in order to be able to map accuracy of identification.

From this result, it would seem that no pattern of accuracy exists in the identification of the correct number of chance events from Vignette 1. There was no compelling evidence to suggest that participants were confident in, or able to accurately locate, the correct number of chance events contained within Vignette 1.

If participants consistently struggle to recognise chance events, it may suggest that education in recognising chance events in early years may be purposeful, highlighting the impact of opportunity awareness.

6.5.6 Correlation of the chance events identified by the participants and their categorisation into specific chance event categories

At each year-level participants were asked, in a limited numerical only response format, whether any of the chance events that they identified from the story they just read related to any of the following factors: Physical, Health, Family, Education, Environmental, Financial, Relational, Spiritual, Social, Travel, or Employability. Results for each Vignette are reported below.

Vignette 1.

62 participants answered the question, which is a 100% response rate for this question. As can be seen in Figure 6.9, 23% (N = 14) of participants correctly stated that there were two chance events present, which were also the two most frequently selected factors relating to Family (N = 52) and Education (N = 57). Interestingly, of the 23% of participants who were able to correctly state that there were two chance events present in Vignette 1, 79% (N = 11) of participants identified both Family and Education as factors, 100% (N = 14) identified Education. While 21% (N = 3) of participants identified Family alone as the only relating factor to the chance events contained within Vignette 1.

Figure 6. 9

Graph depicting which of the chance event categories participants correlated to the chance events they identified in Vignette 1, by all year-levels combined.
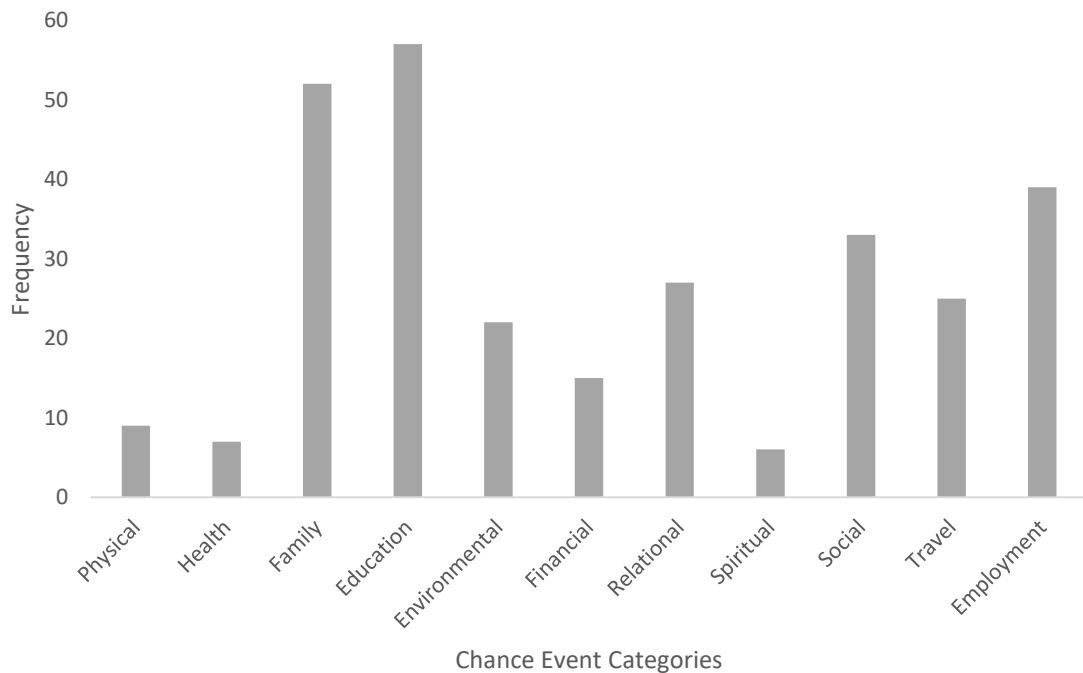
Of the 14 participants from the sample size of 62 who identified that there were two chance events present in the Vignette, only three participants were able to correctly identify and categorise them correctly as the Family and Education factors associated. Only eight participants classified them correctly, with the addition of one extra misclassification. The remainder made classifications that either included multiple spurious classifications or multiple spurious clarifications with one correct classification. This reinforces firstly that participants are not very good at identifying the number of chance events that are presented in a careers scenario and, secondly, that when they have identified the correct number of chance events present they are inaccurate in identifying the nature of those events.

Table 6. 6

Table displaying the classification of participants who correctly identified two chance events, by year-level.

		Chance event categories								Total
		1, 2, 4, 11	3, 4	3, 4, 10	3, 4, 11	3, 4, 5, 9, 10	3, 4, 6, 7, 9, 10, 11	3, 4, 9	4, 11	
Year	10	0	1	1	3	1	0	0	0	6
Level	11	1	2	0	0	0	0	0	2	5
	12	0	0	1	0	0	1	1	0	3
Total		1	3	2	3	1	1	1	2	14

These results reinforce that fact that participants in Years 10, 11 and 12 do not appear to be confident at identifying chance events from scenarios or understanding the nature of those events. From the way participants have classified chance events, their classification did not demonstrate logic or reasoning. All 11 categories were identified across the sample; however, of the 14 participants, the only chance event category that was not identified, accurately or not, was the spiritual category. This has led to the development of a specific recommendation, see Chapter 8, section 8.7.8.

Vignette 2.

62 participants answered the question 'if any of the chance events that they identified from the story they just read, related to any of the following factors: Physical, Health, Family, Education, Environmental, Financial, Relational, Spiritual, Social, Travel or Employability', which is a 100% response rate for this question. 13% of participants (N = 8) correctly stated that there were two chance events present. As can be seen in Figure 6.10, the two most frequently selected factors related to Employment (N = 52) and Health (N = 50), which were the correct two chance events categories related to this Vignette. However, of the 8 participants correctly stating that there were two chance events present, only six identified the correct two categories. Notably, none of them exclusively identified these two categories, as they also included other categories in their responses. Of those six participants, two stated that there was one other category, and the other four stated that there were between three and six categories in addition to the correct two.

Table 6. 7

Table displaying the classification of participants who correctly identified
two chance events, by year-level.

		1, 2, 11	1, 2, 4, 5, 7, 8, 9, 11	1, 2, 4, 6, 8, 11	1, 2, 8, 11	2	2, 5, 9, 11	2, 7, 11	
Year	10	0	1	0	0	2	1	1	5
Level	11	1	0	1	0	0	0	0	2
	12	0	0	0	1	0	0	0	1
Total		1	1	1	1	2	1	1	8

Similar to Vignette 1, these results reinforce that participants in Years 10, 11 and 12 do not appear to be very confident at all at identifying chance events from scenarios, or understanding what those events are. From the way participants have classified the events they identified. All 11 categories were identified across the sample except for Family and Travel, which were not identified by any participants. This may possibly be an artifact of the sample size; however, for all participants to miss both categories, it is conceivable that participants correctly categorised by not selecting either of them.

Figure 6. 10

Graph depicting which of the chance event categories participants correlated
to the chance events they identified in Vignette 2, by all year-levels combined.

Vignette 3.

62 participants answered the question, 'if any of the chance events that they identified from the story they just read, related to any of the following factors: Physical, Health, Family, Education, Environmental, Financial, Relational, Spiritual, Social, Travel or Employability', which is a 100% response rate for this question. 26% (N = 16) of participants correctly stated that there were two chance events present. As can be seen in Figure 6.11, the two most frequently selected chance event categories were Environmental (N = 53) and Family (N = 37). However, the correct two chance event categories related to Vignette 3 were Environmental and Relational (N = 21). This disparity is likely due to the participants' current stage of development, being older adolescents with increased awareness of environmental issues and the need of support of family relationships with the pressure of senior studies.

Table 6. 8

Table displaying the classification by participants who correctly identified two chance events, by year-level.

		Chance event categories																Total
		1, 3, 4, 5, 6, 11	1, 4, 5	2, 3, 5	2, 5	3, 4, 5	3, 4, 5, 6, 7, 8, 9, 11	3, 4, 5, 7, 11	3, 5, 6, 11	3, 5, 9	3, 6	4, 5, 6, 7, 8, 9	4, 5, 9	5	5, 6	5, 6, 7	
Year	10	0	0	1	1	1	0	1	0	1	1	1	1	0	0	1	0	9
Level	11	1	0	0	0	0	1	0	0	0	0	0	0	1	0	0	0	3
	12	0	1	0	0	0	0	0	1	0	0	0	0	0	1	0	1	4
Total		1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	16

Interestingly, of the 26% of participants who were able to correctly state that there were two chance events present in the Vignette, only 15% (N = 4) of them correctly identified both Environmental and Relational as the factors, and none of them identified those correct two on their own. Of those four participants, one stated that there was at least one other category and the other three participants stating that there between two and six chance event categories in addition to the correct two.

Similar to both Vignettes 1 and 2, these results reinforce that participants in Years 10, 11 and 12 in this research do not appear to be confident at identifying chance events from scenarios, or understanding what

those events are. Again, from the way participants have classified their events, it exhibits a similarity to an arbitrary conjecture devoid of substantive differentiation. All 11 categories were identified across the sample; however, of the 16 participants who correctly identified that there were two chance event categories present, there was only one chance event category that was not identified, accurately or not, which was the Travel category. This may possibly be an artifact of the small numbers; however, for all participants to make a correlation to 10 others and only miss one category would appear deliberate, and it is arguable that participants correctly categorised here by not selecting Travel.

Figure 6. 11

Graph depicting which of the chance event categories participants correlated to the chance events they identified in Vignette 3, by all year-levels combined.
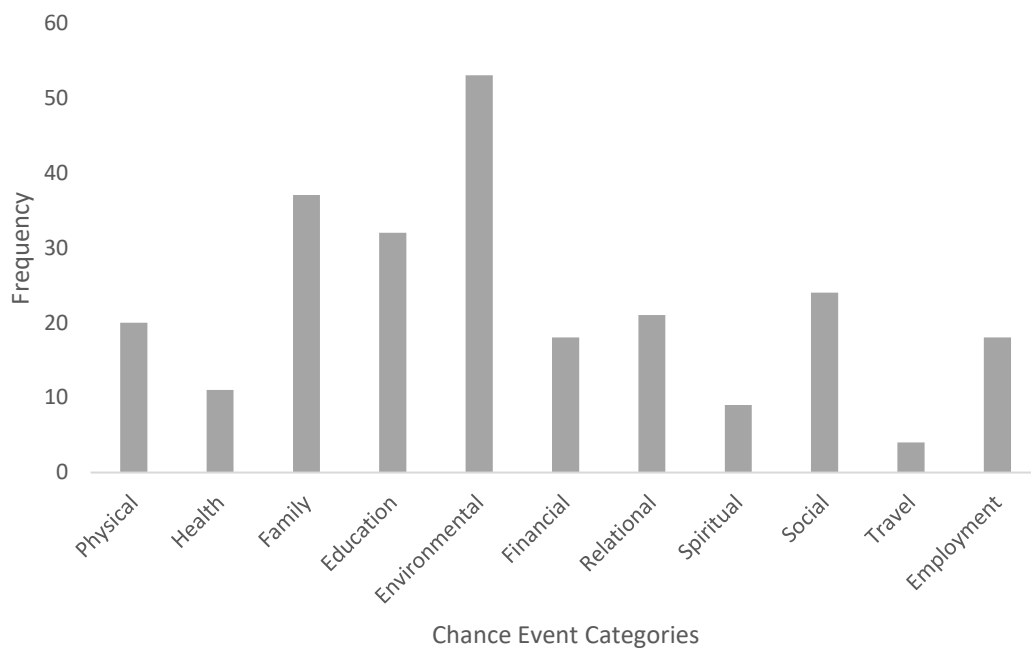
These results reinforce previous results (see Section 6.5.4, 6.5.5 and 6.5.6), that the majority of the sample do not have a good grasp of identifying chance events and/or categorising them. This is an educative opportunity, at least insofar as Vignettes relate, that there is evidence to suggest that participants are not particularly good at identifying how many chance events exist, or the nature of those chance events. Whether or not this was a byproduct of a specific event, or a capacity or performance limitation of the

participants is not clear. Further research is warranted to explore participant ability to identify chance events using a wider range of scenarios. However, it does suggest that if we plan to unambiguously teach participants about the role uncertainty plays in career development, then significant attention is required to be given to enhancing participants' ability to identify unplanned events (See Chapter 8, section 8.7.1).

It is also possible that human beings are pattern makers (Kurzweil, 1999) and, as such, attempt to construct meaning in patterns out of data or scenarios, and it is possible that there is a form of post hoc rationalisation at play. People are not identifying or categorising correctly. However, there is insufficient evidence to draw conclusions solely based on identifying or categorising incorrectly. Further research is warranted in order to do so (See Chapter 8, section 9.6.8).

6.5.7   Participant identification and classification of a personal chance event

At each year-level participants were asked, in a free response format, to think of a chance event that has occurred to themselves and then to relate the event to a chance event category.

Of the 62 participants, 11% (N = 7) answered 'No', that they could not think of a chance event that has occurred to themselves. A further 19% participants (N = 12) did not respond at all, and answered with a statement which was not classified as a chance event at all. Of the remaining responses, 47% (N = 20) were classified as positive chance events, 51% (N = 22) negative and only 2% (N = 1) neutral, i.e., neither positive nor negative in nature.

As is evident in Figure 6.12, it was the Year 10s who identified the greatest number (N = 13) of negative chance events as ones that occurred to themselves. And the Year 12s who recalled the greatest number (N = 11) of positive chance events occurring to themselves.

Figure 6. 12

Graph depicting the chance events they identified as occurring to themselves as positive, negative or neutral in nature, by year-level.
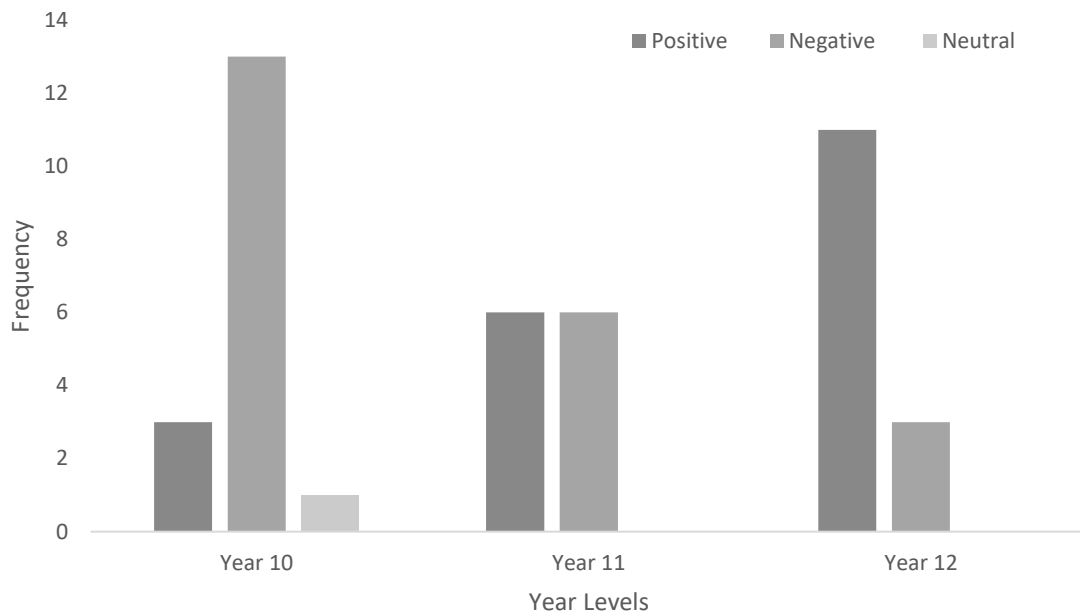
These results might be a consequence of small participant numbers who have more years of life experience. Such as, the Year 12s being able to identify more chance events which were subsequently positive in nature (for example, facing a chance meeting with a potential employer) as opposed to the often more obviously stated negative chances (such as a car accident) as Year 10 participants have done.

Figure 6.13 displays that, when asked to relate the chance event which they identified as happening to themselves to the chance event categories listed, positive chance events were most related to Social, and negative chance events were most related to Family.

Figure 6. 13

*Graph depicting which of the chance event categories participants correlated to the chance events they identified as occurring to themselves, by all year-levels combined.*
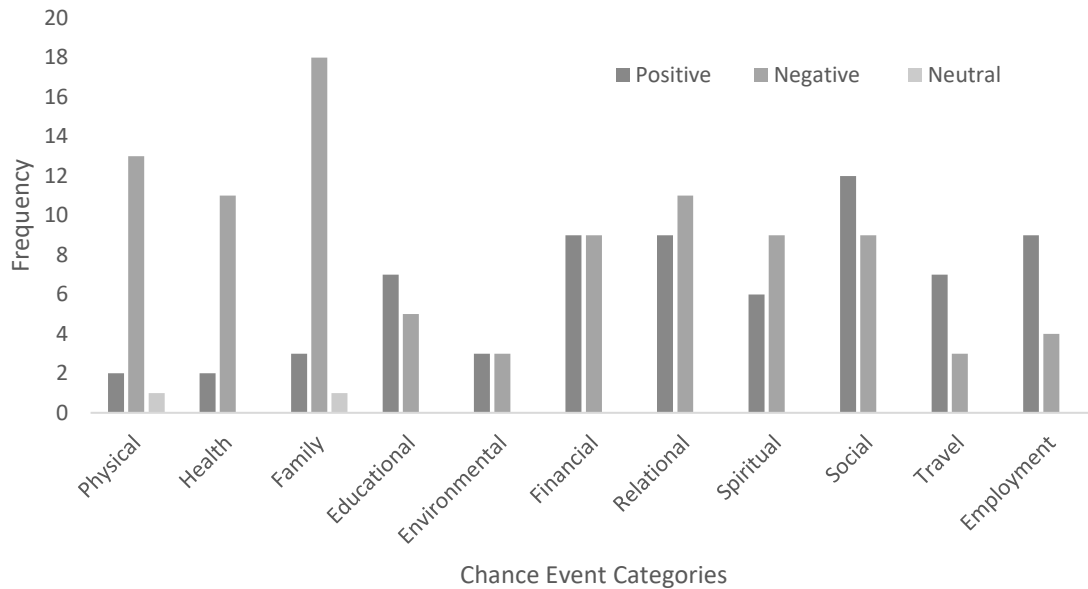
Given the participants' developmental stage as being ostensibly between 15 and 18 years of age, it is perhaps not surprising that they attribute significance to friends for positive influence (social), while perceiving authority figures responsible for setting boundaries (family) as potentially negative. For the chance events which were classified as events that occurred to someone else and not themselves, and as such not considered in this figure, Social was also selected the greatest number of times. Also, interesting albeit not significant, only the chance event categories of Physical and Family had examples of chance events which the Panel deemed as neutral in nature.

6.5.8 Participant identification and classification of a third-party chance event

At each year-level participants were asked, in a free response format, to think of a chance event that has occurred to someone else and then to relate the event they identified to a chance event category.

Of the 62 participants, 10 answered that they could not think of a chance event that has occurred to someone else, and a further 9 participants

did not respond at all, which is 30.6% of the total cohort. Of the 43 responses, 32.5% (N = 14) were classified as positive chance events and 48.8% (N = 21) negative. 18.6% (N = 8) of the responses were not considered to be chance events at all.

As is evident in Figure 6.14, it was the Year 10s who identified the greatest number (N = 11) of negative chance events as ones that occurred to other people, and the Year 12s who recalled the greatest number (N = 6) of positive chance events as occurring to other people.

Figure 6. 14

Graph depicting the chance events they identified as occurring to other people as positive, negative or neutral in nature, by year-level.
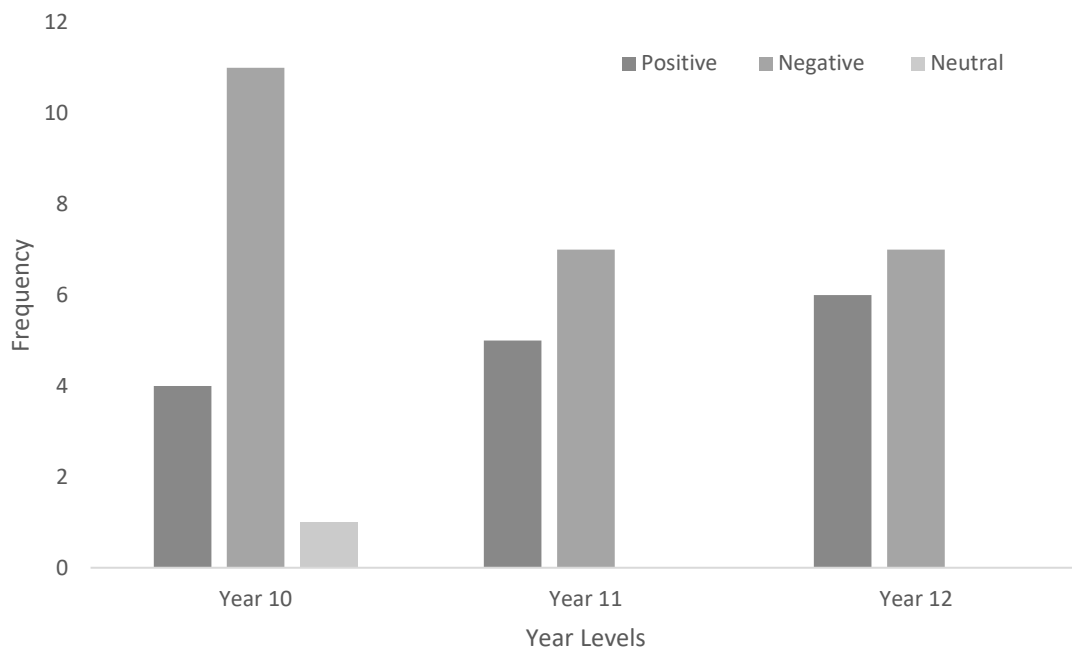
Although, the Year 10 cohort reduced the number of negative chance events (N = 11) they recalled happening to someone else as compared to the number of chance events they recalled occurring to themselves (N = 13). Both the Year 11 and Year 12 cohorts increased in the number of chance events they recalled occurring to someone else compared to the number they recalled occurring to themselves.

This may be an example of increased sophistication amongst Year 12s' ability to recognise all manner of chance events due to their greater exposure

to the world of work, a majority of them having part-time jobs and school-based apprenticeships, as opposed to the Year 10s who do not. Or it may just be a phenomenon caused by the small numbers in the cohort of participants surveyed.

100% of participants answered the question to 'think of a chance event that has occurred to someone else?' and selected categories which they believed that the chance event they described belonged to. Out of the events, 32% (N = 14), were categorised as positive chance events. Participants collectively selected categories 57 times, distributing them as follows: 1 in Physical, 1 in Health, 8 in Family, 6 in Educational, 3 in Environmental, 7 in Financial, 6 in Relational, 3 in Spiritual, 10 in Social, 5 in Travel, and 7 in Employment

As can be seen in Figure 6.15, when asked to relate the chance event that they identified as happening to someone else to the chance event categories listed, positive chance events were most related to Social, and negative chance events were most related to Health, closely followed by Physical with only one fewer.

Figure 6. 15

Graph depicting which of the chance event categories participants correlated to the chance events they identified as occurring to other people, by all year-levels combined.
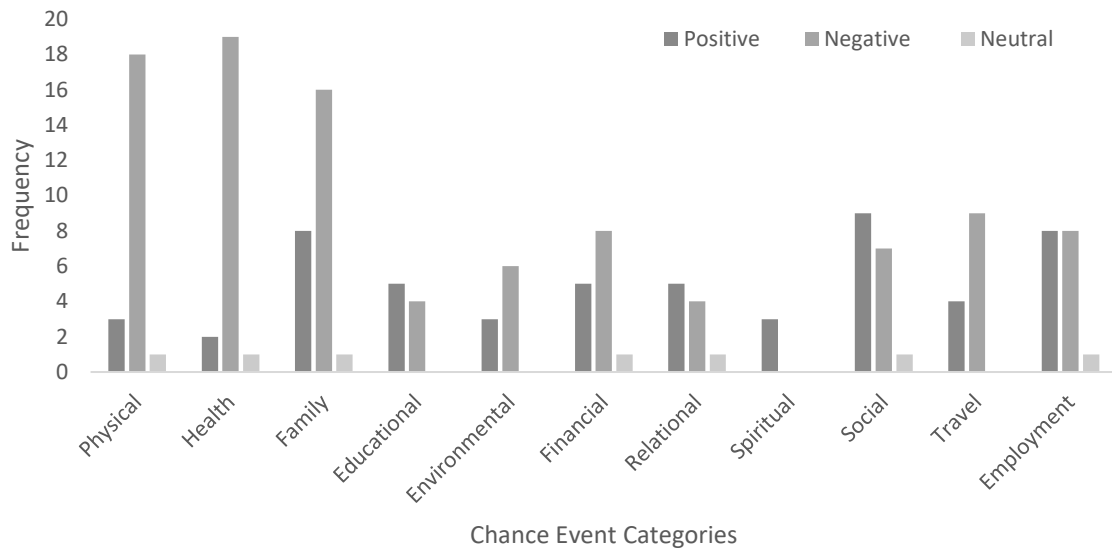
Again, given the participants developmental stage as being ostensibly between 15 and 18, years of age, it is not surprising that they would place such importance on their friends and their social life as being most positive, due to their developmental stage (Erickson, 1963; 1968). Given the significant number associating a negative chance event with both Health and Physical categories, it's possible that the terminology may have led to confusion, causing them to perceive these as inherently negative. And is likely related to the commonly identified negative chance events, such as 'car accident' and 'mother diagnosed with cancer'. Interestingly, albeit insignificant, for identified chance events occurring to someone else, 64% of the chance event categories had examples of chance events which the Panel deemed as neutral in nature as opposed to only 18% identified as chance events occurring to themselves. Overall, this result does suggest that participants are more able to identify a negative chance event as happening to someone else as opposed to happening to themselves. This has led to the development of specific recommendations, see Chapter 8, section 8.7.1 and 8.7.2.

A repeated measures ANOVA was performed to compare the responses between year-levels, with participant responses to 'can you think of a chance event that has occurred to you?' and 'can you think of a chance event that has occurred to other people?' as the within-subjects variables and the year-level of participants as the between-subjects factor. Results indicate that there was no significant main effect, $F(1) = .790$, p .381. The effect size, calculated as eta squared (η^2), was .025, indicating a small effect. This means that differences in ratings of how likely an event would happen to themselves, or others does not differ as a function of the year-level. There was also no significant interaction of participant year-level, $F(2) = .815$, p .452. The effect size, calculated as eta squared (η^2), was .050, indicating a small effect. This suggests as illustrated in Figure 6.16, that participants reported fewer negative chance events as a function of age. For the chance events recalled, they became slightly more positive in nature, though not statistically significantly so, as the year-level increased. A possibility being that the older participants become, the better the get at identifying a broader range of chance events, not merely focusing on those negative in nature. It is plausible that this is due to increasing maturity and, as such, greater experience in life as a function of the adolescent's increasing need for independence (Erikson, 1963; 1968). However, this is speculative because of the researcher's experience, and as no evidentiary conclusions can be made, further research would be required in order to do so (see Chapter 8, Section 8.7.2).

Figure 6. 16

Graph depicting the estimated marginal means by year-level.
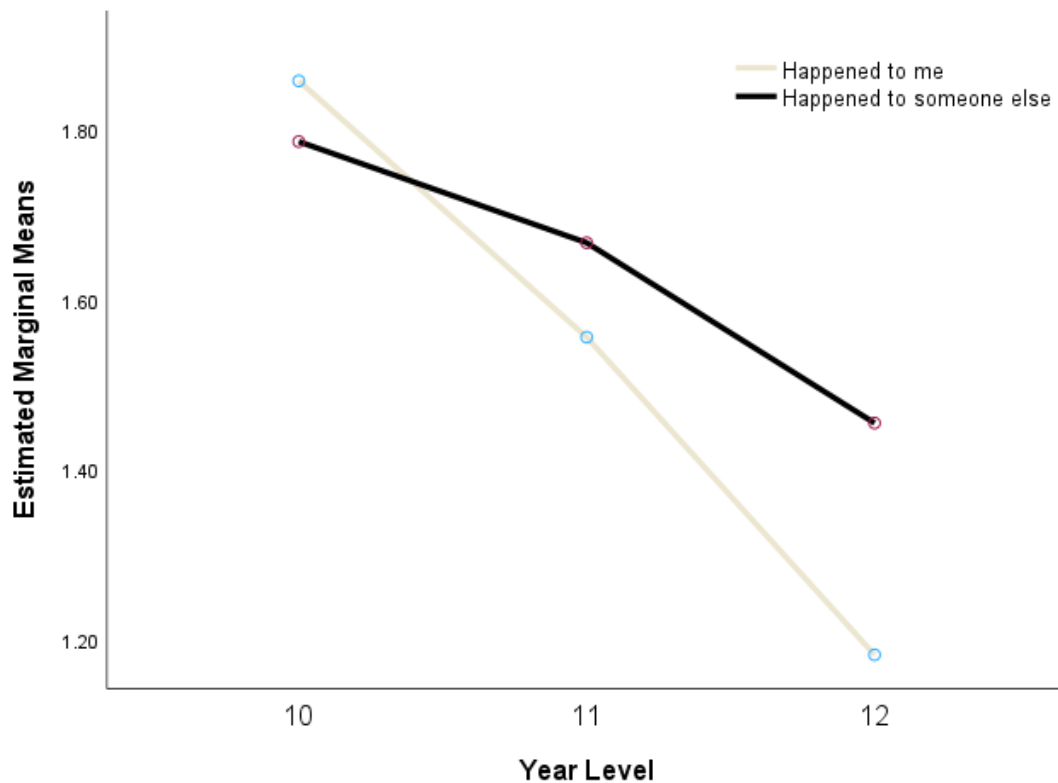
Note. This figure displays the estimated marginal means by year-level of *chance events positive, negative and neutral in nature.*
Data coded pertinent to the y-axis labels, 1.00 = Positive Mention, 2.00 = Negative Mention, 3.00 = Neutral Mention.

6.5.9 Participant perception of chance event categories

At each year-level participants were asked, in a free response format, to give an example for each of the chance event categories. All 11 chance event categories were listed in the following order, unique from previous questions, as: Physical, Relational, Health, Spiritual, Family, Social, Educational, Travel, Environmental, Employment, and Financial. Examples of chance events offered by participants for each of the 11 chance event categories, were then classified as either positive, negative or neutral in nature.

As can be seen in Figure 6.17, respondents in the Year 10 group offered the greatest number of negative examples in the Physical category (N = 20), followed by the Health category (N = 16). The greatest number of positive examples offered were in the Spiritual category (N = 14), closely followed by the Employment category (M = 13). This result is likely an artifact

of the particular cohort of participants in Year 10 who appear to harbour a negative perception of physical and health related events, with participants possibly not distinguishing between the categories. For example, a diagnosis of cancer could have been placed in either the Physical and/or Health category.

Figure 6. 17

Graph depicting the frequency of examples given of each of the chance events categories by participants and categorised as positive, negative or neutral in nature, by Year 10s exclusively.
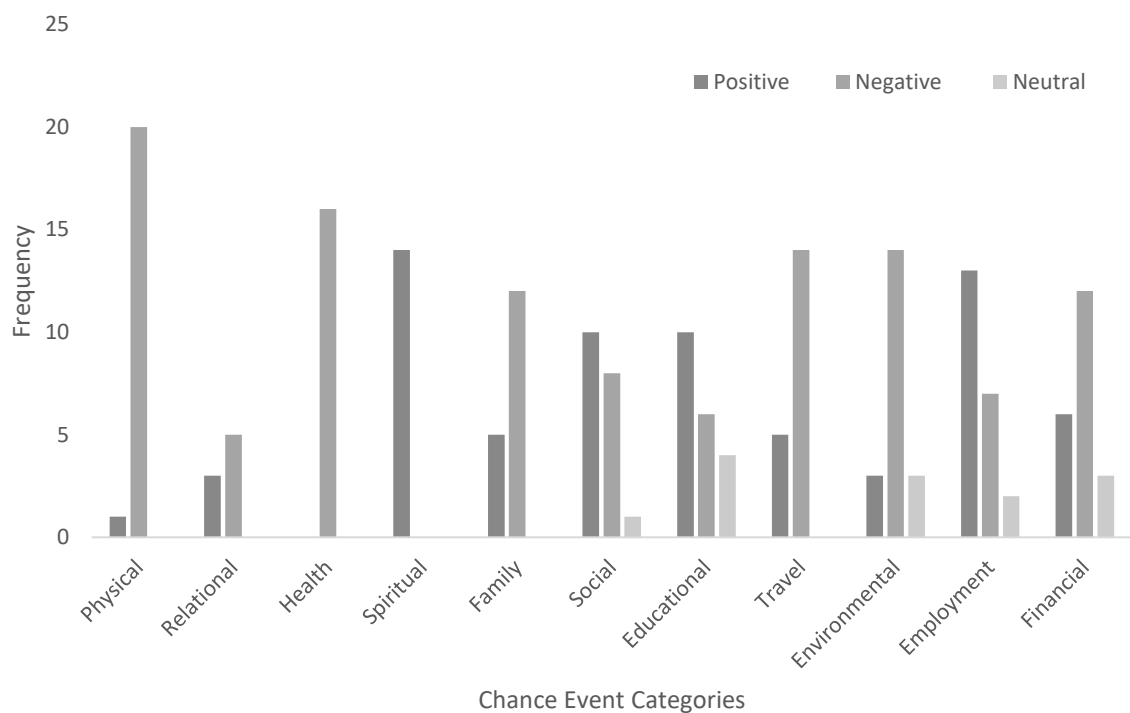
Respondents in the Year 11 offered the greatest number of negative examples in the Health category (N = 15), followed equally by the Physical category (N = 12) and the Environmental category (N = 12). The greatest number of positive examples offered were in the Educational category (N = 11), closely followed by the Spiritual category (M = 10), as displayed in Figure 6.18.

Figure 6. 18

Graph depicting the frequency of examples given of each of the chance events categories by participants and categorised as positive, negative or neutral in nature, by Year 11s exclusively.
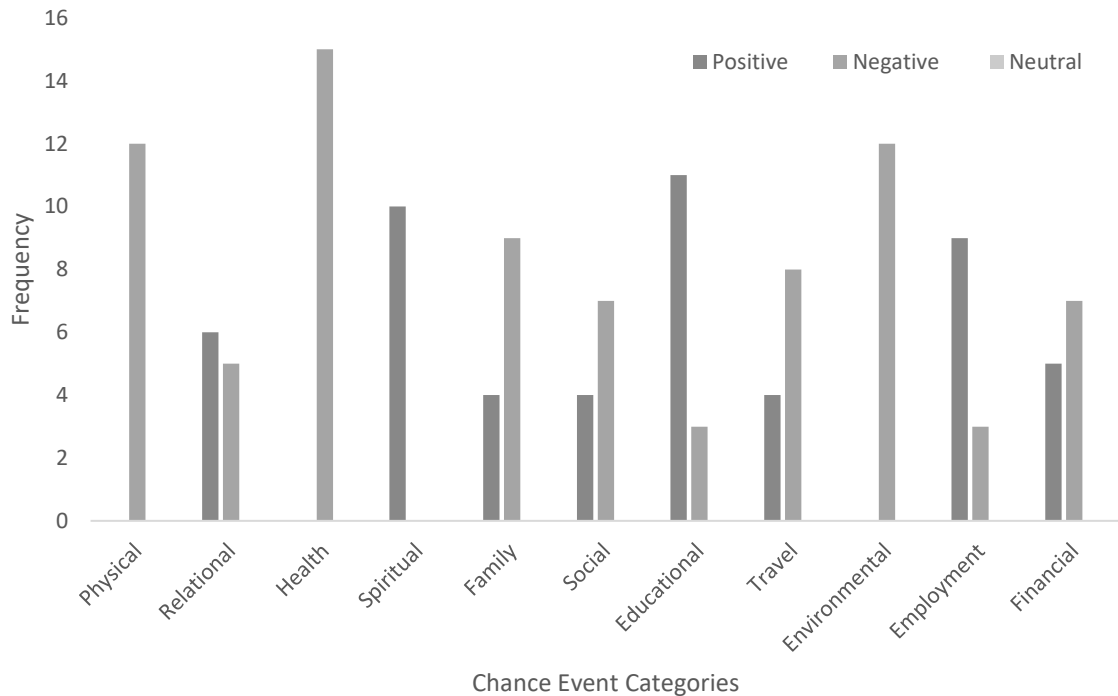
As depicted in Figure 6.19, respondents in the Year 12 offered the greatest number of negative examples in the Health category (N = 16), closely followed by the Physical category (N = 15). The greatest number of positive examples offered were equally in the Spiritual category (N = 13) and Employment category (M = 13), followed by the Educational category (N = 10).

Figure 6. 19

Graph depicting the frequency of examples given of each of the chance events categories by participants and categorised as positive, negative or neutral in nature, by Year 12s exclusively.
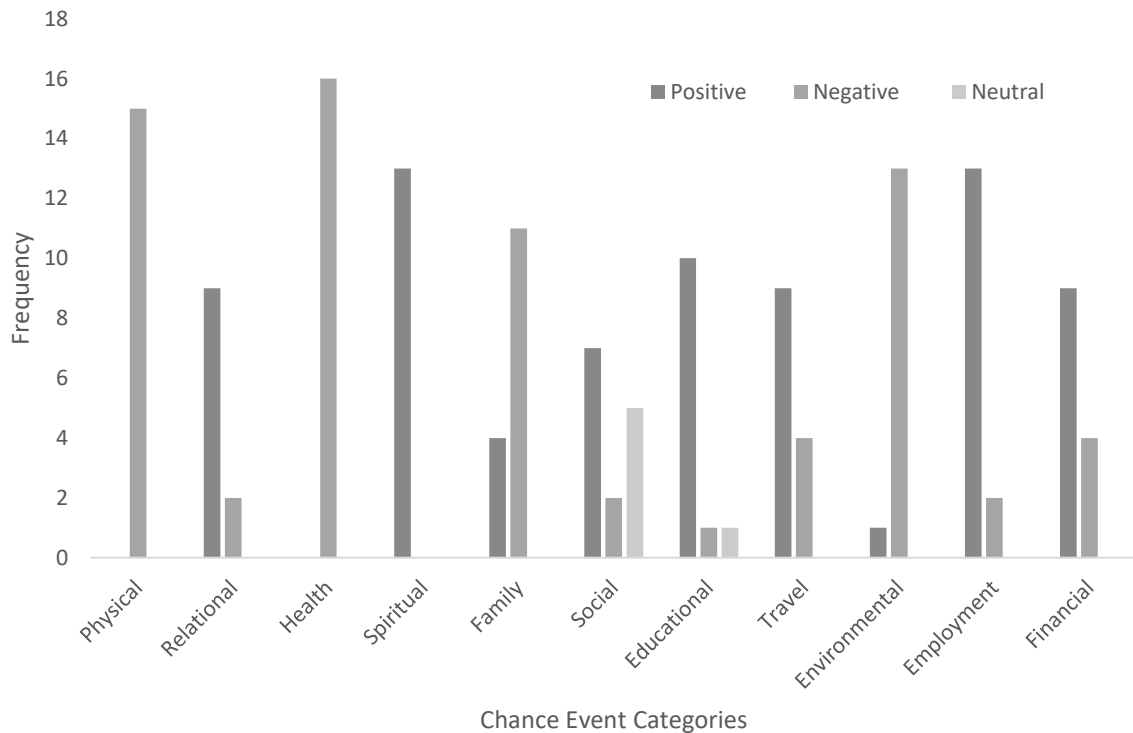
As can be seen in Figure 6.20, the greatest number of examples given overall was equally for the Physical (N = 47) and Health (N = 47) categories, which were all classified as unambiguously negative in nature. This could be possibly due to the terminology of Physical and Health being understood by participants as the same. The fact that they study a subject entitled Health and Physical Education (HPE) from a young age may be influential here. This may have confused their accuracy in classification, leading to the commonly identified negative chance events such as 'car accident' and 'dad had a heart attack'.

Figure 6. 20

Graph depicting the frequency of examples given of each of the chance events categories by participants and categorised as positive, negative or neutral in nature, by all year-levels combined.

Chance Event Categories
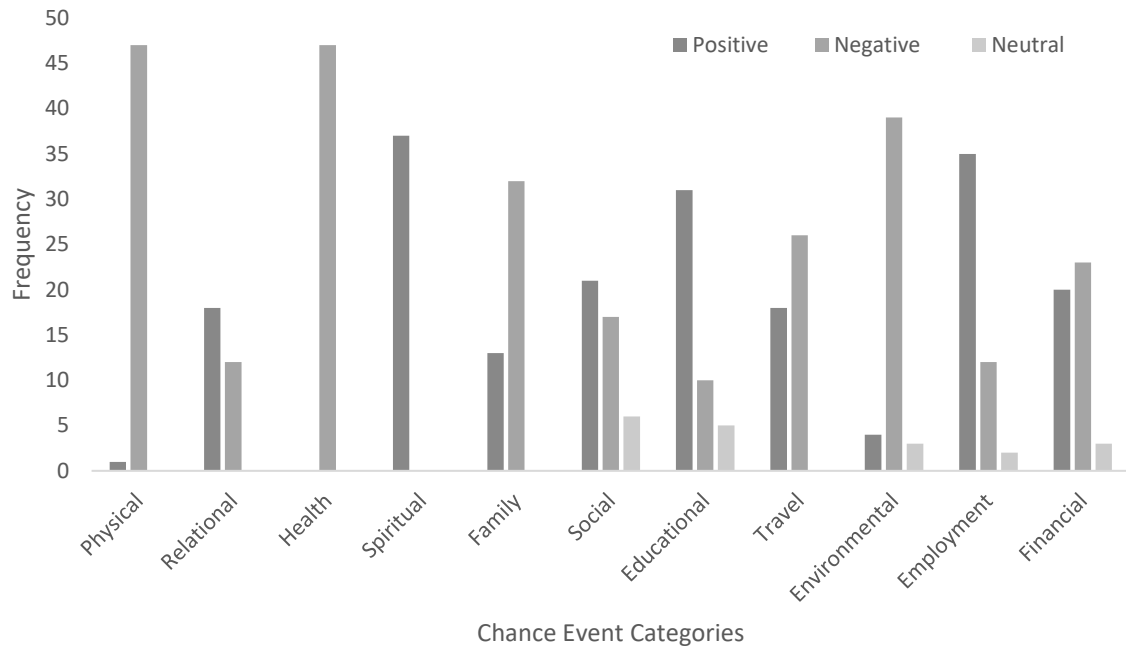
The greatest number of positive examples given was for the chance event category of Spiritual (N = 37). This is an intriguing result, as through all studies so far, Study 1, 2 and the present Study, 3, a common theme emerged when it came to Spirituality, Many participants stated that Luck and Chance do not exist, with explanations attributed instead to 'it is all God'. Given that the research site is a religious-based school, it is unsurprising that the results reflect this influence. Many examples were provided in which the Panel classified events as positive chance occurrences. For instance, they viewed the late-in-life unexpected pregnancy of a respondents' mother as a positive event. In other settings, this might have been considered a neutral or even negative chance event.

The belief in chance events or luck among Christians varies depending on their individual beliefs and interpretation of scripture (Bartholomew, 2016). Some Christians may believe in the concept of luck, which refers to the idea that events happen by chance or coincidence. However, some Christians view events as part of God's plan and may not attribute them to luck or chance

(Bartholomew, 2016). For example, the Bible states "In him we were also chosen, having been predestined according to the plan of him who works out everything in conformity with the purpose of his will, that all things have been ordained by God" (New International Version, 2023, Ephesians 1:11).

In Christianity, the concept of God's sovereignty plays a significant role in understanding the events that occur in life (Bartholomew, 2016). Some Christians believe that everything happens for a reason, and nothing happens by chance. They believe that God is in control of everything and that events are part of God's plan, even if they do not understand the reasons behind them (Bartholomew, 2016). Others may view chance events or luck as simply a part of life and not necessarily connected to their faith. Christians may have different perspectives on this issue, but ultimately, their beliefs about luck or chance events are shaped by their individual interpretation of the Bible and their relationship with God (Landsman & Wolde, 2016). This circumstance has resulted in the formulation of a distinct recommendation, referenced in Chapter 8, section 8.7.7.

When asked to give an example of a Physical-related chance event, nine (or 14.5%) of the 62 participants did not answer the question, giving an 85% response rate. A further seven were unable to give an example of a Physical-related chance event. However, 48 participants were able to give an example of a Physical-related chance event, of which 47 were categorised as being negative in nature, and only one neutral in nature. Of all examples offered by the participants, only one was positive in nature.

When prompted for an illustration of a Relational chance event. Of the 62 participants, 10 (or 16%) did not answer the question, giving an 84% response rate. A further 12 were unable to give an example of a Relational chance event. However, 30 participants were able to give an example of a Relational chance event, 18 were categorised as being positive, 12 negative, and zero neutral in nature.

When requested to provide an instance of a Health-related chance event, six (9.6%) of the 62 participants did not answer the question, giving a 90% response rate. A further five were unable to give an example of a Health-related chance event. However, 47 participants were able to give an example

of a Health-related chance event, and these were categorised as negative in nature.

When tasked with offering an exemplar of a Spiritual-related chance event, 11 (17.7%) of the 62 participants did not answer the question, giving an 82.2% response rate. 21 participants were unable to give an example of a Spiritual-related chance event. However, 34 participants who were able to give an example of a Spiritual-related chance event, provided examples that were all categorised as positive in nature.

When asked to give an example of a chance event which would relate to Family, six (9.6%) of the 62 participants did not answer the question, giving a 90.3% response rate. A further 17 were unable to give an example of a Family-related chance event. However, 45 participants were able to give an example of a Family-related chance event, and these were categorised as 13 being positive and 32 negative in nature.

When called upon to furnish an example of a Social-related chance event, 13 (20.96%) of the 62 participants did not answer the question, giving a 79% response rate. 19 were unable to give an example of a Social-related chance event. However, 44 participants were able to give an example of a Socially-related chance event, and these were categorised as 21 positive, 17 negative, and six neutral in nature.

When invited to share an example of an Education-related chance event, nine (14.5%) of the 62 participants did not answer the question, giving an 85.4% response rate. A further 28 were unable to give an example of an Educational-related chance event. 46 participants were able to give an example of an educationally-related chance event, of which 31 were categorised as positive, 10 as negative, and five as neutral in nature.

When prompted to provide an instance of a Travel-related chance event, 11 (17.7%) of the 62 participants did not answer the question, giving an 82.2% response rate. A further six were unable to give an example of a Travel-related chance event. However, 44 participants were able to give an example of a Travel-related chance event, and these were categorised as 18 being positive and 26 negative in nature.

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In response to a request for an example of an Environmental-related chance event, 10 (16%) of the 62 participants did not answer the question, giving an 84% response rate. A further nine were unable to give an example of an Environmental-related chance event. 46 participants were able to give an example of an Environmental-related chance event, and these were categorised as four positive, 39 negative, and three neutral in nature.

When requested to provide an example of an Employment-related chance event, 10 (16%) of the 62 participants did not answer the question, giving an 84% response rate. A further 12 were unable to give an example of an Employment-related chance event. However, 49 participants were able to give an example of an Employment-related chance event, which were categorised as 35 positive, 12 negative, and two neutral in nature.

When asked to give an example of a Financially-related chance event, 12 (19.3%) of the 62 participants did not answer the question, giving an 80.6% response rate. A further five were unable to give an example of a Financial-related chance event. 46 participants were able to give an example of a Financial-related chance event, and these responses were categorised as 20 being positive, 23 negative, and two neutral in nature.

When participants were asked to provide examples of chance events across the provided categories, findings revealed patterns in participant response rates and the nature of examples provided. Categories related to personal well-being and societal interactions garnered higher response rates, indicating their perceived significance in chance events. Moreover, the prevalence of negative examples across most categories suggests a tendency to associate chance events with adversity. These insights indicate how individuals perceive and relate to different aspects of chance in their lives, offering valuable considerations for understanding human perspectives on uncertainty and its impacts on various facets of life.

6.5.10   Luck Readiness Index

At each year-level participants were presented with a mixture of 52 statements and questions. They were required to indicate, in a limited numerical only response format on a 5-point Likert-type scale – ranging from

1 'Completely Agree', to 5 'Completely Disagree' – the degree to which they agreed or not with each of the 52 statements or questions.

6.5.10.1 Sex difference in the reliability of Luck Readiness Index

An independent sample t-test was employed in order to compare the seven dimensions (sub-scales) of the Luck Readiness Index: Flexibility, Optimism, Risk, Curiosity, Persistence, Efficacy, Luckiness, and an overall Opportunity Awareness score, with Sex. Results (see Table 6.9) indicate that there were no significant differences between males and females on any of the LRI sub-scales or on their overall Opportunity Awareness score. The analyses confirmed that there were no significant effects or interactions of sex present. As such, the focus of the majority of comparisons is between age and stage of participants, i.e., their year-level.

Table 6.9 presents the results of a sex comparison generated by using an independent sample t-test on the elements of the LRI. The table contains the number of participants (N), the mean values, standard deviations (Std. deviation), and standard deviations of the mean (Std. error mean) for each trait between male and female participants.

Table 6. 9

Table displaying the sex comparison from independent sample t-test.

	Sex	N	Mean	Std. Deviation	Std. Error Mean
Flexibility	Male	24	29.17	4.07	0.83
	Female	38	28.35	4.98	0.80
Optimism	Male	24	33.38	4.94	1.00
	Female	38	32.81	5.17	0.83
Risk	Male	24	29.00	4.40	0.89
	Female	38	27.68	4.60	0.74
Curiosity	Male	24	24.96	3.62	0.74
	Female	38	25.15	3.08	0.50
Persistence	Male	24	30.29	4.62	0.94
	Female	38	29.15	4.18	0.67
Efficacy	Male	24	26.83	4.95	1.01
	Female	38	25.50	5.97	0.96
Luckiness	Male	24	12.45	3.10	0.63
	Female	38	11.65	2.91	0.47
Opportunity Awareness	Male	24	186.08	19.43	3.96
	Female	37	180.31	23.65	3.83

6.5.10.2 Reliability of Luck Readiness Index Dimensions

The internal consistency and statistical reliability of each of the eight dimensions of the Luck Readiness Index (LRI): Flexibility, Optimism, Risk, Curiosity, Persistence, Strategy, Efficacy, and Luckiness, was determined using Cronbach's alpha measure.

Various reports have suggested different acceptable ranges for alpha values, which can fall anywhere between 0.60 and 0.95 (Soetewey, 2020). A low alpha value could stem from several factors, such as a limited number of questions, poor interrelatedness between items, or diverse constructs. For instance, if a low alpha value is due to inadequate correlations between items, then some of the questions may need to be revised or eliminated. The simplest way to identify such questions is to calculate the correlation between each test item and the total score test; any items with low correlations (approaching zero) should be removed (Soetewey, 2020). Conversely, if the alpha value is too high, it may indicate that certain items are redundant since

they are essentially asking the same question in different ways (Streiner, 2003).

Congruent with the conservative approach adopted throughout the entirety of the present research, a Cronbach's Alpha of greater than 0.65 is employed as the minimum measure of LRI dimension reliability. With the exception of the LRI dimension of Strategy, which – despite attempts to modify – failed to reach the minimum Cronbach's Alpha score (>0.65) to be deemed statistically reliable, was not included in the analysis. The remaining seven dimensions – Flexibility, Optimism, Risk, Curiosity, Persistence, Efficacy, and Luckiness – measured as acceptably reliable, i.e., they scored a Cronbach's Alpha greater than 0.65 in their own right or with minor modification (by removing certain questions). The LRI was originally developed using University undergraduate student populations, and this demonstrates that further research is required to develop the LRI for more effective use with younger adolescents.

Flexibility achieved statistical reliability with a Cronbach's Alpha score of 0.655 using all 10 measurement questions.

Optimism achieved statistical reliability with a Cronbach's Alpha score of 0.674 using all 10 measurement questions.

Risk required only minor modification in order to achieve a statistically reliable Cronbach's Alpha score of 0.695 using nine measurement questions. The only question removed was Question 22. "I like to overcome all objections before deciding on a course of action".

Curiosity required modification to achieve a statistically reliable Cronbach's Alpha score of .652 using seven measurement questions. The three questions removed were: Questions 8. "Do you enjoy books or movies about other people's lives?", 13. "Do you sometimes pay attention to things even though they have no immediate use to you?", and Question 35. "Is most Study very boring for you?".

Persistence required minor modification to achieve a statistically reliable Cronbach's Alpha score of .686 using nine measurement questions. The only question removed was Question 3. "I get easily distracted if I find a task uninteresting".

Strategy, despite attempts to modify by removing combinations of questions, did not meet the minimum Cronbach's Alpha score to reach statistical reliability. Strategy was consequently not used in any further analysis.

Efficacy required minor modification to achieve a statistically reliable Cronbach's Alpha score of .755 using nine measurement questions. The only question removed was Question 29. "If just a few things would change in my life, then I would be happy".

Luckiness required no modification to achieve a statistically reliable Cronbach's Alpha score of .719 using all four measurement questions.

Following the reliability analysis, the LRI dimension of Strategy and its related questions were removed from the data file used. The subsequent modified data file employing the modified LRI scales based on the reliability analysis was then crosschecked using the individual scores of randomly selected participants, ensuring the calculated scales were using the items deemed reliable from the reliable analysis.

A correlational analysis against all the Luck Readiness Index (LRI) dimensions, participants' comprehension of each LRI dimension, participants' year-levels, and ability to identify chance events, which involved examining the relationships between every possible pair of these variables, was undertaken. Participants' comprehension of each LRI dimension was determined by how well they understood the concepts and strategies associated with each dimension. A participant's year-level was the grade or level at which the participant was currently enrolled, while ability to identify chance events was determined by the participant's understandings and skill in identifying events that occur randomly or without a predictable pattern.

The correlational analysis of these variables could provide insights into the relationships between them. For example, it could reveal that participants with higher levels of self-efficacy are more likely to have a better understanding of the LRI dimensions, or that participants with higher levels of optimism are better at identifying chance events. The analysis could also reveal whether there are any differences in the relationships between these variables across different participants' year-levels.

It is important to remember that correlation does not necessarily imply causation, and additional research would be needed to establish causal relationships between these variables. Nonetheless, a correlational analysis is useful to identify potential relationships and areas for further research (see Chapter 8, Section 8.7.4).

A univariate ANOVA was performed to compare the participant responses to 'Luckiness' as the dependent variable and the identification of chance events combined from all three Vignettes as the fixed factor. Results indicate that there was no significant interaction (F = 3.679, p .060). Figure 6.21 illustrates the participants who accurately stated that there were chance events, the estimated marginal means of 12.5 were contained within all three Vignettes (1.00), and an estimated marginal means of 7 was contained within (2.00). This result suggests that for those who have accurately identified that there were chance events present in every Vignette, overall, these participants score higher in the subscales of the LRI (Flexibility, Optimism, Risk, Curiosity, Persistence, Efficacy, and Luckiness).

Figure 6. 21

Graph depicting the estimated marginal means of combined responses to the identification of chance events for all 3 Vignettes.
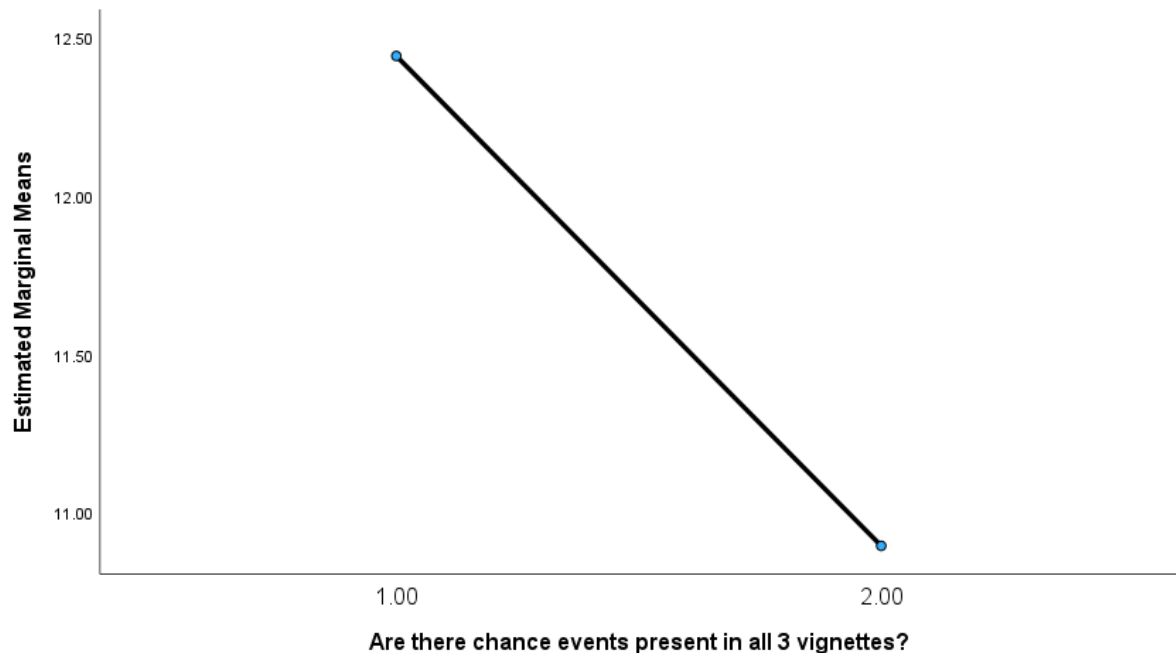
Note. Data coded pertinent to the x-axis labels, 1.00 = have accurately stated that there are two chance events present in each Vignette., 2.00 = represents all other respondents.

A multivariate ANOVA was performed to compare the participant responses to 'Flexibility, Optimism, Risk, Curiosity, Persistence, Efficacy, and Luckiness' as the dependent variables and the identification of chance events combined from all three Vignettes as the fixed factor. Results indicate that there was no significant effect for Flexibility (F = .072, p .789), Risk (F = .317, p .576), Curiosity (F = .637, p .428), Persistence (F = .939, p .336), Efficacy (F = 2.592, p .113), or Luckiness (F = 3.679, p .060). There was, however, a significant effect for Optimism (F = 4.447, p .039).

This last result indicated that Optimism was significant. A univariate ANOVA was performed to compare 'Optimism' as the dependent variable and the identification of chance events combined from all three Vignettes as the fixed factor. Results indicated that there was a significant effect (F = 4.447, p .039). Figure 6.22 indicates participants who accurately identified the presence of two chance events within all three Vignettes (1.00), with estimated marginal means of 34, and all other responses, i.e., inaccurate

identification (2.00), with estimated marginal means of 31. This suggests that, as the Optimism scores drop by 10%, participants were less optimistic and also less accurate in their ability to identify chance events within a given scenario. However, this is not strong evidence of such occurrence and further research would be required to draw any definitive conclusions (see Chapter 8, Section 8.7.4).

Figure 6. 22

Graph depicting the estimated marginal means of combined responses to the identification of chance events for all 3 Vignettes.
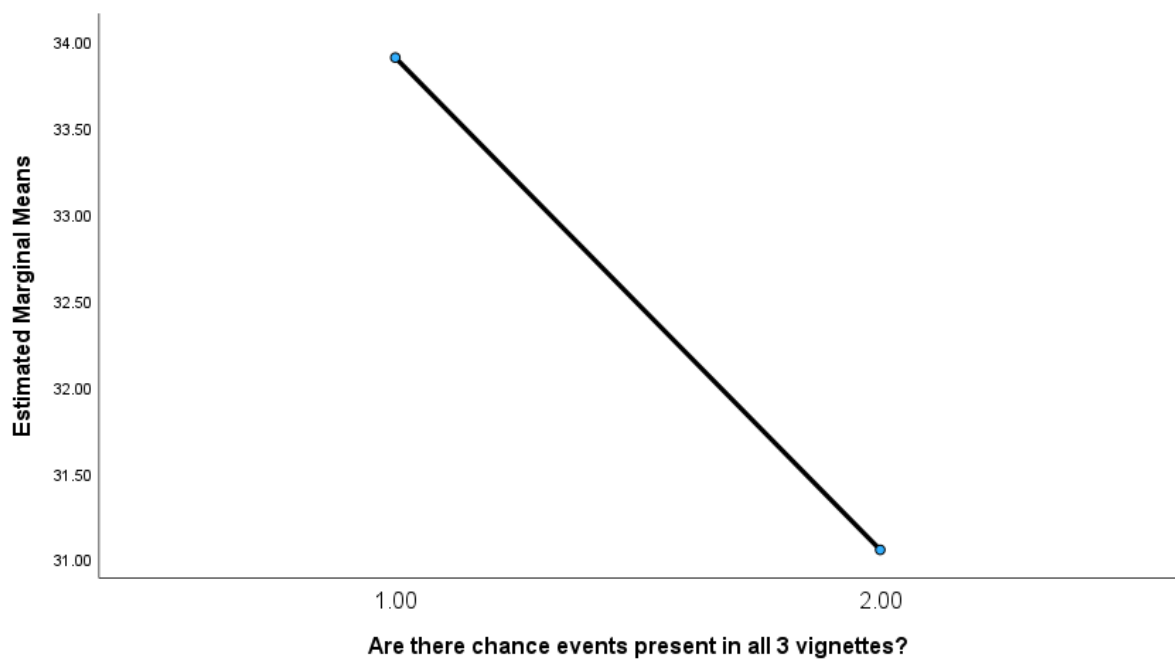
Note. Data coded pertinent to the x-axis labels, 1.00 = have accurately stated that there are two chance events present in each Vignette., 2.00 = represents all other respondents.
Table displaying the correlational analysis of LRI scale items and the answers of all 3 Vignette's totalled.

Table 6. 10
Table displaying the correlational analysis of LRI scale items and the answers of all 3 Vignettes totalled.

		VignetteTotal	VignetteTotalQ2	Flexibility	Optimism	Risk	Curiosity	Persistence	Efficacy	Luckiness
Is there a Chance Event Present? Total	Pearson Correlation	--								
	N	62								
How many Chance Events are present? Total	Pearson Correlation	-.454**	--							
	Sig (2-tailed)	<.001								
	N	62	62							
Flexibility	Pearson Correlation	.006	.045	--						
	Sig (2-tailed)	.963	.731							
	N	62	62	62						
Optimism	Pearson Correlation	-.210	.024	.584**	--					
	Sig (2-tailed)	.102	.853	<.001						
	N	62	62	62	62					
Risk	Pearson Correlation	.089	-.145	.808**	.487**	--				
	Sig (2-tailed)	.490	.262	<.001	<.001					
	N	62	62	62	62	62				
Curiosity	Pearson Correlation	-.090	.017	.573**	.502**	.696**	--			
	Sig (2-tailed)	.486	.898	<.001	<.001	<.001				
	N	62	62	62	62	62	62			
Persistence	Pearson Correlation	-.013	.133	.466**	.444**	.578**	.778**	--		
	Sig (2-tailed)	.919	.304	<.001	<.001	<.001	<.001			
	N	62	62	62	62	62	62	62		
Efficacy	Pearson Correlation	-.218	.056	.532**	.809**	.377**	.308*	.243	--	
	Sig (2-tailed)	.088	.667	<.001	<.001	.003	.015	.057		
	N	62	62	62	62	62	62	62	62	
Luckiness	Pearson Correlation	-.143	.052	.148	.035	.122	.171	.245	-.108	--
	Sig (2-tailed)	.269	.687	.251	.788	.343	.185	.055	.405	
	N	62	62	62	62	62	62	62	62	62

**. Correlation is significant at the 0.01 level (2-tailed).

*. Correlation is significant at the 0.05 level (2-tailed).

As evidenced by Table 6.10, results indicate that the LRI scales were not associated with participants' reporting of chance events. Correlations between scores on LRI scales and the number and type of chance events identified were also not significant.

This segment of Study 3 employed the Luck Readiness Inventory (LRI), which was originally designed for use with adults. Modifications were made to ensure that the scales were suitable for research purposes, investigating adolescents' perceptions, although they did not demonstrate any significant correlation with participants' identification of chance events in the provided scenarios. One plausible explanation for this lack of correlation is that, although the scale's reliability had reached an acceptable minimum level, it remained relatively low, with one scale (Flexibility) exhibiting only marginal reliability, as defined by Soetewey (2020), with Cronbach's Alpha score of 0.655. Consequently, the scales may have been minimally reliable, indicating imprecise measurement and the likelihood of large effects being the only detectable outcome. Another explanation for the absence of any correlations, despite a thorough analysis, is that the dependent variable, i.e., identifying the number of chance events, may have had a restricted range. Notably, the responses appeared to coalesce around one or two answers, such as "are there any chance events in the scenarios?" and "how many chance events are contained within the scenario?", with limited variability in responses, that is yes or no and typically between 2 and 3. In such cases where the range of the results data is restricted, obtaining meaningful results from a correlational analysis can be challenging.

Therefore, future research would need to use a more sensitive dependent measure which includes a greater range, which, for example, may include a range of different scenarios encompassing some which contain no chance events and some which contain eight or nine. With these inclusions a greater range of results could be achieved in which a correlational analysis could be employed more effectively with the LRI (see Chapter 8, Section 8.7.4).

6.6 Conclusion

Study 3 consisted of a total of 93 questions and contained within it four sub-sectional foci that investigated different aspects of luck and chance events. The first sub-section focused on the eight elements of the Luck Readiness Index, while the second sub-section identified and classified chance events from three Vignettes. The third sub-section focused on the participants themselves and their experiences with chance events, asking them to think of and articulate personal and observed chance events and classify them into relevant categories. Finally, the fourth sub-section investigated the Luck Readiness Index. Overall, Study 3 aimed to shed light on the various dimensions of luck and provided valuable insights into how the adolescent perceives and categorise chance events in their lives.

The results demonstrated that, among participants of both sexes and all year-levels, Persistence and Optimism were rated as the most important elements for a successful career, with Persistence being consistently ranked as the top element overall. Meanwhile, Luck was consistently ranked as the least important element, with Curiosity, Risk, and Luckiness also being rated as relatively unimportant. Interestingly, there was a decline in the perceived importance of Curiosity from Year 10 to Year 11, with the latter group ranking it as less important than the former. Nevertheless, the overall rankings of the LRI elements were relatively stable across year-levels. These results provide valuable insights into the factors that participants consider to be important for achieving career success.

Participants in Study 3 rated all eight LRI elements as important, but not of equal importance for their career success. This indicates that they recognised the value of each element to some degree. Interestingly, the Year 11 group rated Risk lower compared to the rest of the participants, which could be due to their particular characteristics as a cohort. Nonetheless, this result does not significantly affect the overall pattern of responding, which remained consistent across the different year-levels. The results indicated that participants have a nuanced understanding of the elements that contribute to career success and prioritised them accordingly.

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All three Vignettes' results clearly demonstrated that the majority of participants (87%) were able to correctly identify chance events within contextually relevant scenarios. This result underscored the participants' ability to discern and appreciate the role of chance in shaping real-world events. As such, these results could have implications for the development of educational curricula that incorporate chance and probability as fundamental concepts. By encouraging participants to think critically about chance and its role in their everyday lives, educators can help prepare them to make more informed decisions and better understand the world around them (see Chapter 8, Section 8.6).

In addition, Study 3 revealed that approximately one third of participants in each year-level were able to correctly identify that there were two chance events present in each Vignette, despite no number of events greater than three being identified with greater frequency. One limitation of Study 3 was that it is unclear which two chance events the participants identified as being correct. Future research could address this by asking participants to describe the chance event they believe to be present to map the accuracy of their identification. These results suggest that there is no clear pattern of accuracy in the identification of the correct number of chance events within the Vignettes, highlighting the importance of developing participants' ability to recognise unplanned events, as it could impact their ability to leverage opportunities in their careers. It is crucial for participants to be aware of the role of chance in shaping their professional paths so they can better navigate the uncertainties of the job market (see Chapter 8, Section 8.7.1 and 8.7.2).

Study 3 found that participants in Years 10, 11, and 12 did not demonstrate much confidence in identifying chance events or understanding their nature. When asked to relate the identified chance events to 11 different factors: Physical, Health, Family, Education, Environmental, Financial, Relational, Spiritual, Social, Travel, and Employability, the results were consistent across all three Vignettes. Participants may have been engaging in guesswork when classifying the events they identified. Although all 11 categories were identified across the sample, only one chance event

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category, which was the Travel category, was not identified accurately or at all by the 16 participants who correctly identified that there were two chance event categories present. It is unclear whether this was due to the small sample size, but it is possible that participants deliberately did not select the Travel category. These results reinforce the previous results, indicating that the majority of participants lacked a clear understanding of identifying and categorising chance events. This lack of understanding represents an educative opportunity to focus on enhancing participants' ability to identify unplanned events. If we plan to teach participants about the role of uncertainty in career development, significant attention must be given to developing their ability to identify chance events accurately. Further research is needed to explore participants' capacity and performance limitations in identifying chance events using a wider range of scenarios (see Chapter 8, Section 8.7.2).

In terms of the identification and classification of personal chance events, the results suggest that Year 10 participants identified more negative chance events while Year 12 participants identified more positive chance events. When asked to relate their personal chance events to the listed categories, Social was the most commonly related category for positive chance events while Family was the most commonly related category for negative chance events. These results are in line with the developmental stage of the participants, with a focus on friends and positive social interactions being more important to younger participants, while boundaries set by authority figures such as family may have more of an impact on older participants.

Study 3 identified that the categories of Family and Health were areas where students frequently associated negative chance events. This discovery prompts a further scrutiny into potential frameworks that could explain this phenomenon.

Negative chance events within the family and health realms likely hold immense significance for students, as they can disrupt daily routines, emotional stability, and overall functionality. The inherent importance of these

domains makes any negative event within them particularly memorable and potentially distressing.

Stress and coping mechanisms can also play a pivotal role. Family and health issues are known stressors for students, and when negative events transpire in these areas, they can intensify existing stress levels and challenge students' ability to cope effectively, impacting on their learning. This heightened stress response may contribute to a stronger link between negative events and these specific domains.

These findings underscore the imperative to cultivate students' resilience and bolster their coping strategies, equipping them to not only navigate but also flourish through unpredictable events?

In terms of the participants' ability to recall chance events that occurred to someone else and relate them to chance event categories, the results were similar to those seen with personal chance events. Year 10 participants identified the highest number of negative chance events, while Year 12 participants recalled the greatest number of positive chance events. Interestingly, the Year 10 cohort actually reduced the number of negative chance events they recalled happening to someone else compared to the number they recalled happening to themselves. Year 11 and Year 12 participants, on the other hand, increased the number of chance events they recalled occurring to someone else, which could be due to the participants' increased exposure to the world of work, as a majority of them had part-time jobs and school-based apprenticeships, which could have given them greater opportunities to encounter chance events. Alternatively, it could be an artifact of the small sample size.

Participants were requested to provide an example of a chance event for each of the chance event categories, positive chance events were most often associated with the Social category, while negative chance events were most frequently linked to Health and Physical categories. This is consistent with the developmental stage of the participants, who are between 14 and 20-years old, and may place a high value on their social life and relationships (Erikson, 1968). It is possible, however, that the terminology used in Study 3 may have caused confusion among the participants, leading them to perceive

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Health and Physical events as negative. The prevalence of negative events related to car accidents and medical diagnoses suggests that this may be the case. Overall, the findings indicate that participants are more adept at identifying negative chance events happening to others rather than to themselves.

Through extensive analysis of the Luck Readiness Index scores, it appears that participants who accurately identified the presence of chance events in every Vignette scored higher overall in the LRI subscales. This result suggests that, as Optimism scores decrease by 10%, participants may become less optimistic and less accurate in their ability to identify chance events in a given scenario. However, this finding is not conclusive and further research is needed to make definitive statements based solely on these results. A subsequent univariate ANOVA was conducted following the significant discovery of optimism in the previous MANOVA. The analysis compared Optimism as the dependent variable and the identification of chance events combined from all three Vignettes as the fixed factor. The results showed a significant effect, further supporting the notion that there may be a relationship between Optimism and the ability to identify chance events accurately. Nevertheless, additional research is necessary to confirm these findings.

There appears to be an intriguing, however, statistically non-significant trend, that participants who reported chance events of a negative nature had lower levels of opportunity awareness as measured across the majority of the elements of the Luck readiness Index.

The upcoming Chapter (Chapter 7) engages in a deeper exploration of adolescents' perceptions of chance events. The fourth Study encompassed three focus group interviews designed to elicit insights into participants' worldviews, attitudes, and cultural beliefs, among other traits. Focus Groups aimed to utilise the results from Studies 1, 2, and 3 to provide further explanations for results of significance. This Chapter scrutinises participants' perspectives of chance events and their attitudes towards them, exploring how this understanding may impact their ability to recognise opportunities and be "Luck Ready." Study 4 utilises older participants – those in Years 10-12

exclusively – and aimed to further investigate their comprehension of luck and chance events through open discussion.

CHAPTER 7

STUDY 4: Chance, Opportunity, and Control: A Focus Group Exploration of How Young People Perceive Uncertainty and Its Implications Across Year Levels.

7.1   Introduction

Study 3, presented in the previous Chapter (Chapter 6), investigated participants' ability to identify chance events within a contextual scenario and their perception of such events. The study collected data from participants in Years 10 to 12 and found that most participants were capable of identifying chance events within the vignettes presented. However, there was a bias towards recalling negative events over positive ones, irrespective of the year-level. Furthermore, only a third of participants could accurately identify the number of chance events within the vignettes, suggesting a lack of consistency in identifying the correct number of events. Study 3 also found that participants in all year-levels did not demonstrate confidence in understanding the nature of chance events.

Results indicate that, when categorising chance events, positive events were commonly associated with the Social category (related to interactions with other people), whereas negative events were more frequently linked to Health (something that affects a person's health) and Physical (something that affects a person's body) categories.

Persistence and Optimism were identified as the most crucial elements for career success by both sexes and all year-levels. Interestingly, Luck was rated as the least important element, with Curiosity, Risk, and Luckiness also being considered relatively unimportant.

Finally, the study found that participants did not view all eight Luck Readiness Index (LRI) elements as equally important for their career success. Nevertheless, participants rated all LRI elements at some level of importance, indicating a recognition of their value to some extent. These findings have important implications for educators and policymakers who aim to develop

strategies to enhance participants' understanding of chance events and their impact on career success.

This Chapter presents the findings from Study 4. Through the use of focus groups.

The purpose of Study 4 was to gain a richer understanding of how young people in different year levels (years 10, 11, and 12) perceive chance events and relate them to their awareness of opportunities. This study utilised qualitative methodology through focus groups to explore the nuances in participants' perspectives beyond the insights obtained from the quantitative surveys conducted in Studies 1, 2, and 3. By analysing the combined transcripts from the focus groups, the study identified themes and patterns in how adolescents perceive chance, their beliefs about it, and how these perceptions connected to their awareness of opportunities available to them.

Three separate focus groups were facilitated in total, one focus group per year-level 10, 11, and 12, to allow for a detailed exploration of the nuances in participants' perceptions across the different year-levels. Three sub-themes emerged from analysing the combined transcripts from the Years 10, 11, and 12 focus groups. The three main themes which emerged are: unpredictability and consequences, attitude and beliefs, and coping and control.

The focus groups were conducted after the completion of all questionnaire-based surveys (Studies 1, 2, and 3), aiming to provide further insights into the research questions.

The following research questions were guided by the literature review (see Chapter Two):

1) How do adolescents construe the nature and structure of a chance event?

2) Is there a meaningful taxonomy of adolescent chance events?

3) How do adolescent perceptions of chance events relate to their awareness of opportunities?

The same 10 questions were asked of each of the focus groups, with the aim to elicit discussion guided by these research questions. Specifically, each focus group aimed to elicit the participants' perspectives on chance

events and opportunity awareness, and to gain a greater understanding of their comprehension in these areas.

The findings from this study may have important implications for educators and policymakers seeking to enhance students' understanding of chance events and their ability to identify and seize opportunities in their academic and professional lives.

7.2   Participants

All participants in the senior school (Years 10-12) who participated in Studies 1, 2 and 3, were invited to participate in a Year-level specific focus group, hence all participants were volunteers. The Year 10 group consisted of 2 males and 3 female participants (N = 5) aged between 15-16 years. The Year 11 group consisted of 2 male and 3 female (N = 5) aged between 16 – 17 years. The Year 12 group consisted of 2 males and 3 female participants (N = 5) aged between 17-18 years (N = 15). All participants who participated in the focus group were volunteers. No reward for participation was advertised or offered.

No discrimination was made based on sex or academic ability, but only on their capacity to attend their year-level-specific focus group, which was held (in the case of the Years 10 and 11 groups) during the participants' lunchtime. Considerable endeavours were undertaken to ensure the avoidance of scheduling conflicts between each allocated lunchtime and the diverse array of concurrent academic and extracurricular activities conducted within the College during that period. As the Year 12 participants had completed their academic year at the time of the focus group, their focus group was facilitated one afternoon of the school day.

It was important that these participants were in a disposition to participate fully without distractions (See Chapter 3 with section 3.5). The researcher was told anecdotally by various participants that they either did attend the focus group to the detriment of their other lunchtime activity either academic or extra-curricular, because they found the topic of the focus group interesting; or they did not attend the focus group because they found the topic of the focus group "boring", "stupid", or "irrelevant" and they would rather

do their own thing at lunchtime. It is interesting to note that those particular participants were either highly academic and engaged in study sessions or tutorials at lunchtime, or participants choosing a vocational pathway, who appeared more interested in playing sport or socialising at lunchtime. The Year 12 graduate group who voluntarily came back for the Focus group after finishing for the year were a mixture of high-achievers – those who achieved ATARs (Australian Tertiary Admission Rank) in the 90s – and non-academic streamed participant graduates. The Australian Tertiary Admission Rank (ATAR), which is used by tertiary institutions as a participant recruiting tool, is a number between 0.00 and 99.95 that represents a participant's standing in relation to all other participants in their age group (UAC, 2023).

In order to promote optimal interaction among participants, the focus groups were conducted in a natural, free-flowing manner while adhering to an established and uniform script consisting of a predetermined set of questions or prompts (Appendix E). It should be noted that all participants who participated in each focus group were given equal opportunity to provide responses to all questions and threads of the dialogue.

7.3   Method and Material

The study employed three focus groups, facilitated in the research site's boardroom. The selection of this venue was based on its central location within the college and its conducive environment, characterised by soundproofing and a single large table facilitating eye contact among all participants. The homeroom teacher of each year-level group, on the specified day and time, met the participants in the lobby of the administration building and, once all participants had arrived, led participants into the boardroom where the researcher was waiting, and then invited participants to sit down around the boardroom table. Before participants arrived, all nonessentials, such as posters, folders, etc. were removed so as to avoid any distractions. The blinds were closed to the outside area where to avoid distraction by people passing by. Only the number of seats needed remained in the boardroom. These were placed evenly around the boardroom table with a digital voice recorder located centrally to the group.

The stimulus questions for the focus group were fashioned from participant responses to the surveys they completed during Studies 1, 2, and 3 (see Chapters 4, 5, and 6 respectively) and aimed to gain a deeper understanding of the research questions.

Each group was facilitated in an identical manner, with the researcher eliciting discussion from the group by asking the same ten questions, in the same following order:

1. What do you see as the elements of chance events?
2. Now that we've spoken about chance is there a difference between chance and luck?
3. Can you think of a way to place different sorts of chance events into broad categories?
4. Much of the survey results seem to suggest that many young people perceive chance events in a negative light. Why do you think people perceive chance events in a negative light and planned events in a positive one?
5. a) Has this come from experience? If so,
   b) in what context? If not, continue on to question six.
6. Do chance events only happen to unlucky people?
7. Is there a way to avoid chance events?
8. Is there a way to mitigate/alleviate the consequences of chance events?
9. Is there a way to increase the possibility of a chance event?
10. Is there a way to gain an advantage, opportunity or benefit from a chance event?

See Appendix E for the script used to introduce and give context to each focus group.

The digital voice recorder was turned on after the reading of the script (Appendix E).

7.4   Procedure

Students who elected to participate were given the date, time and location to attend their particular year-level's focus group by their respective homeroom teacher.

Each of the focus groups began with the researcher reading a script (Appendix E), giving a brief introduction comprising both the research topic and how to participate in a focus group. Participants were informed about the confidential nature of the group and that they were encouraged to be completely candid. They were also told to alert the researcher immediately if anything was brought up during discussion which upset or distressed them. Alternatively, if they preferred, they could talk to the researcher, their homeroom teacher, or another trusted adult at the conclusion of the focus group session.

Questions were read one at a time, directly from the script (see appendix E). There were no time limits imposed on each focus group. Each group was simply allowed to answer the question and move on only when it appeared that the group had exhausted their response to the stimulus question, allowing each member of the group ample opportunity to contribute to the discussion. At the conclusion of each group session, participants were thanked for their participation and excused.

Following the conclusion of the focus group sessions, a research assistant transcribed each of the resulting audio recordings verbatim. The researcher then went through each transcript and checked for accuracy. This process enabled him to engage more systematically and thoughtfully – via voice recognition – with each participant's responses. This was achieved by frequently returning to the recordings and newly transcribed data, engaging in the mood and nuances of the group. Member checks were then performed with six participants to ensure transcription accuracy.

Following Creswell's (2007) approach for qualitative data analysis, the researcher used open coding to identify categories or common themes in participant responses for each focus group in each year-level. The generated codes were compared with the interview data to validate relationships and

further develop the categories. Axial coding was then performed to analyse the data from each year-level-specific focus group.

Finally, selective coding was applied to construct a thematic storyline that elaborated on and developed the emerging themes and relationships within the qualitative data from the focus groups, based on Creswell's methodology.

7.5   Results and Discussion

Each of the 10 focus group questions underwent individual coding and analysis, with each question followed by a discussion of the collected responses. Tables are included to present the results of axial coding, revealing distinct categories across various properties and dimensions (Tables 7.1 – 7.9).

When discussing individual contributions to group discussions from the focus group sessions, participants were identified based on the sequence of their initial verbal response to the prompting question. For instance, the first female participant to contribute following the first prompting question in each focus group session was labelled as F1. The subsequent female participants were referred to as F2 and F3. Similarly, the first male participant to contribute following the first prompting question was denoted as M1, followed by M2. If the participant's year-level was relevant, the designation included the Year level as well. For example, the first female participant in Year 10 to contribute following the first prompting question was referred to as F1Y10, and so on for other year-levels and sex.

7.5.1   The elements of chance events

The elements of a chance event refer to all those components and forces which contribute to its occurrence and outcome, which are considered unpredictable and out of one's control. Such elements include probability, uncertainty, randomness and circumstances that occur without intentional human influence – all fundamental aspects which define and distinguish chance events from those that have been planned and controlled with intent. Commencing the series of focus group sessions held at each year-level,

participants were presented with the thought-provoking question: 'What do you see as the elements of chance events?'.

There were no signs of confusion about the meaning of the question; however, there is evidence to suggest that they might not have understood the meaning of the term 'element' and/or they did not know how to address it in the context of this question. However, through a brief discussion, a total of five elements were identified, which are: unpredictability, lack of control, risk, luck (both positive and negative), and significant consequences (also both positive or negative). Due to the brevity of the discussions, no overarching theme could be inferred.

There is evidence of agreement in the responses across all three year-levels. Participants agreed that chance events are random in nature and described them as uncontrollable, unpredictable, and unexpected. There were disagreements across all three year-levels. Year 10s described chance events as having significant consequences that are either good or bad, whereas the Year 11s did not describe chance in that way, only see luck as being good or bad. There are signs of maturity in some statements, with one Year 10 female using more sophisticated vocabulary in contrast to her group peers "influences…an outcome that wouldn't normally occur" (F2). The Year 12 females were able to define more sophisticated categories of chance events than either sex in the Year 10 and 11 groups, such as "risk prevention" (F3).

Table 7. 1

Coding the elements of a chance event.

Category	Properties	Dimensions	Example excerpts
Elements of chance events	Unforeseen nature of chance events	Anticipation of change through chance	*"I reckon, I would see it as something that you see coming, that kind of made a change happen"* (F1Y10).
		Influence leading to unexpected outcomes	
		Significance and consequences of chance	
	Unpredictability	Unpredictability and diverse outcomes	*"Um, not predicted, so it's something you don't see coming. Something you can't control"*
		Temporal nature of chance	
	Consequential effects	Influence on likelihood through personal choices	(F1Y12Y12). *"Chance can be unpredictable, it has many different outcomes"* (F2Y11).
		Risk prevention and mitigation	

Three sub-themes emerged from the combined focus group discussions regarding the unforeseen nature of chance events: their unpredictability, the consequential effects they can have, and whether they are advantageous or disadvantageous. Some participants recognised the involvement of luck in chance events, yet also acknowledged that it is not always referred to in such a manner.

In summary, participants did not appear confused by the question, but there were indications that they might not have understood the term 'element' or how to address it. Despite this, five elements were identified: unpredictability, lack of control, risk, luck (positive and negative), and significant consequences (positive or negative). No overarching theme could

be inferred due to the brevity of the discussions. Agreement was found across all three year-levels regarding the random and uncontrollable nature of chance events. Disagreements arose in how chance events were described, with Year 10 participants emphasising significant consequences, while Year 11 participants focused on luck. Some participants displayed maturity in their statements, using sophisticated vocabulary and defining more advanced categories of chance events. While there were no indications of uncertainty about the question, the brevity of discussion suggests a possible lack of understanding of the term "element."

7.5.2 Difference between chance and luck

The difference between chance and luck lies in their respective connotations, with chance referring to unpredictable events influenced by probability and randomness, while luck implies a personal perception of fortunate or unfortunate outcomes beyond one's control as a chance event was defined by Rojewski (1999) as ''unplanned, accidental, or otherwise situational, unpredictable, or unintentional events or encounters that have an impact on career development and behaviour'' (p. 269).

  In the focus group sessions, conducted at each year-level, participants were prompted with the open-ended verbal inquiry: 'Now that we've spoken about chance is there a difference between chance and luck?'.

There is evidence of agreement in the responses across all three year-levels. Year 10s and 12s saw luck as generally positive and chance as negative. Year 10s and 11s did not believe in luck, but view chance as a divine process and a personal interpretation of an event.

There are signs of maturity in some statements, such as a Year 10 participant (F2) who defined the difference between luck and chance as: "luck being an internal personal experience, whereas chance an external experience to the individual", a perspective which assigns luck to individual perception.

There are signs of confusion about the meaning of the question amongst the Year 10s of both sexes about the difference between luck and

chance. Participants became focused on types of luck as opposed to differentiating between chance and luck.

Responses from the three year-levels combined suggest that participants believe that there is a difference between chance and luck, but the distinction is not always clear-cut. Participants generally agreed that luck is often associated with positive outcomes and is more personal, while chance is more unpredictable and can be positive or negative. However, some participants argued that luck can also have negative connotations, and others questioned the existence of luck and chance altogether, attributing all events to a divine plan.

Table 7. 2

Participant discussion highlights.

Participant	Year	Opinion
F1Y10	10	Chance can be positive or negative, while luck is generally seen as positive.
F2Y10	10	Luck is not real and comes from God.
F3Y10	10	Luck is seen as a personal reward, while chance happens to a person without their control.
M1Y10	10	Luck is clearer than chance and can be either good or bad, while chance is more unknown.
M2Y10	10	Luck can be positive or negative, and luck and chance are different things.
M1Y11	11	Chance and luck do not exist because everything happens for a reason and is part of God's plan.
F2Y11	11	Luck is a personal perception of events.
F3Y11	11	Agrees with the idea that luck is a personal perception of events.
F3Y12	12	Disagrees with the idea that luck and chance are different things.
F1Y12	12	Luck is generally positive.
M1Y12	12	Chance can be measured while luck cannot.
M2Y12	12	Points out humorously that luck is not involved in the game of Monopoly.

There are varying opinions about the difference between chance and luck. F1Y10 believes that chance can be positive or negative, while luck is generally seen as positive. F2Y10 agrees with F1Y10, but also emphasises that luck is not real and that it comes from God. F3Y10 adds that luck is seen as a personal reward, while chance happens to a person without their control. M1Y10 believes that luck is clearer than chance and that luck can be either good or bad, while chance is more unknown. M2Y10 agrees that luck can be positive or negative and that luck and chance are different things. M1Y11 believes that chance and luck do not exist because everything happens for a

reason and is part of God's plan. F2Y11 believes that luck is a personal perception of events, and F3Y11 agrees with this idea. F3Y12 disagrees with the idea that luck and chance are different things, while F1Y12 believes that luck is generally positive, and M1Y12 emphasises that chance can be measured while luck cannot. Finally, M2Y12 humorously points out that luck is not involved in the game of Monopoly. Table 7.2 summarises participant opinion.

Participants also highlighted the subjective nature of luck, with some participants seeing it as a personal perception of events and others emphasising its role in broader patterns of causality. Overall, it appears that the difference between chance and luck is a matter of interpretation, with individuals attributing different meanings and values to these concepts based on their experiences and beliefs.

Table 7. 3

Coding of the difference between chance and luck.

Category	Properties	Dimensions	Example excerpts
Difference between chance and luck	Perceiving chance events as luck	Differentiating luck and chance	"I think that luck can be defeated, more positive, but chances I guess, just through life, a lot of people have plans and then they classify the chance events that come along, which are positive, and can grow consistently, or better beneficial, as luck rather than chance luck, and I think it's all in all, they are chances"(F2Y10).
		Perceived rewards and external influences	
	Faith	Role of sarcasm and perspective	
			"No, because they're both not real" (M1Y11).
	Outcome	Clarity and ambiguity	"Now, then you can normally measure chance, like it's a chance this is going to happen, or it was like a slim chance that was going to happen at that time, sort of thing, where luck is either sort of it was good or it was bad, it's not sort of a scam" (M1Y12).
		Belief in chance and luck	
	Cultural	Measurement and comparison	
			"You don't draw luck cards in monopoly" (M2Y12).

Four sub-themes are inferred from the combined focus group discussions about the difference between chance and luck.

Perceiving Chance Events as Luck: Participants described luck as a favourable occurrence, whereas chance was deemed more ambiguously and more adverse in nature, i.e., luck as a gratifying or generous reward, while chance is viewed as more arbitrary and coincidental.

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Faith and the influence and/or convictions on an individual's belief of chance and luck: Some participants interpreted luck as an expression of divine intervention, while others refuted the notion of luck and chance entirely, attributing events to a larger design or rationale.

Outcome: That luck and chance can be both positive and negative, and that they are not always clearly distinguishable from one another. Participants described luck as a personal interpretation of events.

Cultural: That luck and chance can be socially constructed, with participants noting that the concept of drawing "luck cards" in Monopoly is a societal invention.

In summary, participants differentiated between luck and chance, perceiving luck as a favourable occurrence and chance as more ambiguous and adverse. Luck was seen as a gratifying reward, while chance was viewed as arbitrary and coincidental. Faith played a significant role in shaping individuals' beliefs about luck and chance. Some participants attributed luck to divine intervention, while others rejected the concept altogether, attributing events to a larger design or rationale. Luck and chance can have both positive and negative outcomes, and they are not always clearly distinguishable from each other. Participants described (perceived) luck as a personal interpretation of events. The cultural aspects of luck and chance were perceived by the participants as a societal invention, suggesting that luck and chance are socially constructed phenomena.

7.5.3 Categorising chance events

Categorising chance events involves organising and classifying unpredictable occurrences based on various criteria, such as their nature, impact, or likelihood. During the focus group sessions held at each year-level, participants were presented with the open-ended verbal prompt: 'Can you think of a way to place different sorts of chance events into broad categories?'

From the discussions had, there was evidence of agreement in the responses across all three year-levels. Years 11 and 12 identified the broad categories of money/finance, physical/health, and nature/environment. Years 10 and 11 agreed that family/friends were a category.

There is also evidence of clear disagreements across all three year-levels. Year 12s' responses also included emotional, mental, spiritual and careers, whereas Year 11s also included terrorism and Year 10s struggled to answer at all, but identified both major and minor events as the categories that were dependant on the individual's perception of events.

Some signs of maturity were demonstrated by the Year 10s evidenced by the sophistication of their discussion "It's very hard to categorise…It's those chance meetings that are so broad…" (F2). In contrast, the Year 11 group were more easily able to list off possible categories, a likely reason being the age and exposure to these categories in their lives, that this group has had more diverse life experiences than the Year 10 and 12 groups.

The Year 10s exhibited signs of confusion about the meaning of the question and appeared not to understand the question at all, going off on a tangent about good or bad luck rather than categories of chance events.

The Year 10 group struggled to grasp the essence of the question, oversimplified categories into mere dichotomies of good/bad or major/minor, perceiving it as highly subjective. The discussion began with a confident start: "Well obviously, in the first, which is fortunate or unfortunate" (F1), yet after more discussion, F1 turned around her previous comment, "However you see, you can't actually have the two classifications, I've adjusted my perspective, and I've back-pedalled on it." This inquiry was not adequately tended to by the participants. "It's hard to arrange... since something...could be tremendous to one individual however irrelevant to another, and you know how it will be, it's those incidental experiences that are so huge, they are" (F2). No general classifications were talked about or offered, and .the general line of conversation moved towards irrelevance, focusing on great and terrible results rather than the categorisation of chance events. There was general understanding that karma might be fortunate or unfortunate, yet that possibility is for the most part obscure. In any case, the discussion pivoted to discussing another topic (incidental pregnancy), redirecting consideration from the primary theme.

The Year 11 group initially struggled and required clarification by the facilitator; however, following clarification participants experienced little

difficulty responding to this inquiry and were prepared to propose thoughts for new classifications, expanding on each other's thoughts. "Great possibility, awful possibility, such as winning the lottery, or being in a fender bender", another mentioned developing the class with a model (F3). There were no distracting turns in the participant discussion since it was centred around the issue. The inflection was on the negative, for example, "Car crash" (F1 and F2), "Getting a malignant growth" (F2), and afterward proceeding to recognise explicit clinical diseases, "Prostrate malignancy" (M1) and "A coronary failure" (M2).

The Year 12 group engaged in a reasonable discussion, although not as significant in number as the Year 11 group (23 responses). Participants initially struggled to address this question, and it's unclear whether they characterised "chance events" effectively, which is possibly the source of the uncertainty. Participants had clearly thought that it was troublesome, if certainly feasible, to figure out what "classification" signifies in this specific circumstance: "physical, enthusiastic, mental", "profound", or "monetary, vocation". Participants distinguished "normal possibility" events and "Nature" as classifications in spite of the fact they expressed uncertainty around how these would classify differently contextually.

Overall, participants suggested nine categories of chance events:

- Good or bad events, e.g., 'winning the lottery' was considered a good chance event, and 'getting cancer' was considered a bad chance event.
- Magnitude of the event itself. Participants further discussed breaking them into major and minor events, e.g., 'having an accidental baby' was considered a major chance event, while 'forgetting to do something small' considered a minor chance event.
- Personal gain, e.g., 'winning the lottery'.
- The effect of the event on the individual, e.g., money, family, or health.
- Wrong place, wrong time, e.g., 'such as a terrorist attack'.
- Personal health, e.g., the 'impact on different aspects of our lives, such as physical, emotional, mental, and spiritual'.

- Financial and career, e.g., 'based on their impact on our financial or career prospects'.

- Nature, e.g., 'natural disasters'.

- Environmental, but no examples offered.

It appears that participants hold the belief that chance events can be classified in numerous ways. Such classifications may be influenced by the viewpoint of the person perceiving the event.

Table 7. 4

Coding of the categorisation of chance events.

Category	Properties	Dimensions	Example excerpts
Categorisation of chance events	Impact	Difficulty in categorising chance events	"It's very hard to categorise something like that because something like that could be so huge to someone but little to someone else, and you know it, it's those chance meetings that are so broad" (F2Y10).
	Personal gain or loss	Impact and consequences	
	Impact on life	Personal gain and different levels of impact	"And it all comes from a slight chance that they are in a class with a bad influence" (F1Y10).
	Nature & environment	Nature of chance events	"Getting cancer…That's not something by chance, it can be hereditary"(F2Y11).
		Influence and inspiration	"Just different types, so it might be an injury, or it might be like a thought been planted in your mind by a movie that you watched, you decided to take that career path, kind of thing" (F2Y12).

Four sub-themes are inferred from the combined focus group discussions on categorising chance events.

Impact: Participants categorised events based on their severity, ranging from major ones, like an accidental pregnancy, to minor ones, such as forgetting something small.

Personal Gain or Loss: Positive chance events, such as winning the lottery, were deemed to bring personal gain, while negative events like cancer were seen as bad chance events, i.e., future loss.

Impact on Life: The influence of chance events on different areas of life, including personal health and financial/career prospects. Participants highlighted how chance events can impact one's physical, emotional, mental, and spiritual wellbeing, as well as their financial and professional future.

Nature and Environment: Participants mentioned events that are beyond human control, such as natural disasters, and those that are related to the environment, such as climate change.

In summary, participants categorised chance events according to their severity, from major occurrences, such as an unintended pregnancy, all the way down to smaller incidents, such as misplacing something. Chance events associated with personal gains, like winning the lottery, were seen as beneficial, while, on the other hand, negative events, such as cancer diagnosis and treatment, were perceived as bad luck leading to future loss. Participants recognised the impact of chance events on many aspects of their life, including personal health, financial well-being, and career prospects. Participants emphasised how chance events could alter physical, emotional, mental, and spiritual wellbeing, as well as professional future prospects.

7.5.4 Perception of chance events

The perception of chance events refers to how individuals interpret and make sense of unexpected and unpredictable occurrences in their lives. During the focus group sessions held at each year-level, participants were presented with the open-ended verbal prompt: 'Much of the survey results seem to suggest that many young people perceive chance events in a negative light. Why do you think people perceive chance events in a negative light and planned events in a positive one?'

From the ensuing discussions there is evidence of agreement in the responses across all three year-levels. Year 10s and 11s agreed that you plan for positive events, and we perceive chance events as negative due to a perceived lack of control. Year 10s and 12s believe that it is personal

interpretation that ultimately influences negative perception of a chance event. Year 10s and 11s believe that they generally do not focus on the positive aspects of chance events, but are drawn to the negative.

There is also evidence of clear disagreements across all three year-levels. Year 10s suggested that you need to make the effort to look for positives and when this occurs you are more likely to see more positives.

Any signs of maturity for this question came from the Year 11 group. They were all able to engage in discussion, bringing up a number of relevant examples to illustrate their points. There were, however, also signs of confusion about the meaning of this question amongst the Year 10 and 12 groups. This resulted in neither group fully addressing the question, but discussing their interpretation of the question. The Year 10 group's discussion was sophisticated in nature, unlike the Year 12 group's brief response.

From the tone of the overall combined responses, it could be inferred that participants tend to perceive chance events in a negative light because they cannot control them. For example, "people plan events with a positive outcome in mind, and when something unexpected happens, they view it as negative because it disrupts their plans" (F1Y12). Participants indicated that this is because most people prefer to have their life planned out the way they want it, and any slight or major interference with their plans results in a negative perception.

Participants tend to think of chance events as something catastrophic, such as a car accident, or something that affects them negatively. They rarely think of winning the lottery or falling in love as chance events. Yet participants also perceive chance events as attractive or acceptable, also by calling them luck or giving them names. Overall, they view chance events as just that - chance, whether good or bad.

Table 7. 5

Coding of the perception of chance events.

Category	Properties	Dimensions	Example excerpts
Perception of chance events	Perception	Life plans disrupted	"…because most people would like to have their life all planned out, the way they want to have it, and once something slight, or something major interferes with their plans, either it changes it, and whether it, at the start is negative, inner it obvious different from what they originally had, you know wanted for" (F1Y10).
	Control	Negative perception of chance events	
	Outcome	Sugar coating of good events as luck	
		Focus on the negative in life	I think, when good things happen, the chances are we sugar coat it with good luck, and call like give it names and stuff, it just the same as, just chance whether it's good or bad, is the difference." (M2Y10)
	Unpredictability	Lack of control over chance events	
		Inability to see positive outcomes	
		Emotional reactions to loss of control	"I think, also we focus, a lot on the bad in our lives, so when we hear about something, we turn to the negative first, and then later we might turn to the positive, but not always something we do." (F1Y10)

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Four sub-themes were inferred from the combined focus group discussions on the perception of chance events.

Perception: According to the participants, chance events are typically perceived as negative by individuals because they interfere with their plans and their perceived level of control over their lives.

Control: As per the participants' perspective, individuals prefer having authority over their lives and the events that take place in them. Consequently, the absence of control, according to them, causes pessimistic assessments of chance events.

Outcome: Participants suggested that they, in general, tend to focus more on negative experiences, and when good things happen, they tend to attribute them to luck.

Unpredictability: Participants believe that they tend to dislike the unpredictable and prefer to have plans and certainty over their lives. As chance events are inherently unpredictable in nature, they can lead to fear and uncertainty.

In summary, participants often perceived chance events as disruptors to individuals' plans and control over their lives, leading them to blame it on luck or attribute positive outcomes to randomness. Due to its unpredictable nature, chance events often cause fear and uncertainty to those affected.

7.5.5 Experience and context

It was important to elicit from participants whether their perceptions of chance events were impacted by their experiences or the context from which the events occurred. During the focus group sessions held at each year-level, participants were presented with the open-ended verbal prompt: "People perceive chance events in a negative light and planned events in a positive one. Has this come from experience? If so, in what context?"

As evidenced from the discussion that followed, there was evidence of agreement in the responses across all three year-levels. Year 10s and 11s agreed that a negative chance event could be turned into a positive depending on the perspective of the individual; while the Year 12s did not

describe this process but did agree that it comes down to individual interpretation.

There is evidence of clear disagreements across all three year-levels, the Year 10s and 11s were able to articulate the experiences of chance events as a positive experience, albeit not initially in all cases.

Any signs of maturity in utterances came from the Year 11 group, who were able to link examples that were personal to either themselves or their family. Amongst all three year-levels there were signs of confusion about the meaning of the question, but only from Years 10 and 12 who were unable to adequately address this question due to their difficulty in comprehending the question.

The collective responses from Years 10, 11 and 12 indicated a varied perspective towards chance events. Some participants perceived chance events in a positive light based on personal experiences, while others tend to view them negatively. It is worth noting that some individuals associated planned events with positive outcomes, whereas others attributed their success to their own efforts. Participants provided examples to reinforce their viewpoints, such as one participant's family getting a chance to move to a new location, and another participant missing a road accident due to forgetting their keys. The group agreed that unfavourable chance events are typically associated with misfortune, while positive ones are often regarded as luck. Participants also discussed the tendency for some people to link positive outcomes to their hard work, but negative events to chance. Ultimately, the group concluded that one's life experiences greatly shape their perception of chance events.

Three sub-themes are inferred from the combined focus group discussions on the experience and context of their thoughts.
Perception of Chance Events: Participants noted that the way they perceived chance events could have a significant impact on how they felt about them. The chance events they experienced in their life so far could be considered positive or negative, and could have significant impacts on their life. Notably, the outcomes of these events which were not always predictable appeared to

have greater impact thanks to the outcomes of those events that were predictable.

Diversity of Life Experiences: According to the participants, their experiences played a significant role in the shaping of their attitudes towards chance events. Participants mentioned that their experiences influenced their beliefs about whether chance events were positive or negative. "…because she was never in control, she didn't know what to do with herself, she hated the whole experience, she just like broken down, whereas us, because we kind of, I think, with chance to her, the chance event has been whole negative experience, but we kind of look on the chance" (F1Y10).

Work and Luck: Participants discussed their sentiment that positive outcomes only occurred to people who worked hard. A general sense that chance events were more likely to be associated with negative outcomes, while hard work was more likely to be associated with positive outcomes.

Overall, participants acknowledged that their perceptions of chance events had an enormous effect on how they felt about them and the positive or negative events that had an impactful presence in their lives thus far. However, unpredictability was found to have an even larger influence. Life experience played a pivotal role in shaping participants' perceptions of chance events. Experiences had an influence over whether participants viewed chance events as positive or negative. Participants discussed their beliefs that positive outcomes can only be achieved through hard work, leading them to believe that chance events were likely to result in negative outcomes while hard work led to positive ones.

7.5.6 Connection between chance events and unlucky people

It may have been possible that participants perceived chance events as only occurring to unlucky people. During the focus group sessions held at each year-level, participants were presented with the open-ended verbal prompt: 'Do chance events only happen to unlucky people?'

As demonstrated by the discussion which followed, there is evidence of agreement in the responses across all three year-levels. All year-levels unanimously agreed that chance events do not only happen to unlucky people

but that they happen to everyone. Participants qualified this stance by stating that it is more to do with attitude and individual interpretation.

There is no evidence of any clear disagreements across all three year-levels. There are, however, signs of maturity in the utterances of participants in both Year 11 and 12 (F3) and one Year 12. "No, chance events happen to everyone, unlucky people choose to react badly to them" (M2). There were no signs of confusion about the meaning of this question in any year-level.

Responses from Years 10, 11 and 12 combined suggest that at least these participants do not believe in luck or chance as a defining factor in their lives. A significant number of participants perceive chance events as an integral component of the divine scheme, and they hold the conviction that all incidents take place for a purpose. Attitude influences how one perceives and handles situations according to their beliefs. The participants, who possess a profound understanding of life, i.e., have broader life experience, acknowledge that every individual undergoes a plethora of positive and negative occurrences, and the crucial aspect lies in their response towards those incidents. There were participants who perceived challenging circumstances as a chance for self-improvement, and they maintained the conviction that every circumstance has a favourable aspect. Some participants argued that the act of expressing gratitude is an absolutely crucial component in an individual's ability to locate and embrace positivity even in the most challenging and difficult circumstances. Most participants value individual autonomy and the influence of their viewpoint.

Participants seemed to possess a core conviction that their capacity to respond to life circumstances dictates the potency of their decisions, and the magnitude of these decisions can greatly affect the calibre of their encounters. Their strong emphasis lies in the fact that every single person, without any exception, encounters both advantageous and disadvantageous situations, and that no one is entirely lucky or unlucky.

Table 7. 6

Coding of do chance events only happen to unlucky people

Category	Properties	Dimensions	Example excerpts
Chance events only happens to unlucky people	Personal perspective and attitude	Negative view of chance events	"…that puts a chance event in a negative light again, and also we don't believe in luck" (F1Y10).
	Religious beliefs	Rejection of luck and chance	"I think, we see it in a different way, as well a majority of us are Christian, we see it as part of God's plan, that this happens in our life, rather than a chance or a luck, like, later, after chance event it probably happen, we thank God, care in our life, but I don't think I see those chance events, sort of as a chance, I just think it's part of the broader plan" (F2Y10).
	Noone inherently unlucky	View on being lucky or unlucky	"I don't think that there is such a thing as an unlucky person, because I guess, again it comes to your attitude, the way you view some things, if you have a car accident,
	Gratitude and perspective	Opinion and circumstances	you can't pay your bills, and then you get kicked out of your house, and all of that, yes it sounds like a lot of bad luck, but you know you can always, you can always find positive in any situation at all, even the worse situation" (F3Y11).
			"You could just be thankful, that you're still alive, that there's oxygen, that your house didn't burn down, and you didn't die" (M1Y11).

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Four sub-themes could be inferred from the combined focus group discussions about the connection between chance events and unlucky people.

Personal Perspective and Attitude: Many participants stated that one's perspective towards chance events is heavily influenced by their personal outlook and attitude. They maintained that a positive mindset could determine how one responds to chance events, and that optimistic perspectives can help identify opportunities or blessings in unexpected circumstances.

Religious Beliefs: Participants shared their Christian beliefs and how their faith shapes their perception of chance events. Some stated that chance events are part of God's plan and that everything happens for a reason, that even difficult situations could have future blessings, and that it was all a matter of faith.

Not one person is inherently unlucky: There was a general consensus that nobody is inherently unlucky. It was highlighted that good and bad experiences are a part of everyone's life and that it is the individual's reaction to the chance event which determines their perception of luck.

Gratitude and Perspective: There was some emphasis on the importance of gratitude and perspective in the management of chance events. Some participants suggested – and all agreed – that being grateful, even in difficult circumstances, can change an individual's perception and response to chance events. Having a positive outlook can help identify opportunities and blessings in unpredictable situations.

In conclusion, participants highlighted the influence of personal perspective and attitude on how one perceives and responds to chance events. A positive mindset can lead to recognising opportunities or blessings in unexpected circumstances. Religious beliefs, particularly Christian faith, played a role in shaping participants' views on chance events. They expressed the belief that everything happens for a reason and that difficult situations could potentially lead to future blessings. There was a consensus that no one is inherently unlucky, that both positive and negative experiences are part of everyone's life, and how individuals react to chance events

determines their perception of luck. The importance of gratitude and perspective was emphasised. Being grateful, even in challenging circumstances, can change one's perception and response to chance events, and a positive outlook can help identify opportunities and blessings in unpredictable situations.

7.5.7 Circumventing chance events

Circumventing chance events refers to finding ways to avoid or minimise the impact of unexpected and unpredictable occurrences in order to exert greater control over the outcomes. During the focus group sessions held at each year-level, participants were presented with the open-ended verbal prompt: 'Is there a way to avoid chance events?'

There is evidence of agreement in the responses across all three year-levels. All year-levels unanimously agreed that there is no way to avoid chance events. However, all have gone on to qualify this assertion with harm minimisation scenarios, thus contradicting their original response.

There is evidence of agreement across all three year-levels that an individual may minimise the inevitability of a chance event. However, signs of maturity in utterances were noted in sophistication of their examples: "…you can avoid a car accident, by being a good driver; a poor driver is more likely to have an accident, than a good driver" (Y10F2). There were no signs of confusion about the meaning of this question, and comprehension of the question was evident in the erudition of their discussion.

It is crucial to emphasise that, when asked about the possibility of avoiding chance events, participants across all three year-levels unanimously responded with a resounding "no." Nevertheless, their responses varied in the way they expanded upon their reasoning.

Some participants suggested that while chance events cannot be entirely avoided, an individual can "prepare for them by being flexible with plans" and "being a good driver to reduce the likelihood of accidents" (F2Y10). F1Y10 added that "character is important in being able to handle chance events and see them in a positive light".

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Others, like M2Y10, emphasised the unexpected nature of chance events, making it difficult to avoid them. F3Y10 even pointed out that "even if one stays home all day, something unexpected could still happen". M1Y11 and F1Y11 agreed that chance events are events that cannot be controlled, hence the name.

There was also a discussion about the role of God or destiny in chance events. M1Y11 believed that some chance events may be planned by God and therefore cannot be avoided. F3Y11 suggested that one can avoid chance events by following God's plan, but F1Y11 disagreed, stating that chance events by definition cannot be skipped or avoided.

The Year 10 group generated good discussion and explored different interpretations of chance events. Participants reacted to this question by collectively concurring that it is absolutely impossible to avoid chance events; however, they could be managed through being conscious of one's environmental factors: "You can keep away from a car crash by being a decent driver; an awful driver is bound to have a mishap than a decent driver" (F2).They also agreed that, while horrible chance events cannot be avoided, a decent demeanour might be created to make the best of an awful situation. They likewise stressed the need of being versatile to more readily deal with unexpected conditions.

The Year 11 group had a good discussion that moved from God focused and free will to looking at change as not controllable. Participants reacted quickly to the point, with one stating, "Likely not, since in my view, chance events aren't really chance occasions, they're God" (M1). Another reaction went further by noting the issue with an example, " I don't think, there is any way to avoid it, it's kind of like the cycle of life, really like bad things happen, good things happen, and can't do anything to stop it." (F2). For some time there was banter, but in the end all concurred that "in the event that they occur, no one can really tell when they'll occur."

The Year 12 group had some meaningful discussion, but not as in-depth as the Year 10s. Participants answered promptly during a fast discussion. There was wide agreement that chance events cannot be avoided, "No, they wouldn't be chance events" (F1). The discussion was on

the most proficient method to lessen the odds of a chance event, for example, driving cautiously or protecting oneself, such as "Lock yourself in a bubble" (M1). However, they concluded with a passivism stance that it does not make any difference what you do. There was no unrelated discussion, and all participants contributed comparably.

Participants agreed that, while chance events cannot be avoided entirely, one can take steps to prepare for them and reduce the likelihood of negative outcomes. There was also discussion about the role of personal character and belief systems in coping with chance events.

Table 7. 7

Coding of possibility of circumventing chance events.

Category	Properties	Dimensions	Example excerpts
Circumvention chance events	Perception of Chance Events.	Preparation for chance events	"In a way you can prepare for them" (F2Y10). "If you're prepared to be flexible with your plans, and stuff, it won't affect you as much, or as greatly" (F2Y10).
		Inevitability of chance events	"Yes and No, in a way, I think you change what happens, but there is no way you can avoid it from happening at all" (M1Y10).
	Coping with Chance Events.		
		Influence of environment and behaviour	"You can stay home, sit on the couch all day, but still, something could happen to you" (F3Y10).
	Influence of Environment and Choices.		"…what sort of environment you put yourself into. If you go out clubbing all night and then you're driving home,

		Role of God or higher power	you know there's going to be people on the road that will be drunk or under the influence of drugs or even just really tired at the time" (F1Y10).
	Religious beliefs.	Limited control over chance events	"Chance events aren't actual chance events; they're God's plan, and you can't avoid things that God has planned" (M1Y11).
	Personal Experiences.	Minimising chances, but not eliminating them	"That's the whole point of them; when they're called chance, you have no control over them" (F2Y11). "Being a good driver can reduce your chance, but you can't remove the chance entirely" (F1Y10).

Generally, responses from Years 10, 11 and 12 combined generated five sub-themes when considering whether there is a way to avoid chance events.

Perception of Chance Events: All participants agreed that chance events cannot be avoided. Participants emphasised that chance events are unexpected and unpredictable and cannot be prepared for. They seemed to have a fatalistic view of chance events, perceiving them as a natural part of life, that which cannot be controlled.

Coping with Chance Events: Participants discussed being mentally prepared, having a positive attitude, being flexible, and standing up for one's beliefs as different ways to cope with chance events. Having a supportive environment and being in control of their actions were ways to minimise the

impact of chance events, viewing coping with chance events as an individual responsibility.

Influence of Environment and Choices: According to the participants, having good driving skills can minimise the likelihood of a vehicular mishap, while evading hazardous circumstances can lower the possibility of getting injured. Nonetheless, the participants acknowledged that certain unforeseen incidents, such as natural calamities or unfavourable timing, are inevitable regardless of personal decisions or surroundings.

Religious Beliefs: Participants mentioned their belief in God and they perceived all chance events as part of God's plan, with a discussion of fate also ensuing.

Personal Experiences: Participants discussed their own experiences of chance events, such as car accidents and natural disasters, which appeared to inform their views on chance events and surviving them. Participants acknowledged that some events cannot be avoided regardless of personal choices, and emphasised the importance of being mentally prepared, and having a positive attitude.

By way of a précis, participants unanimously agreed that chance events cannot be avoided, perceiving them as unexpected, unpredictable, and beyond control. They viewed chance events as a natural part of life that must be accepted. Coping mechanisms were discussed, including being mentally prepared, maintaining a positive attitude, flexibility, and standing up for one's beliefs. Participants emphasised the importance of individual responsibility in coping with chance events and creating a supportive environment. The influence of the environment and personal choices was acknowledged, with participants recognising that certain incidents, such as car accidents or natural disasters, can be mitigated through good driving skills or avoiding hazardous circumstances. However, they also acknowledged that some unforeseen events are inevitable regardless of personal decisions or surroundings. Religious beliefs played a role, as participants mentioned their belief in God and perceived chance events as part of God's plan, sometimes discussing the concept of fate. Personal experiences of chance events, such as car accidents and natural disasters, shaped participants' perspectives and

highlighted the importance of mental preparation and maintaining a positive attitude when facing such events.

7.5.8   Mitigating consequences

There are mitigating circumstances of chance events to alleviate them, but not to avoid them. During the focus group sessions held at each year-level, participants were presented with the open-ended verbal prompt: 'Is there a way to mitigate/alleviate the consequences of chance events?'

There is evidence of agreement in the responses across all three year-levels. All year-levels unanimously agreed that there is no way to avoid the consequences of chance events, but that there are ways to alleviate them. While no disagreements were observed, there were signs of maturity in the utterances, particularly in the Year 12 discussion. There were also signs of confusion about the meaning of the question, but only in the Year 10 and 11 groups.

Responses from Years 10, 11 and 12 combined suggests that participants agreed that it is not possible to completely eliminate the consequences of chance events, but that they can be reduced or alleviated through various means. Some of the methods they discussed include being a good driver to reduce the risk of car accidents, staying positive and optimistic, and having a flexible attitude towards unexpected events.

During the discussion, one participant pointed out that personal growth and changes in life circumstances can greatly impact one's ability to handle unexpected events. It was emphasised that how you respond to events may vary over time as they personally develop and build resilience. Additionally, the importance of having a solid foundation and being able to adapt to changes was discussed. One participant illustrated their point by sharing a personal experience of their family having to change their plans due to their father's accident.

Another participant emphasised the role of perception and attitude towards chance events, suggesting that a positive attitude can alleviate some of the negative consequences.

Table 7. 8

Coding of the mitigation or alleviation of the consequences of chance events.

Category	Properties	Dimensions	Example excerpts
Mitigation of consequences	Perception of chance events	Mitigating chance events	"Some consequences cannot be avoided, but efforts can be made to mitigate them" (F3Y12).
		Trust and stability	"You can reduce chance events by being a good driver or staying home" (M2Y10).
	Control	Flexibility in response to chance events	"Character and internal factors, such as optimism, can reduce the consequences" (F1Y10).
	Coping with Chance Events	Consequences and their perception	"Putting trust solely in a perfect plan can lead to failure when unexpected events occur" (F2Y10).
		Limited control over consequences	"Flexibility and adaptability are important in handling major chance events" (F1Y10).
	Decision Making	Embracing and accepting chance events	"Consequences remain the same, but the perception and attitude can change" (F1Y11).
			"Rehabilitation and personal efforts can influence the effects of consequences" (M2Y12).

"Adopting a "roll with it" attitude towards chance events" (F3Y12).

Four sub-themes emerged during the combined discussion about mitigating consequences.

Perception of Chance Events: Participants discussed the importance of their opinion and attitude towards chance events, with one insightful Year 10 female suggesting that a chance event can also be seen as an opportunity rather than a negative experience.

Control: Participants suggested that being a good driver, staying at home, having flexibility, and being optimistic were ways to mitigate the consequences, while acknowledging that some consequences cannot be eliminated entirely, e.g., injuries from an accident.

Coping with Chance Events: Participants discussed the importance of coping and suggested that one should just "roll with it" and be flexible in order to cope with the unexpected changes that chance events may bring.

Decision-Making: Participants considered the importance of personal responsibility and decision-making, and that personal decisions and reactions can either get worse or alleviate the consequences of a chance event.

In summary, participants recognised the mitigating consequences, the significance of their perception, and attitude towards chance events. They viewed chance events as opportunities rather than solely negative experiences. Participants explored strategies to exercise control over chance events, such as being a good driver, staying at home, maintaining flexibility, and adopting an optimistic outlook. However, they acknowledged that certain consequences, like injuries, may remain unavoidable. Coping with chance events was highlighted, with participants emphasising the importance of adaptability and going with the flow to navigate unexpected changes. Participants reflected on the role of personal decision-making and responsibility, understanding that their choices and reactions can either exacerbate or alleviate the consequences of chance events.

7.5.9 Increasing the probability of a chance event

In order to increase the probability that a chance event will occur, deliberate action taken, or specific choices must be made. Participants were asked to respond verbally to the following open-ended question during the focus groups held at each year-level: 'Is it possible to increase the probability of a random event?'

The Year 10 group had a good discussion with particular participants contributing to the bulk of the response. The participants all concurred that there is a strategy to improve the odds of a chance event happening. Decisions made by participants recommended that chance events can be improved or reduced. "You can raise the probability of something happening once more, yet not the probability of it happening once more, similarly as you may improve the probability of anything occurring from nothing to something. …you can increase the possibility from nothing to something, by buying a Tattslotto ticket that increases the possibility of something happening, not by much but, you can increase it" (F1). Participants arranged these choices into conscious and unconscious choices dependent on whether they limited or upgraded the probability of a chance event.

The Year 11 group engaged in a detailed discussion. Participants seemed to concur that luck and chance were connected, for example "being in the perfect area at the perfect second, yet you never know," as in "you can buy 20,000 lottery tickets, however you won't ever know. But it does not suggest you're sure you've tracked down the one that will make you this money; it simply implies you can attempt" (F1), which one participant connected to the articulation "Increase your odds" (F2). Participants likewise investigated the thought of accepting dangers as an approach to improve the probability of a chance event happening. "What happens if you just like to go, and say put yourself in a position, where you're bungy jumping off a cliff, and you know the rope's not good, you're sort of putting yourself in danger" (F1). All participants contributed to the discussion in some way, however it was led by the female participants, and they all concurred with every example given. There were no side discussions.

The Year 12 group was concise in their discussion and remained on topic. Participants concurred that placing oneself in a specific position increases the odds of a chance event occurring; the example given was a "shark attack" (M2), which involves swimming. The third example offered was winning the lottery; "the more tickets you purchase, the better your shots at winning" (F2), and participants by and large associated chance with luck. To put it another way, purchasing more lottery tickets increases your chance at winning. This is at any rate a positive view of chance, instead of the immediate examples of negative chance events more often given.

There was evidence of agreement in the responses across all three year-levels that there is a way to increase the possibility of a chance event; however, some within both the Year 11 and 12 groups stated that there was no way to increase a chance event.

Any signs of maturity in utterances were only to be evidenced in the erudition of their discussion and subsequent examples given, which was at all year-levels. The concept of "…the more tickets you buy, the more chance you have got of winning" (Y12F2) was used as an example across all groups. There were no obvious signs of confusion about the meaning of the question.

It appears evident by the combined responses from Years 10, 11 and 12 that participants agreed that it was possible to increase the possibility of a chance event happening. However, there was consensus that it is impossible to make the event happen, as chance events are unpredictable and random.

Participants suggested various ways of increasing the possibility of a chance event, such as buying lottery tickets, making certain decisions, and putting oneself in a specific scenario. The discussion highlighted that conscious and unconscious decisions could impact the possibility of a chance event happening and that making good decisions could reduce negative consequences.

Groups also discussed how a planned event could also be considered a chance event. Participants suggested that they could improve their odds of winning the lottery by purchasing extra tickets, whilst also acknowledging the unpredictable nature of chance events, and how chance events are

unpredictable and can happen at any time. They stressed that chance events are impossible to prepare for.

Participants indicated generally that enhancing the probability of a chance event occurring is possible, but causing a chance event to happen is impossible. Participants suggested various ways of increasing the possibility, such as making certain decisions and putting oneself in specific scenarios. However, chance events remain unpredictable and random, and even with more chances, winning a lottery is not guaranteed.

Table 7. 9

Coding of increasing the probability of a chance event.

Category	Properties	Dimensions	Example excerpts
Increasing probability	Perceiving chance	Increasing possibility vs. making it happen	"Choosing to place oneself in specific scenarios to increase chances" (F3Y10).
	Decision-making	Conscious decisions, increasing/decreasing chances	"So when you say, would it be like a line between unconsciously and consciously deciding, something whether reduces or increases the possibility, would you say it is unconscious decision, would reduce it or increase it. (F1Y10).
	Risk-taking	Good decisions and planned events	"Maybe you make sure you make good decision" (F3Y10). "I see you can sort of predict probability, you can sort of decide that this is likely to happen, but when it actual comes time for the situation, there is either a 0% chance, it's going to happen, or a 100% chance it could happen, it's either not, or it is, so like, you could never so, chance event you know you can't ever sort, prepare for you might always have a 0% chance of something happening, no matter what you do" (M1Y11)
		Probability, preparation, and risk-taking	
	Controlling	Multiple chances and increasing likelihood	
		Unpredictability and real chance events	

Four sub-themes are inferred from the combined focus group discussions about increasing the probability of a chance event.

Perception of Chance: Participants discussed the distinction between possibility and probability and how they are interconnected. They reached an agreement that, although it is possible to increase the possibility of an event taking place, it may not inevitably enhance its likelihood or probability.

Decision-Making: Participants discussed how conscious decisions can increase or decrease the chances of a chance event happening.

Risk-Taking: There was discussion that some chance events involve risk-taking behaviour and the level of responsibility individuals have for the outcomes of their own risk-taking.

Control: Participants considered whether a chance event can be a planned event or not, such as participating in extreme sports, that can involve a level of risk-taking and uncertainty, but may also involve planning and preparation.

By way of summation, participants deliberated on the perception of chance and recognised the interconnectedness between possibility and probability, understanding that increasing the possibility of an event does not guarantee its likelihood. Participants explored the role of decision-making in influencing the occurrence of chance events. They discussed how conscious decisions can impact the chances of such events happening. The concept of risk-taking was examined, with participants considering the responsibility that individuals bear for the outcomes of their own risk-taking behaviour. The theme of control was raised, with participants questioning whether chance events can be planned or involve a level of uncertainty. They discussed examples like extreme sports, where planning and preparation coexist with risk-taking and uncertainty.

7.5.10 Advantage, opportunity or benefit from a chance event

Gaining an advantage, opportunity, or benefit from a chance event refers to leveraging an unexpected occurrence to achieve a positive outcome or advantage. During the focus group sessions held at each year-level,

participants were presented with the open-ended verbal prompt: 'Is there a way to gain an advantage, opportunity or benefit from a chance event?'

There was evidence of agreement in the responses across all three year-levels. All year-levels agreed that there is a way to gain an advantage, opportunity, or benefit from a chance event; however, there was a minority within the Year 12 group who believed that positive chance events were much harder to come by, or that chance events were purely a negative thing.

There was no evidence of clear disagreements across all year-levels. Once again, any signs of maturity in utterances were only to be evidenced in their knowledge of the topic through their discussion and subsequent examples given, and this occurred at all year-levels. There were no obvious signs of confusion about the meaning of the question at any year-level.

Responses from Years 10, 11 and 12 combined suggest that participants believe there are ways to gain an advantage, opportunity, or benefit from chance events. The majority of the participants responded positively, indicating that they believe it is possible to gain something positive from a chance event, even if it is a negative one.

One of the main ways participants suggested gaining an advantage was through networking and building relationships. Year 10 female participants suggested 'that getting in good with the boss could lead to a job offer' and gave an example of someone who turned their life around after witnessing a family tragedy. A Year 11 male suggested 'that meeting someone who is a drug addict could be an opportunity to help that person' (M1).

The discussions also demonstrated that participants believe that chance events could lead to unexpected opportunities or paths in life. For example, a Year 12 participant suggested that "missing out on a spot in a university degree could lead to finding a better course or opportunity" (M1). A Year 12 participant also suggested that "negative events could lead to opportunities if one is open to them" (F1).

All the year-levels concurred that there is a possibility to gain a benefit, opportunity, or advantage from a chance event. However, there was a minority of Year 12 participants who felt that good chance events were

undeniably harder to obtain, or that chance events were exclusively
something negative.

Table 7. 10

Coding of the advantage, opportunity or benefit from a chance event.

Category	Properties	Dimensions	Example excerpts
Possibility of gaining any benefit	Attitude	Finding personal growth and meaning in chance events	"…if you look at it and you try and find what you can get from it, and what you can learn from it, well it can turn into a positive experience for you" (F2Y10).
		Positive perspective and resilience	"…you can always find something positive in everything, so you can always make the best of any situation" (M1Y11).
	Personal Growth	Transforming negative events into positive outcomes	
		Learning and personal development from adversity	"…a breakdown in your family could lead to stronger relationships within the family in other aspects you haven't had before" (F2Y11).
	Relationships	Seizing opportunities and leveraging multiple chance events	"…good things can come from the bad, like what you were saying, but yeah, not as much as the good ones, it's easy to get something good out of a good chance event than it is to get something out of a bad" (M1Y12).
	Faith		"…bringing the Christianity aspect into it, there's like that

	Positive outcomes through faith or belief systems	God brings all the good out of bad events" (M1Y10). "You have more advantage over other people by having more than chance events because if you choose to use them to your advantage over other people" (F2Y12).

Four sub-themes emerged from the combined groups discussion on gaining an advantage, opportunity, or benefit from a chance event.

Attitude: Participants discussed maintaining a positive attitude towards chance events, which may help them see opportunities and benefits that may not have been immediately obvious to them. Also, they suggested that negative situations can have a silver lining with a positive outlook.

Personal Growth: Participants suggested the potential for personal growth and development which could come from a chance event, providing an opportunity for learning, growth, and self-improvement.

Relationships: Some participants suggested that a chance event, depending on what it was, could be used to develop and strengthen relationships. One participant mentioned using a chance encounter to become friends with someone who may have connections to job opportunities.

Faith: A few participants mentioned the role that faith can play in helping them find positives in chance events, suggesting that having faith can provide comfort and support, and help to see the bigger picture.

To encapsulate, participants emphasised the importance of maintaining a positive attitude towards chance events as it allows them to perceive opportunities and benefits that may not be immediately apparent. They discussed how adopting a positive outlook can help find silver linings in negative situations. Participants recognised the potential for personal growth and development that can arise from chance events. They viewed these events as opportunities for learning, growth, and self-improvement. Participants highlighted the impact of chance events on relationships. They

discussed how certain events, depending on their nature, can be used to develop and strengthen connections with others. They shared examples of using chance encounters to forge friendships that may lead to job opportunities through networking. The role of faith was mentioned, and they expressed how their faith can provide comfort, support, and a broader perspective, helping them find positives in chance events.

7.6 Comparisons and contrasts

Figure 7. 1

Total focus group duration by year-level.
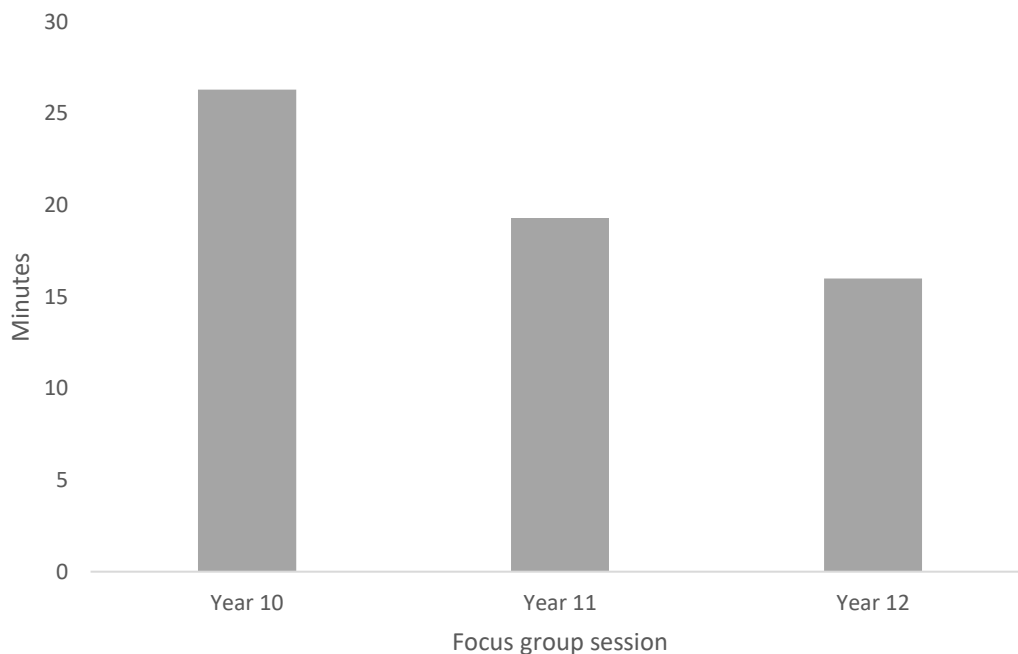
The results revealed variations in the total duration of the focus groups, measured in minutes and seconds, across the different Year levels. The Year 10 focus group had the longest duration, lasting 26.30 minutes. In comparison, the Year 11 focus group had a slightly shorter duration of 19.30 minutes. The shortest focus group in duration was observed by the Year 12s, which had a total duration of 16 minutes. These findings indicate differences in the amount of time spent in the focus group discussions between the different year-levels. The longer duration for the Year 10 group suggests that participants in this year-level engaged in more extensive and in-depth

discussions, potentially exploring a broader range of topics. Conversely, the shorter duration for the Year 12 group may indicate a more focused or concise discussion. However, this is likely due to the small size of each group, the personalities, and differing levels of experience of the individuals' therein rather than anything definitive. As such, no definitive conclusions can be drawn from these findings.

Figure 7. 2

Percentage of verbal contributions to the overall discussion by each year-level.
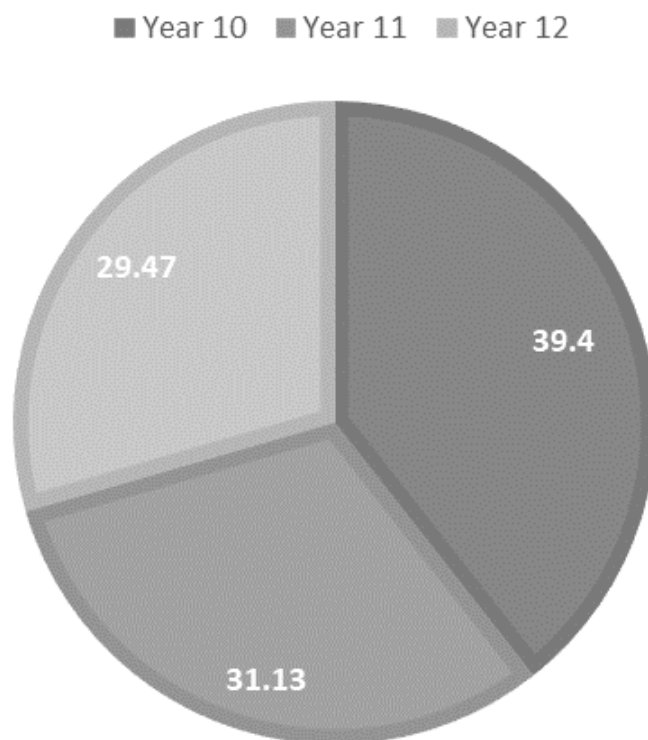
Figure 7.2 displays the distribution of discussion contributions across different Year levels. The results indicated that Year 10 participants accounted for the highest percentage of discussion, with 39.4%. Following closely behind, Year 11 participants contributed 31.13% of the overall discussion, while Year 12 participants made up 29.47% of the total. These findings suggest that Year 10 participants were the most actively engaged in the focus group discussions, demonstrating a greater inclination to participate and share their perspectives. Conversely, Year 12 participants had a slightly lower participation rate, indicating a potentially decreased level of

engagement or a shift in focus towards other aspects of their academic journey.

Figure 7. 3

Mean time elapsed in the discussion of each verbal inquiry.
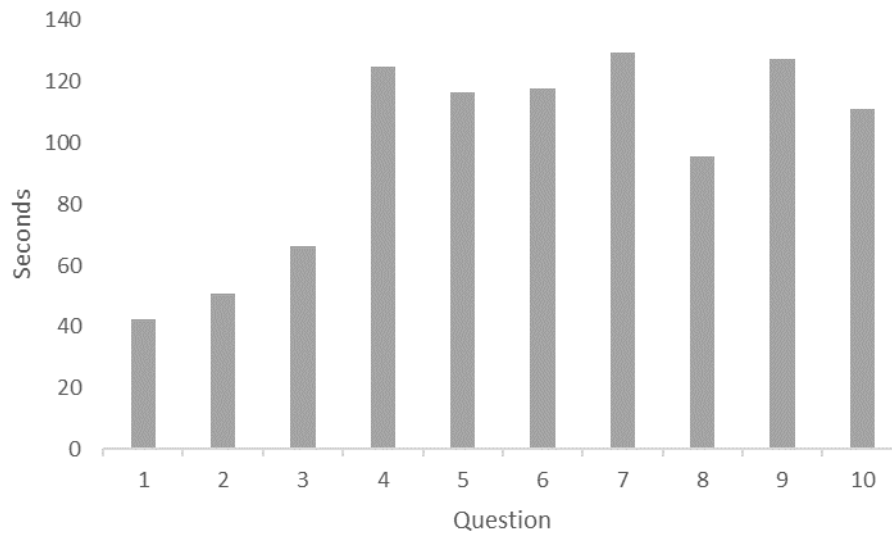
The mean time in seconds for each individual question during the focus group discussions was calculated by combining the data from the three year-level-specific groups. The results revealed variations in the average time spent on different questions. As displayed in figure 7.3, Question 1 had the shortest mean time, with participants spending an average of 42.66 seconds discussing it. Question 2 followed closely behind, with an average discussion time of 50.66 seconds. Question 3 had a slightly longer mean time of 66.33 seconds. The mean time for Question 4 was 125 seconds, indicating a comparatively longer discussion. Similarly, Questions 5 and 6 had mean times of 116.66 seconds and 117.66 seconds, respectively. Participants spent an average of 129.33 seconds on Question 7, which had the longest mean time among the questions analysed. Questions 8 and 9 had mean times of 95.66 seconds and 127.33 seconds, respectively. Finally, Question 10 had a mean time of 111 seconds. These findings provide insights into the relative importance and depth of discussion for each question, allowing for a better understanding of the focal points and areas of interest within the focus group conversations.

The brevity of the Question 1 discussion (M = 42.66 seconds) suggests that the participants might have struggled with recognising the components of a chance event and/or lacked a clear comprehension of what constitutes an element of a chance event.

Similarly, it can be deduced that the participants' understanding of the distinction between chance and luck (Question 2) was mirrored by the brevity of their discussion (M = 50.66 seconds). Additionally, their proficiency in categorising (Question 3) chance events (M = 66.33 seconds) further supports this inference.

Conversely, the three questions (4, 7 and 9) which invoked the greater discussion duration (M = 127.33 seconds) suggest that participants had no problem offering suggestions for why people perceive chance events in a negative light and planned events in a positive one, a way to avoid chance events, and a way to increase the possibility of a chance event.

Table 7.11 displays the number of verbal contributions made to each question and to the overall discussion by each year-level.

Table 7. 11

Number of verbal contributions to the discussion by each year-level and to each question.

Question	Year 10	Year 11	Year 12	Total
1	8	3	5	16
2	9	8	6	23
3	11	23	10	44
4	9	5	3	17
5	8	4	7	19
6	8	15	14	37
7	21	11	11	43
8	12	2	12	26
9	24	13	11	48
10	9	10	10	29
Total	119	94	89	302

The following are examples of participants' responses which were not counted and therefore not captured in table 7.11:

Year 10:

F2: "Can you repeat the last question?"

M1: "Yeah" in the context of agreeing to M2s response and "What do you mean?"

Year 11:

F1: "Could you repeat the question again?" and "Yeah" in the context of agreeing with M2s contribution to the discussion.

F3: "Yeah" in the context of agreeing with the readers comment.

Year 12:

F2: "Pardon?"

F3: "Can you say the question again?"

M2: "So what was the question?"

Of the Year 10 group, one hundred and nineteen separate contributions were recorded as the sum total of this group's responses to the stimulus questions. F1 was the first to respond for eight out of the ten questions. She also responded 31.57% of the time out of a total of ninety-five responses recorded overall, which was the highest percentage of responses for this group. F2 responded first for two out of the ten questions, and contributed to the discussion a total of 21 times, that being 22.10% of the responses overall. Of the remaining discussion, F3 and M1 each contributed six times which is 16.84%, and M2 12.63% with only 12 comments. F1 was not only the first to talk, but also had the most to say, her comments often being the springboard used by the participants to make their contributions.

Of the Year 11 group, ninety-four separate contributions were recorded as the sum total of this group's responses to the stimulus questions. F3 was the first to respond to four out of the ten questions. She also responded 34.14% of the time out of the total eighty-two responses recorded overall, which was the highest percentage of responses for this group. F1 responded first for three out of the ten questions, and contributed to the discussion a total of twenty-two times, that being 26.82% of the responses for this group. M1 responded first for three out of the ten questions; however, he only

contributed to the discussion a total of thirteen times, that being 15.85% of the responses overall. Of the remaining discussion, F2 contributed twenty-two times, or 26.82%, and M2 7.31%, with only six contributions offered.

Of the Year 12 group, eighty-nine separate contributions were recorded as the sum total of this group's responses to the stimulus questions. F1 was the first to respond to five out of the ten questions. She also responded 27.79% of the time out of the total of ninety responses recorded overall. This was the highest percentage of responses for this group overall. F3 responded first for three out of the ten questions, a total of 16 times in total, or 17.77%. M1 responded first for two out of the ten questions and contributed to the discussion a total of seventeen times, that being 18.88% of the responses overall. Of the remaining discussion, F2 contributed seventeen times, or 18.88%, and M2 offered the least to the discussion at 16.66%, with fifteen contributions offered.

There are also obvious variations at each of the three year-levels. Chance occurrences are described by Year 10s as having major effects that are either good or terrible, but Year 11s do not characterise chance in this manner – they simply perceive luck as good or bad. With one Year 10 female participant (F2) employing more advanced terminology than her peers, e.g., "As a result, that would not ordinarily occur" (F2). Females in Years 10 and 12 were able to describe more complicated categories of chance occurrences than males in Years 10 and 11. There were no indicators of misunderstanding regarding the question's meaning, but there was evidence to imply that they did not understand the term "element" and/or didn't know how to handle it. Across all three year-levels there were modicums of agreement in the replies. Year 10 and 12 participants considered luck to be usually good and chance to be largely bad. Year 10 and 11 participants did not believe in luck, but rather saw chance as a divine process that allows for a unique interpretation of an occurrence. There were no obvious conflicts at any of the three year-levels. One Year 10 female participant (F2) described the distinction between luck and chance as luck being an internal personal experience, with chance being an external experience to the individual. It is an intriguing viewpoint, assigning luck to individual perception.

Across each of the year-levels there was evidence of understanding in the answers. The fundamental categories of cash/account, physical, and nature/climate were suggested by Years 11 and 12. Family/companions was a general category that Year 10 and 11 concurred on. There were, additionally, clear contrasts at every one of the year-levels. Year 12s discussed "being enthusiastic, mental, profound, and professional classes", while Year 11s included "illegal intimidation". The Year 10s minimally engaged, but suggested all shapes and sizes of chance events as categories that were reliant upon the "person's viewpoint of event". The Year 11 group showed indications of maturity when it came to this topic. They were all able to participate in the debate and provide a variety of relevant examples to support their viewpoint. However, there were hints of uncertainty among the Year 10 and 12 groups concerning the interpretation of this question.

When discussing people seeing chance events in a negative light, the Year 11 group were able to participate in the discussion and provide a variety of examples to support their points. The Year 10 and 12 groups, on the other hand, showed signs of being perplexed by the question's meaning. It appears that the questions that elicited the greatest responses were those to which the participants could connect the most from personal experience, whereas those that elicited the fewest responses may have been beyond the participants' experience.

Figure 7. 4

Percentage of total verbal contributions to the overall discussion by sex.
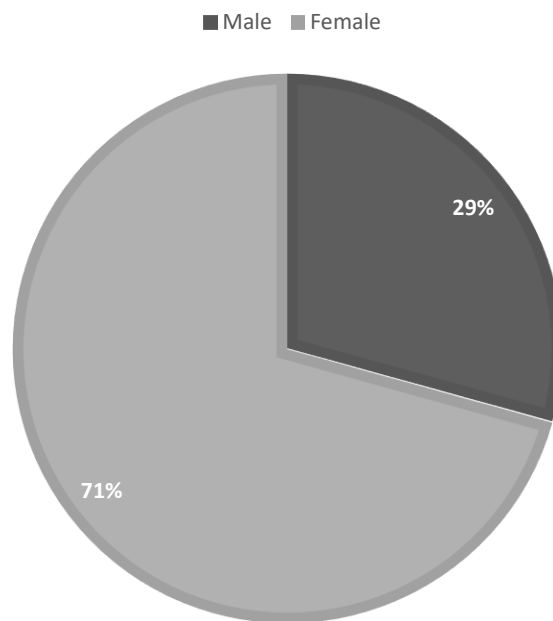
The distribution of discussion contributions based on sex, displayed in figure 7.4, indicated that female participants were responsible for the majority of the discussion, contributing 70.7% of the overall conversation. In contrast, male participants made up 29.3% of the total discussion. These findings highlight a significant disparity in the level of participation within the focus groups. The higher percentage of female contributions suggests a greater willingness or inclination among female participants to actively engage in group discussion. However, the 3 focus groups did contain 33% more female students that male which inevitably gives them the greater likelihood of speaking more. It is vital to acknowledge and address this sex imbalance to ensure that all voices and perspectives of participants are equally represented. However, this was not the focus of Study 4 and, as such, no definitive conclusions can be drawn from this result, and further research would be required in order to do so. Future research could investigate the underlying factors contributing to this sex disparity and implement strategies to encourage and foster equal participation from both male and female participants in group discussions.

Table 7. 12

Individual verbal contributions to the discussion.

Female Participant	Year 10	Year 11	Year 12	Male Participant	Year 10	Year 11	Year 12
1	30	26	25	1	14	13	17
2	21	24	16	2	12	7	14
3	16	13	15				
Total	67	63	56		26	20	31

Note. Number of individual responses, discounting group consensus responses.

Table 7.12 displays the number of individual verbal contributions made to group discussion, which does not include group consensus responses. Female participants consistently made a greater number of contributions than their male counterparts at each year-level, indicating that they were the most talkative and responsive participants. This is consistent with previous studies, such as Onnela et al., (2014), where "…women talked significantly more than men, except in groups of seven or more people when men talked more" (p. 4). In the present study each group consisted of five participants.

Figure 7. 5

Thematic map presenting the main sub-themes in relations to one another.
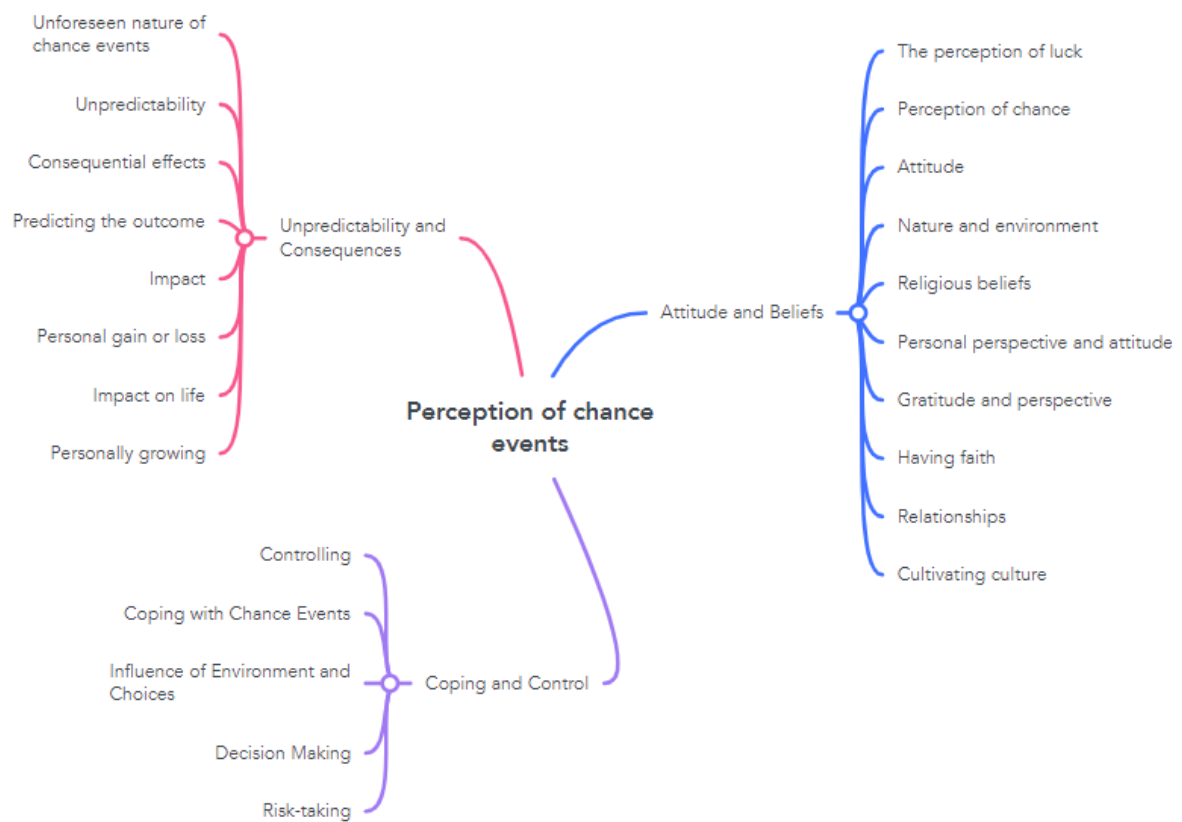
As displayed in Figure 7.5, three main themes have emerged from analysing the combined transcripts from all three year-level- focus groups. The three main themes which have been identified presented in an indiscriminate order of significance, were: unpredictability and consequences, attitude and beliefs, and coping and control.

The theme of unpredictability and consequences demonstrates that participants recognised chance events as inherently unpredictable and acknowledged the potential consequences that may follow. "Chance can be unpredictable, it has many different outcomes" (F2Y11), "Like significant consequences either good or bad" (F2Y10). This awareness underscores the importance of preparedness and adaptability when faced with uncertain circumstances. Understanding this perspective can help educators and policymakers develop strategies to enhance participants' career resilience and capacity to navigate unexpected situations.

The theme of attitude and beliefs elucidates the role of participants' attitudes and beliefs in shaping their responses to chance events. "I don't think that there is such a thing as an unlucky person, because I guess, again it comes to your attitude, the way you view some things, if you have a car accident, you can't pay your bills, and then you get kicked out of your house, and all of that, yes it sounds like a lot of bad luck, but you know you can always, you can always find positive in any situation at all, even the worse situation" (F3Y11). Participants' perceptions of chance may be influenced by their underlying beliefs about luck, fate, or personal agency. "I think, we see it in a different way, as well a majority of us are Christian, we see it as part of God's plan, that this happens in our life, rather than a chance or a luck, like, later, after chance event it probably happen, we thank God, care in our life, but I don't think I see those chance events, sort of as a chance, I just think it's part of the broader plan" (F2Y10). Recognising the impact of these subjective interpretations can guide educators in fostering positive mindsets and empowering participants to approach chance events with optimism and a proactive mindset.

The theme of coping and control emphasises the strategies participants suggested to utilise in order to cope with chance events and regain a sense of control. "I think, we also see chance events that we think about negatively, because we can't control it, other than plan events we can, and figure it out what we want" (F2Y10). Participants suggested adopting various coping mechanisms, such as seeking social support, utilising problem-solving skills, or reframing their perspectives. "I reckon, it's a character thing, to be able to handle it, and cope with it, and see a different light, and positively kind a thing" (F1Y10). Understanding these coping strategies enables educators to provide targeted support and resources to participants, helping them effectively navigate and manage the challenges that arise from chance events.

7.7   Limitations of Study 4

The efficacy of each focus group may have been impacted by the competence, disposition, and the participants' familiarity with the facilitator, as

well as their level of awareness, or lack thereof, regarding any potential predispositions.

The cohort of focus group participants comprised solely of participants who had undertaken Studies 1, 2, and 3, thereby having prior exposure and experience in responding to inquiries analogous to the expanded queries posed by the focus group stimuli.

The investigation of whether the differences in the quantity and nature of contributions are influenced by variations in individual maturity levels or by age disparities across Years 10, 11 and 12 is beyond the scope of Study 4, but could provide possible explanations for variations.

Participant numbers, may have limited the diversity of perspectives and experiences represented in discussions. With only limited individuals involved, findings may fail to capture all of the opinions and insights available from a larger sample size, leading to potential lack of generalisability that fails to fully represent views and experiences from an entire population.

7.8   Conclusion

Study 4 consisted of three year-level-specific focus groups, facilitated identically, utilising the same 10 stimulus questions. The study aimed to deepen the understanding of how young people perceive chance events and opportunity awareness. All three focus groups were conducted following the completion of Study 3 and aimed to provide further insights into the research questions.

It would appear that the questions that generated the highest number of comments were those that resonated most with participants based on their own experiences. Conversely, questions receiving fewer comments may have been beyond the participants' comprehension level. It is possible that the variations in the quantity and nature of contributions can be attributed to age differences among the three groups, from their particular life experiences or they might be attributed to variances in individual maturity levels. While striving for acceptance among their peers, participants engaged in discussions where they shared their ideas, emotions, perceptions, and viewpoints with others who were also expressing their own thoughts and

opinions. However, the researcher observed from various group discussions that certain participants' attention was divided between fitting in and expressing their opinions on the topic, leading to a loss of focus being observed.

Overall, participants perceived luck as a favourable occurrence, while chance was seen as more adverse and arbitrary. Some attributed luck to divine intervention, while others rejected the concept entirely, attributing events to a larger design. Luck and chance can have both positive and negative outcomes and are not always distinguishable. Additionally, luck and chance can be socially constructed, as seen in the comment about "luck cards" in Monopoly.

As participants categorised chance events, four sub-themes emerged: impact, personal gain or loss, life impact, and nature/environment. Participants identified chance events by severity; associated positive events with personal gains and negative ones with future losses; recognised life impact from different aspects; and events beyond human control that related to nature/environment.

Findings suggest that participants perceive chance events as predominantly negative, as these disrupted their plans and sense of control over their lives. Control was highlighted with individuals wanting authority over their lives and events, while an absence of it contributed to pessimism towards chance events. Participants tended to attribute positive outcomes of negative experiences more readily as luck rather than predictability - an aspect they disliked in chance events that often led to fear and uncertainty.

Participants noted, in general, that how they perceived chance events affected how they felt about these experiences and whether they were positive or negative. Unpredictability proved particularly influential on participant interpretation of random events, with life experience also playing a critical role. Participants discussed hard work being necessary for achieving positive results, which led them to perceive chances events as more likely having negative outcomes, while hard work leads to positive ones.

Participants summarised the impact of personal perspective and attitudes on how people perceive and react to chance events. Positive

thinking can help you see the blessings or opportunities in unexpected situations. Participants' opinions on chance events were influenced by their religious beliefs, especially the Christian faith. Participants expressed their belief that all things happen for a purpose and that even difficult situations can lead to blessings in the future. Everyone agreed that everyone has both positive and bad experiences in their lives. How people react to these events will determine how they perceive luck. Perspective and gratitude were stressed. Even in difficult circumstances, being grateful can alter one's response and perception to random events. A positive outlook will help you identify blessings and opportunities in unexpected situations.

When considering the possibility of avoiding chance events, participants unanimously agreed that chance events are unavoidable and perceived them as unexpected and beyond control. Coping mechanisms included mental preparedness, positivity, flexibility, and standing up for beliefs. Environmental factors and personal choices were recognised as influencing the likelihood of certain events. Religious beliefs were also mentioned, viewing chance events as part of God's plan. Personal experiences shaped perspectives and highlighted the importance of mental preparation and a positive attitude.

Mitigating the consequences of chance events, participants recognised the significance of their perception and attitude toward chance events, with an awareness that these may serve as opportunities rather than being exclusively negative experiences. Participants developed strategies to exert some degree of control over unexpected events, such as being an experienced driver, living at home and practicing flexibility - although certain consequences, like injuries, may remain unavoidable. Coping with chance events was discussed, with participants emphasising the value of adaptability and being flexible to help navigate unexpected changes. They considered how individual decision-making and responsibility can either exacerbate or mitigate consequences caused by chance events.

Participants conversed that probability and possibility are connected. Participants also realised that increasing the probability of an event does not guarantee it. They explored the impact of decisions on the probability of

random events, and examined how conscious decisions can affect the probability of such events. Participants considered their personal responsibility for risk-taking behaviours. They also asked whether chance events can be planned and, if so, if the uncertainty was high. Extreme sports were used as an example of how planning and preparation coexist with risk and uncertainty.

Participants saw the potential to gain advantage, opportunity, or benefit from chance events by maintaining a positive attitude and seeking opportunities within them. They recognised the chance events as catalysts for personal growth and self-improvement. They acknowledged the impact of chance events on relationships, using them to forge connections and create opportunities. Some participants also mentioned how their faith provided comfort and a broader perspective, enabling them to find positives in chance events.

The findings from Study 4 suggest that participants of both sexes and all year-levels perceived chance events through three lenses: unpredictability and consequences, attitude and beliefs, and coping and control. This study will add to the existing pool of knowledge regarding the interpretation of chance events, benefiting the fields of career education/development, student wellbeing, and academic performance. Additional exploration in this domain could delve into the precise elements that shape participants' interpretations of chance, and investigate the enduring impacts of these interpretations on their personal and academic paths. Study 4 has emphasised the significance of contemplating chance events within the framework of participants' lives and educational journeys. By acknowledging the roles of unpredictability, attitudes, beliefs, and coping mechanisms, educators can develop more targeted and effective career education interventions. Also, career advisors can better support students in developing resilience, adaptability, and a proactive approach to navigating chance events throughout their educational journeys and beyond.

The upcoming and final Chapter (Chapter 8) presents a synthesis of the essential research findings. It serves to address the research questions and objectives with clarity, elucidate the primary contributions made by the

study, critically assess encountered limitations and drawbacks, and propose recommendations for future research endeavours. Chapter 8 essentially outlines the significant outcomes of the overall research investigation while acknowledging areas that could benefit from improvement, and it offers insights for potential directions to pursue in further investigations.

CHAPTER 8: DISCUSSION AND CONCLUSION

"Deliberately disrupting predictable patterns keeps things fresh and allows for creative new solutions. It demands that we can adapt to changing circumstances. To live is to move. To move in ways that allow new and unpredictable patterns to emerge is to live fully" (Bright, 2023, para. 8).

8.1 Introduction

The COVID-19 pandemic has had a profound impact on various aspects of our lives, including career education and career resilience. During the pandemic, traditional methods of career education, such as in-person workshops and job fairs, were disrupted or cancelled altogether (Al Moosawi et al., 2021). However, this crisis also created new opportunities and highlighted the importance of adaptability and resilience in navigating the ever-changing job market. As we move forward, it is crucial for individuals to embrace career education platforms and online networking opportunities to enhance their skills and currency on industry trends (Akkermans et al., 2020). Additionally, it is recommended educators and practitioners collaborate to develop strategies to prepare students for career shocks. By leveraging the lessons learned from the pandemic, career education and resilience can be reimagined to better prepare individuals for future challenges. Ensuring digital literacy and equitable access to resources will be essential in promoting career education and resilience post-COVID. Furthermore, the pandemic has highlighted the need for ongoing feedback and communication between educators and learners to understand the impact of these changes on personal and professional lives. It is important to recognise the systemic barriers, such as disparities in digital literacy and access to resources, that were exposed by COVID-19. Overcoming these barriers require flexible approaches to instruction and curriculum objectives in both academic and practice settings (Moosawi et al., 2021). To thrive in the post-COVID job market, individuals must prioritise not only acquiring new skills but also developing resilience and adaptability.

The purpose of the overall research investigation was to investigate the perception of chance events among students aged 10 to 20, enrolled in an independent school in regional Victoria, Australia. This Chapter serves as a conclusion to the thesis, wherein the research findings are discussed, recommendations are provided, and the main research question, "How do adolescents perceive chance events?" answered by explicitly addressing each of the research sub-questions derived from the literature review (see Chapter 2). The research sub-questions that have directed the study design are:

1) How do adolescents construe the nature and structure of a chance event?

2) Is there a meaningful taxonomy of adolescent chance events?

3) How do adolescent perceptions of chance events relate to their opportunity awareness?

The research consisted of four studies. This included a mixed methods design and was conducted in two phases. The quantitative phase consisted of Studies 1, 2, and 3. The qualitative phase (Study 4) consisted of three year-level-specific focus groups.

This Chapter begins with a refresher on the research design (see Section 8.2), followed by a comprehensive view of the research outcomes, presented by summarising and reviewing the findings obtained from all four studies. This synthesis highlights the key insights from each study, offering a holistic perspective on the research findings (see Section 8.3). By addressing the research questions directly, this Chapter leads to explicit understandings of how chance events are perceived by participating students (see Section 8.4).

The final section of this Chapter presents the limitations of the research investigation (see Section 8.5) and explores potential avenues for further investigation for research, counselling, and educational interventions (see Section 8.6). It emphasises the necessity of continued investigation in recognition of an ever-evolving field with new insights emerging sporadically.

As we progress forward with knowledge advancement and practical applications, it is important to acknowledge future directions. The thesis concludes with final reflections offered by the researcher (see Section 8.7).

8.2 The Research Design

This research design engaged with certain philosophical and methodological viewpoints. Ontology is approached from a realist viewpoint, which acknowledges the existence of an objective reality that exists independent of human perception. The realist viewpoint aligns research design with the understanding that external factors influence career development, and seeks to uncover truths and phenomena relevant to the topic. A stance of epistemology of objectivism highlights the possibility for knowledge to be acquired through objective measurement and empirical observation. This perspective recognises the importance of gathering reliable and valid data to gain a better understanding of the subject. The studies employ an objectivist approach to epistemology in order to provide empirical evidence and objective insight that will contribute to the body of knowledge on career development.

This research promoted rigorous methods advocating three of the studies with methods based on scientific principles. The first three studies adhered to a positivist framework to detect and identify patterns and draw general conclusions about the complex perceptions of adolescents. It promote rigorous methods to facilitate the discovery of generalisable information and establish causal relationships, and adopts methods that are based on the use of scientific principles. The fourth study, with a qualitative approach, enabled validation and further insights about the complexities involved in how participants perceive chance events.

In line with the theoretical framework, mixed methods research was used, which incorporated both quantitative and qualitative approaches. Mixed methods allowed for a deeper exploration of the topic as it combined quantitative data with qualitative insights. Quantitative survey questionnaires allowed for the collection of structured information from participants. The thesis data were then analysed statistically, and trends identified. Focus groups allowed for a more in-depth exploration and analysis of participant

perspectives, stories, and experiences. The exploration of their perspectives helped to better understand the complex nature of adolescents' perceptions about chance events.

Participant selection was based on a convenience sample. The research design used survey questionnaires and focus group data collection strategies to examine the participants' perception of chance events. The surveys and focus groups included diverse perspectives, allowing for comprehensive data analysis.

8.3   Summary of the Studies

8.3.1 Study 1

Study 1 focused on exploring participants' perceptions of chance events in an open-ended manner, aiming to comprehend their thoughts with little to no prompting. By comparing these perceptions across different year groups, the study investigated whether there were variations based on this prompting factor. Understanding the prevailing thought patterns of participants is crucial for designing effective classroom interventions that can enhance their educational progress. The study by Galindo and Newton (2017) emphasises the significance of comprehending chance events and their role in career development. Additionally, this can give participants an enhanced decision-making capacity when confronted with a chance event.

To examine participants' perceptions of chance events, the study employed various techniques. Firstly, participants were asked to generate words associated with chance events. Secondly, to capture participants' personal experiences of chance events. Finally, they were tasked with creating narratives that depicted possible chance events occurring during their job search, enabling them to reflect on and analyse these narratives.

Study 1 involved participants from Years 6 to 12, and alongside basic demographic information such as age, sex, and year-level, it consisted of four questions (refer to Appendix J). The questions were: 1) Identify four or five words that come to mind when you think of chance events. 2) Have you encountered any chance events that have had a significant impact on your life? 3) How many chance events can you recall that have had a significant

impact on your life? And 4) Provide three examples of different chance events that could occur when you are working or looking for work.

Results suggest that participants demonstrated their capacity to identify chance events within careers by being able to recognise such instances themselves and provide relevant examples. At all year-levels there was an increased and consistent generation and reporting of high-control chance events across participants' lives, suggesting an improvement in their levels of self-efficacy and understanding of agency among them. Participants with an enhanced level of agency suggests that they are cultivating a more robust understanding of their self-determination, independence, and confidence in their ability to navigate and excel in their academic pursuits (Starke, 2021). This positive development is viewed as encouraging because, when participants possess a stronger sense of agency, they tend to participate actively in their educational journey, establish and attain objectives, and make decisions that align with their educational ambitions. Consequently, this can result in better academic performance and increased satisfaction with the overall learning process (OECD, 2019). Regardless of age, participants reported the existence of chance events that have had an influence on their lives to date. Additionally, there was no significant variation between educational stages when reporting such chance occurrences - three quarters reported experiencing at least one such incident while 24 percent did not recall experiencing any at all.

An ANOVA was conducted to evaluate the impact of sex in the study, revealing that females were significantly more inclined than males to report positive and negative chance events in response to Question 1, but this distinction was not significant for Questions 2, 3, or 4.

These findings expand upon previous work conducted by Bright, Pryor and Harpham (2005); Bright, Pryor, Wilkenfeld et al. (2005); and Bright, Pryor, Chan et al. (2009), highlighting the need to consider chance events carefully when developing career pathways, while at the same time understanding their nature (Bright, Pryor, Chan et al., 2009). The expansion of this research contributes to understandings about adolescents and their levels of agency

and participation in their educational journey aligning in their academic performance, with a strong recognition of chance events in their lives.

8.3.2 Study 2

Study 2 aimed to understand the prevailing bias towards negativity and impact when participants think about chance events. Previous research (e.g., Bright et al., 2005, 2009; Chen, 2005) has shown that participants tend to recall negative events, such as losses or injuries, more effectively than positive events, like finding money. This bias is concerning because, if people default to negativity, they are less likely to embrace chance events or intentionally increase their chances of experiencing them. Where we focus our attention is a major challenge with negativity bias. We may start to overcome the imbalance of negativity bias by focusing more of our attention on the good things that happen to us and how we feel (Moore, 2019). Approaches to career exploration, such as Chaos Theory of Careers and Happenstance Learning Theory, emphasise embracing chance, making this bias potentially detrimental to their effectiveness.

Study 2 explored participants' ability to identify chance events in realistic scenarios and examined their attributions of personal relevance to such events. It addresses questions regarding participants' identification of chance events based on their nature, impact, and valence. The findings may have implications for interventions that encourage embracing uncertainty and unexpected events in career development. Given the complexity of the scenario presented, Study 2 engaged participants in Years 8 to 12 exclusively.

Results reveal that participants in Years 8 to 12 demonstrate the ability to identify chance events when presented in relatable scenarios. There is a consistent bias towards recalling negative events, aligning with the findings of Bright et al. (2005a; 2005b), Bright et al. (2009). Additionally, regardless of event valence, most participants believe that chance events are more likely to happen to others rather than themselves (Harris et al., 2008; Harris & Hahn, 2011).

The order of chance events within the scenario does not appear to influence participants' recall of the least obvious chance event. Some participants showed confusion by listing events that were not considered chance events, while others initially denied the presence of chance events but later recognised them.

The results demonstrated that the ability to recognise chance events improves with higher educational levels. These findings raise the question of whether younger participants lack conceptual understanding or if older participants possess a better appreciation of chance events due to greater life experience and knowledge. If conceptual understanding is lacking in younger participants, it has implications for career education interventions. However, if it is a matter of exposure, early interventions emphasising chance events may be highly beneficial in familiarising younger participants with the prevalence of chance and happenstance in the world of work.

8.3.3 Study 3

Building upon the findings of Study 1 and Study 2, Study 3 aimed to further investigate the default bias of participants towards negativity and impact-fulness in relation to chance events. Study 3 explored two areas, once again building on the findings from Studies 1 and 2. Study 3 explored participants' comprehension of eight dimensions of opportunity awareness, such as flexibility, persistence, and self-efficacy, which are key for developing a comprehensive career education program. Additionally, Study 3 examined how participants identify and categorise chance events by presenting plausible vignettes. The study contributes to understanding how young people perceive chance events and their awareness of opportunities. Study 3 involved participants in Years 10, 11, and 12 only, and consisted of a total of 93 questions.

Persistence and Optimism were rated high in terms of importance, while Luck was considered least important. Curiosity, Risk, and Luckiness were seen as relatively unimportant. Curiosity's importance declined from Year 10 to Year 11, but overall rankings remained stable.

Though participants recognised all elements as important, only about one third accurately identified two chance events in each scenario. Identifying the correct number of chance events showed no consistent pattern. Participants lacked confidence in understanding chance events, emphasising the need to improve their recognition of unplanned occurrences.

Year 10 participants identified more negative chance events, while Year 12 participants identified more positive ones. Positive chance events were associated with social interactions, while negative events related to family. Similar patterns emerged when recalling chance events happening to others.

Participants who accurately identified chance events scored higher in optimism and overall chance event identification. However, more research is needed to establish the definitive relationship between Optimism and accurate identification.

A non-significant trend indicated participants reporting negative chance events had lower levels of opportunity awareness.

Persistence and Optimism are vital for career success (Cullen, 2023). Participants' understanding of chance events and their impact on career paths requires improvement. Enhancing participants' recognition of chance events and their outcomes can better prepare them for the uncertainties of the job market – see Recommendation 1 and 2 (Section 8.6).

8.3.4 Study 4

Empirical research has primarily concentrated on the career chance experiences of young adults instead of older adults and professionals (Kim, 2021). Most quantitative studies have collected data from college participants, making them the most widely studied group. However, no qualitative research has been conducted on younger participants. Since the perceptions and experiences of these younger individuals regarding career chance events could offer valuable insights into career education and vocational guidance, exploring their viewpoints becomes crucial (Kim, 2021). Therefore, the summary of Study 4, which follows below, is slightly lengthier compared to the summaries of Studies 1, 2, and 3 presented above.

Study 4 was designed to improve our understanding of young people's perceptions and awareness of chance events. Themes developed during the coding analysis of the combined transcripts were from all three focus groups. The three main themes which emerged were: unpredictability and consequences, attitude and beliefs, and coping and control.

Focus groups were conducted among senior school participants from Years 10, 11 and 12. The focus groups were arranged according to the participants' year-level. Focus groups were conducted following the completion of the questionnaire-based studies (Studies 1, 2, and 3). They were designed to give further insight into the research questions (see Chapter 2).

Each focus group was asked the same 10 questions derived from the research questions, which were used to guide the discussion. Each focus group was designed to explore the perspectives of participants on chance events, opportunity awareness, and their understanding in these areas. This study's findings may have significant implications for educators who want to improve students' ability to recognise and take advantage of opportunities.

Findings indicate that certain questions generated more comments, indicating resonance with participants, while others received fewer comments, possibly due to comprehension difficulties. Age differences and individual maturity levels may have contributed to variations in contributions. Participants engaged in discussions to share ideas, emotions, and viewpoints, but some struggled with balancing peer acceptance and self-expression, leading to a loss of focus.

The concept of luck and chance was examined, with participants perceiving luck as favourable and chance as adverse and arbitrary. The distinction between the two was not always clear, and social constructs like "luck cards" in Monopoly influenced perceptions. Participants categorised chance events into themes like impact, personal gain or loss, life impact, and nature/environment. Chance events were predominantly seen as negative, disrupting plans and control over life. Control and authority were desired, and positive outcomes of negative experiences were more readily attributed to luck than predictability. The implications of this finding underscore the

intricacy of human perceptions and ascriptions in relation to chance and luck. It indicates that cultural influences and predispositions have the capacity to meld individuals' interpretations and reactions to chance events in their lives, and may affect their mental health, decision-making, and coping strategies. It may be beneficial for individuals, educators, and policymakers to grasp these implications so as to foster logical reasoning, resilience, and a sense of individual accountability.

Participants' interpretations and attitudes towards chance events were influenced by their perspectives, religious beliefs (especially Christianity), and gratitude. It appears that many participants believe that all things happen for a purpose and that difficult situations can lead to future blessings. Chance events were considered unavoidable and beyond control, but participants suggested coping mechanisms like mental preparedness, positivity, flexibility, and religious faith to help mitigate their consequences. The implication of participant perspectives could also lead some participants to relinquish a sense of control over their lives, attributing events solely to fate. Understanding these influences is crucial for educators and policymakers to foster a supportive environment that respects diverse perspectives and encourages critical thinking while helping participants build a balanced and adaptable mindset.

Participants recognised the importance of perception and attitude towards chance events, and the need to develop strategies to exert control, adapt, and navigate unexpected changes. Probability, decision-making, and personal responsibility for risk-taking behaviours were also explored.

The findings from Study 4 may contribute to the understanding of participants' interpretation of chance events, such as viewing luck positively and chance negatively, associating luck with divine intervention or larger design, while considering chance events beyond human control. Chance events are seen as disrupting plans and control, but positive thinking and gratitude can shape their perception. Coping mechanisms involve mental preparedness and flexibility, as chance events are unavoidable. Participants recognised that perception and attitude can turn chance events into opportunities. Probability and possibility are linked, and planning does not

guarantee outcomes. Chance events can lead to personal growth, positive relationships, and favourable outcomes. Such understandings will benefit career education/development, participant wellbeing, and academic performance. Educators can use this knowledge to develop targeted interventions and support participants in developing resilience and adaptability in the face of chance events throughout their educational journeys and beyond (see Recommendation 1 and 2, Section 8.6).

8.4   Research Questions Addressed

8.4.1   Research Question 1

How do adolescents construe the nature and structure of a chance event?

The literature review demonstrates the presence of chance events, but indicates a limited amount of empirical research in this area. Some theories, such as Accident Theory (Crites, 1969), Change Theory of Vocational Selection (Osipow, 1983), and the Chaos Theory of Careers (Pryor & Bright, 2003a, 2003b, 2011), recognise the influence of chance events on career decision-making. However, the significance of chance events in shaping an individual's career has been undervalued, with limited attention given to understanding their role beyond concepts like happenstance and planned happenstance. Defining and studying chance events with consensus is challenging, as they are rarely discussed and lack clear definitions.

Chance events are referred to in various fields of social sciences, such as non-normative events in life-span psychology (Baltes, 1987), life events in stress paradigm (e.g., Brown & Harris, 1989), turning points in life course sociology (Hareven & Masaoka, 1988), and fortuity or serendipity in counselling psychology (Williams et al., 1998), among others. Behaviourists emphasise the interpersonal nature of chance events (Bandura, 1982; Munn, 1983). Shanahan and Porfeli (2006) outline four defining features for a chance event to be considered causal or influential, including being unlikely, causal, unintended, and warranting explanation. Despite the difficulty in defining chance events, various terms have been used to explain the concept, such as chance, serendipity, happenstance, and synchronicity, all referring to

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unplanned, accidental, or situational events that impact career development and behaviour.

Scholars such as Miller and Form (1951), have noted the role of chance in career decision-making, emphasising its influence as many occupational choices occur by accident. Laymen also accept this explanation for vocational choices; researchers such as Caplow (1954), Brayfield (1964), and Crites (1969) also acknowledge its impact in their own decision-making processes.

Existing research primarily focuses on understanding how individuals perceive the effect of chance events on their career decisions; however, quantitative empirical research examining how various factors such as age, socio-economic status, and personality traits might influence these perceptions is scarce. Hirschi's (2010) study discovered that socio-demographic variables and personality characteristics, such as openness and locus of control, significantly impacted individuals' perceptions of chance events. Individuals who perceived an increased influence from chance events were less likely to observe an alignment between their current vocational education and original desires for vocational study.

Research results indicate that participants in Grade 6 through to Year 12 inclusively, regardless of their year-level, tend to generate more negative chance events and those with less control (e.g., car accidents). The findings consistently showed a bias towards reporting negative chance events, aligning with previous research.

Regardless of age or year-level, participants predominantly report low-control chance events. Female participants report more chance events, both positive and negative, following a similar pattern (see Chapter 4, Figure 4.2). Most participants had experienced impactful chance events in their lives so far (see Chapter 4, Figure 4.3). Overall, the results indicate a strong inclination among participants to suggest negative chance events rather than positive ones. The importance of promoting a positive mindset is recognised (Limeri et al., 2020), hence careers educators face the challenge of shifting students' perceptions of chance events. It is noteworthy that there is a consistent increase in the reporting of positive chance events as participants grow older

and gain more experiential understanding. This may be attributed to their increasing maturity and decision-making abilities in both planned and unplanned situations.

Results for participants in Years 8 through to Year 12 inclusively indicate that the capacity of participants to recognise chance events in each scenario remains consistent regardless of their year-level or sex. A majority of the sample (94%, N = 103) reported successfully identifying a chance event within the presented scenario.

The capacity of participants to accurately identify chance events present is not extraordinary. As depicted in Figure 5.4, the most prevalent response from the sample indicated that there were five chance events present in the scenario, accounting for 28% (N = 30) of the participants. However, according to the design and panel confirmation, there were actually six chance events in the scenario, resulting in only 14% (N = 15) of participants accurately identifying the correct number. Figure 5.5 demonstrates a trend suggesting that, as participants' progress through the year-levels, their ability to recognise the correct number of chance events appears to improve with increased age and maturity.

When contemplating the most obvious chance events contained within the scenario presented, there is an inclination to recall and report the chance events which are negative in nature (74.5%) as opposed to ones that are positive in nature (25.5%). For example, the greatest number of participants (40%, N = 44) identified the 'car accident' as most obvious chance event. There was an overall bias towards the reporting of chance events as unlikely to happen to them, with a perception that it is more likely to occur to other people rather than themselves.

When contemplating the least obvious chance event contained within the Study 2 scenario, 'Bumping into a defence force recruiter' was considered the least obvious by 26% of participants (N = 28), making it the most frequently identified event. In terms of career education, this particular study highlights the significance of this event, as it is the only one explicitly connected to careers despite being perceived as the least obvious. It is possible that participants are adept at recognising chance events like motor

vehicle accidents that have minimal or no immediate relevance to careers. The findings suggest that while chance events are generally understood and acknowledged, there may still be a lack of recognition regarding the importance of chance events related to careers.

Participants who recalled a negative chance event as the least obvious perceive it as more likely to occur to someone else rather than themselves. Similarly, participants who recalled a positive chance event as the least obvious also believe that it is more likely to happen to someone else and not to them personally. Therefore, regardless of whether participants recall a negative or positive chance event as the least obvious, their belief remains consistent that it is more likely to happen to someone else rather than themselves.

The remainder of this section is dedicated to results found for participants in Years 10, 11 and 12 exclusively. They identified a total of five elements of a chance event, which are unpredictability, lack of control, risk, luck – both positive and negative – and significant consequences – also either positive or negative.

Participants indicated that their negative perception of chance events stems from feeling a lack of control over them, which can be attributed to the natural inclination of these participants to prefer a well-planned life where events unfold according to their desires. Consequently, any interference, whether minor or significant, with these carefully crafted plans tends to elicit a negative perception.

Life experiences have played a crucial role in shaping participants' perspectives on chance events. These experiences have exerted an influence on whether participants perceive such events as positive or negative. During discussions, participants expressed their belief that positive outcomes can only be attained through diligent effort, thereby leading them to associate chance events with negative outcomes, while attributing positive outcomes to hard work (Musu-Gillette et al., 2015; Rakhshani et al., 2021).

When discussing the possibility of circumventing chance events participants unanimously recognised the inevitability of chance events, viewing them as unexpected and uncontrollable aspects of life. They

emphasised coping strategies like mental preparedness, maintaining a positive attitude, flexibility, and standing up for one's beliefs. Individual responsibility and creating a supportive environment were deemed important. Participants acknowledged the impact of the environment and personal choices, understanding the role of good driving skills and avoiding risky situations in mitigating certain incidents. They also mentioned religious beliefs, seeing chance events as part of God's plan or fate. Personal experiences, such as car accidents and natural disasters, shaped their perspectives, emphasising the need for mental readiness and a positive mindset.

Participants expressed the importance of perception and attitude towards chance events, viewing them as both opportunities and challenges, when considering mitigation or alleviation of the consequences thereof. They explored strategies to exert some control over these events, such as safe driving and staying at home. Maintaining flexibility and optimism were also highlighted. However, they recognised that certain consequences may still be unavoidable, such as injuries. Coping strategies emphasised adaptability and embracing unexpected changes. Participants reflected on the role of personal decision-making and responsibility, understanding that their choices can impact the outcomes of chance events.

Participants acknowledged the potential to increase the likelihood of chance events, but recognised the impossibility of deliberately causing them. They proposed strategies such as decision-making and creating specific scenarios to enhance probabilities. However, they also conceded that chance events remained inherently unpredictable and random. Even with increased opportunities, winning a lottery, for instance, remained uncertain.

Participants also acknowledged the potential to gain advantages or benefits from chance events. They discussed the importance of maintaining a positive outlook to find silver linings, in adverse situations. Participants recognised the potential for personal growth and saw chance events as opportunities for learning, development, and self-improvement. They also highlighted the impact of chance events on relationships, noting how certain events can foster stronger connections. The role of faith was mentioned, with

participants expressing how it provides comfort, support, and a broader perspective to find positives in chance events.

Congruent with similar studies (Betsworth & Hansen, 1996; Bright, Pryor, Wilkenfeld et al., 2005; Hirschi, 2010), no consistent significant gender differences occurred in perceived chance events.

Overall, the participants of the overall research investigation tended to perceive chance events as events that are more likely to happen to someone else before it happens to them, often with a negative bias and limited control. However, as they grow older, their understanding and recognition of both positive and career-related chance events tended to improve. Educators can play a crucial role in shifting participants' perception of chance events towards a more positive and proactive mindset. These points are reflected in Recommendations 1 and 2 (see Section 8.6).

8.4.2 Research Question 2
Is there a meaningful taxonomy of adolescent chance events?

The literature review indicated that research on chance events in career development has explored various aspects, such as incidence, attribution, diverse populations, event categories, multiplicity effects, and dimensionality. Krumboltz (1979), identified environmental conditions and events as a category that influences career decision making, encompassing unplanned factors resulting from social, cultural, political, economic, or natural forces. Bright et al. (2009) conducted three studies investigating chance events, revealing the influence and control levels of different categories, the prevalence of single and multiple concatenated chance events, and the perception that such events have greater influence when connected, particularly for negative outcomes. Another study by Betsworth and Hansen (1996) focused on serendipitous career development events, identifying 11 categories through critical incident analysis, including professional connections, unexpected advancement, and right place/right time. Although there is no widely accepted taxonomy for adolescent perceptions of chance events, approaches such as locus of control and attributional style shed light on how individuals attribute life outcomes to internal or external factors, with

other dimensions including beliefs about randomness, luck, and personal control shaping adolescents' views on chance events.

There were 11 categories of chance events, specifically developed for use in this research by an expert panel. This panel consisted of two academics (the progenitors of the Chaos Theory of Careers) and two experienced career practitioners. The 11 categories are Physical, Health, Family, Education, Environmental, Financial, Relational, Spiritual, Social, Travel, and Employability.

When asked to classify chance events into different categories, participants had difficulty, their accuracy appeared to be no better than guesswork. The Travel category was consistently misidentified. Year 10 participants identified more negative chance events, while Year 12 participants identified more positive ones. Social interactions were important to younger participants, while family boundaries had a greater impact on older participants. When identifying chance events happening to others, Social was the most selected category. Year 10 participants recalled fewer negative chance events happening to others compared to themselves, and Year 12 participants recalled more chance events happening to others, possibly due to their exposure to the world of work. Positive chance events were associated with the Social category, while negative events were linked to Health and Physical categories, potentially influenced by terminology confusion. It is worth noting that only the Physical and Family categories had examples of neutral chance events, although this was not a significant finding. Participants were better at identifying negative chance events happening to others than to themselves.

Participants were presented with the open-ended verbal prompt: 'Can you think of a way to place different sorts of chance events into broad categories?' All groups initially struggled with responding to the question; however, participants ultimately proposed nine categories of chance events:

- Good or bad events.
- Magnitude of the event itself.
- Personal gain.
- The effect of the event on the individual.

- Wrong place, wrong time.

- Personal health.

- Financial and career.

- Nature.

- Environmental.

Reasonable examples were offered to rationalise each suggested category, except for Environmental, where none was offered. Environmental was also the only category which was identical to one of the 11 developed for use in Study 3. All participants in Study 4 also participated in Study 3.

Essentially, the available evidence suggests the possible existence of a meaningful taxonomy of adolescent chance events, and the significance of this potential taxonomy is recognised in Recommendation 9 (see Section 8.6). However, additional research is imperative to delve deeper into the nine categories proposed by the participants, as well as the 11 categories formulated and employed in the third study. Once these categories are established, educators and career development professionals will face the task of effectively educating young people to ensure the practicality and usefulness of such a chance event taxonomy. Further exploration and refinement of this taxonomy has the potential to meaningfully contribute to the field of career education and development (see Recommendation 9, Section 8.6).

8.4.3 Research Question 3
How do adolescent perceptions of chance events relate to their opportunity awareness?

The concept of opportunity awareness in the realm of career development has been around for quite some time, but there is a lack of substantial literature specifically focused on this topic. Instead, it is often integrated into other theories, such as the DOTS model (Law & Watts, 1977), "Openness to experience" as referred to by McCrae and John (1992), and Luck Readiness as discussed by Pryor and Bright (2007).

Opportunity awareness has gained attention in the field of career development, with models like the DOTS model (Law & Watts, 1977)

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emphasising the importance of facilitating opportunity awareness, self-awareness, decision learning, and transition learning in participants. The shift from linear career development to an understanding of individuals as self-organising systems highlights the need to intentionally act on changing environments and leverage past experiences while positioning for future opportunities. Overall, opportunity awareness is seen as an emergent property of human experience, influenced by various cognitive and personal factors.

Study 3 incorporated the measuring tool employed in the present research, The Luck Readiness Index (Pryor & Bright, 2005b) as the measure of participants' opportunity awareness. The Luck Readiness Index (LRI) assesses eight dimensions (Flexibility, Optimism, Risk, Curiosity, Persistence, Strategy, Efficacy, and Luckiness) which are considered useful and necessary for an individual to recognise and capitalise on chance events.

The research investigation employed a conservative approach, using a minimum Cronbach's Alpha of .65 for dimension reliability. The Strategy dimension did not meet this threshold and was excluded. The remaining seven dimensions showed acceptable reliability with minor modifications. Further research is needed to adapt the Luck Readiness Index for younger adolescents as it was initially developed using university aged participants.

An analysis looked at the relationships between various factors, including participants' comprehension of LRI dimensions, year-levels, and their ability to identify chance events. The analysis examined all possible combinations of these variables. The results suggested that participants who accurately identified chance events in vignettes scored higher on LRI subscales, particularly in Optimism. Statistical analysis showed a significant effect, indicating that, as Optimism scores decrease, participants may be less accurate in identifying chance events. However, more research is needed to draw definitive conclusions from these findings. The overall research investigation found no significant relationship between participants' reporting of chance events and their scores on the LRI scales. Correlations between LRI scores and the number and type of chance events identified were also not significant. The results of Study 3 indicated clearly that the Luck Readiness

Index, requires modification for it to be used with adolescent populations. This extends the literature on the effectiveness and qualities of the LRI (e.g., Pryor & Bright, 2005b).

From focus group discussions it could be concluded that these participants did not generally attribute luck or chance as a significant factor in their lives. Instead, a notable portion of participants viewed chance events as an integral part of a divine plan, believing that all incidents occur for a purpose. Their perspectives on chance events were influenced by their religious beliefs, particularly within the context of Christian faith. Participants expressed the conviction that everything happens for a reason and that challenging circumstances can potentially lead to future blessings. Overall, there was a consensus among the participants that no one is inherently unlucky, and individuals' reactions to chance events shape their perception of luck. This poses the question and significance of contextual perception of chance and luck in religious schools and led to the formulation of Recommendations 4, 5, 6 and 7 (see Section 8.6).

8.4.4 Major Research Question
How do young people characterise career-related chance events?

Participants regularly characterised career-related chance events as unforeseen and unplanned occurrences. Notably, they perceived these occurrences as a significant influence on their vocational trajectories. These events are perceived as instances of fortuity, rather than being the result of deliberate planning or meticulous decision-making. They are viewed as occurrences that deviate from the anticipated or expected course of the individual's career path.

Chance events were often described as having several defining features. First, they are considered unlikely or unexpected, making them stand out distinct from the ordinary progression of a career. Second, chance events are seen as causal, capable of instigating a shift or change in an individual's vocational direction. Third, they are events that call for explanation or reflection, as they are perceived as having a notable impact on one's career journey.

Participants categorised chance events into two broad categories: positive and negative. Positive chance events were perceived as opportunities that unexpectedly present themselves, potentially leading to advancements, breakthroughs, or positive outcomes in their career. Conversely, negative chance events were perceived as setbacks or obstacles that arise unexpectedly, potentially derailing the individual's career plans or causing difficulties. In terms of perception, there was a bias towards reporting negative chance events. These events left a more lasting impression, as they involved challenges, adversity, or disruptions to their career progression. This bias may stem from the natural tendency to remember and learn from negative experiences. However, as individuals grow older and gain more life experience, there was a trend towards an increased recognition of positive chance events. This shift in perception may be attributed to greater maturity and enhanced decision-making abilities, both in planned and unplanned situations. Additionally, personal experiences, such as accidents or unexpected encounters, contribute to shaping these characterisations. Overall, young people characterise career-related chance events as unexpected occurrences that hold the power to alter the course of their vocational journeys. They perceive these events as influential, whether they bring about positive opportunities or present challenging setbacks.

Insights from research findings

Age, Locus of Control and Self-awareness

Participants reported more negative chance events and those perceived as outside their control. This aligns with established psychological concepts like negativity bias, where people focus more on negative experiences, and locus of control, where a sense of control is linked to well-being.

Interestingly, females reported more chance events overall, both positive and negative. While previous research suggests women might be more sensitive to negative emotions, our findings require further exploration. Do women perceive chance events differently, or simply experience a higher frequency of them?

The association between age and reporting more positive chance events aligns with the Positivity Bias (Ackerman, 2018), where older adults tend to focus on positive aspects of life. This could be due to socioemotional selectivity theory (Barber et al, 2016), where older adults prioritise positive emotions to maintain well-being.

The ability to identify chance events highlights self-awareness. However, the bias towards reporting negative chance events implies interventions encouraging a more balanced perspective could be beneficial.

The finding that career education were the least recognised domain of chance events is intriguing. Perhaps individuals perceive careers solely as a result of deliberate choices, overlooking the role of chance encounters, opportunities, or setbacks. Future research could explore the factors influencing this perception seeking the gender disparities, if any.

The view of chance events as more likely to happen to others indicates a form of optimism bias, where people believe they are less susceptible to negative events. Additionally, perceiving chance events as external to themselves highlights the concept of external locus of control.

The view of chance events as both opportunities and challenges reflect a realistic understanding. Life experiences, even unexpected ones, can offer both growth and hardship.

The lack of significant gender differences in perceived chance events is somewhat surprising. Future studies could explore this further with larger samples or more nuanced measures of chance event perception.

These results shed light on how students identify, experience, and perceive chance events. The findings highlight the interplay of negativity bias, locus of control, age, and gender in shaping these perceptions. Future research can seek understanding as to the mechanisms underlying these relationships and explore potential interventions to foster a more balanced and adaptive approach to chance events.

Challenges of Adolescents Discriminating Chance Events

Findings demonstrated the complexities adolescents face in comprehending the stochastic nature of chance events. The struggle to categorise these

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events is evident, with inaccuracies and difficulties particularly pronounced in specific categories like travel. There is a need for targeted interventions or educational tools to help adolescents better understand the specific events that are concerning for them.

Older adolescents demonstrate a positivity bias, identifying more positive events and being influenced by family dynamics. This shift may reflect a growing sense of agency and control over their own lives. The influence of age on categorisation is intriguing. Younger adolescents seem to have a negativity bias, focusing more on negative events and social interactions. This could be due to heightened social awareness during this developmental stage.

Interestingly, the ability to categorise negative events appeared stronger when applied to others than oneself, demonstrating a need for self-awareness better emotional regulation or a distancing mechanism when faced with negative experiences. Additionally, the perspective on positive events differed across age groups, highlighting the need for age-appropriate approaches when fostering a sense of optimism and possibility in adolescents.

While the categories of chance events presented in the study, and the subsequent categorisation thereof, revealed inconsistencies and ambiguities, they also showcased the potential for a meaningful taxonomy. Despite the challenges identified, such as accuracy, specificity, consistency, and biases related to age, self-other perception, and positive events, findings point to the importance of developing a comprehensive and age-sensitive taxonomy for adolescent chance events.

Adolescent Optimism, Religious Beliefs and Luck

One interesting finding of this study is the causal link between optimism and chance event identification, raising the question of adolescent optimism. Do optimistic adolescents simply perceive more randomness in the world, or does their positive outlook lead them to attribute outcomes less to personal control and more to chance? Future studies could explore adolescent optimism by employing longitudinal designs, following adolescents over time to see if changes in optimism influence how they perceive chance events.

It is important to acknowledge the limitations of self-reported measures like the LRI. Adolescents, especially those with strong religious beliefs, might be inclined to downplay the role of luck to present a more controlled and optimistic image. Investigating alternative assessment methods that rely less on self-report, such as implicit association tasks, could provide a more objective measure of chance perception in this age group.

Results underscore the necessity for future studies to account for the heterogeneity within religious belief systems (Zysberg & Schwabsky, 2021). While the present study was set with a college with an influence of Christianity, a religion that often emphasises predetermination, other religious traditions may offer contrasting perspectives on chance and luck. While students in the sample with overt Christian beliefs emphasised a predetermined plan, other religions might hold different views on chance and luck. Future research with more religiously diverse samples could shed light on how specific belief systems influence adolescent perceptions of randomness. Additionally, it would be valuable to explore the influence of cultural factors beyond religion. Cultures with a strong emphasis on personal agency might lead adolescents to attribute more to their own control, potentially impacting chance event identification.

In conclusion, the current investigation has yielded a nuanced perspective on chance perception in adolescence. Findings highlight the potential interplay between optimism, religious beliefs, and the ability to identify chance events, suggesting a complex interplay that merits further exploration. The interplay between age, optimism, religious beliefs, and cultural contexts creates a multifaceted picture that warrants further investigation to establish more targeted career education interventions. Developing more nuanced assessment tools such as the Luck Readiness Index and exploring potential causal relationships will be crucial in understanding how adolescents navigate the world of chance and luck.

8.5 Limitations of the overall research investigation

8.5.1 Uniqueness of the individual

Every individual has their unique viewpoint on life, and situations can be subject to different interpretations. Consequently, the notion of pursuing a single objective truth becomes a distraction when examining someone's career narrative. Certain aspects of a person's life are influenced by the undeniable realities that exist (Bright & Pryor, 2014). It is important to consider the perceptions, judgments, and decisions of each individual. This is particularly pertinent as it pertains to adolescents and the context of their present reality when making generalisations.

8.5.2 Cultural characteristics

Participant perception of chance events and luck may differ considerably in non-faith-based schools. The cultural characteristics of the research site reflect a Christian college steeped with a conservative protestant worldview. This is characterised by its Christian identity and adherence to specific doctrinal beliefs. These schools tend to prioritise spiritual formation, and encourage participants to deepen their relationship with God through activities such as chapel services, Bible studies, and prayer groups. The integration of faith and learning is emphasised, incorporating Christian perspectives into academic disciplines. Strict moral standards aligned with Christian teachings are upheld, encompassing personal behaviour, dress codes, and guidelines for relationships. Community engagement and service from a Christian perspective are encouraged, along with a narrower range of theological diversity compared to more liberal or secular institutions.

It is important to note that these characteristics, i.e., the degree of conservatism, can vary among Christian colleges. However, how participants perceive chance events and luck may be very different in secular schools.

8.5.3 Sample range

The range of participants in all four studies were drawn from the same population of enrolled students, that of a convenience sample drawn from within the same single campus research site. Such a sampling method also

imposed limitations on the number of participants; as such, the relative low number of participants should also be taken into account when considering the generalisability of research results.

8.6   Contribution to the body of knowledge

The findings from this research investigation extend the body of knowledge to younger adolescents' perceptions of chance events. Recently, there has been an upsurge in research studies on chance events (Borg, 2015; Hirschi & Valero, 2017; Kim et al., 2019; Kim & Baek, 2020; Kindsiko & Baruch, 2019; Torpy, 2017), However, in the past, the research scope was constrained, and they primarily involved older participants. The Chaos Theory of Careers has been the basis for some notable studies, such as "The role of chance events in career decision making" (Bright et al., 2005) and "Chance events in career development, such as influence, control and multiplicity" (Bright et al., 2009). These studies did, however, have age-related limitations that prevented them from exploring all possible avenues, concerning age, of investigation. Only a portion of one of these research (Bright et al., 2005) included 105 high school students, with the other two studies concentrating mostly on respondents in their 20s and 30s. As opposed to older individuals and professionals, young adults have received the majority of attention in empirical study about their experiences with career opportunity (Kim, 2021). University students have been the subject of most quantitative studies, making them the subject with most research studies. However, been no qualitative study has occurred with younger adolescents. Investigating younger adolescents' perspectives is essential since the perceptions and experiences of these younger adolescents about career chance occurrences provides insightful information for career education and vocational assistance (Kim, 2021).

The present investigation contributes to the present body of knowledge as it only focused on adolescents between the ages of 10 and 20 attending a faith-based school. Firstly, the investigation found how adolescents perceived the nature and structure of a chance event (see Section 8.4.1). Secondly, it determined whether there existed a meaningful taxonomy of adolescent perceptions regarding chance events (see Section 8.4.2). Thirdly, the study

found the potential relationship between adolescent perceptions of chance events and their opportunity awareness (see Section 8.4.3). And finally, participants drew the researcher's attention to the importance of religious beliefs influencing their perceptions of chance events.

8.7 Recommendations

The findings of this investigation have implications for career practitioners and educational leaders, curriculum and policy makers, and parents/carers. The following recommendations are based on empirical findings and conclusive outcomes of the overall research investigation. They are presented without any specific order of importance or priority.

8.7.1 Recommendation 1

Incorporate Chaos Theory of Careers concepts into a formal wholistic career education.

Incorporate elements of the Chaos Theory of Careers, such as chance event recognition, continual, uncertain and non-linear change, complexity of influences, and emergent fractal patterns in careers, into a wider career education program, implemented into the Australian Curriculum as a cross-curriculum priority beginning in the Foundation years and continuing into secondary school. To incorporate these key facets would ensure adolescents can embrace uncertainty as opportunities in their career trajectories.

8.7.2 Recommendation 2

Develop an evidenced based program incorporating a chaos/happenstance informed approach to begin in primary school.

The program should systematically introduce the concept of chance contextually at the appropriate educational age and stage, and aim to graduate students who have the ability to:

- Identify chance (what are the signs/elements of a chance event?).
- Recognise the difference between positive and negative chance events.
- Appreciate the role chance can play in their own lives personally.

- Recognise the personal relevance of such an event, i.e., not something that just happens to other people.
- Identifying serendipitous events which are immediately impactful in terms of careers.

Piaget and Inhelder (1975) assert that, when it comes to chance events, children typically do not understand their random nature and often attribute outcomes to differences in behaviour. Early education would better prepare younger students for recognising opportunity amidst uncertainty.

8.7.3 Recommendation 3
Develop a micro-education program for the key influencers of adolescent career development.

Key influencers referred to are specifically Parents (carers/family) and Teachers. The findings suggest a tendency for individuals to have a stronger recall of negative chance events compared to positive ones. This observation holds implications for career education, particularly regarding how events are presented. To address this bias in an education unit contextualised for the audience and their specific interactions with the young person, it is important to strategically emphasise positive career chance events and make them more memorable to students. By doing so, positive events can have a similar impact on thinking and career planning as negative events, ensuring a more balanced perspective.

8.7.4 Recommendation 4
Researching further into the Luck Readiness Index (LRI)

The LRI should be modified to better suit younger student populations and should also address the low reliability of scales, particularly Flexibility. Limited correlation with students' identification of chance events may be due to imprecise measurement and restricted range of responses. Future research should use a more sensitive dependent measure with a wider range of scenarios, including those with no chance events and multiple chance events. This will enable a more effective correlational analysis using the LRI.

8.7.5 Recommendation 5
Incorporate the Luck Readiness Index as an assessment tool.

It would be beneficial for Practitioners and educators to incorporate the Luck Readiness Index as a tool to assess students' level of knowledge against the dimensions Flexibility, Optimism, Risk, Curiosity, Persistence, Strategy, Efficacy, and Luckiness. This could be facilitated as a pre and post educative unit assessment, enabling the educator to make the best use of limited class time to target which of the dimensions need to be taught explicitly and contextually as essential elements for individuals to recognise and capitalise on chance events in the future.

Based on the findings of Study 3, students lacked confidence in understanding the concept of 'Strategy'. Considering this outcome, it is recommended to dedicate, if not an entire unit, at least a single lesson, to educate students about Strategy, its relevance in career contexts, and its broader significance in life.

8.7.6 Recommendation 6
Developing educational curricula that incorporate Opportunity Awareness, chance, and probability as fundamental concepts.

By encouraging students to think critically about chance and its role in their everyday lives, educators can help prepare them to make more informed decisions and better understand the world around them, and to encourage people to become comfortable with, and embrace, uncertainty in order to see the potential as opposed to any drawbacks of uncertainty or chance. This is important in a career's context because of the dynamism and complexity of the world of work, where "today's 15-year-olds will likely navigate 17 changes in employer across 5 different careers" (Foundation for Young Australians, 2018, p. 8).

8.7.7 Recommendation 7

Foster context-specific teaching and learning components on the topic of 'Luck'.

In certain schools which emphasise religious teachings, luck may be seen as the least important factor for career success. Due to the belief in a meticulously designed universe, some individuals consider luck as non-existent. To address this, provide an educational opportunity that explores the concept of luck within the context of the faith tradition, offering a discussion or clear explanation that demonstrates how luck can be understood without conflicting with genuine religious beliefs. This is important because evidence presented in section 6.5 suggests that luck were interrelated with religious beliefs with some participants.

8.7.8 Recommendation 8

Researching further into the development of a taxonomy of adolescent specific chance events.

Based on the findings from Studies 3 and 4, it became evident that participants faced challenges, both in categorising chance events into the given categories (as seen in Study 3), and in proposing authentic categories themselves (as observed in Study 4). These findings underscore the need for additional research to establish an appropriate taxonomy for classifying chance events specific to adolescents.

8.8 Final Reflections

The findings of the overall research investigation indicate that participants in Years 8 to 12 can successfully identify chance events, particularly in situations can relate to, but they tend to remember negative events more consistently. Surprisingly, regardless of the event's nature, most participants believe that chance events are more likely to occur to other people rather than to themselves. The results suggest that, as participants advance in their education, their capacity to recognise chance events improves. This raises the question of whether this improvement is attributable to enhanced conceptual understanding or simply to the accumulation of life experience and

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knowledge in older participants. If younger participants lack conceptual understanding, it could have implications for career education interventions. On the other hand, if it is a matter of exposure, early interventions focusing on chance events may greatly benefit younger participants, helping them understand the prevalence of chance in the world of work. Moreover, there is a consistent increase in reporting positive chance events as participants grow older and gain more experiential understanding, which may be attributed to their increasing maturity and decision-making abilities in both planned and unplanned situations. However, while participants generally understood and acknowledged chance events, there might be a lack of recognition regarding the importance of chance events in the context of careers. During discussions, participants expressed a belief that positive outcomes can only be achieved through hard work, associating chance events with negative outcomes and attributing positive outcomes to diligent effort. Although there is no widely accepted taxonomy for adolescent perceptions of chance events, approaches such as locus of control and attributional style shed light on how individuals attribute life outcomes to internal or external factors, with other dimensions such as beliefs about randomness, luck, and personal control shaping adolescents' views on chance events.

If the COVID-19 pandemic that interrupted life on a global scale has taught us anything, it is that chance, change, and uncertainty are inherent aspects of our existence, which requires resilience and adaptability.

We have witnessed how chance events can disrupt our plans and routines, forcing us to navigate through uncertain times. As school-based teachers of the compulsory and post-compulsory year-levels, we were forced to pivot from 100% classroom-based instruction, adapting overnight to 100% online, something that the majority of teachers had never attempted before.

In the course of their lives, most individuals will encounter multiple career transitions, work for various organisations, and face periods of unemployment or underemployment (Ellyard, 1993; Handy, 2007, 2012; Sullivan & Ariss, 2021; Career Development Association of Australia, 2022). Considering this reality, career education should prioritise equipping participants with the skills to navigate change, and understand that change

itself is neither inherently positive nor negative; it is simply a part of life. The Greek philosopher Heraclitus said, "Everything flows, nothing stays still" (Kölbel, & Panuccio, 2021, p. 227), suggesting that change is a natural and inevitable part of life. Heraclitus is also credited as saying, "The only thing that is constant is change" (Perl & Kornowski, 2019, p. 2), emphasising the importance of accepting change and adapting to it. Accepting that change is the only constant in life, reminds us that we cannot control change, but we can choose how we respond to it. It is crucial for students to develop career resilience, enabling them to reframe perceived negative changes as opportunities. In this context, students should strive to become "Opportunity Aware" or "Luck Ready," recognising and capitalising on potential opportunities that arise.

It is fitting to end this thesis with insights from the progenitors of the theory which inspired this research (the Chaos Theory of Careers). In a way, COVID-19 has heightened people's awareness of the constant presence of chaos in our lives, as repeatedly claimed by the CTC (Chaos Theory of Careers). The pandemic has exposed the limitations of our understanding and control over the world, our lives, and our careers. Witnessing the profound impact of unplanned events on individuals' lives and careers fuelled our dissatisfaction with traditional career development theories and inspired our quest that led to the development of the CTC. Living with uncertainty can be anxiety-provoking or simply unsettling for different individuals. However, events like COVID-19 undeniably expose the reality that uncertainty is something we all must confront, regardless of our wealth, technology, knowledge, or power (Pryor & Bright, 2022). Confronting uncertainty is an essential element in careers education, giving the consistent changing of context of the careers landscape and our students will be better equipped if they have the skills and knowledge to embrace uncertainty with an opportunistic mindset.

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Appendix A Ethics Approval Letter

Human Research Ethics Committee
Approval Form

Principal Investigator/Supervisor: Prof James Bright

Co-Investigators:

Student Researcher: Trenton Loader

Ethics approval has been granted for the following project:
AN INVESTIGATION OF THE PERCEPTION OF CHANCE EVENTS OF ADOLESCENTS IN AN
INDEPENDENT SCHOOL IN REGIONAL VICTORIA

for the period: 05/08/2015

Human Research Ethics Committee (HREC) Register Number: 2013 02N

This is to certify that the above application has been reviewed by the Australian Catholic
University Human Research Ethics Committee (ACU HREC). The application has been approved
for the period given above.

Researchers are responsible for ensuring that all conditions of approval are adhered to, that they
seek prior approval for any modifications and that they notify the HREC of any incidents or
unexpected issues impacting on participants that arise in the course of their research.
Researchers are also responsible for ensuring that they adhere to the requirements of the
National Statement on Ethical Conduct in Human Research, the *Australian Code for the
Responsible Conduct of Research* and the University's *Code of Conduct*.

Any queries relating to this application should be directed to the Research Ethics Manager
(resethics.manager@acu.edu.au).

Kind regards

 Date 14/02/2018
Acting Research Ethics Manager

Research Ethics | Office of the Deputy Vice-Chancellor (Research)
Australian Catholic University
T: +61 2 9739 2646
E: Res.Ethics@acu.edu.au
W: ACU Research Ethics

Appendix B College Principal Approval Letter

Ballarat Christian College

Wednesday, 28 November 2012

Dear ACU Human Research Ethics Committee,

Re. Trent Loader, proposed research

I wish to confirm to the committee that I have been fully briefed by Trent and have a copy of his research proposal, which includes the proposed research methodology, that being computer based survey and three follow-up focus groups.

After discussion with Trent, I fully support his application and give him permission to conduct research with the middle and senior schools within the college, when granted permission to do so by yourselves.

Yours truly,

Kerry Hutton
Principal.

Appendix C Letter to Parents and Carers

ACU | education
Transforming learning communities

PROJECT TITLE: An investigation of the perception of chance events of Adolescents in an independent school in regional Victoria.

STUDENT RESEARCHER: Mr. Trent Loader

PRINCIPAL SUPERVISOR: Professor James Bright

STUDENT'S DEGREE: Doctor of Education

Dear Parent/Guardian,

Your student/s is/are invited to participate in the research project described below.

What is the project about?
I am conducting research into adolescent perception of chance events. Chance events refer to events that occur throughout one's life that are not planned on and that may alter the course of their life. Many young people tend to view these chance events negatively, rather than the opportunity they often are. My research will seek to record adolescent perceptions of chance events and document how their perceptions of these chance events relate to their awareness of potential opportunities. As a career advisor this is important in terms of the development of appropriate career education and also informing counselling practice.

Who is undertaking the project?
This project is being conducted by Mr. Trent Loader and will form the basis for the degree of Doctor of Education under the supervision of Professor James Bright.

Are there any risks associated with participating in this project?
There are no foreseeable risks to students who participate in this project.

Where and when will the research will take place?
The research will be conducted in a computer laboratory or classroom on campus at Ballarat Christian College, during semester 2, 2013.

What will students be asked to do?
This project will seek students' views, by having them answer an online survey with questions, such as 'can you give an example of a chance event?'. Students in years 6-9 will be asked to complete one online survey.

How much time will the project take?
For students in years 6-9 the survey should take no more than 20 minutes of their time to complete.

What are the benefits of the research project?

Chance events happen to us all but how we choose to view them may dictate the ultimate outcome each time. The results of this study will be published in international academic journals and, as such, could inform the future practice of both careers advisors and counsellors across a broad area. However, as the survey is completely confidential, students will not be identified in any way nor will the name of the College be divulged. This note is to inform you that all child/ren in year 6-12 will be invited to participate in this project. If you have any concerns or would like to discuss this matter, please contact me at the College on 5337 5900 or via email tloader@balcc.vic.edu.au.

Can I withdraw from the study?

Participation in this study is completely voluntary. Students are not under any obligation to participate. If you and your child agree to participate, you can withdraw from the study at any time without adverse consequences; however, you cannot withdraw after you submit your survey, as surveys are non-identifiable. If I have taught, teach or are likely to teach your child in the future, non-participation or withdrawal will not affect their ongoing treatment or enrolment in the college.

Will anyone else know the results of the project?

The study may be published in academic journals that focus on Psychology and Career Development. Data collected, in the form of survey responses and focus group transcripts, will be completely non-identifiable. Neither individual students or the college name will ever be divulged and only aggregated data published with reference to the demographics of an independent school in regional Victoria.

Will I be able to find out the results of the project?

I will be happy to facilitate an information evening to present the results of the study to the college community and/or a summary of the results will be made available to the participants upon request.

Who do I contact if I have questions about the project?

If you have any concerns or would like to discuss your child/ren's participation, please contact me through the College on 5337 5900 or via email tloader@balcc.vic.edu.au.

What if I have a complaint or any concerns?

The Principal of Ballarat Christian College, Mr. Kerry Hutton, has approved and supports my study amongst students in Years 6 through to 12. Please feel free to contact him through the College office in relation to the study or any concerns you may have with your child/ren's participation.

Any complaint or concern will be treated in confidence and fully investigated. You will be informed of the outcome.

I want to participate! How do I sign up?

The homeroom teacher of each class will supervise the students' completion of the online survey, thereby ensuring no bias or coercion on my part. This will occur after class or in a break at the homeroom teachers' discretion, sometime during semester 2, 2013. Please sign the attached consent form and return it directly to the general office who will collate returned forms. A copy of the completed consent form will be sent home for your records.

The study has been approved by the Human Research Ethics Committee at Australian Catholic University (approval number 2013 02N). If you have any complaints or concerns about the conduct of the project, you may write to the Chair of the Human Research Ethics Committee care of the Office of the Deputy Vice Chancellor (Research).

Chair, HREC
c/o Office of the Deputy Vice Chancellor (Research)
Australian Catholic University
Melbourne Campus
Locked Bag 4115
FITZROY, VIC, 3065
Ph: 03 9953 3150
Fax: 03 9953 3315
Email: res.ethics@acu.edu.au

Any complaint or concern will be treated in confidence and fully investigated. You will be informed of the outcome.

Yours sincerely,

Education Victoria
Locked Bag 4115
FITZROY MDC, VIC 3065
T: (03) 9953 3247 F: (03) 9953 3475

Australian Catholic University Limited
ABN 15 050 192 660
CRICOS registered provider:
00004G, 00112C, 00873F, 00885B

Appendix D Participant Consent Forms

PARENT/GUARDIAN CONSENT FORM

TITLE OF PROJECT: An investigation of the perception of chance events of adolescents in an independent school in regional Victoria.

SUPERVISOR: Professor James Bright

STUDENT RESEARCHER: Mr. Trent Loader

I _____ (*the parent/guardian*) have read and understood the information provided in the Letter to the Participants. Any questions I have asked have been answered to my satisfaction. I agree that my child, nominated below, may participate in this study consisting of an on average 15 minute online survey, realising that I can withdraw my consent at any time (without adverse consequences). I agree that research data collected for the study may be published or may be provided to other researchers in a form that does not identify my child in any way.

NAME OF PARENT/GUARDIAN: ....

SIGNATURE: ....   DATE: ___ / ___ / 2013

NAME OF CHILD: ....

SIGNATURE OF STUDENT RESEARCHER: ....

DATE: ___ / ___ / 2013

ASSENT OF PARTICIPANTS AGED UNDER 18 YEARS

I .... (*the participant aged under 18 years*) understand what this research project is designed to explore. What I will be asked to do has been explained to me. I agree to take part in this study consisting of an on average 15 minute online survey, realising that I can withdraw at any time without having to give a reason for my decision.

NAME OF PARTICIPANT AGED UNDER 18: ....

SIGNATURE:...DATE: ___ / ___ / 2013

SIGNATURE OF STUDENT RESEARCHER: ....

DATE: ___ / ___ / 2013

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ACU|education
Transforming learning communities

PARENT/GUARDIAN CONSENT FORM

TITLE OF PROJECT: An investigation of the perception of chance events of adolescents in an independent school in regional Victoria.

SUPERVISOR: Professor Jim Bright

STUDENT RESEARCHER: Mr. Trent Loader

I .... (*the parent/guardian*) have read and understood the information provided in the Letter to the Participants. Any questions I have asked have been answered to my satisfaction. I agree that my child, nominated below, may participate in this study which consists of two online surveys, which may take up to half an hour to complete. And may be selected to take part in a year level specific focus group meeting which will run for approximately 30 minutes, and will be audio recorded for content analysis. I realise that I can withdraw my consent at any time (without adverse consequences). I agree that research data collected for the study may be published or may be provided to other researchers in a form that does not identify my child in any way.

NAME OF PARENT/GUARDIAN: ....

SIGNATURE: ....   DATE: ___ / ___ / 2013

NAME OF CHILD: ....

SIGNATURE OF STUDENT RESEARCHER: ....

DATE: ___ / ___ / 2013

ASSENT OF PARTICIPANTS AGED UNDER 18 YEARS

I .... (*the participant aged under 18 years*) understand what this research project is designed to explore. What I will be asked to do has been explained to me. I agree to take part this study which consists of two online surveys, which may take up to half an hour to complete. I can also volunteer and may be selected to be involved in a year level specific focus group meeting which will run for approximately 30 minutes, and will be audio recorded for content analysis. I realise that I can withdraw at any time without having to give a reason for my decision.

NAME OF PARTICIPANT AGED UNDER 18: ....

SIGNATURE:...DATE: ___ / ___ / 2013

SIGNATURE OF STUDENT RESEARCHER: ....

DATE: ___ / ___ / 2013

CONSENT FORM

TITLE OF PROJECT: An investigation of the perception of chance events of adolescents in an independent school in regional Victoria.

SUPERVISOR: Professor James Bright

STUDENT RESEARCHER: Mr. Trent Loader

I .... *(the participant)* have read and understood the information provided in the Letter to Participants. Any questions I have asked have been answered to my satisfaction. I agree to participate in this study which consists of two online surveys, which may take up to half an hour to complete. I am aware that I can also volunteer and subsequently be selected to be involved in a year level specific focus group meeting which will take an additional 30 minutes approximately, and will be audio recorded for content analysis. I realise that I can withdraw at any time without having to give a reason for my decision.

I agree that research data collected for the study may be published or may be provided to other researchers in a form that does not identify me in any way.

NAME OF PARTICIPANT: ....

SIGNATURE .... DATE ....

SIGNATURE OF STUDENT RESEARCHER: ....

DATE:..........................

Appendix E Script for Focus Groups

Thank you all for volunteering to be a part of this Focused Group, I know there are other placed that you could be right now, as such, I appreciate you willingly giving your time like this.

I hope you all remember completing three separate online surveys earlier this term. The focus of this research is on how you perceive chance events and how that might relate to your awareness of an opportunity. You all completed the first part of the research by completing the online surveys and from the results of that survey, my Doctoral supervisor Professor Bright and myself devised the questions which I will ask you today, to further gain your opinions and enhance the richness of the research.

Everything said in here is completely confidential, unless you express sentiments that make me believe that you plan to hurt yourself or someone else, at which point I have no choice but to share those sentiments with the appropriate adults.

If there is anything that is brought up during discussion which upsets or distresses you, please tell me immediately or at the conclusion of the focused group session or if you'd prefer, talk to your homeroom teacher, a member of the College student wellbeing team or another trusted adult, as soon as possible.

I will be taking some notes, but I would also like to audio record the session so that I do not miss anything and so that I can go back and revisit the session. The total length of time of the focus group is expected to be about half an hour, however, I will only move onto the next question once you have completed exploring the present question as a group.

Do not hold back. It is safe for you to freely express your opinions. Please respect each other's opinions. There's no right or wrong answer to the questions I will ask. I would like to hear what each of you thinks and it is okay to have different opinions, as such, I encourage you to express them.
I'd like to stress again, to keep the session confidential, so I ask that you do not use names or anything directly identifying when you talk about your personal experiences. I also ask that you do not discuss other participants'

responses outside of the discussion and session. However, because this is a focus group, the other individuals participating will know your responses to the questions and as such we cannot guarantee that they will not discuss your responses outside of the focus group.

Do you have any questions so far? If not, let's begin with the first question…

1. What do you see as the elements of chance events?
2. Now that we've spoken about chance is there a difference between chance and luck?
3. Can you think of a way to place different sorts of chance events into broad categories?'
4. Much of the survey results seem to suggest that many young people perceive chance events in a negative light, why do you think people perceive chance events in a negative light and planned events in a positive one.
5. a) Has this come from experience? If so,
   b) in what context? If not, continue on to question six.
6. Do chance events only happen to unlucky people?
7. Is there a way to avoid chance events?
8. Is there a way to mitigate/alleviate the consequences of chance events?
9. Is there a way to increase the possibility of a chance event?
10. Is there a way to gain an advantage, opportunity or benefit from a chance event?

Appendix F Study 1 Paper Based Version

Study 1: Years 6 -12

Researcher: Trent Loader**, Degree:** Doctor of Education**, University:** Australian Catholic University (ACU)

This questionnaire is designed to capture your thinking about chance events. There are no right or wrong answers. Do not overthink your responses; generally your first response is the most reliable.

Which gender are you? Male   Female

How old are you at the moment? 10, 11, 12, 13, 14, 15, 16, 17, 18, 19, 20 (circle only one)

In which year level are you? 6, 7, 8, 9, 10, 11, 12 (circle only one)

Question 1. In the space below, write 4 or 5 words that spring to mind when you think of chance   events.

Question 2.   Have you experienced any chance events that have made a big impact on your life?

Yes/No

Question 3.   If Yes, how many chance events can you remember that have made a big impact on your life?

Question 4.   In the space below, give 3 examples of different chance events that <u>could</u> happen when you are working or looking for work.

Appendix G Study 2 Paper Based Version

Study 2: Years 8-12

Researcher: Trent Loader**, Degree:** Doctor of Education**, University:** Australian Catholic University (ACU)

This questionnaire is designed to capture your thinking about chance events. There are no right or wrong answers. Do not overthink your responses; generally your first response is the most reliable.

Which gender are you? Male   Female   ■   ■

How old are you at the moment? 14, 15, 16, 17, 18, 19, 20 (circle only one)

In which year level are you? 8, 9, 10, 11, 12 (circle only one)

Instructions: Read the following story carefully and then answer the questions below that relate to this story.

William was a Year 12 student at a prestigious private school. His Dad owned a national company. His family was very wealthy. William's ambition was to become a pilot and fly jumbo jets for QANTAS. His family had the money for him to do his commercial pilot's license privately, which costs in excess of $100,000.

A financial crisis hit and the company owned by William's father was severely affected. It eventually went into receivership and closed. William's family lost a lot of money and, though still able to pay for his education fees for this final year at school, they were no longer able to afford tuition for his pilot's license.

As William was walking around the school at lunch time, he bumped into a defence force recruiter who was visiting the school. William was not really interested in careers anymore since he thought becoming a pilot was no longer an option, however he decided to stop and talk to the recruiter anyway. The recruiter asked William if he had considered a career in the defence force. William told him that all he wanted to be was a pilot and that was no longer possible because his family could no longer afford it. The recruiter told him that he could join the Australian defence force and get paid to be trained as a pilot.

William was now feeling positive about his future. To help celebrate he went out to a friend's place the following Friday night. It was late and he needed to get back home. Williams's dad was going to pick him up, but was called away unexpectedly and could no longer take William home. His neighbour, who was also there at the time, offered William a ride home. William had the choice between staying at his friend's house overnight and wait for his dad to pick him up in the morning or to let his neighbour drive him home. Not prepared to sleep away from home William decided to let his neighbour drive him home. Whilst driving home, he was involved in a car accident. William was seriously injured and he had to spend weeks in the hospital. He missed the last semester of Year 12. His physical injuries meant he was unable reach the very high physical fitness standards of the defence

force, but he was fit enough to complete a commercial pilot's license. He received more than $200,000 in compensation for his injuries which he planned to use to put himself through his commercial pilot's license privately.

Question 1. Does this story contain any chance events? Yes/No

Question 2. If you answered yes to the last question, how many chance events do you believe are present in the story?

1, 2, 3, 4, 5, 6, 7, 8,9,10+

Question 3. If you answered yes to question 1, briefly describe what you believe is the most obvious chance event.

Question 4. How likely is it that this event could happen to you?

1	2	3	4	5
Very Unlikely		Neither Likely or Unlikely		Very Likely

Question 5. How likely is it that this could happen to other people?

1	2	3	4	5
Very Unlikely		Neither Likely or Unlikely		Very Likely

Question 6. If you answered yes to question 1, briefly describe what you believe is the least obvious chance event.

Question 7. How likely is it that this event could happen to you?

1	2	3	4	5
Very Unlikely		Neither Likely or Unlikely		Very Likely

Question 8. How likely is it that this could happen to other people?

1	2	3	4	5
Very Unlikely		Neither Likely or Unlikely		Very Likely

Study 3: Years 10-12

Researcher: Trent Loader**, Degree:** Doctor of Education**, University:** Australian Catholic University (ACU)

This questionnaire is designed to capture your thinking about chance events. There are no right or wrong answers. Do not overthink your responses; generally your first response is the most reliable.

Which gender are you? Male   Female   ■   ■

How old are you at the moment? 15, 16, 17, 18, 19, 20 (circle only one)

In which year level are you? 10, 11, 12 (circle only one)

Question 1.   Rank in order from 1 being most important, to 8 being least important, the following elements in terms of importance for you to have a successful career.

Flexibility, Optimism, Risk, Curiosity, Persistence, Strategy, Efficacy, and Luckiness

e.g. if you think Risk is most important, followed by Optimism, then Strategy, then Luckiness, then Persistence, then Flexibility, then Efficacy and lastly Curiosity then type:

Risk, Optimism, Strategy, Luckiness, Persistence, Flexibility, Efficacy, Curiosity

Question 2.   How important is Flexibility in terms of you having a successful career?

(Circle only one)

1	2	3	4	5	6	7
Totally Unimportant	Quite Unimportant	Somewhat Unimportant	Neither Unimportant or Important	Somewhat Important	Quite Important	Very Important

Question 3.   How important is Optimism in terms of you having a successful career?

(Circle only one)

1	2	3	4	5	6	7
Totally Unimportant	Quite Unimportant	Somewhat Unimportant	Neither Unimportant or Important	Somewhat Important	Quite Important	Very Important

Question 4.   How important is Risk in terms of you having a successful career?

(Circle only one)

1	2	3	4	5	6	7
Totally Unimportant	Quite Unimportant	Somewhat Unimportant	Neither Unimportant or Important	Somewhat Important	Quite Important	Very Important

Question 5.   How important is Curiosity in terms of you having a successful career?

(Circle only one)

1	2	3	4	5	6	7
Totally Unimportant	Quite Unimportant	Somewhat Unimportant	Neither Unimportant or Important	Somewhat Important	Quite Important	Very Important

Question 6.   How important is Persistence in terms of you having a successful career?

(Circle only one)

1	2	3	4	5	6	7
Totally Unimportant	Quite Unimportant	Somewhat Unimportant	Neither Unimportant or Important	Somewhat Important	Quite Important	Very Important

Question 7.   How important is Strategy in terms of you having a successful career?

(Circle only one)

1	2	3	4	5	6	7
Totally Unimportant	Quite Unimportant	Somewhat Unimportant	Neither Unimportant or Important	Somewhat Important	Quite Important	Very Important

Question 8.   How important is Efficacy in terms of you having a successful career?

(Circle only one)

1	2	3	4	5	6	7
Totally Unimportant	Quite Unimportant	Somewhat Unimportant	Neither Unimportant or Important	Somewhat Important	Quite Important	Very Important

Question 9.   How important is Luckiness in terms of you having a successful career?

(Circle only one)

1	2	3	4	5	6	7
Totally Unimportant	Quite Unimportant	Somewhat Unimportant	Neither Unimportant or Important	Somewhat Important	Quite Important	Very Important

Question 10. How confident are you that you understand the term Flexibility?

(Circle only one)

1	2	3	4	5
Unconfident	Somewhat Unconfident	Neither Confident or Unconfident	Somewhat Confident	Confident

Question 11. How confident are you that you understand the term Optimism?

(Circle only one)

1	2	3	4	5
Unconfident	Somewhat Unconfident	Neither Confident or Unconfident	Somewhat Confident	Confident

Question 12. How confident are you that you understand the term Risk?

(Circle only one)

1	2	3	4	5
Unconfident	Somewhat Unconfident	Neither Confident or Unconfident	Somewhat Confident	Confident

Question 13. How confident are you that you understand the term Persistence?

(Circle only one)

1	2	3	4	5
Unconfident	Somewhat Unconfident	Neither Confident or Unconfident	Somewhat Confident	Confident

Question 14. How confident are you that you understand the term Strategy?
(Circle only one)

1	2	3	4	5
Unconfident	Somewhat Unconfident	Neither Confident or Unconfident	Somewhat Confident	Confident

Question 15. How confident are you that you understand the term Efficacy?
(Circle only one)

1	2	3	4	5
Unconfident	Somewhat Unconfident	Neither Confident or Unconfident	Somewhat Confident	Confident

Question 16. How confident are you that you understand the term Luckiness?
(Circle only one)

1	2	3	4	5
Unconfident	Somewhat Unconfident	Neither Confident or Unconfident	Somewhat Confident	Confident

Question 17. How confident are you that you understand the term Curiosity?
(Circle only one)

1	2	3	4	5
Unconfident	Somewhat Unconfident	Neither Confident or Unconfident	Somewhat Confident	Confident

Read the following vignettes and circle your answers to the questions that follow.

Vignette 1:

I was shopping in Launceston whilst holidaying in Tasmania with my family when we came across some students from the local Australian Maritime College. The students were standing next to a display in the shopping centre advertising an upcoming open day at the college. They were demonstrating how they test different ship hull designs in a big test tank. As I approached the display I recognised one of the students was my cousin whom I had not seen in ten years. It turned out that he was doing a Bachelor of Engineering in Naval Architecture. Generously he offered to show me around campus the following day, he showed me the facilities where he was learning about the design and construction of marine craft such as high-speed ferries, submarines, racing yachts, cruise liners and cargo and military ships. I thought it was really interesting, as I never had an interest in Engineering before. I was in Year 11 at the time and I was going to drop maths because I did not like it. Instead I stayed in Maths and did Math Methods in Year 12 so that I would have the pre-requisite to do engineering. That is how I began my journey to become an engineer.

Question 18. Are there any chance events that occurred in the above story?

Yes/No

Question 19. If you answered Yes question 18, how many chance events do you believe have occurred? (If you answered No, circle 0)

0 1 2 3 4 5 6 7

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Question 20. If you answered Yes to question 18, did any of them relate to any of the following factors: (circle as many as you think apply)

1) Physical (Something that affects a person's body)
2) Health (Something that affects a person's health)
3) Family (Related to a person's family)
4) Educational (Related to school, college, university or any type of learning)
5) Environmental (Related to things in the environment or your surroundings)
6) Financial (Related to money)
7) Relational (Related to relationships with other people)
8) Spiritual (Related to a higher power)
9) Social (Related to interactions with other people)
10) Travel (Related to time spent away from home i.e. on a journey)
11) Employment (Related to work at a job)

Vignette 2:

When I was in Year 11, I had a part time job at the local McDonald's restaurant. I really enjoyed working there and was doing my best to get into the management program. As it happened there were two others ahead of me who were older and more experienced so I did not think it would happen any time soon, however, I prayed about it and that I would be where God wanted me to be. A short time later an executive from McDonalds head office visited the store unannounced and spoke with the staff that were there. Both of my older rivals were off on sick leave as there was a bad flu virus going around at the time, I chose to have the flu injection, they did not. Consequently, I was in the right place at the right time and I was able to enrol in new management recruiting program before my older and more experienced rivals. And that is how my career in management began.

Question 21. Are there any chance events that occurred in the above story?

Yes/No

Question 22. If you answered Yes to question 21, how many chance events do you believe occurred in the story? (If you answered No, select 0)

0 1 2 3 4 5 6 7

Question 23. If you answered Yes to question 21, did any of them relate to any of the following factors: (circle as many as you think apply)

1) Physical (Something that affects a person's body)
2) Health (Something that affects a person's health)
3) Family (Related to a person's family)
4) Educational (Related to school, college, university or any type of learning)
5) Environmental (Related to things in the environment or your surroundings)
6) Financial (Related to money)
7) Relational (Related to relationships with other people)

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8) Spiritual (Related to a higher power)
9) Social (Related to interactions with other people)
10) Travel (Related to time spent away from home i.e. on a journey)
11) Employment (Related to work at a job)

Vignette 3:

I grew up on an apple orchard near Ballan. I had two brothers who were both very athletic and played football. I was more of an indoor type, I was not good at sport, I just was never as fast as my brothers and got tired out easily. The apple orchard has been in my family for generations and there is an expectation that my brothers and I will take it over and continue the family tradition. The worst drought in memory occurred and with a severe shortage of water the apple orchard had to adapt our methods or we would go broke. Giselle one of my older friends from youth group was studying agronomy and was always talking about sustainability and the environment. I never really took much notice about the specifics until the drought hit. I enjoyed science and between Giselle and the drought they really sparked my interest in agronomy. I went to university and instead of returning to the orchid as a farmer and to the outdoors work I did not like, I returned as an agronomist and helped my family adapt the orchard that survived and now runs more sustainably.

Question 24. Are there any chance events that occurred in the above story?

Yes/No

Question 25. If you answered Yes to question 24, how many chance events do you believe occurred in the story? (If you answered No, select 0)

0 1 2 3 4 5 6 7

Question 26. If you answered Yes to question 24, did any of them relate to any of the following factors: (circle as many as you think apply)

1) Physical (Something that affects a person's body)
2) Health (Something that affects a person's health)
3) Family (Related to a person's family)
4) Educational (Related to school, college, university or any type of learning)
5) Environmental (Related to things in the environment or your surroundings)
6) Financial (Related to money)
7) Relational (Related to relationships with other people)
8) Spiritual (Related to a higher power)
9) Social (Related to interactions with other people)
10) Travel (Related to time spent away from home i.e. on a journey)
11) Employment (Related to work at a job)

The following and final section is about you and your experiences.

Question 27. Can you think of a chance event that has occurred to you? Please type in the box below.

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Question 28. Circle which categories would it/they relate to?

1) Physical (Something that affects a person's body)
2) Health (Something that affects a person's health)
3) Family (Related to a person's family)
4) Educational (Related to school, college, university or any type of learning)
5) Environmental (Related to things in the environment or your surroundings)
6) Financial (Related to money)
7) Relational (Related to relationships with other people)
8) Spiritual (Related to a higher power)
9) Social (Related to interactions with other people)
10) Travel (Related to time spent away from home i.e. on a journey)
11) Employment (Related to work at a job)

Question 29. Can you think of a chance event that has occurred to someone else? Please type in the box below.

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Question 30. Circle which categories would it/they relate to?

1) Physical (Something that affects a person's body)
2) Health (Something that affects a person's health)
3) Family (Related to a person's family)
4) Educational (Related to school, college, university or any type of learning)
5) Environmental (Related to things in the environment or your surroundings)
6) Financial (Related to money)
7) Relational (Related to relationships with other people)
8) Spiritual (Related to a higher power)
9) Social (Related to interactions with other people)
10) Travel (Related to time spent away from home i.e. on a journey)
11) Employment (Related to work at a job)

Question 31. In the box below, give an example of a Physically related chance event?

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Question 32. In the box below, give an example of a Relational chance event?

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Question 33. In the box below, give an example of a Health related chance event?

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Question 34. In the box below, give an example of a Spiritually related chance event?

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Question 35. In the box below, give an example of a chance event which would relate to Family?

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Question 36. In the box below, give an example of a Socially related chance event?

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Question 37. In the box below, give an example of an Education related chance event?

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Question 38. In the box below, give an example of a Travel related chance event?

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Question 39. In the box below, give an example of an Environmentally related chance event?

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Question 40. In the box below, give an example of an Employment related chance event?

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Question 41. In the box below, give an example of a Financially related chance event?

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Luck Readiness Index

1. Are you "set in your ways"?

Completely Agree	Agree	Neither Agree nor Disagree	Disagree	Completely Disagree

Publishing all 52 of the LRI questions would violate copyright and as such the remaining 51 questions have been omitted from the thesis.

Appendix I Demographic data of participants.

Demographic data collected from participants before completing each study.

Sex of participants.
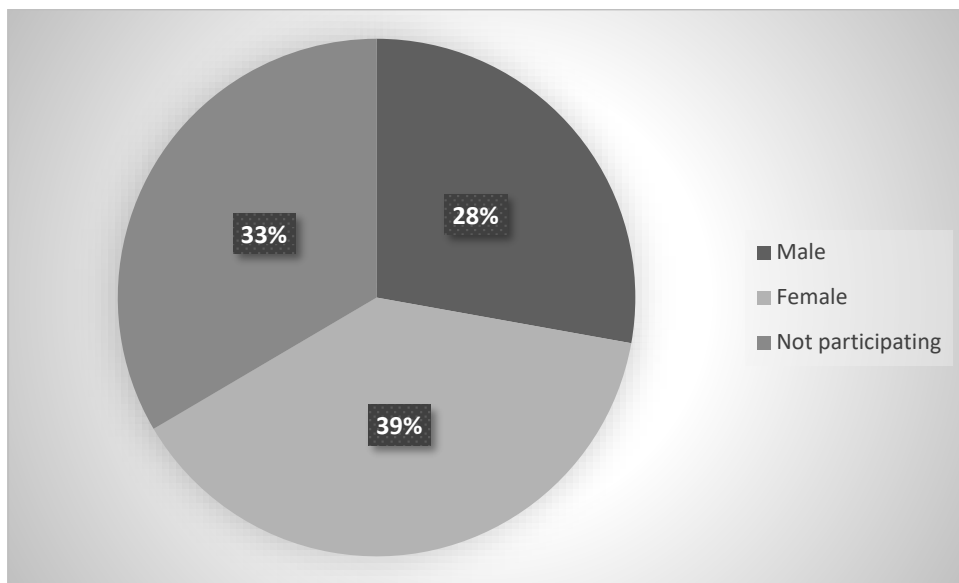
As presented in Table 4.2, in total 69 males (28%) and 96 female students (39%) (N=165) completed Study 1, which was the only study to include participants in all year levels from Grade 6 to Year 12.   With a total enrolment in the college at years 6-12 of 248 students, this gives an overall participation rate of 66.5%.

Age of participants at time of research.

Student ages at time of research

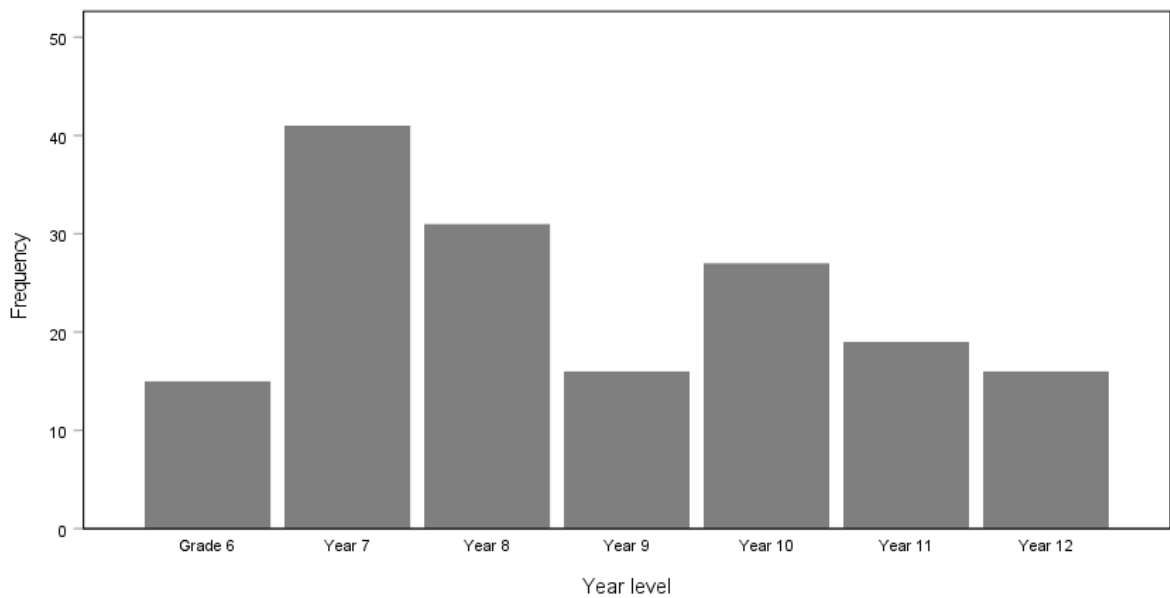| Student age	Number of students
10	1
11	6
12	21
13	41
14	24
15	23
16	22
17	13
18	6
19	6
20	2
Total	165

Age
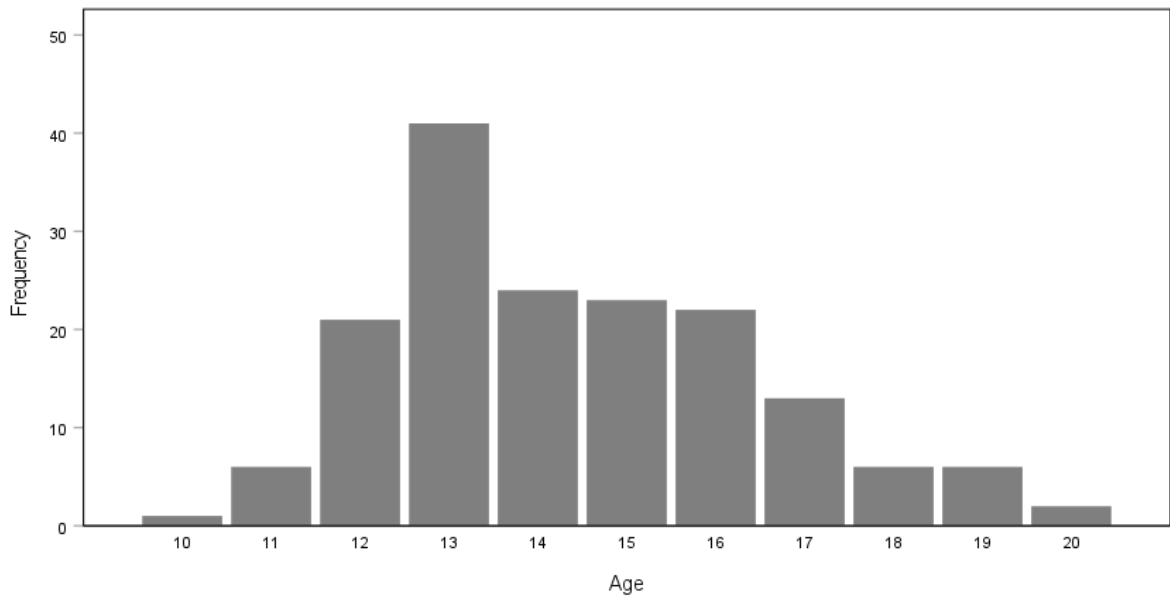
In total, one hundred and sixty-five students completed Study 1. They ranged in age from 10 years to 20 years (M=14.90, SD = 3.33).

In which year level are you?

Participant numbers by year level

Year Level	Number of students
6	15
7	41
8	31
9	16
10	27
11	19
12	16
Total	165

Year level

385

The year level with the greatest number of participating students was the year 7 class (N = 41) and the grade 6 class had the least number of participating students (N = 16), (M = 8.7, SD = 1.9). The disparity in participating numbers was in a large part due to the return rate of parental permission forms and subsequent perceived parental support amongst the various year levels.

Participants numbers by year groups

Year levels	Male	Female	Total	Total Enrolment	% of participation
6 & 7	20	36	56	76	73.6
8 & 9	25	22	47	85	55.3
10 -12	24	38	62	87	71.3
Total	69	96	165	248	66.5

Note. Variation in participation rate and reversal of sex ratio for Group B are due solely to enrolment number variation in years 8 & 9 that year.

Year 7 & 8 group participant numbers by age and year level.

Student Age	Number of students	Year Level	Number of students
10	1	6	15
11	6	7	41
12	21	Total	56
13	28		
Total	56		

Years 8 & 9 group participant numbers by age and year level.

Student Age	Number of students	Year Level	Number of students
13	13	8	31
14	23	9	16
15	11	Total	47
Total	47		

Years 10-12 Group participant numbers by age and year level.

Student Age	Number of students	Year Level	Number of students
14	1	10	27
15	12	11	19
16	22	12	16
17	13	Total	62
18	6		
19	6		
20	2		
Total	62		