Burning passion, burning out : The passionate school principal, burnout, job satisfaction, and extending the dualistic model of passion

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Abstract

Paradoxically, school leaders as a group report high levels of burnout but also high job satisfaction and passion for their work. School principals are passionate about their job, but this passion can be a double-edged sword leading to good (job satisfaction) and bad (burnout) outcomes. We extend the dualistic model of passion (DMP) in a study of changes over a one-year period (3,996 school leaders) in three components of work passion (general, harmonious, obsessive), burnout, and job satisfaction. We begin by placing the DMP into a broader framework of passion research and how passion is related to other well-being constructs. We then develop the rationale for integrating within the same study the obsessive passion and harmonious passion constructs used in DMP studies and general passion used in most other passion studies, but also the inappropriateness of the exclusion strategy based on general passion in DMP research. We found that Time1 harmonious passion was related to job satisfaction (positively) and burnout (negatively), whilst the pattern of relations was the opposite of obsessive passion. However, over time, harmonious passion and obsessive passion were moderated by general passion. The protective effect of harmonious passion on burnout was smaller when general passion was high, whilst undesirable obsessive passion effects were only evident when general passion was high. School principals' work passion may help them avoid burnout and maintain high job satisfaction, but only when manifested harmoniously. We describe how future studies of longitudinal passion can be integrated into the broader job demands-resources model.

Educational Impact and Implications Statement

Schools are increasingly facing a crisis as aging principals retire early due to burnout, with suitable candidates reluctant to take their place. School principals are passionate about their job, but this passion can be a double-edged sword leading to both good (job satisfaction) and bad (burnout) outcomes. Our longitudinal study (3,996 principals and school leaders over two years) shows that

passion can manifest in three distinct components (general, harmonious, and obsessive). When general passion is high, obsessive passion leads to increases in burnout and undermines job satisfaction. Harmonious passion facilitates job satisfaction and protects against burnout, but even harmonious passion can lead to burnout if general passion levels are too high. Implications are how to manage passion for facilitating good outcomes but protect against mental health problems.

School Principal: "Wanted: A miracle worker who can do more with less, pacify rival groups, endure chronic second-guessing, tolerate low levels of support, process large volumes of paper and work double shifts (75 nights a year). He or she will have carte blanche to innovate, but cannot spend much money, replace any personnel, or upset any constituency" (R. Evans, Education Week, April 12, 1995).

Schools are increasingly facing a crisis as aging principals retire early due to burnout, and suitable candidates are reluctant to take their place (Riley, 2019). School principals are passionate about their job, but this passion can be a double-edged sword leading to both good (job satisfaction) and bad (burnout) outcomes. In our longitudinal study (3,996 principals and school leaders over two years) we show that passion can manifest in three distinct components of passion (general, harmonious, and obsessive) that lead to different outcomes.

School leaders are vital to the life of our schools and communities. School leaders recognize, promote, and build the leadership capacity of staff, students, parents, and the community to enhance leadership density across the school community, by providing support, guidance, direction, and visions. A good school leader can create a supportive school ethos that facilitates positive motivation of teachers and students and lifts academic success (Riley, 2013; Leithwood & Louis, 2012; Leithwood et al., 2006; Day, 2011; Day, Gu & Sammons, 2016; Walsh & Dotter, 2018). Thus, school leaders directly influence teachers, classrooms, and their school, and indirectly influence student learning (Coelli & Green, 2012; Wahlstrom, Louis, Leithwood & Anderson, 2010).

However, Tran et al. (2018) note that school-principal shortages are an international crisis (also see National Association of Elementary and Secondary Principals, 2008; Kruger, Van Eck, & Vermeulen, 2005). Contributing to this crisis, Wahlstrom et al. (2010) noted that as many as half of all new principals leave their position within three years, whilst Goldring and Taie (2018) estimate that turnover in the US is 18%. Bartanen et al. (2019) also note that principal turnover negatively affects student achievement. School principals themselves report increasingly high levels of strain, resulting in a shortage of qualified school leaders (Dewa et al. 2009; Grissom, Loeb, & Mitani, 2015; Darmody and Smyth 2016; Riley 2019).

With such a vital role to play, reports of workplace burnout and unsustainable attrition among principals are concerning (Darmody & Smyth, 2016; Dewa et al., 2009; Grissom et al., 2015; Riley, 2013; Friedman, 2002). Significant, ever-changing legislative requirements add stress to the job, giving school principals more responsibility for key budget, personnel decisions, and managerial tasks (Green et al. 2001; Kruger et al., 2005), with little or no increase in resources (Riley, 2019; Dewa et al., 2009). Adverse health outcomes result from high job demands and stress (Kuper & Marmot, 2003). School principals suffer from high levels of occupational stress (Maslach & Leiter, 2008; Riley, 2013, 2014, 2015), resulting in a myriad of harmful outcomes. Friedman (2002) noted that principal burnout is a function of unreasonable demands by parents and weak teacher performance as well as stress due to overload of work demands. Riley et al., (2018; also see Riley, 2018; Wells & Klocko, 2018) principal burnout affects student learning, as school principals are an important influence on student outcomes (Coelli & Green, 2012; Day et al., 2016; Klusmann et al., 2016; Leithwood et al., 2006; Sebastian & Allensworth, 2012).

School leaders also report greater job satisfaction compared with the general population (Riley, 2019). Riley (2019; also see Gurr, Drysdale, & Mulford, 2007) found that almost 90% of principals reported being passionate about their work. In contrast, Gallup (2013) found that only 13% of the general working population are engaged in their work. Deloitte found that only 11% of typical employees were passionate about their work (Hagel, Brown, & Samoylova, 2013).

Nevertheless, not all passion is created equal. Whereas general passion refers to overall levels of passion; this construct does not differentiate how this general passion is manifested. Whether school leaders experience burnout or remain satisfied with their job may depend on how their passion is manifested. Using an extension of the Vallerand et al. (2003) dualistic model of passion (DMP) as a theoretical basis, we test the role of passion, and its harmonious or obsessive manifestations, in explaining changes in burnout and job satisfaction over two years in a sample of over 3,996 Australian school leaders. We begin with a broad overview of passion research and how the DMP that is the focus of our research fits into the broader framework.

Theoretical Framework of Passion

A Broad Conceptual Overview of Work Passion Research

The study of passion has a long history in philosophy. As outlined by Vallerand (2012), early philosophical thinking focused on the emotional aspects of passion. One perspective of passion was in relation to a loss of reason and control (Plato, 429-347 BC; Spinoza, 1632-1677) that had negative consequences (from the Latin word "passion" for suffering). Alternatively, emotion can lead to positive behaviors if tempered by reason (Descartes, 1596-1650) and contributes to achieving the highest standards of excellence (Hegel, 1770-1831). However, according to Vallerand (2012), a focus on the psychology of passion and the motivational aspects of passion are more recent phenomena.

The current zeitgeist based on popular press and academic research suggest that work passion has positive effects on a diverse range of positive outcomes, whilst a lack of passion has deleterious consequences (e.g., Curran et al., 2015; Perrewé et al., 2014; Pollack et al., 2020; Vallerand, 2012). Passion can motivate, enhance well-being, and provide meaning, but can also lead to negative emotions, inflexibility, and unhappiness (Marsh et al., 2013).

In their systematic review of passion research, Pollack et al. (2020) argued that there are three distinct research streams. In addition to the DMP that is the focus of the present investigation, Pollack et al. noted other streams of passion research that focused on general work passion and

what they referred to as role-based passion. Role-based passion has a focus on entrepreneurship (passion for roles of developing, founding, and inventing) that is not the focus of our study. The main distinction between the general and DMP streams is that the general stream treats passion as a relatively unidimensional factor (general passion, GP), whilst the DMP stream distinguishes between two factors of passion (obsessive passion, OP, and harmonious passion, HP-see subsequent discussion below for more detail). Pollack et al. emphasized that the different streams of passion research have progressed more or less independently in relation to construct definition, empirical measurement, and outcomes. This hinders research integration and can result in jingle-jangle fallacies (in which conceptually different measures are given the same label or when the same construct is given different labels; Kelley, 1927; Marsh et al., 2019).

Pollack notes that general passion is defined as love of work (Baum & Locke, 2004) with a core premise that "Passionate love for work provides the motivation and drive to persist and persevere so as to maintain such positive feelings" (p. 4). In this stream, general work passion is hypothesized to positively affect positive affect, positive psychological states and attitudes, and positive work behaviors. In their meta-analysis of studies within this general passion stream, Pollack et al. (2020) found robust support for the positive relations between passion and diverse positive outcomes, but noted a surprising lack of correlation –either positive or negative – with negative outcomes (also see Table 1). Hence, their recommendation was that research on general work passion needed to consider negative outcomes as well as positive ones.

Of particular relevance to the present investigation, they recommended that researchers within each of the streams of work passion research needed to consider measures used in the other streams to facilitate cross-stream comparisons, and compare them in relation to convergent and discriminant validity (and potential jingle-jangle fallacies). Following this general overview of work passion research, we now move to a detailed consideration of the DMP that is our primary focus.

The Dualistic Model of Passion (DMP)

Theoretical and Conceptual Basis of the DMP and Self-Determination Theory

In their theoretical model of passion, Vallerand et al. (2003; Vallerand, 2008; Vallerand, Paquet et al., 2010) define passion as a strong inclination toward self-defining activities that are enjoyable, seen to be important and meaningful, the basis considerable investment of time and energy on an ongoing basis, and internalized as part of one's identity. The conceptual underpinning of the model posits that in order to become passionate, people need to grow psychologically, and to develop a sense of self and identity. Passionate individuals will develop a passion towards activities they find to be enjoyable that are internalized as part of their identity.

The DMP is based substantially on self-determination theory (Deci & Ryan, 2000; Ryan & Deci, 2017). Self-determination theory is a metatheory of human motivation that focuses on basic human needs (competence, autonomy, and relatedness), inherent growth tendencies, integrated regulation, and motivations that underpin the choices that individuals make. Thus, it is important to assess motivation in relation to the quality, type, and regulatory basis, as well as quantity. Self-determination theory focuses on intrinsic motivation (and intrinsic regulation) in which activities are chosen for their own sake because they are inherently interesting, satisfying, and enjoyable. Intrinsic motivation is distinguished from amotivation (non-regulation) and four types of regulation associated with extrinsic motivation that varies in the extent to which choices are autonomously regulated (externally regulated, introjected regulation, identified regulation, and integrated regulation). Integrated regulation, the most autonomous or self-determined form of extrinsic motivation, occurs when regulators are assimilated into the self in relation to values and needs. However, although clearly internalized, the choices are aimed at achieving separate outcomes rather than the inherent enjoyment associated with the activity. Following from self-determination theory, the DMP (Vallerand et al., 2003; Vallerand, 2008) posits two types of passion, obsessive and harmonious, that differ in relation to how the activity has been internalized.

Harmonious work passion (HP) emerges through autonomous internalization (Ryan & Deci, 2017) of an activity into one's identity. As posited in self-determination theory, this means that engagement in an activity is self-determined, and the activity has been freely incorporated into

one's identity without any contingencies attached to it (Deci et al., 1994). With this form of internalization, individuals freely choose and personally endorse the activity in a way that is in harmony with other aspects of their lives. In this way, harmoniously passionate individuals can focus on their activity and experience positive outcomes during and after engagement in a way that does not conflict with other activities. Thus, the harmoniously passionate person is in control of the activity and is free to choose when to engage or disengage with the activity, so it does not conflict with other aspects of their life (e.g., relationships with friends and family). HP is associated with positive outcomes (Marsh et al., 2013), not only during (e.g., positive affect, concentration, flow) but also after task engagement (e.g., general positive affect, psychological adjustment, etc.). Thus, HP is a consequence of pursuing an activity for intrinsic motivation as posited in the self-determination framework.

Obsessive work passion (OP) is based on a controlled internationalization (Ryan & Deci, 2017). Controlled internalization can result from internal or external pressure when there are contingencies associated with the activity or when the desired outcomes are not controllable by the person undertaking the activity. OP leads to the passion becoming part of the person's identity, but individuals develop ego-invested self-structures toward the source of their passion (Deci & Ryan, 2000; Hodgins & Knee, 2004). Obsessively passionate individuals are driven to undertake an activity, thereby risking negative consequences and conflict during or after undertaking the activity. Obsessively passionate individuals are contingently motivated to pursue an activity to gain valued outcomes, such as tangible rewards, social acceptance, or self-esteem. This manifestation of passion can have destructive effects on the individual, how they perform the activity itself, and other life domains. Hence, persons with OP may experience conflict with other life domains and negative consequences (e.g., negative affect, rumination, burnout) during and after engagement in the passion and, eventually, lower psychological adjustment levels.

Within the self-determination framework, OP is an extrinsic motivation that has qualities associated with introjected regulation (ego-involvement and externally controlled) and, perhaps,

identified regulation (personal importance) regulation. Although the OP activity is an important component of one's self-identity, this synthesis is not in harmony with one's other values, needs, and activities that is a defining feature of integrated regulation (Ryan & Deci, 2000). Consistent with this interpretation, the Pollack et al. (2020) meta-analysis found OP correlated positively with both controlled (.27) and extrinsic (.20) motivation. However, they also found that OP was positively correlated with autonomous (.29) and intrinsic (.26) motivation – although substantially less so than HP (.82 and .51, respectively).

In the initial conceptualization of DMP, Vallerand et al., (2003) demonstrated that HP and OP are positively correlated with each other, with the perceived value of the activity, and with the inclusion of the passion in one's identity. Importantly, however, HP and OP are differentially associated with various outcomes. HP is positively related, whereas OP is either unrelated or negatively related with psychological adjustment (Pollack et al., 2020; Vallerand et al., 2003, Study 2; Vallerand, Templin, Hasenau, & Riley-Doucet, 2007), and with positive emotions and flow during activity engagement (Lafrenière, Jowett et al., 2008, Study 2; Vallerand et al., 2003, Study 1; Vallerand et al., 2006, Study 2). Importantly, conflict is positive related to OP, but negatively related to HP (Vallerand et al., 2003, Study 1; Vallerand, Paquet, Philippe, & Charest, 2010). In their meta-analysis, Pollack et al. (2020) reported that turnover intentions were negatively correlated with HP, but almost uncorrelated with OP.

Vallerand et al. (2003, Study 2) also demonstrated that prior HP and OP contributed to predicting subsequent positive and negative affect and engagement, even after controlling for intrinsic and extrinsic motivation. Relatedly, Houlfort, Philippe, Vallerand, and Ménard (2013, Study 2) demonstrated that HP and OP contributed to changes in job satisfaction and depression in the predicted direction even after controlling for measures of autonomous and controlled motivation. Thus, OP and HP predict outcomes beyond what can be explained by intrinsic/autonomous and extrinsic/controlled motivation.

The Role of General Passion in the DMP Theory and Research

General passion has an ambiguous role in the DMP theory and research. On the one hand, DMP posited two types of passion, HP and OP, in contrast to traditional models hypothesizing a single, general passion construct. From this perspective, DMP theory and research have discounted GP and mostly ignore GP in the design of DMP studies. On the other hand, many DMP studies do include GP items (e.g., "the activity is a passion for me") that form a GP factor, in addition to items measuring HP and OP. Indeed, this GP item has been used as an exclusion criterion to exclude individuals (those scoring less than 4 on a 7-point response scale) deemed not to be sufficiently passionate to manifest either OP or HP (e.g., Vallerand et al., 2003). This item was subsequently incorporated into a multi-item GP scale that was also used for excluding individuals judged not to be passionate (those having an average score of 4 or less on a 7-point response scale; Fernet, Geneviève, et al., 2014). Because the purpose of this strategy is to exclude individuals seen to be lacking in passion, DMP studies rarely discuss the substantive importance of general passion as used in this strategy.

In this selection strategy, the general passion exclusion criterion is dichotomized and represented as 0 (low general passion) or 1 (high general passion). This strategy is based on an assumption of an interaction or threshold model in which HP and OP are assumed to not affect outcomes when general passion is below a threshold value, but significant effects when general passion is above the threshold. Thus, GP is assumed to magnify the effects of HP and OP. This implies significant GPxHP and GPxOP interactions, but we note that this implicit assumption has not been explicitly tested in DMP theory and research.

To better explain the application of the exclusion strategy, we present schematic diagrams (Figure 1) of GPxHP interactions that would be consistent with the DMP exclusion strategy. For purposes of this example, we plot the interaction in relation to the effects of HP and GP (and the GPxHP interaction) on burnout and job satisfaction in terms of predicted values and simple slopes (Figure 1A). In the exclusion strategy, GP is operationalized in relation to a cut-point based on the GP measure, a dichotomous classification of individuals into Low GP and High GP groups.

According to the exclusion strategy, HP has no effect on either BO or JS for those individuals in the Low GP group (i.e., those who fall below the GP cut-off). This can be tested as a traditional interaction, as depicted in Figure 1A. However, it also implies that the interaction has a very particular form. In particular, the appropriate application of the exclusion strategy makes the very strong assumption that HP (and OP) are unrelated to outcomes for all individuals who fall below the cut-off (i.e., the flat line relating HP to BO and JS for the Low GP group). In Figure 1B we illustrate the simple slopes for this same interaction. Here we show that the slope of HP effect is zero for the Low GP group for both burnout and job satisfaction. It is only for the High GP group that HP is related to burnout (negative slope) and job satisfaction (positive slope). Also implicit in the exclusion strategy that GP is unrelated to both burnout and job satisfaction for those in the Low GP group and likewise for those in the High GP group. Hence, the most basic test of the appropriateness of the exclusion strategy is whether the HP (and OP) are uncorrelated with outcomes (burnout, job satisfaction, but all other outcomes as well) for individuals who fall below the Low GP cut-off.

Importantly, dichotomizing continuous scores and their use in threshold models is typically seen as problematic because it attenuates relationships with other variables (see discussion by MacCallum et al., 2002). As used in DMP studies, this strategy also excludes from analyses a potentially large number of participants in many settings (e.g., workplaces where general passion is not high). This might also explain in part the inconsistent findings of relations between HP, OP, job satisfaction, and burnout—particularly for that have not reported whether or not participants have been excluded based on this exclusion strategy. This exclusion strategy also does not allow an analysis of HP and OP's influence below the cut-off threshold, but implicitly assumes that there is none. We note that the use of this exclusion strategy is explicit, although it has been operationalized in different ways, and its application is apparently unreported in some studies. However, within the context of this strategy, we refer to the interactions as implicit because they are not actually tested, or even identified in the DMP theory.

Relatedly, in their systematic review of work passion research, Pollack et al. (2020) distinguished between one stream that represents passion with a single GP factor and DMP studies that represent passion with two factors. Although recommending that passion researchers adopt a DMP approach, they also recommended that researchers in each stream also include measures from the other stream to evaluate their convergent and discriminant validity in relation to each other, and whether different measures contribute independently to the prediction of different outcomes. From this perspective, it is useful to juxtapose GP with HP and OP when all three are considered simultaneously in the same study.

In contrast to GP's use as part of an exclusion strategy in previous DMP passion studies, we explicitly consider GP as a substantive variable. This allows us to include all participants—those above and below the threshold. Importantly, we explicitly test the implicit interaction used to exclude participants. In this way, we focus not on whether or not a principal is passionate, but rather on the 'dose' of passion and whether it is manifested obsessively or harmoniously. Finally, following recommendations from the Pollack et al. (2020) systematic review, we juxtapose GP with HP and OP in relation to the convergent and discriminant validity of the three constructs, and the incremental contribution to the prediction of key constructs in our study.

Reciprocal Effects

DMP studies typically assume that the causal flow is from passion to outcomes, but not the other way around. However, particularly as most of the studies are cross-sectional, this assumption is not readily testable. Tests of the reciprocal relations between passion and outcomes have potentially important practical consequences as well as theoretical and methodological implications. Elaborating upon this issue, Birkeland and Buch (2015; also see Fredrickson & Joiner, 2002; Vallerand, 2012) specifically suggested that reciprocal effects between passion and outcomes might result in positive (or negative) spirals. Thus, for example, HP is related to positive work outcomes, and these positive outcomes might inspire workers to become even more harmoniously passionate about their work. However, adverse outcomes might reinforce the rigidity associated with obsessive

passion, leading to an individual becoming obsessively passionate. Making a similar point concerning extensions of the Job Demands and Resources model, Bakker and Demerouti (2017) noted that longitudinal studies found what they refer to as causal and reversed causal effects relating to job demands and resources to well-being outcomes. Thus, Trépanier et al. (2014) give an example of an obsessively passionate nurse in an emotionally difficult situation who cannot accept the social support and other resources available to alleviate the stress that leads to the obsessive manifestation of passion. This reasoning led Birkeland and Buch (p. 404) to propose that "Future studies on passion and performance should investigate the degree to which such spirals or reverse causality exist."

Our review of the DMP research suggests few tests of reciprocal effects between the DMP passion factor and outcomes. Many studies report correlations (see meta-analysis by Pollack et al., 2020), but nearly all of these studies use cross-sectional data. Although some studies evaluated OP and HP's longitudinal effects on outcomes, they did not test a full cross-lag-panel model in that OP and HP were only included at T1, so that their reciprocal effects were not tested (e.g., Vallerand, Paquet et al., 2010). However, we found several true cross-lag panel studies (Carbonneau, Vallerand, Fernet, & Guay, 2008; Lavigne et al., 2012; Lavigne et al., 2014;) in which outcomes and the passion factors were measured twice over a relatively short period of time. There were significant effects of the passion factors on changes in the outcomes in each case, but no significant effects of outcomes on changes in the passion factors. Hence a very limited amount of research provides no support for positive or negative spirals suggested by Birkeland and Buch (2015) and Vallerand (2012). On the other hand, the assumption that paths from prior outcomes to subsequent passion measures are all equal to zero is a very strong assumption for which there is little empirical support. Hence, in the present investigation, we purse this issue of reciprocal relations as an open research question rather than a research hypothesis for which we make directional predictions based on prior theory and research.

DMP: Measuring Passion in the Workplace

Psychometric Properties of HP and OP in Workplace Settings. HP and OP measures used in DMP studies are psychometrically sound and invariant over time, gender, age, and activities (Marsh et al., 2013). In traditional DMP studies, respondents note the activity that was the source of their passion and then completed the same set of items associated with that activity. Most individuals are passionate about some activity, but there are substantial differences in the activities about which individuals are passionate. Based on an archive of responses from different settings, Marsh et al. categorized the source of passion into one of five categories (leisure, sport, social, work, education). Using advanced statistical modeling (exploratory structural equation modeling, ESEM), they demonstrated that the factor structure relating the Passion scale items to the a priori latent (HP and OP) factors was invariant over the different activities, as well as gender, age, and (French and English) language.

Marsh et al. (2013) also provided support for the convergent and discriminant validity of the HP and OP for a range of validity criteria (life satisfaction, rumination, conflict, time investment, and activity liking and valuation). This strong support for invariance over different activities is important, demonstrating that the same set of items are equally valid in relation to passion for diverse activities—including work passion that is the focus of our study.

Distinctive Contribution OP and HP in Relation to Other Workplace Constructs. Vallerand, Paquet et al. (2010; also see Perrewé et al., 2014) distinguish their conceptual definition of passion from related constructs in organizational research such as affective engagement, work engagement, and vigor. They note in particular that these constructs typically do not distinguish between types, strength, and internalization that are at the heart of the DMP. Similarly, Astakhova & Porter (2015) argue that DMP theory offers a more fine-grained evaluation of relations between work passion and outcomes. Thus, whereas work engagement can be manifested as either OP or HP, these different manifestations of passion are associated with different forms of motivation (Vallerand & Houlfort, 2003; also see Astakhova & Porter, 2015). From the perspective of self-determination theory, HP is based on intrinsic motivation such that the activity is rewarding in

itself, and success per se is not a primary motivation. In contrast, OP is based on an extrinsic motivation that may have positive short-term effects on performance but undermines intrinsic motivation. However, Houlfort et al. (2013) also demonstrated that HP and OP have an independent contribution to predicting behaviors beyond autonomous and controlled motivation (also see results from Pollack et al 2020, meta-analysis summarized in Table 1).

Relations of HP, OP, and GP with Burnout and Job Satisfaction

Freudenberger (1975) argued that you must first be on fire before you can burnout. Freudenberger's pioneering research posited that burnout was an affliction of the passionate worker who would disregard their own health and well-being, substituting all aspects of their lives in service to their jobs. Initially healthy, positive, and motivated workers would become irritable, antisocial, frustrated, and condescending toward their co-workers and clients. Over time they would become more exhausted and cynical, and their work performance would decline (Freudenberger, 1975). While these later burnout stages are important, emotional exhaustion is generally seen as the initial and most critical component (Malach-Pines & Carlson, 2005). Job satisfaction also is considered an important employee outcome. Job satisfaction research has a long history, typically defined as a self-reported, evaluative judgment of either particular or holistic work attitudes (Kornhauser & Sharp, 1932; Judge et al., 2017, Marsh & Scalas, 2018).

Freudenberger's (1975) statement is one of the most widely cited quotations in the burnout literature. This demonstrates that even from the inception of burnout research, thinking about it has been entangled with thinking about passion. This linking of the two constructs occurs in the broader popular culture as well as in the research literature. Clearly, the constructs of passion and burnout are correlated (see Table 1 and the meta-analytic review by Pollack et al., 2020). However, implicit in the Freudenberger's claim is the further assumption of a causal ordering in which passion leads to burnout. However, we note that we do not make this assumption in our longitudinal analysis relating all T1 constructs to T2 constructs. Instead, we leave issues of causal ordering and reciprocal effects as a research question to be pursued in the present investigation.

General Passion. The construct GP is central to and has a long history in both the job satisfaction and burnout research literatures. Thus, within the general stream of work passion research identified by Pollack et al. (2020), job satisfaction was one of the most frequently studied and most highly related correlates of GP (see Table 1). Historically, the role of general passion that has been closely aligned to workplace burnout. Thus, in their Annual Review article entitled "job burnout," Maslach et al. (2001, p. 405) repeated the widely cited adage that "You have to have been on fire in order to burn out" (also see Freudenberger, 1975). Implicit in this maxim is the understanding that workers have to have high GP levels before they are likely to burnout. Within this general passion stream of research relating GP to burnout and job satisfaction, the focus has been on the quantity of GP rather than how this GP is manifested. In contrast to this research on GP, Vallerand et al.'s (2003) DMP model posits that it is critical to differentiate between OP and HP. Here the focus is more on how passion is manifested—the type of passion as well as the quantity of passion.

Dualistic Passion Model. Vallerand et al.'s (2003) DMP has been applied widely in the workplace (Bushardt et al., 2016; Vallerand, Paquet et al., 2010), particularly in the area of employee burnout and job satisfaction. Although burnout among school principals has been studied (e.g., Friedman, 2002), our study is apparently the first research to focus on the role of passion in burnout among school principals.

Consistent with theory and a priori predictions, DMP studies have found that burnout is negatively related to HP and positively related to OP (Birkeland & Buch, 2015; Trépanier et al., 2014). Yet other studies have found these relations to be non-significant (e.g., Fernet et al., 2014). In their meta-analysis of these relations based on 8 studies, Pollack et al. (2020) reported that on average, burnout correlated -.61 with HP and .46 with OP. However, the variation in these relations was considerably higher for OP (observed SD = .251) than for HP (observed SD = .100). Hence, the mean OP relation was not statistically significant in relation to the 95% credibility internal in that a

correlation of zero fell within the credibility interval (but was for the 80% credibility internal reported by Pollack et al.)

School principal job satisfaction is significantly related to teacher job satisfaction and student achievement (Dicke et al., 2019). Job satisfaction correlates positively with HP, whereas it typically it correlates negatively or not at all with OP (Houlfort et al., 2013; Moe, 2016; Burke et al., 2015; Vallerand et al., 2010). In their meta-analysis of these relations based on 12 HP studies and 13 OP studies, Pollack et al. (2020) reported that on average, job satisfaction correlated .72 with HP and .14 with OP. Again, however, the variation in these relations was considerably higher for OP (observed SD = .178) than for HP (observed SD = .07). Hence, the mean OP relation was not statistically significant even with the 80% credibility internal reported by Pollack et al.

Lack of Integration. Surprisingly, as Pollack et al. (2020) emphasized, the DMP and general passion research literatures have evolved relatively independently. In particular, there has been little or no theoretical or empirical research in either of these research literatures to integrate GP, OP, and HP into a unified, overarching framework. This integration is an overarching aim of the present investigation.

The Present Investigation: An Extended Model of Passion in School Settings

For analyses of these longitudinal data, we have three key research aims: test the impact of prior HP and OP on burnout and job satisfaction for school leaders; extend the DMP by testing the implicit interactions between HP and OP with GP; and explore longitudinal path models of the causal ordering of GP, OP, HP, burnout, and job satisfaction (see Figure 2). Following from these broad aims, we posit three research hypotheses (where there is a sufficient basis for making a priori, directional predictions based on theory and empirical research). In addition, we pose one additional research question where there is insufficient information to make a priori, directional predictions – but are nevertheless important issues.

Hypothesis 1: Convergent and Discriminant Validity of Passion Factors. The five a priori factors (OP, HP, GP, job satisfaction, and burnout) are all highly stable and differentiable over time based on a multitrait-multimethod (MTMM) tests for convergent and discriminant validity.

***Hypothesis 2*.** HP at T1 (T1HP) predicts positive changes in job satisfaction and negative changes in burnout (i.e., effects of T1HP on T2 job satisfaction and T2 burnout after controlling the effects of all T1 variables, including T1 job satisfaction and T1 burnout).

***Hypothesis 3*.** OP predicts negative changes in job satisfaction and positive changes in burnout (i.e., effects of T1OP on T2 job satisfaction and T2 burnout after controlling all T1 variables, including T1 job satisfaction and T1 burnout).

Hypothesis 4. Predictions here are based on our interpretation of the application of the exclusion strategy in DMP research. GP magnifies the beneficial effects of HP and the harmful effects of OP on both job satisfaction and burnout (i.e., there are significant effects of T1GPxT1HP and T1GPxT1OP interactions on T2 outcomes). We note that at least the direction of these predictions follows from the use of GP as a filter variable use to exclude individuals low in GP in DMP studies. Nevertheless, the form of interaction implicit in the exclusion strategy is highly restrictive, so support for these hypotheses does not necessarily support the exclusion strategy.

In addition to these three a priori research questions, we propose a research question that is substantively and theoretically important, but for which there is not sufficient basis for making a priori predictions.

Research Question 1. Implicit in the DMP is the assumption that OP and HP lead to outcomes (e.g., job satisfaction and burnout), but this cannot be tested with cross-sectional data. Although there is limited support for this assumption, we consider this an open question. Hence, it is entirely possible that there are reciprocal effects such that job satisfaction and burnout are reciprocally related to HP and OP (i.e., job satisfaction and burnout □ OP and HP as well as OP and HP □ job satisfaction and burnout). Although still based on correlational data, our longitudinal (cross-lagged panel) design provides a stronger basis for assessing the direction of causality than do

cross-sectional data. We leave as a research question whether there are reciprocal effects between the variables considered here.

Method

This study is based on an overarching research project entitled "XXXX" that was funded by the XXX Research Council (Grant Number XXX) under the supervision of lead principal investigator Professor XXXX. This research project, including research presented here, was judged to be of low risk and approved by the xxx University Ethics Review Committee (Ethics report number XXXX) and subsequently extended (Ethics report number xxx) through 2025.

Sample

Participants were a large (N = 3,996) sample of Australian school leaders (74% principals, 26% deputy principals and other school leaders) surveyed in 2015 and 2016 (44% male; mean age = 57.61, SD = 7.29). 64% of leaders worked in primary schools, 22% in secondary schools, and 14% in other settings (e.g., Kindergarten -Year 12 schools, special education schools). The average tenure in the current position was 5.2 years (SD = 4.3) and 12.5 years in leadership roles generally (SD = 7.3).

Participants are school principals and school leaders who responded to invitations sent to them by national and state-based school principal organizations. This sample includes nearly one-third of the school principals in Australia. Although a self-selected sample, as outlined in more detail in publicly-available annual reports (see https://www.healthandwellbeing.org/principal-reports), the respondents and their schools broadly represent the population of Australian school principals as a whole. Thus, for example, the Australian Bureau of Statistics reports that in 2019, 66% of Australian schools were primary schools, approximately the same as we reported in our study. (There are more primary schools because they tend to be smaller than high schools, which is likely to be the case in other countries as well, such as the US where 75% of its schools are elementary; Duffin, 2020). Hence the breakdown is consistent with the population of interest.

Measures

In Supplemental Materials, we present detailed information in the form of the following descriptive statistics (central tendency, variability, distribution):

- Section 1a. Item wording of constructs used in the present investigation
- Section 1b. Descriptive Statistics for HP, OP, GP for 2015 and 2016 (total group)
- Section 1c. Correlations for HP, OP, and GP items for 2015 and 2016
- Section 1d. Descriptive Statistics and Frequency Distributions for Groups with High and Low General Passion

GP, HP, and OP items were from the Passion Scale (Marsh et al., 2013; Vallerand et al., 2003; see Supplemental Materials for the wording of all items). To clarify the focus as the work context, we replaced the word "activity" in the original scale to "work" as is typical in work passion studies (see Marsh et al., 2013). School principals responded on a 7-point response scale: not agree at all (1); Very slightly agree (2); Slightly agree (3); Moderately agree (4); Mostly agree (5); Strongly agree (6); Very strongly agree (7).

Burnout and job satisfaction measures were from the Copenhagen Psychosocial Questionnaire that has been validated with school principals (e.g., Lavigne et al., 2012; also see Dicke et al., 2018). As part of the presented results, we present factor loadings and coefficient alpha estimates of reliability for the five factors over two occasions (see subsequent discussion of Table 4).

Statistical Analyses

All analyses were done with Mplus 8 (Muthén & Muthén, 2008-18) using the robust maximum likelihood estimator (MLR), which is robust against violations of normality assumptions. For present purposes, we include all participants who responded at T1 (N= 2,701) or T2 (3084)—a total of 3996 participants.

Missing Data

The data came from a larger project in which school principals are invited annually to complete the XXXX survey (Author 3 et al., 2018; Author 4, 2014, 2015, 2017). As such, there is

an overlapping set of school principals who completed the survey in 2015 and 2016. For present purposes, we include all participants who responded at T1 (N = 2701) or T2 (N = 3084)—a total of 3728 participants. A majority of the principals (1951) had complete data for both years. The numbers for T2 are greater than T1 because the sample was invited separately for each year of the study, and there were new participants at T2 who did not participate at T1.

Particularly in longitudinal studies, there is increasing awareness of the limitations of traditional approaches to missing data (Graham, 2009). Here, to make full use of the data from students with missing data, we applied the full information maximum likelihood method (FIML; Enders, 2010). FIML has been found to result in trustworthy, unbiased estimates for missing values even in the case of large numbers of missing values (Enders, 2010) and to be an adequate method to manage missing data in large longitudinal studies (Jeličič, Phelps, & Lerner, 2009). More specifically, as emphasized in classic discussions of missing data (e.g., Newman, 2014), under the missing-at-random (MAR) assumption that is the basis of FIML, missingness is allowed to be conditional on all variables included in the analyses, but does not depend on the values of variables that are missing. In a longitudinal panel design, this implies that missing values can be conditional on the same variable's values collected in a different wave. This makes it unlikely that MAR assumptions are seriously violated, as the key situation of not MAR is when missingness is related to the variable itself. Hence, having multiple waves of parallel data provides strong protection against this violation of the MAR assumption.

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Confirmatory Factor Analysis (CFA) and Exploratory Structural Equation Modeling (ESEM) Models

We tested the a priori factor structure with confirmatory factor analysis (CFA) and exploratory structural equation modeling (ESEM) models and the structures' invariance over time and groups. However, following Marsh et al. (2013; also see Birkeland & Buch, 2015), our main emphasis was on the ESEM results. More specifically, Marsh et al. argued that the use of ESEM, compared to their parallel analyses based on confirmatory factor analysis (CFA), was a potentially important contribution. CFA requires that all items load on one and only one factor (an independent clusters assumption), whereas ESEM allows items to cross-load on multiple factors. When the CFA assumption of independent clusters is violated, the CFA solution results in a poorer fit to the data and biased parameter estimates. Applied and simulation studies demonstrate that the CFA solution's bias is likely to result in inflated (positively biased) estimates of correlations among the latent factors (Marsh, Guo et al., 2020; Marsh, Morin, Parker & Kaur, 2014). In terms of DMP studies, this means that the correlation between OP and HP are likely to be positively biased. In the Marsh et al. (2013) study, the correlation between OP and HP was .451 in the CFA model, but .175 for the parallel ESEM model. By way of comparison, the Pollack et al. (2020) meta-analysis reported that the mean corrected correlation between OP and HP was .207, but noted that 80% credibility interval based on 62 studies was -.218 to .631.

Consistent with a priori predictions, ESEMs fitted the data better than traditional independent cluster CFAs and resulted in much better differentiation (lower correlations) between the OP and HP factors. Extended ESEM models showed that the OP and HP were differentially related to a range of background and validity criteria, providing support for both factors' convergent and discriminant validity.

Tests of Factorial Invariance. To address the substantive issues, we estimated the auto-regressive cross-lagged models (see Figure 2). For purposes of these models, we considered background demographic variables (participant age, gender, and group—coded 1 = principals, 0 = other school leaders), the three latent passion factors (GP, OP, and HP) measured at T1 and T2, and the two outcome variables (burnout and passion) measured at T1 and T2. In various models, we tested configural, metric, and scalar invariance over time and multiple groups. In all models, we included all items representing all the latent variables at T1 and T2. As recommended by Marsh et al (2013), our a priori model included correlated uniquenesses relating residual variance terms for the same item at T1 and T2(for further discussion see Marsh, Balla & Hau, 1996; Joreskog, 1962). In unreported analyses, we showed that models without correlated uniquenesses provided a poor fit to the data, generally the case for longitudinal data, and we did not consider them further.

In some of these models, we also included latent interactions (GPxHP and GPxOP) to evaluate predictions that GP moderates HP and OP's effects. Latent interactions were estimated using the latent moderated structural equation modeling (LMS) approach as operationalized in Mplus (Klein & Moosbrugger, 2000; Klein & Muthén, 2007; also see Marsh, Wen, Nagengast & Hau, 2012).

Multitrait-Multimethod (MTMM). Multitrait-multimethod (MTMM) analysis tests the convergent and discriminant validity of the five factors (OP, HP, GP, job satisfaction, and burnout) over time (Hypothesis 1) in relation to their stability. This MTMM design provides an exceptionally strong approach to evaluating the discriminant validity of multiple constructs in relation to stability over time, as emphasized by Campbell and O'Connell (1967). They specifically operationalized the

multiple methods in their MTMM paradigm as multiple occasions. Marsh (Marsh et al., 2005; Marsh et al., 2010) also recommended this approach to evaluate support for the convergent and discriminant validity in relation to temporal stability over time. In this approach to MTMM, convergent validities refer to stability over time (i.e., test-retest correlations), and the "method" factor is time. Although the design might be considered weak concerning support for convergence based on maximally different methods (e.g., multiple respondents—self vs. peer; multiple instruments designed to measure the same traits), it provides a "best case" test for discriminant validity. Thus, if there is no support for discriminant validity for convergent validities based on time as the method factor, support for discriminant validity is unlikely to be found with other, more demanding tests of convergent validity. Marsh et al. (2010) demonstrated new and evolving latent-variable approaches that allow convergent and discriminant validity to be assessed using the traditional Campbell & Fiske (1959) criteria (the original and most widely used basis of assessing MTMM data) while still overcoming subsequent criticisms of these criteria.

Preliminary Analyses: Test of the DMP Exclusion Strategy

A critical issue underpinning the present investigation's rationale is the appropriateness of the DMP exclusion strategy based on GP. In these preliminary analyses, we begin with a test of the exclusion strategy based on cross-sectional data that is the basis of most DMP previous research (see Figure 1 and related discussion). Following the original application of the exclusion strategy (e.g., Vallerand et al., 2003), we divided the sample into Low Passion and High Passion groups based on responses to the original general passion item used by Vallerand et al. (High Passion is all participants above the midpoint of the 7-point response scale, Low Passion is all others). For this sample, the cut-off is 1.27 SD below the mean (M = 5.50, SD = 1.18) and results in a dichotomous split with N = 450 in the low passion group (16.6%) and N = 2253 in the High Passion group (83.4%). This split is conservative in relation to previous DMP research. Thus, for example, Vallerand and colleagues suggest that 15%-25% of people are not passionate about any activity in their lives (see Philippe et al., 2009; Schellenberg, et al. 2019; Vallerand et al., 2003). Hence it

follows that if as many as 25% of the population are not passionate about ANY activity, the number deemed not to be passionate in relation to a particular activity (e.g., work) would typically be much higher. However, more recently Schellenberg et al. (2019) argued that high- and low-passion groups with cut-off values should be relative to values actually obtained for a particular activity and sample, using a criterion of 1 SD below the mean.

We then fit a simple path model (see Supplemental Materials for more details) in which HP and OP predicted JS and BO. We fit this model separately for each of the three (Total, Low GP, and High GP groups. The critical test of the exclusion strategy is for the Low GP group - OP and HP should be unrelated to JS and BO according to the appropriate use of the exclusion strategy. Also of interest is how correlations, path coefficients, and multiple correlations differ for the total group and High GP group.

Results for the Low GP group (Table 1; also see Supplemental Materials for further detail) demonstrated that assumptions underlying the exclusion strategy are seriously violated. In the Low GP group, HP is negatively correlated with BO ($r = -.353$) and positively correlated with JS ($r = .403$). HP and OP significantly predicted both BO (MultR = .422) and JS (MultR = .404). All correlations and multiple regression coefficients are highly significant ($p < .001$). Because OP and HP are substantially related to JS and BO for this Low-GP group, we conclude that assumptions implicit in the traditional exclusion strategy are violated, and the exclusion strategy is inappropriate.

Results are similar for the Total and High GP groups. In the Total Group, HP and OP predicted BO (multiple correlation = MultR = .610) and JS (MultR = .601) as well or better than the same model applied to the High GP group for which the exclusion strategy was applied (MultR = .599 for BO, MultR = .510 for JS). Although the variance explained in the Total and High GP group is somewhat higher than in the Low GP, the pattern of path coefficients is similar in the three analyses.

What is clear from these analyses is that the application of the exclusion strategy (High GP group) results in no better and, perhaps, slightly poorer predictions of the outcome variables compared to

not applying the exclusion strategy (Total group). Notably, the results show that HP and OP are systematically related to outcomes, even in the Low GP group. Both these results lead us to reject the appropriateness of the exclusion strategy. We also note that in addition to these empirical results, there are a host of practical, statistical, and theoretical reasons (e.g., power, standardized effect size, reliability, model specification, and the interpretability of results) for why the use of a dichotomous (high-low) split and associated threshold models are dubious more generally as well as in the present investigation (e.g., DeCoster et al., 2009; MacCallum et al., 2002; Preacher et al., 2005; also see Supplemental Materials for further discussion).

Results

Factor Structure

Goodness of Fit

We began by comparing confirmatory factor analysis (CFA) and exploratory structural equation modeling (ESEM) models of the a priori factor structures and the invariance of the structures over time. Consistent with previous research (e.g., Marsh et al., 2013; also see Birkeland & Buch, 2015), none of the traditional CFA models provided an acceptable fit to the data (Table 3). In contrast, all the ESEM models positing three separate passion factors (GP, OP, and HP) for each time wave provided good fits to the data (Table 3; also see parameter estimates in Table 4). Also, we also tested models positing one or two passion factors, rather than three. Consistent with the a priori predictions, the fit of these alternative models was not acceptable and noticeably poorer than the fit of models with three passion factors.

In a series of models, we tested the factor structure's invariance over time (T1 vs T2) and over multiple grouping variables (principals vs. other school leaders; primary vs. secondary schools). Goodness-of-fit statistics (see Tables 1 and 2) showed that strong support for configural, metric (factor loading), and scalar (intercept) invariance over time and the multiple groups of participants. Indeed, the model imposing scalar invariance simultaneously over time, and the multiple groups resulted in a good fitting model (Table 3). These results demonstrate that the a

priori factor structure was very robust, generalizing over time and multiple groups (principals vs. other school leaders, and primary vs. secondary schools).

Parameter Estimates

Factor loadings based on the a priori model (Table 4) demonstrate that all five latent factors are well-defined. Target loadings relating each item to its a priori factor (those shaded in gray in Table 4) are substantial, whereas non-target loadings are consistently much smaller.

Coefficient alpha estimates of reliability (last row of Table 4) are substantial for all five factors (.78 to .92), and consistent over time. However, we note that correlations in Table 4 are latent correlations and, thus, already corrected for measurement error.

Correlations demonstrate a pattern of relations among the five factors that is also consistent over T1 and T2. Thus, for example, HP is negatively correlated with OP and burnout, but positively correlated with GP and job satisfaction. OP is positively correlated with GP and burnout, but negatively correlated with job satisfaction. Interestingly, GP correlates positively with both HP and OP, and job satisfaction, but correlates negatively with burnout.

Correlations between the five factors and the set of covariates (see covariate correlations in Table 4) are consistently small in size (the largest correlation is .21 in absolute value). However, we focus on those greater than .10. Males have lower levels of GP (-.18 & -.17). Age is positively related to job satisfaction (.10 & .11) and HP (.12 & .11), but negatively related to burnout (-.19 & -.21). Differences between principals and other school leaders, and between secondary and primary schools are small (correlations less than .10) for all five factors at T1 and 2.

Convergent and Discriminant Validity: MTMM Analysis (Hypothesis 1)

Our MTMM analysis is based on the set of latent correlations among the five factors at T1 and T2. For this design, the "method" factor is time, and the test-retest stability coefficients (correlations shaded in gray in Table 4) are the convergent validities. The test-retest stability coefficients are substantial for all five latent constructs, varying from .68 (burnout) to .76 (OP).

Tests of discriminant validity are based on the comparison of these stability coefficients (correlations of these same construct over time, monotrait-heteromethod correlations) with correlations among the different traits (heterotrait correlations). In support of convergent validity in this MTMM design, the 5 convergent validities (the 5 test-retest stability correlations) vary from .65 to .76. By comparison, the 20 heterotrait-monomethod correlations (correlations among five factors within each of the two waves) vary from .11 to .60 in absolute value, and the 20 hetrotrait-heteromethod correlations (correlations of five T1 factors with 5 T2 factors) vary from .08 to .46 in absolute value. Because correlations among the five factors are modest and never exceed the corresponding convergent validities, there is good support for the five factors' discriminant validity.

Of particular relevance is the distinctiveness of the three passion factors. However, correlations among these three passion factors are modest at both times 1 and 2. There is consistently a small negative correlation between OP and HP (-.23 & -.20), and modest positive correlations relating GP to HP (.46 & .46) and to OP (.33 & .33). Hence, the three passion factors are highly differentiated.

Effects of OP and HP on Burnout and Job Satisfaction: Hypotheses 2-4

A priori hypotheses 2-4 are based on our auto-regressive cross-lagged models (see Figure 2). In alternative models A-D (see Table 5), we tested results with and without covariates, and with and without the GP and its interactions.

Effect of HP (Hypothesis 2)

The effect of T1HP was positive for change in job satisfaction (.09) and negative (-.07) for change in burnout (see Table 5). However, when we introduced GP into Models C and D, T1HP remained a significant negative (-.08) predictor of change in burnout, but the positive effect of T1HP (.06) was no longer statistically significant for changes in job satisfaction.

Consistent with Hypothesis 3, the T1HP interacted significantly with T1GP

Effect of OP (Hypothesis 3)

In none of the models (Table 5), was T1OP a significant predictor of change in either job satisfaction or burnout. However, T1OP did have a positive effect on changes in GP and significant effects on burnout when GP was high (see Hypothesis 4 below).

Moderated Effects (Hypothesis 4)

A Priori Predictions. On the basis of the logic of the exclusion strategy, Hypothesis 4 posited that GP would magnify the beneficial effects of HP and the harmful effects of OP on job satisfaction and burnout. Of particular relevance are the four interactions; the effects the T1GPxT1HP and T1GPxT1OP interactions on job satisfaction and burnout at T2 (see Table 5; also see Figure 3 for graphs of the statistically significant interaction effects in Table 5).

The effects of the T1GPxT1OP interactions were consistent with predictions. The positive effects of T1OP on T2 burnout were larger when T1GP was high. Inspection of the graph of this interaction (Figure 3) shows that T1OP has a positive effect on T2 burnout when T1GP is high, but a negative effect when T1GP is low. The negative effects of T1OP on T2 job satisfaction were also larger when T1GP was high. Inspection of the graph of this interaction shows that T1OP has a more negative effect on T2 job satisfaction when T2GP is high, but has little effect when T1GP is low. Hence, consistent with Hypothesis 2, T1GP magnified the adverse consequences associated with T1OP.

However, the effects of the T1GPxT1HP interactions were not consistent with predictions. T1GP did not moderate the positive effects of T1HP on job satisfaction. Furthermore, the effect of the T1GPxT1HP on burnout was positive rather than negative. Inspection of the graph of this interaction shows that T1HP had no effect on burnout when T1GP is high, but a negative effect when T1GP is low. Thus, the effect of high GP countered the otherwise negative effects of T1HP on T2 burnout. Hence, in contrast to Hypothesis 4, high GP did not magnify the positive consequences of HP, and actually diminished the positive effects of HP on burnout.

In relation to the DMP research, we note that the nature of these interaction effects further undermines support for the DMP exclusion strategy. Hence, in relation to burnout, there were

systematic effects of OP and HP for school principals who were low in general passion. For job satisfaction, HPxGP interaction was not significant, whereas OPxGP interaction was in the opposite direction to predictions based on the exclusion strategy. Hence the moderating effects associated with T1GP are more complex – and interesting – than suggested by application of the exclusion strategy. However, our results—even those that were inconsistent with our predictions--support our contention that GP, and the GPxHP and GPxOP interactions, need to be formally included in DMP research rather than leaving these effects implicit in the DMP exclusion strategy.

Other Interaction Effects. Although not central to our predictions, there were also four other statistically significant interactions involving T1GP (see Table 5 and Figure 3). Three are for the T1OPxT1GP interactions, and one is for T1HPxT1GP. The effect of theT1OPxT1GP interaction on T2HP shows that T1OP has a negative effect on T2HP when T1GP is high, but a positive effect when T1GP is low. Thus, the combination of high GP and high OP undermines subsequent harmonious passion. The effect of the T1OPxT1GP interaction on T2GP shows that T1OP has a negative effect on T2GP when T1GP is high, but a positive effect with T1GP is low. Thus the combination of high GP and high OP leads to declines in subsequent levels of general passion. The effect of the T1OPxT1GP interaction on T2OP interaction shows that T1OP has a stronger positive effect on T2OP when T1GP is high. Thus, the combination of high T1OP and T1GP leads to subsequent increases in obsessive passion. Finally, the effect of the T1HPxT1GP interaction on T2OP shows that T1HP has a positive effect on T2OP when T1GP is high, but a negative effect when T1GP is low. Thus, the combination of high T1HP and high T1OP leads to increases in subsequent obsessive passion.

Summary of Moderation Effects. In relation to the DMP research, we note that the nature of these interaction effects further undermines support for the DMP exclusion strategy. This is evident in the four interactions posited in Hypothesis 4. Hence, in relation to burnout, there were systematic effects of OP and HP for school principals who were low in general passion. This violates the assumption of the exclusion strategy that there should be no effects when GP For job

satisfaction, HPxGP interaction was not significant, whereas OPxGP interaction was in the opposite direction to predictions based on the exclusion strategy.

There is a consistency with these results and those based on our a priori predictions. In particular, the adverse effects of OP tend to be magnified by the high levels of GP. However, the positive effects of HP are not magnified by high levels of GP and, in some instances, are undermined by high levels of GP.

Hence, the moderating effects associated with T1GP are more complex – and interesting – than suggested by predictions based on the exclusion strategy. However, our results, even those that were inconsistent with our predictions, support our contention that GP, and the GPxHP and GPxOP interactions, need to be formally included in DMP research rather than leaving these effects implicit in the DMP exclusion strategy.

Reciprocal Effects (Research Question 1)

At least implicitly, the DMP posits GP (as an exclusion variable) is a precursor to OP and HP, and that effects flow from OP and HP (the independent variables) to job satisfaction and burnout outcomes. Thus, from the perspective of Research Question 1, we are particularly interested in the so-called "reverse causality" – the effects of T1 outcomes (burnout and job satisfaction) on T2 measures of passion.

Based on our longitudinal path model (Figure 2), our results show that there are reciprocal effects between job satisfaction and GP (i.e., the T1 job satisfaction➔T2GP and T1GP➔T2 job satisfaction paths are both positive), and between HP and burnout (the T1 burnout ➔T2HP and T1HP➔T2 burnout paths are both negative). HP and JS were also reciprocally related, positively, for models without GP, but when we included GP, the effect of T1HP on T2 job satisfaction became non-significant.

In summary, although the pattern of reciprocal effects is complex, the simple causal ordering of variables implicit in cross-sectional studies of the DMP (passion ➔ outcomes) is too simplistic when tested in relation to longitudinal data.

Discussion

Our overarching aim was to test and extend the DMP model with school principals. Our preliminary psychometric analyses showed that DMP measures (OP, HP, and GP) and also our measures of job satisfaction and burnout are well-defined in our sample of school principals. Of particular relevance to our extension of the DMP model to include GP (as well OP and HP), the three passion factors are quite distinct. Consistent with the GP factor logic, GP was moderately positively correlated with both HP and OP, even though there was a small negative correlation between HP and OP.

Harmonious Passion

Consistent with DMP predictions, our longitudinal results suggest that T1HP is protective against burnout one year later and leads to positive change in job satisfaction. However, this positive effect became non-significant when we included GP; GP then became a positive predictor of job satisfaction. Taken together, it appears that GP and its harmonious manifestation are additive and positive in explaining high job satisfaction and low burnout.

However, contrary to expectations, the HPxGP interaction effect was not significant for job satisfaction and was significantly positive (rather than negative) for changes in burnout. Thus, HP's protective effects on burnout are diminished, not magnified, when GP is high. Although contrary to our a priori predictions, a post hoc explanation of this finding is that HP is a protective factor folr burnout if GP is not too high, but that too much passion – no matter how it is manifested – can lead to job burnout. Although inconsistent with our a priori hypothesis based on DMP, this is not completely unexpected in relation to the important maxim: You have to have been on fire to burn out. Implicit in this maxim is the understanding that high levels of passion can lead to burnout. Our results suggest that even too much HP can generate enough fire to lead to burnout. Nevertheless, because this interaction effect was small (and only marginally significant) and unexpected, it is important to replicate this result in further research and test underlying mechanisms to understand the theoretical and practical implications better.

Obsessive Passion

Contrary to DMP predictions, T1OP had no significant effects on changes in either job satisfaction or burnout. Indeed, the only significant effect was the positive effect of T1OP was on changed in GP. However, consistent with a priori predictions, there were effects of the GPxOP on both job satisfaction and burnout. Thus, when T1GP was high, T1OP did lead to a negative change in job satisfaction and positive burnout changes. Although nuanced, we interpret these results to support our predictions about OP's consequences (but only when GP is high) and our extension of the DMP to include GP as a moderating variable.

General Passion: A Substantive Variable and an Exclusion Criterion.

Our major theoretical contribution to DMP theory was to more fully explicate the role of GP in juxtaposition to OP and HP. In doing so, we fill the gap identified in Pollack et al.'s (2020) systematic review of work passion research. More importantly, for DMP research, we make explicit the general passion exclusion strategy and the untested interaction effects that underpin this strategy.

Pollack et al. (2020) noted that there were few, if any, studies that included both GP (used in the general passion stream) and OP and HP (used in the DMP stream). Hence, he was unable to ascertain the correlations relating GP to OP and HP. Although based on different sets of studies, his meta-analyses showed that when the same outcomes were related to GP, HP, and OP. However, GP's correlations consistently fell between those based on HP and OP. Our results are consistent with this pattern of results (see correlations of GP, HP, and OP in Table 4). Thus, for example, at T1, burnout correlates -.55 with HP and .40 with OP, whereas the correlation with GP is -.12 (correlations at T2 are nearly the same). In summary, our study fills a gap in work passion research and supports Pollack et al.'s (2020) recommendation that work passion studies should include GP as well as HP and OP.

Our use of the GP scale from Vallerand et al.'s Passion Scale (2003) as a substantive factor in our longitudinal study is a potentially important contribution to DMP research. We suggest that

previous researchers who have used the general passion as a filter variable may be missing a potentially powerful explanatory variable. As emphasized earlier, GP's use as an exclusion variable in DMP research is based on an implicit assumption that GP moderates HP and OP's effects. We identified limitations with implementing this strategy (dichotomizing genera passion, an apparently arbitrary threshold, discarding potentially many individuals who fall below the threshold, and possibly incomplete implementation and reporting across different studies). However, we accepted this strategy's logic and operationalized it in terms of a priori predictions (Hypothesis 4). However, we found mixed support for these predictions and, thus, the use of the general passion exclusion strategy. There was reasonable support for GP's moderating effect on OP (the negative consequences of OP were greater when GP was high); this was consistent with the underlying logic of using GP as a selection variable. However, there was no support for the predicted moderating effects for HP (the GPxHP effects were non-significant for job satisfaction and in the wrong direction for burnout). Although we offered a plausible post-hoc explanation of the lack of support as a basis for further research, this lack of support reinforces our extension of the DMP to include GP and formally test the implicit assumption that GP moderates HP's effects and OP.

Nevertheless, we emphasize that none of our results provide any support for the continued use of the exclusion strategy in DMP research—the dichotomization of GP, the exclusion of potentially substantial numbers of participants who fall below the arbitrary cut-off values used to define a Low GP group, or threshold models underpinning the exclusion strategy. Our preliminary analyses based on the Low GP group and our subsequent tests of GP interactions all demonstrate that HP and OP are systematically related to job satisfaction and burnout for principals with low GP. This conclusion is consistent with well-established limitations of these approaches more generally (e.g., DeCoster et al., 2009; MacCallum et al., 2002; Preache et al., 2005; also see Supplemental Materials for further discussion).

Indeed, we note that our position is consistent with recent research by Vallerand and colleagues (e.g., Schellenberg, et al. 2019) who tested latent interaction models similar to those

considered here to evaluate results for low-passion participants (albeit low passion defined by simultaneously low values in both HP and OP rather than GP) instead of an exclusion strategy to exclude participants who were low in passion. Although their focus was on passion subtypes (low-passion, High-HP, High-OP, and High HP and OP), and did not evaluate longitudinal cross-lagged panel data, their subtype groups were defined terms of main and interaction effects based on a multi-level latent regression analysis with continuous variables like those used here. Hence, an important area of further research is to juxtapose the use of GP and high/low combinations of HP and Op to understand better the implications of different types of passion for subsequent outcomes.

Reciprocal Effects

DMP studies typically assume that the causal flow is from passion to outcomes, but not the other way around. However, because most of the studies are cross-sectional, this assumption is not readily testable. Tests of the reciprocal relations between passion and outcomes have potentially important practical consequences as well as theoretical and methodological implications. Elaborating upon this issue, Birkeland and Buch (2015; also see Fredrickson & Joiner, 2002; Vallerand, 2012) specifically suggested that reciprocal effects between passion and outcomes might result in positive (or negative) spirals. Thus, for example, HP is related to positive work outcomes, and these positive outcomes might inspire workers to become even more harmoniously passionate about their work. However, adverse outcomes might reinforce the rigidity associated with an obsessive passion. Bakker and Demerouti (2017) make a similar point concerning extensions of the Job Demands and Resources model. They noted that longitudinal studies found what they refer to as both causal effects and "reverse causal effects" relating job demands and resources to well-being outcomes. Relatedly, Trépanier et al. (2014) gave the example of an obsessively passionate nurse in an emotionally difficult situation who was unable to accept the social support and other resources that are available to alleviate the stress would protect her from obsessive manifestations of passion. This reasoning led Birkeland and Buch (p. 404) to propose that "Future studies on passion and performance should investigate the degree to which such spirals or reverse causality exist."

Our review of the DMP research suggests few tests of reciprocal effects between the DMP passion factors and outcomes based on longitudinal cross-lagged models. Many studies report correlations (see meta-analysis by Pollack et al., 2020), but nearly all of these studies use cross-sectional data. A few studies evaluated OP and HP's longitudinal effects on subsequent outcomes. However, they did not test a full cross-lag-panel model; OP and HP were only included at T1, so that their reciprocal effects were not tested (e.g., Vallerand, Paquet et al., 2010). However, in several true cross-lag panel studies (Carbonneau, Vallerand, Fernet, & Guay, 2008; Lavigne et al., 2012; Lavigne et al., 2014), outcomes and the passion factors were measured twice over a relatively short period of time. In each of these cross-lagged panel studies, there were significant effects of T1 passion factors on changes in the outcomes, but no significant effects of T1 outcomes on changes in the passion factors. Hence a very limited amount of research provides no support for positive or negative spirals suggested by Birkeland and Buch (2015) and Vallerand (2012). Hence, we pursued this issue of reciprocal relations as an open research question rather than a research hypothesis. Nevertheless, we found evidence for spirals and so-called reverse causation. Thus, T1HP negatively effected T2BO, but T1BO also negatively effected T2HP. Likewise, T1GP positively effected T2JS, but T1JS also positively effected T2GP.

We also note that this issue of reciprocal effects is also relevant to Freudenberger's (1975) widely cited claim that one has to be one fire before they burn. Implicit in this claim is one assumption that passion leads to burnout. However, our results suggest that the reality might be more complex than typically depicted. In the case of harmonious passion, burnout and passion are reciprocally related. T1 passion did negatively affect T2 burnout (consistent with Freudenberger, 1975). However, T1 burnout also had a negative effect on T2 harmonious passion. Hence, although there might have to be a fire before you can burn, it also seems that burnout can put out the fire of passion. However, for general passion, only the path from prior passion to subsequent burnout was significant. Finally, for obsessive passion, there were no significant causal links. In summary, as is often the case with widely accepted wisdom, our results show that the linkages between burnout and

passion are more complex than suggested by a possible superficial interpretation of Freudenberger's (1975) claim.

Strengths, Limitations, and Directions for Further Research

Our research combined new and evolving statistics (e.g., set-ESEM and latent interactions) with a theoretical innovation, arguing that the effects of passion manifestation depend on GP. We demonstrated a well-defined, robust factor structure underpinning our measures and its invariance over multiple groups. Further, we used large, longitudinal samples (particularly for principal research). This allowed us to determine temporal precedence between passion and burnout and job satisfaction and apply advanced statistical procedures (e.g., multiple latent interactions).

Despite these strengths, there are some important limitations. We based ou measures on self-reports that might introduce method effects that distort relations between passion variables and our outcomes (Podsakoff and Organ 1986). This is a difficult issue to address as school principals are best suited to judge their own levels of passion, burnout, and job satisfaction. Nevertheless, it would be useful to also collect ratings by colleagues to evaluate self-other agreement and potential method effects using multitrait-multimethod analyses. Furthermore, it would be useful to expand the set of outcomes to include objective measures (e.g., school performance measures, turnover, medical history) and reports by significant others, in addition to the self-report measures considered here.

Our large, broadly representative sample of Australian school principals is a limitation as well as a strength. There is a need to test the generalizability of our results to school principals in other countries, teachers, and other occupational groups. Although our sample is broadly representative of Australian school principals, it is possible that the sample is biased in being underrepresented by the principals suffering most from burnout.

Our study is longitudinal, allowing us to establish the temporal ordering of variables and reciprocal effects. However, we cannot rule out the influence of third variables as our data is still correlational. Also, further research is needed with more than just two waves of data that allow application of more sophisticated models of longitudinal data that separate within- and between-

person effects in longitudinal panel data (e.g., random intercept cross-lag panel models and bivariate STARTS model—see Hamaker & Muthen, 2019; Usami, Murayama & Hamaker, 2019).

Broadening the Theoretical Frameworks

An important limitation of our research, as well as DMP research and theory more generally, is a failure to provide underlying explanatory mechanisms to explicate findings and place the research into a broader theoretical framework. The DMP is based on self-determination theory, a metatheory of human motivation that focuses on fulfilling basic human needs, inherent growth tendencies, integrated regulation, and motivations that underpin the choices that individuals make. However, central aspects to self-determination theory have not been fully integrated into the DMP, such as fulfilling specific needs (competence, autonomy, and relatedness), and the role of an integrated regulation of work and work-related issues in the formation of particularly HP.

Relatedly, we considered a limited number of demographic covariates, primarily to demonstrate the invariance of factor structure and to control for differences associated with them. However, we note that we have not included many possible job demands and resources (personal or organizational) that could impact on passion and our outcome variables. This is an obvious limitation of our research and a relevant direction for further research. Here we briefly outline some directions that this research might take.

In a landmark study, Trépanier et al. (2014) integrated the DMP model into the broader framework of the Job Demands/Resources (JD-R) model. The JD-R model posits that all job characteristics can be classified as job demands or job resources, corresponding to mostly negative (demands) and positive (resources) aspects. Thus, job demands are predictive of burnout, and job resources are predictive of engagement and job satisfaction. Trépanier et al. noted that JD-R studies rarely study mediating mechanisms leading from job demands and job resources to multiple outcomes. Integrating JD-R and DMP models, they demonstrated that job demands predicted OP (positively) and, to a lesser extent, HP (positively), but job resources predicted HP (positively). Importantly, OP and HP partially mediated relations from job demands/resources to burnout and

engagement. Integrating DMP into the broader JD-R framework will provide a basis for the incorporation of additional demand and resources, as well as more outcomes. For example, previous research found that social job demands, such as a heavy workload and lack of autonomy, are associated with burnout (see Maslach et al., 2001). Further longitudinal cross-lagged studies are needed to test whether passion mediates the effects of a broader range of resources and demands on job satisfaction, burnout, and other outcomes, including performance.

As Trépanier et al. (2014) noted, their studies' cross-sectional design based on a single wave of data precluded causal interpretations implicit in their analyses – particularly mediation based on a unidirectional causal ordering. Minimally adequate tests of the causal paths underlying the J-DR model and its integration with DMP require longitudinal data with at least two waves, and preferably more. Nevertheless, integrating the JD-R and DMP models in longitudinal studies should lead to a better understanding of the relations between job characteristics, work passion, and work outcomes. As Trépanier et al. emphasized, this integration promises to explain how job demands and resources influence school principals' internalization of their work experience, which underpins the nature of their passion for work. Critical issues in subsequent longitudinal research include the clarification of the role of passion in the JD-R model (e.g., is passion a mediating mechanism or simply another personal resource like self-efficacy and optimism), juxtaposition with competing psychological mechanisms that mediate relations between job demands/resources and outcomes (e.g., need satisfaction/frustration posited in self-determination theory), potential reciprocal effects (particularly so-called reverse causation noted by Trépanier et al.), and tricky statistical issues in increasingly complex models of longitudinal panel data (e.g., multicollinearity, moderation, mediation, mediated-moderation, and moderated-mediation). Although beyond the present investigation scope, we see these issues as important directions for further research, more fully integrating DMP into broader theoretical frameworks.

Policy Implications

School principals play a crucial role in our society. They significantly influence the academic success and well-being of our children well beyond graduation. School principals report increasingly high levels of stress, burnout, and attrition. Thus, policymakers must act to reverse this imminent crisis to ensure our schools and society flourish rather than flounder. However, school leaders are generally passionate about their job; indeed, much more passionate than the average worker (Riley, 2019). Our analysis of the paradox of reported high levels of burnout and job satisfaction provides insight into how we may tackle this issue. When coupled with a harmonious manifestation, high passion typically leads to high job satisfaction and low burnout. However, high GP diminishes even the protective role of HP for burnout (as well as T2OP). This suggests that very high levels of passion, regardless of manifestation, may have negative consequences. Nevertheless, high GP is particularly deleterious when manifesting obsessively. Thus, we argue that passion manifestation may be part of the key to understanding the paradoxical situation where the principal profession is characterized by high job satisfaction and high burnout.

Initiatives that promote work-life balance, a key component of harmonious passion, may well allow school leader passion to manifest harmoniously and thus, act as a buffer against burnout. Harmonious passion can also be reinforced by providing school principals with appropriate training, skills, resources, and social support identified as important in the JD-R model, and implementing appropriate strategies such as job crafting (Rosso, Dekas, & Wrzesniewski, 2010), mindfulness training (Brown & Ryan, 2003), autonomy support in flexible approaches to work (Mageau et al., 2009), promoting work valuation (Vallerand & Houlfort, 2003), and the use of signature strengths (Forest et al., 2012). Conversely, OP stems from a controlled internalization (Ryan & Deci, 2017) resulting from pressures associated with contingencies linked to the activity rather than the intrinsic motivation associated with the activity itself. Thus, high job demands, between school competition, and metrics promoting extrinsic rather than intrinsic outcomes may result in obsessively passionate leaders, furthering increasing the already alarming high levels of burnout and attrition. Researchers

and policymakers need to focus on how school climate and educational policy impact the school principal's passion, ensuring that our education system is of the highest, sustainable quality.

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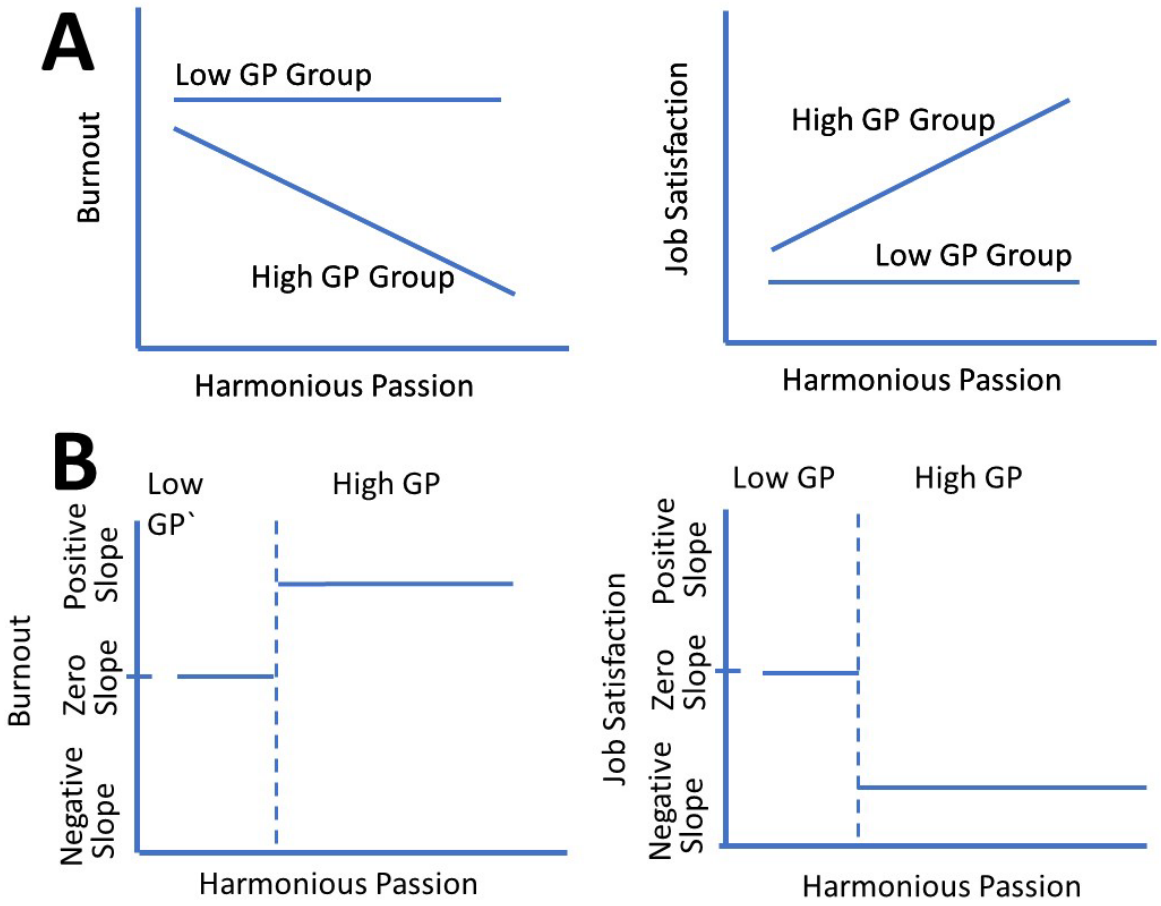
Figure 1

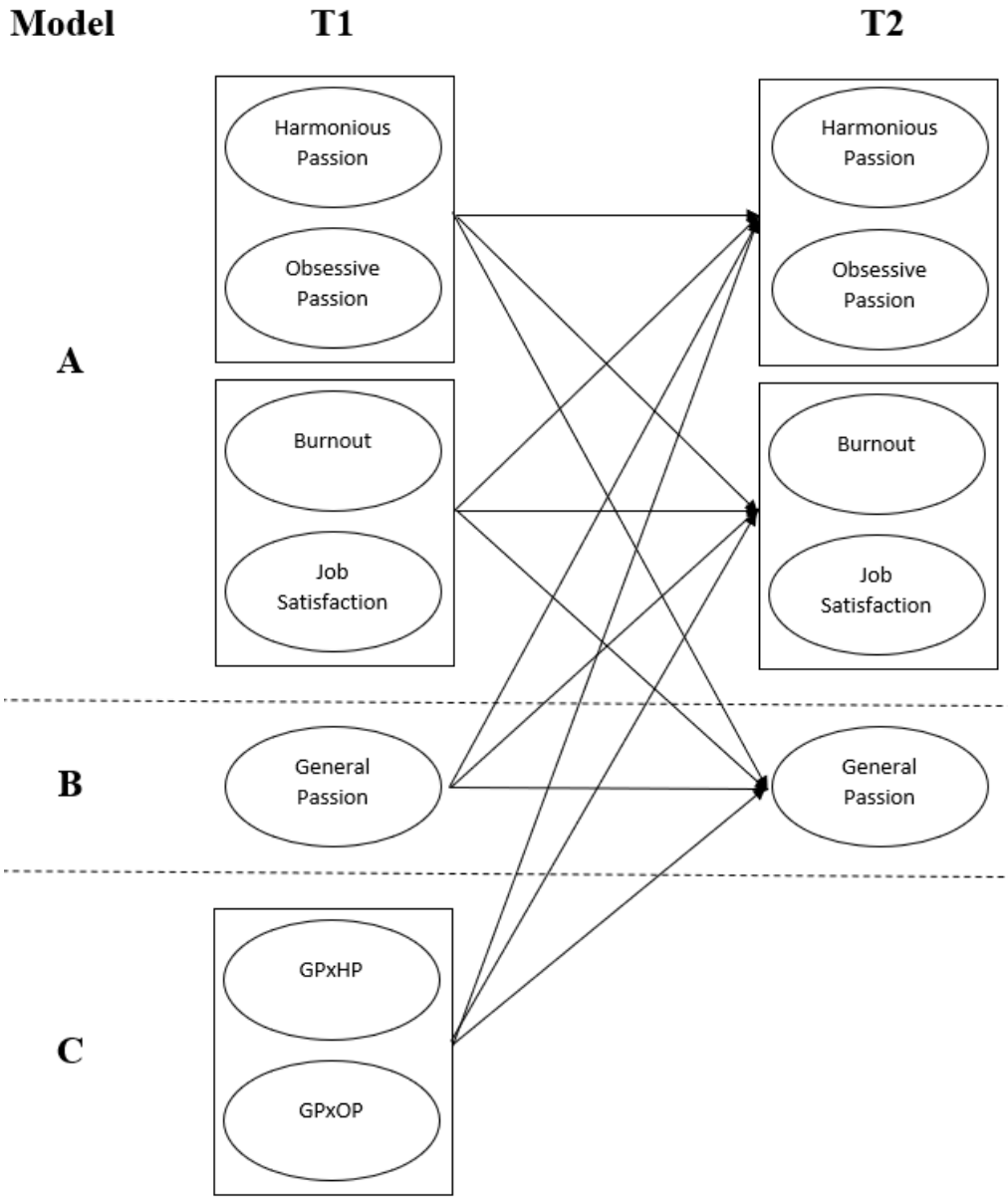
Schematic diagrams of the interaction between general passion (GP) and Harmonious Passion (HP) in relation to two outcomes (burnout and job satisfaction) that would be consistent with the exclusion strategy used in studies of the Dualistic Model of Passion (DMP)



Note. To better explain the application of the exclusion strategy, we present schematic diagrams (Figure 1) of GPxHP interactions that would be consistent with the DMP exclusion strategy. For purposes of this example, we plot the interaction in relation to the effects of HP and GP (and the GPxHP interaction) on burnout and job satisfaction in terms of predicted values and simple slopes (Figure 1A). In the exclusion strategy, GP is operationalized in relation to a cut-point based on the GP measure, a dichotomous classification of individuals into Low GP and High GP groups. According to the exclusion strategy, HP has no effect on either BO or JS for those individuals in the Low GP group (i.e., those who fall below the GP cut-off). This can be tested as a traditional interaction, as depicted in Figure 1A. However, it also implies that the interaction has a very particular form. In particular, the appropriate application of the exclusion strategy makes the very strong assumption that HP (and OP) are unrelated to outcomes for all individuals who fall below the cut-off (i.e., the flat line relating HP to BO and JS for the Low GP group). In Figure 1B we illustrate the simple slopes for this same interaction. Here we show that the slope of HP effect is zero for the Low GP group for both burnout and job satisfaction. It is only for the High GP group that HP is related to burnout (negative slope) and job satisfaction (positive slope). Also implicit in the exclusion strategy that GP is unrelated to both burnout and job satisfaction for those in the Low GP group and likewise for those in the High GP group. Hence, the most basic test of the appropriateness of the exclusion strategy is whether the HP (and OP) are uncorrelated with outcomes (burnout, job satisfaction, but all other outcomes as well) for individuals who fall below the Low GP cut-off.

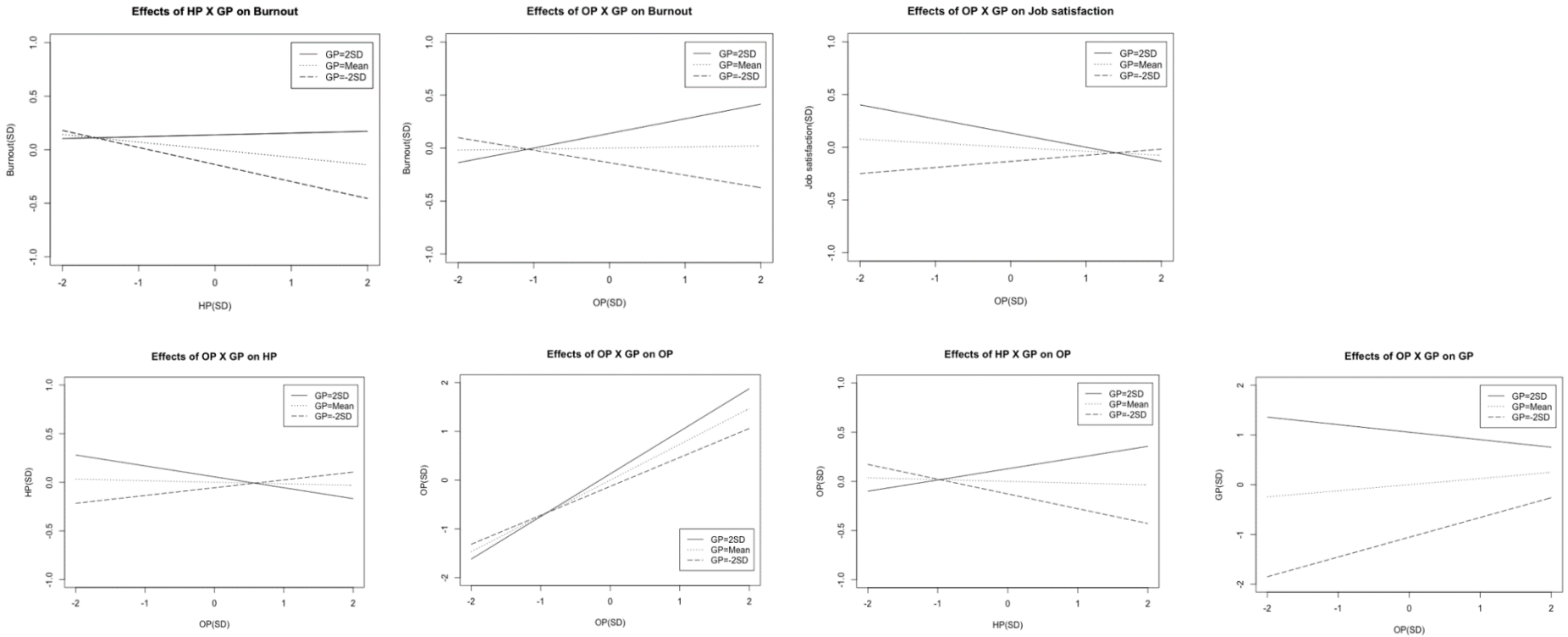
Figure 2

Workplace Passion Longitudinal Models



Note. T1 = Time One, T2 = Time Two, GPxOP = interaction term of general and obsessive passion, GPxHP = interaction term of general and harmonious passion. Model A is a traditional reciprocal effects model relating the four latent factors at T2 to the same factors measured at T2. Model B adds general passion at T1 and T2. Model C adds the two latent interaction terms. For the present investigation, we different analyses based on Models A and C, noting that results based on Models B and C were nearly identical in relation to variables common to each of these models.

Figure 3. Graphs of the seven statistically significant interactions relating T1 variables to T2 outcomes.



Note. In Table 5 there are seven statistically significant interactions. Plots of these interactions are presented here.

Table 1

Correlations between Job-Specific Constructs and the Three Components of Passion

Job-specific constructs	GP	HP	OP
Burnout		-.61	.46
Job satisfaction	.42	.72	.14
Negative affect	-.07	-.31	.15
Positive affect	.31	.78	.30
Autonomous motivation		.82	.29
Intrinsic motivation		.51	.26
Controlled motivation		-.17	.27
Extrinsic motivation		.00	.20
Self−efficacy	.29	.40	.11
Engagement		.64	-.11
Performance		.29	.13
Turnover intention		-.35	-.04

Note. Correlations are population (corrected) estimates of correlations between selected job-specific constructs and three components of passion: GP = general passion; HP = Harmonious Passion, OP = obsessive passion. Correlations are based on results from three separate meta-analyses reported by Pollack et al. (2020). Results were only reported that were based upon at least three studies. For further information, see the original article.

Table 2

Preliminary Test of Exclusion Strategy

Variables	Low General Passion N = 450	High General Passion N = 2253	Total Group N = 2703
	Regression Coefficients		
BO on OP	0.25	0.25	0.24
BO on HP	-0.35	-0.54	-0.54
JS on OP	0.01	0.10	0.13
JS on HP	0.57	0.59	0.70
Multiple Correlation			
BO	0.42	0.60	0.61
JS	0.40	0.51	0.60
Correlations			
OP with HP	-0.30	-0.42	-0.34
OP with BO	0.33	0.44	0.40
OP with JS	-0.11	-0.12	-0.09
HP with BO	-0.35	-0.55	-0.57
HP with JS	0.40	0.50	0.59
BO with JS	-0.35	0.38	-0.43

Note. General passion (GP) was used to divide the total group (N = 2703) into High GP (N = 2253) and Low GP (N = 450) based on the exclusion strategy. Separately for each of the three groups, dependent variables (BO = burnout, JS = job satisfaction) were regressed on the independent variables (OP = obsessive passion, HP = harmonious passion). All coefficients are statically significant except for those shaded in gray.

Table 3

Goodness of Fit for Confirmatory Factor Analysis (CFA) and Exploratory Structural Equation Models (ESEM): Tests of Invariance Over Time and Over Groups (School Principals and Other School Leaders)

Model	χ^2	*df*	CFI	TLI	RMSEA	Description
CFA: Total Group Invariance over time						
Configural	23231	1042	0.693	0.668	0.073	1 Passion Factor
Configural	9052	1011	0.889	0.876	0.045	3 Pasion Factors
Configural	9052	1011	0.889	0.876	0.045	3 Pasion Factors
Scalar	9095	1054	0.889	0.881	0.044	3 Pasion Factors
SET-ESEM: Total Group Invariance Over Time						
Configural	21006	1029	0.721	0.694	0.071	1 Passion Factor
Configural	8404	988	0.896	0.882	0.044	2 Pasion Factors
Configural	3999	947	0.958	0.95	0.028	3 Pasion Factors
Metric	4041	998	0.958	0.952	0.028	3 Pasion Factors
Scalar	4066	1022	0.958	0.954	0.027	3 Pasion Factors
SET-ESEM: Multi-Group Invariance (Principal vs. other school leader)						
Configural	5178	2044	0.956	0.952	0.029	3 Pasion Factors
Metric	5292	2095	0.956	0.953	0.029	3 Pasion Factors
Scalar	5346	2157	0.956	0.953	0.028	3 Pasion Factors
SET-ESEM: Multi-Group Invariance (Primary vs. Secondary)						
Configural	4708	2044	0.957	0.952	0.029	3 Pasion Factors
Metric	4735	2095	0.957	0.954	0.028	3 Pasion Factors
scalar	4779	2109	0.956	0.953	0.028	3 Pasion Factors

Note. Summary of Goodness-of-fit statistics for the different factor analyses considered in the present investigation. ESEM = exploratory factor analysis; CFA = confirmatory factor analysis; χ^2 = chi-square; df = degrees of freedom ratio; CFI = Comparative fit index; TLI = Tucker-Lewis Index; RMSEA = Root Mean Square Error of Approximation. Model. All modes were based on responses to all 5 factors across the two waves. Preliminary models looked posited 1, 2 or 3 passion factors for each of the three waves. Total group models tested invariance over time: Configural = no invariance, Metric = invariance of factor loadings; scalar = invariance of factor loadings and intercepts. Multi-group models tested invariance over school leader groups (principals vs others) or over school type (primary vs. secondary—excluding other school types). The multi-group models began with the scalar model of invariance over time.

Table 4

Factor Structure for Five Factors over Two Waves

Variables	T1					T2				
	HP	OP	GP	BO	JS	HP	OP	GP	BO	JS
Factor Loadings										
Harmonious Passion (HP)										
HP1 Harmony with life	.88	-.09	-.15			.88	-.09	-.15		
HP2 Appreciate new things	.52	.17	.21			.52	.17	.21		
HP3 Work reflects me	.44	.16	.33			.44	.16	.33		
HP4 variety experiences.	.50	.06	.20			.50	.06	.20		
HP5 integrated into life.	.79	-.03	-.03			.79	-.03	-.03		
HP6 things part of me.	.86	-.06	-.03			.86	-.06	-.03		
Obsessive Passion (OP)										
OP1 difficulty control urges.	.02	.74	-.05			.02	.74	-.05		
OP2 obsessive feeling.	.03	.86	.02			.03	.86	.02		
OP3 Only Work captivates.	.11	.57	-.02			.11	.57	-.02		
OP4 only do my work.	.12	.46	-.04			.12	.46	-.04		
OP5 lose control over work.	.25	.55	.07			.25	.55	.07		
OP6 work controls me.	-.37	.57	-.04			-.37	.57	-.04		
General Passion (GP)										
GP1 like work.	.25	-.13	.72			.25	-.13	.72		
GP2 work important.	.00	-.09	.89			.00	-.09	.89		
GP3 work is a passion.	.01	.00	.84			.01	.00	.84		
GP4 work is who I am.	-.05	.03	.74			-.05	.03	.74		
Burnout (BO)										
BO1 felt worn out?				.94	.02				.94	.02
BO2 physically exhausted?				.89	.03				.89	.03
BO3 emotionally exhausted?				.75	-.10				.75	-.10
BO4 felt tired?				.86	.03				.86	.03
Job Satisfaction (JS)										
JS1 work prospects?				.02	.76				.02	.76
JS2 physical conditions?				-.02	.51				-.02	.51
JS3 use your abilities?				.04	.85				.04	.85
JS4 job as a whole				-.05	.85				-.05	.85
Factor Correlations										
HP-T1	1									
OP-T1	-.23	1								
GP-T1	.46	.33	1							
BO-T1	-.55	.40	-.12	1						
JS-T1	.60	-.11	.49	-.45	1					
HP-T2	.70	-.18	.36	-.46	.49	1				
OP-T2	-.19	.76	.26	.32	-.07	-.20	1			
GP-T2	.34	.28	.69	-.09	.40	.46	.33	1		
BO-T2	-.41	.29	-.08	.68	-.30	-.55	.36	-.14	1	

JS-T2	.46	-.1	.37	-.34	.65	.60	-.12	.46	-.42	1
Covariate Correlations										
Male	.00	-.08	-.18	-.04	-.04	.01	-.06	-.17	-.06	-.05
Age	.12	-.09	.03	-.19	.10	.11	-.10	.03	-.21	.11
Principal	-.01	.04	.05	.00	.04	.00	.04	.07	-.02	.07
Secondary	.01	-.02	-.03	-.01	-.01	.02	-.03	-.02	-.03	.01
Alpha Reliability Estimates	.87	.78	.85	.92	.81	.88	.78	.85	.92	.84

Note. Five latent factors (general passion,. obsessive passion, harmonious passion. burn-out, and job satisfaction) were each measured one year apart (T1 and 2).. Factor loadings shaded in gray are the a priori target loadings for items designed to measure each factor. In the a priori model, factor loadings were constrained to be equal over time, T1 items were constrained not to cross-load on T2 factors, and items representing the three passion factors were constrained not to cross-load on the burnout and job satisfaction factors. Also included were the four covariates. Factor correlations shaded in gray are stability (test-retest) coefficients. Also included in the model are four covariates and their relations to the ten factors.

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Table 5

Parameter estimates (Est) and Standard Errors (SE) Relating T1 (T1) Predictor Variables, Group, and their Interactions to T2 Outcomes

T2 Outcome	Model		T1 Predictor					T1 Interactions	
			OP	HP	GP	BO	JS	GPxHP	GPxOP
OPT2	No GP	Est	.74	-.03		.02	.05		
		SE	*.02*	*.03*		*.03*	.03		
	GP	Est	.73	-.02	.06	.02	.03	.07	.07
		SE	*.03*	*.04*	*.03*	*.03*	*.03*	.02	.02
HPT2	No GP	Est	.00	.58		-.09	.10		
		SE	*.02*	*.03*		*.03*	*.03*		
	GP	Est	-.02	.57	.03	-.09	.08	.00	-.05
		SE	*.03*	*.03*	*.03*	*.03*	*.03*	.02	.02
GPT2	No GP	Est							
		SE							
	GP	Est	.12	.04	.53	.01	.11	-.03	-.14
		SE	*.03*	*.03*	*.04*	*.03*	*.03*	.03	.03
BOT2	No GP	Est	.02	-.07		.63	.04		
		SE	*.02*	*.03*		*.03*	.03		
	GP	Est	.01	-.07	.07	.65	.02	.04	.06
		SE	*.03*	*.03*	*.03*	*.03*	.03	.02	*.02*
JST2	No GP	Est	-.01	.09		-.02	.59		
		SE	*.02*	*.03*		*.03*	.03		
	GP	Est	-.04	.06	.07	-.03	.58	.02	-.05
		SE	*.03*	*.04*	*.03*	*.03*	.04	.02	*.02*

Note. Five latent factors (GP = general passion, OP = obsessive passion, HP = harmonious passion. BO = burnout, JS = job satisfaction) were each measured one year apart (T1, T1; T2, T2). In four models, T1 variables predicted T1 outcomes (see Figure 1). Models differed in term of the inclusion or not of the GP factor (GP vs. No GP), and the inclusion or not of covariates (age, role, gender). Statistically significant effects (Est) are shaded in gray (standard errors, *SE*, are also presented in italics).