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Journal article

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The Link between Perceived Maternal and Paternal Autonomy Support and Adolescent Well-Being across Three Major Educational Transitions

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### Abstract

To what extent does maternal and paternal autonomy support enhance well-being across the major transitions of high school? We tested the degree to which perceived autonomy supportive parenting facilitated positive changes in self-esteem and life satisfaction and buffered against negative changes in depressive symptoms and school related burnout in three Finnish longitudinal studies, each with a measurement point before and after a major transition (middle school,  $N_1 = 760$ , 55.7% girls; high school,  $N_2 = 214$ , 51.9% girls; post high school,  $N_3 = 858$ , 47.8% girls). Results showed that perceived parental autonomy support was negatively related to depressive symptoms and positively related to self-esteem. The findings for the effects on depressive symptoms were replicated across all three transitions, while effects on self-esteem were only found for the high school and post high school transitions. Moreover, evidence of co-regulation was found for depressive symptoms. Depressive symptoms before the transition were found to decrease autonomy support after the transition for both the high school and post high school transitions. Maternal and paternal autonomy support was of equal importance. Importantly, the effects on depressive symptoms increased as children developed, suggesting the continual importance of parents throughout high school and into emerging adulthood.

*Keywords:* educational transition, well-being, autonomy support, parenting, self-determination theory, co-regulation

The Link between Perceived Maternal and Paternal Autonomy Support and Adolescent Well-Being across Three Major Educational Transitions

One of the many developmental tasks navigated by youth and their parents is educational transition (e.g., transition into high school, post high school transition; Dietrich & Salmela-Aro, 2013; Salmela-Aro, 2009). Educational transitions are focal points for development and often coincide with developmental tasks in a number of life domains. Understanding how young people navigate these changes, while maintaining mental health and well-being, is a priority area of research (Zarrett & Eccles, 2006). Parents can potentially support young people in the transition by providing resources and psychological need support (Ryan & Deci, 2017). Findings of a variety of developmental contexts indicate that parental autonomy support and parental involvement predicts adaptive outcomes for children, such as school achievement and well-being (e.g., Dietrich, Kracke, & Nurmi, 2011; Grolnick & Ryan 1989; Guay, Senécal, Gauthier, & Fernet, 2003; Ryan & Deci, 2017; Salmela-Aro & Little, 2007). Developmental tasks such as educational transitions are events which trigger the need for increased responsibility and independence (Zarrett & Eccles, 2006), autonomy support before the transition thus may prepare children for this increase allowing them to flourish. However, only a small amount of research has been conducted on the role of parental supports in educational transitions (see Grolnick, Kurowski, Dunlap, & Hevey, 2000; Ratelle, Guay, Larose, & Senécal, 2004), and little of this research takes into account bidirectional influences (i.e., co-regulation; Dietrich, P. Parker, & Salmela-Aro, 2012).

Here we will investigate whether autonomy supportive ties can protect and/or enhance well-being for all major educational transitions of high school. Inspired by the work on secondary data analysis by Elder, Pavalko, and Clipp (1993), we utilize multiple existing longitudinal databases of Finnish young people. These databases help us to consider the role

of autonomy supportive parenting for the transition into middle school, transition into high school, and transition from high school.

Research on transition is important given major developmental tasks at educational transitions generally require an increase in independence (Zarrett & Eccles, 2006). Autonomy support prepares young people for this enhanced independence and consequentially promotes flourishing. Having multiple databases at our disposal allows us to do what no research on autonomy supportive parenting has been able to do before in a single study; a) articulate the degree to which autonomy supportive parenting is important across all three transitions surrounding high school, b) consider whether autonomy support from mothers and fathers differ in strength and exert equal influence at the different transitions, and c) examine whether these effects are bidirectional, making it possible to see not only how adolescents react to their parents, but also how parents may change their parenting approach according to how their child is functioning. This study will test the extent that parents can improve their child's experience of a successful transition, which may be especially helpful for children who are at risk of unsuccessful transitions. Additionally, the examination of bidirectional effects will provide further understanding of maternal and paternal co-regulation mechanisms (Dietrich et al., 2012) across three educational transitions.

### **Educational Transitions and Well-being**

**The Potential Issues.** High school provides an important developmental context for adolescents (Eccles, 2004). During this time adolescents face both the largest number, and most wide ranging set of developmental tasks with critical implications for life-long development (e.g., Dietrich et al., 2012; Zarrett & Eccles, 2006). Educational transitions are part of these developmental tasks and are, as a result, associated with a significant increase in vulnerability of the psychological, social, and intellectual well-being of students. These vulnerabilities include negative effects on students such as increased stress, decreased self-

esteem, and reduced effort (e.g., Litalien, Lüdtke, P. Parker, & Trautwein, 2013; Vasalampi, Salmela-Aro, & Nurmi, 2010).

Youth must deal with changes in the organizational and social structure of the educational setting for each educational transition. School may become less personal, and peer networks may change for both the transition to middle school and high school (Eccles, 2004; Frey, Hirschtein, Edstrom, & Snell, 2009; Midgley, Middleton, Gheen, Kumar, 2002). For some students these changes provide too much stress, compromising academic and emotional functioning (e.g., Salmela-Aro, Kiuru, & Nurmi, 2008). The social change, in combination with concern about social acceptance, often causes a loss of self-esteem, decrease in academic performance, and rising anxiety and depression levels (Akos, 2006; Marston, 2008).

Although the middle and high school transitions seem quite similar, the middle school transition is a relatively minor transition in Finland, although similarly associated with social changes, it has fewer implications for the future of an individual. The high school transition in Finland can be more stressful as it is additionally associated with educational choices that are most critical in directing an individual's further education and career trajectory (Malmberg, 1996). The stress of choices that impact the future is akin to that of the post high school transition. Similar changes in peer groups take place with the post high school transition however, leading to an even more depersonalized educational setting where greater independence is required, or employment where there are significant changes to the quantity and quality of social relationships (Cohen, McCabe, Michelli, & Pickeral, 2009; Midgley et al., 2002). Although middle school transition may not be associated with important career choices the middle-, high school, and post high school transitions are still quite similar as the effects come down to the same issues. The social environments and required degrees of

independence suddenly change, and when not appropriately prepared for this, may lead to declines in well-being.

**Consideration of the Positive Side.** While problems with well-being triggered by educational transitions are of concern, many youth handle educational transitions well, not only experiencing no decline in well-being but even an increase (Litalien et al., 2013; P. Parker, Lüdtke, Trautwein, & Roberts, 2012). Indeed, a successful transition eases feelings of distress, resulting in a sense of well-being which may lead to better outcomes for developmental tasks (Eccles & Midgley, 1989). Well-being is important for the quality of our lives, cognitive capacity, physical health, and social productivity over the life course (Huppert, 2007), and so successful educational transition is an important concern.

In the current study well-being is used as an operational definition and is identified through a combination of well-being (i.e., life satisfaction and self-esteem) and lack of psychological distress (i.e., depressive symptoms and emotional exhaustion). This approach follows Keyes' model of complete state mental health, in which it is important to explore both the presence and absence of mental illness and mental health symptoms (Keyes, 2002, 2005). In the current research the presence of mental health will be examined with subjective well-being measures of life satisfaction and self-esteem, and the absence of mental illness with subjective well-being measures of depression and emotional exhaustion. However, in this study emotional exhaustion has specifically been measured in the school context (see P. Parker & Salmela-Aro, 2011).

**The Generalization Approach.** We hypothesize that autonomy support from parents is a significant determinant of the post-transition experience of adolescents. To deal with issues of internal validity we have used longitudinal data, but interpretation of results can still be limited by problems regarding external validity (see Campbell, 1986). This can be overcome however, by applying the same theorised model to multiple samples that vary in

threats to external validity (e.g., maturation, instrumentation), and then see whether the pattern of results are consistent across these samples (Shadish, Cook, & Campbell, 2002). We provide a stronger test by applying our model to multiple developmental periods (i.e., maturation), context (i.e., educational transition), and instrumentation (i.e., different measures used to assess the central construct, see Method). Testing multiple educational transitions rather than a single transition in isolation is not only important from a developmental perspective, but different samples make it possible to apply pattern matching with consistent results across contexts increasing the external validity of those results (for a review see Shadish et al., 2002; for an example of this approach see P. Parker, Schoon et al., 2012).

### **Determinants of Well-being at Educational Transitions**

How an adolescent deals with transitional changes depends on intrapsychic factors, their social network, and wider conditions that are shaped by structural constraints (e.g., societal, cultural, and institutional conditions). Successful engagement in educational transitions is often facilitated by goal setting, identity negotiation, and co-regulation (Dietrich et al., 2012). Co-regulation refers to the idea that a transition represents shared projects and goals between youth, and typically, their parents. This does not only mean that parents influence their children, but also that youth influence their parents. Parents remain important across adolescence and into emerging adulthood (Oswald & Clark, 2003; P. Parker, Lüdtke et al., 2012). It is a common misconception that parents become less important as children grow up. As argued by Ryan and Lynch (1989) even as adolescents gain independence in various domains in life, parental supports for autonomy continue to be critical to well-being. Indeed, transition success is not only affected by personal capacities, but also by support from the family context (Dietrich et al., 2012; Salmela-Aro & Little, 2007).

Co-regulation and the effectiveness of autonomy supportive parenting during transitions can be explained via the stage-environment fit theory. This theory outlines how



optimal development occurs when the needs of a person fit with opportunities in different stages of life (Eccles & Midgley, 1989). In the present study, the important fit occurs between a young person's need in the transition (e.g., increased autonomy) and the social environment (e.g., autonomy supportive parenting). A mismatch between the needs and environment can have negative influences on behaviour, motivation, and well-being (Eccles, Midgley, Buchanan, Wigfield, Reuman, & MacIver, 1993; Gutman & Eccles, 2007). The mismatch between autonomy need and autonomy support may be particularly problematic during transitions in which children are expected to take on more responsibility and direct control over the course of their lives (Tanner, 2006; Zarrett & Eccles, 2006). We thus expect autonomy support to increase in importance from childhood to young adulthood.

In line with co-regulation, parental autonomy support may be seen as a resource, which eases the strain of developmental tasks and allows young people to take advantages of the new affordances offered by educational transitions and thus experience greater well-being (Salmela-Aro & Little, 2007). With this connection in mind, it is hypothesized that parents that are responsive and developmentally sensitive to the adolescent's needs and experience serve as a resource that buffers against detrimental resources of stress and a promotive resource that increases general well-being. Here we focus specifically on the concept of autonomy supportive parenting using a self-determination framework (e.g., Grolnick & Ryan, 1989).

### **Self-Determination and Well-Being**

Self-determination theory (SDT) is a theoretical framework that emphasizes the importance of autonomous motivation in psychological development and positive coping (Deci & Ryan, 1985; Ryan & Deci, 2017). This theoretical framework has been applied to education research in numerous empirical studies (for review, see Ryan & Deci, 2017). The theory argues that there are basic psychological needs that must be fulfilled across the

lifespan for autonomous motivation and well-being to be maintained or enhanced (Ryan, Deci, & Vansteenkiste, 2016). More specifically, psychological needs are those that are required for sustenance, growth, and health. Within the frame of SDT there are three essential or basic psychological needs: the need for autonomy, competence, and relatedness (Deci & Ryan, 1985). Autonomy refers to the feeling that one's behaviour is volitional and self-endorsed, not pressured or controlled (Ryan & Deci, 2017). When others support autonomy, they are nurturing capacities for self-regulation, and contributing to wellness. This study focusses on the autonomy need because a great number of studies have shown that autonomy support alone increases not only autonomy, but also competence and relatedness satisfaction (e.g., Deci, Ryan, Gagné, Leone, Usunov, & Kornazheva, 2001; Grolnick, 2003; Ryan & Grolnick, 1986; Soenens & Vansteenkiste, 2005).

It is recognized by SDT that social environments may work against the development of the psychological needs. Environments where the psychological need satisfaction is neglected or thwarted promote psychological distress and psychopathology. Particularly critical in this respect is parental autonomy support which has been empirically shown to facilitate greater mental health and lower psychopathology (Ryan et al., 2016). Thus in the current study, we will focus on the autonomy support that parents provide.

### **The Role of the Parent**

Autonomy support allows individuals to actively reflect upon and adapt values and interests as their own. Parental behaviours that are consistent with autonomy support include taking the child's perspective, providing relevant choices, and encouragement to take initiative and explore (Grolnick, 2003; Ryan et al., 2016; Soenens & Beyers, 2012). Consequently, adolescents with awareness of personal interests, values, and goals, will be better at making decisions throughout their developmental tasks, as they have something to base their own actions on (Grolnick, 2003; Van der Giessen, Branje, & Meeus, 2014).

Overall, autonomy support encourages an adaptive style of development, characterized by age-appropriate behavior and well-being.

During development, parents can be thought of as a resource. Parents who meet the adolescents' changing needs (e.g., by providing opportunities of increased autonomy) provide a better match for the adolescent and the developmental task at hand. This positive role of parents in the adolescents' development has, in turn, shown to be associated to a greater overall well-being (Chirkov & Ryan, 2001). In fact, autonomy support is positively associated with adolescent well-being across all ages and gender (La Guardia, Ryan, Couchman, & Deci, 2000; Soenens, Park, Vansteenkiste, & Mouratidis, 2012).

It is shown in a variety of studies that an autonomy supportive environment is essential to the child's adjustment (Guay et al., 2003). Higher autonomy support has been shown to relate to low emotional exhaustion (e.g. Van den Berghe et al., 2013; Roth, Assor, Kanat-Maymon, & Kaplan, 2007). Autonomy supportive parenting has been associated with less depressive symptoms in youth (Chirkov & Ryan, 2001; Ryan et al., 2016). Moreover, perceived parental autonomy also promotes a sense of well-being by increasing life satisfaction (Park, 2004) and self-esteem (Soenens et al., 2007). In fact, most positive educational outcomes and well-being are associated with autonomous motivation (see Vallerand, Fortier, & Guay, 1997). This includes positive educational outcomes such as greater achievement and easier adjustment to school (see Joussemet, Landry, & Koestner, 2008; Lord, Eccles, & McCarthy, 1994). We expect autonomy support to influence well-being (both general and school related) across educational transitions.

It is important to note, however, that parents are likely to be influenced by factors other than the developmental transitional period. Specifically, parents may adjust their level of autonomy support based on their child's particular circumstances, including their level of mental health and well-being. Current research suggests parents and adolescents can mutually

influence, or “co-regulate”, each other (Dietrich, et al., 2012; Nurmi, 2004). Therefore, a young person’s well-being may influence what parenting style is used. However, the mechanisms behind co-regulation are not well defined (Dietrich, et al., 2012). Therefore it is difficult to hypothesize the extent that well-being is an antecedent to changes in parenting style during educational transitions. As such we leave this co-regulation influence as a research question.

### **Influence of Parental Gender**

Despite the increasing influence and involvement of fathers in a child’s upbringing (Lindsey & Mize, 2001), there are several developmental psychologists that claim that mothers and fathers play different roles. Such theorists suggest that mothers have more influence on the adolescents’ direct social environment (e.g., friendship), while fathers are more influential for goal oriented activities (e.g., career development; Grolnick, Weiss, McKenzie, & Wrightman, 1996; Tynkkynen, Nurmi, & Salmela-Aro, 2010). Because educational transitions often include goal oriented activities such as career choice, it is possible that fathers exert more influence with autonomy support in the current study. On the other hand, social environments are also affected by transitions (P. Parker, et al., 2012), making it likely that maternal autonomy support is also influential in the current study.

Most autonomy support research does not mention any distinction between parental genders (e.g., Brenning, Soenens, Van Petegem, & Vansteenkiste, 2015; Soenens et al., 2007). Studies that do make a distinction report a difference between effects of maternal and paternal autonomy support on self-determination and achievement, but none of these differences have been explored for effects on well-being (e.g., Grolnick, Ryan, & Deci, 1991; Soenens & Vansteenkiste, 2005). Given a lack of evidence on differential effects of paternal and maternal autonomy support on well-being, we present this as a research question.

### **The Current Study**

Educational transitions are a critical period for the development of well-being (Larose & Boivin, 1997). The current study will explore perceived parental autonomy support and its relationship with change in well-being across all major educational transitions of high school. The social context in which an adolescent develops can either facilitate or thwart developmental tasks such as school transitions. Parents seem to have a great influence on this by providing autonomy support (Ryan & Deci, 2017). Perceived parental autonomy support, in turn, is expected to contribute to the adolescents' successful educational transition as characterized by greater general- and school related well-being. Since this relationship is bidirectional according to co-regulation, we will also look at the effects of well-being on parental autonomy support across the transitions via cross-lagged structural equation modeling (SEM). On this basis we propose the following hypothesis and research questions:

**Hypothesis:** We hypothesize that perceived autonomy support would promote positive changes in well-being (i.e., life satisfaction and self-esteem) and buffer against declines in well-being (i.e., depressive symptoms and emotional exhaustion) during the transitions surrounding high school. As children are expected to take on more responsibility over time, it is expected that autonomy support becomes increasingly important. A series of longitudinal cross-lagged SEM will be used to test this hypothesis. We explore the influence of perceived autonomy supportive parenting on changes in well-being during three major educational transitions (i.e., middle school transition, high school transition, and post high school transition). Given that we cannot use directly comparable measures across all three transitions due to differences in measures and samples (see below), our focus will be on effects that are consistent across transitions and thus display evidence of generalizability across educational transitions (see P. Parker, Schoon, et al., 2012, for an example).

**Research Question 1:** Co-regulation theory suggests that parents and youth will demonstrate bidirectional influences during developmental tasks such as educational transitions (Dietrich et al., 2012). Therefore, it is possible that perceived autonomy support does not only affect well-being but also that well-being affects perceived autonomy support. Where data allows, our research tests the statistical significance and direction of these bidirectional relationships.

**Research Question 2:** Given limited existing research we explore whether perceived autonomy support, and its effect on well-being, is contingent on parental gender.

## Method

### Secondary Data Analysis

Research in developmental psychology has profited greatly from secondary data analysis (e.g., Elder, 1998). Secondary or archive data analysis can be defined as the repurposing of existing datasets to answer new questions of significance and it represents both a central objective of major funding bodies (e.g., Commonwealth of Australia, 2011, 2012) and a developing science in its own right (Elder et al., 1993). There exists a paucity of databases that covers multiple educational transitions from the perspective of autonomy supportive parenting and its influence of well-being. However, leveraging off a series of large scale databases from Finland we are able to develop reliable and construct valid measures of perceived autonomy supportive parenting (see supplementary material) and use them to explore all major educational transitions of high school. In addition, we were able to leverage off unique aspects of two of the transitions to compare and contrast young people's perception of the autonomy support they receive from their father and/or mother. Thus the current research provides a novel approach to leveraging value from existing data.

## Participants and Procedure

The current research consisted of three samples from two Finnish longitudinal databases: the Mind the Gap (MtG) study and the Finnish Educational Transitions (FinEdu) study. Three transitions were explored. See Table 1 for an overview of the samples used for each transition in addition to the description below.

**Middle School Transition.** The MtG study is a longitudinal follow-up study (2013-2016) of a sample of Finnish adolescents from Helsinki. The aims of the MtG are to examine challenges in development, including the effects of social and cultural context, particularly educational practices. Two waves of MtG data are used in the current study for the middle school transition consisting of data before the middle school transition (MS-pre; T1, grade 6,  $N = 760$  [55.7% girls]; mean age = 12) and after the middle school transition (MS-post; T2, grade 7,  $N = 483$  [55.8% girls]; mean age = 13). The participants were distributed across 34 schools from Helsinki at MS-pre. Of these students 68% lived with both their mother and father. Regarding the parents, 93% of the mothers and 94% of the fathers were employed, and 89% of the mothers and 91% of the fathers spoke Finnish as their first language. Questionnaires of MS-pre and MS-post were administered during school hours around the middle of the school year, with one year taking place between data collection points.

**High School Transition.** Data for the high school and post high school transition comes from the FinEdu study which is a seven wave longitudinal follow-up study (2004-2013/2014) of a sample of ninth grade students in Finnish high schools from an industrial town. The FinEdu research aims to study the educational transition and the choices that people face after compulsory comprehensive education. A subset of only two schools had measures for perceived autonomy support in the first wave of the high school transition waves, therefore only this subset was used consisting of data before the school transition (HS-pre; T1, grade 9,  $N = 214$  [51.9% girls]; mean age = 16,  $SD = 0.23$ ) and after the high

school transition (HS-post; T2, grade 10,  $N = 189$  [55.9% girls]; mean age = 17,  $SD = 0.20$ ). After the high school transition 59% of the students transferred to the university track, 27% to vocational education, 5% started employment, 6% was unemployed without education, and 3% started something else. Of these students 63% lived with both their parents. Regarding the parents, 93% of the mothers and 88% of the fathers were employed. Ninety-nine percent of both parents spoke Finnish as their mother tongue. Questionnaires for both HS-pre and HS-post were administered during school hours around the middle of the school year (i.e., January, after the winter holidays), with one year taking place between data collection points.

**Post High School Transition.** For the post high school transition we used the full available FinEdu data consisting of data before the post high school transition (PHS-pre; T1, grade 11,  $N = 858$  [47.8% girls]; mean age = 18) and after the post high school transition (PHS-post; T2, 1 year after the transition,  $N = 607$  [52.6% girls]; mean age = 21). In this case the survey design had transitioned from collecting parental data from a subset to the whole sample. The participants from the PHS-pre sample came from 12 different schools from an industrial town in Finland. After the post high school transition 36% of the students started university, 13% vocational education, 34% employment, 14% was unemployed without further education, and 2% stayed in high school. Fifty-eight percent of the students lived with both their parents. Questionnaires for PHS-pre were administered during school hours, whereas questionnaires for PHS-post were completed at home of which 75% was done on paper and the rest was taken online. The data was collected around the middle of the school year for PHS-pre. For PHS-post the questionnaires were sent out around the middle of the school year of which the last few questionnaires were returned in April. Data collection of PHS-pre and PHS-post took place around two years apart from each other.



## Measures

**Autonomy Supportive Parenting Index.** In the MtG, at MS-pre, the autonomy supportive parenting index was developed from items contained in a modified version of the Child Rearing Practices Report (CRPR; Aunola & Nurmi, 2004; Roberts, Block, & Block, 1984). Participants indicated how well each item describes their relationship with their mother and father (1 = *Not at all true*; 7 = *Completely true*). From this data we composed an index of three items that assess perceived autonomy support from the mother and father individually which includes items such as: “My mother/father takes my thoughts into consideration, when planning family matters” (see supplementary material). Reliability scores of the autonomy support index showed a Cronbach’s alpha of .76 and a greater lower bound (glb) value of .78.<sup>1</sup>

Autonomy supportive parenting in FinEdu, at HS-pre and HS-post, were measured by completing a modified version of the CRPR (Aunola & Nurmi, 2004; Roberts et al., 1984). Participants had to indicate how well each item describes their relationship with the mother and father separately (1 = *Does not fit me at all*; 7 = *Fits me completely*). The autonomy support index is composed of five items that assess perceived autonomy support with items such as: “My mother/father respects my opinions” (see supplementary material). Alpha of the autonomy support index ranged from .86 to .87, the glb value ranged from .85 to .90.

For PHS-pre and PHS-post a shortened and modified version of the CRPR questionnaire was used. Here participants had to indicate how well each item describes their relationship with both their parents (1 = *Not at all true*; 7 = *Very True*). The scale is composed of four items that assess perceived autonomy support with items such as: “My

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<sup>1</sup> There are quite serious issues with alpha which suggests alternatives should be considered (Sijtsma, 2009). Although glb is a better measure of reliability than alpha (Bentler & Woodward, 1980), continued persistence of alpha in the literature led us to retain the alpha.

parents have supported me in my own decisions” (see supplementary material). Reliability of the modified autonomy support index showed both alpha and glb ranging from .78 to .82.

**General Well-Being.** General well-being for all time waves were measured by completing the DEPS depression scale (Salokangas, Poutanen, & Stengård, 1995), a short version of Rosenberg’s Self-Esteem Scale (Rosenberg, 1965), the Satisfaction with Life Scale (Diener, Emmons, Larsen, & Griffin, 1985), and the School Burnout Inventory (SBI; Salmela-Aro, Kiuru, Leskinen, & Nurmi, 2009; Salmela-Aro & Näätänen, 2005). On the DEPS depression scale participants report on the occurrence of 10 types of moods in the past month (1 = *Not at all*; 4 = *Very much*), with items such as “I have felt all the joy had disappeared from my life”. Reliability of the original DEPS was .86 (Salokangas, et al., 1995), in the current study the alpha ranged from .91 to .92 and the glb ranged from .94 to .95. Rosenberg’s Self-Esteem Scale comprises of five items that assess one’s agreement (1 = *Completely disagree*; 7 = *Completely agree*) on acceptance, self-respect, and overall attitude towards oneself with items such as “I think I have many good qualities”. Reliability of the original self-esteem scale ranged from .77 to .88 (Rosenberg, 1965), in the current study the alpha ranged from .71 to .83 and the glb ranged from .82 to .91. The Satisfaction with Life Scale consists of five items on which participants had to indicate how much they agree (1 = *Completely disagree*; 7 = *Completely agree*) with statements such as “For the most part my life is near my ideal”. The original Satisfaction of Life Scale’s reliability was .87 (Diener, et al., 1985), in the current study the alpha ranged from .87 to .89 and the glb ranged from .88 to .91.

On the SBI participants rate how well the 10 items (nine items for HS-pre and HS-post) describe their school situation (1 = *Completely disagree*; 7 = *Completely agree*) with items such as “I feel overwhelmed with my school work”. A subset of three items from the SBI was averaged to create a subscale of emotional exhaustion (Salmela-Aro & Näätänen,

2005). Reliability of the original emotional exhaustion subscale was .80 (Salmela-Aro et al., 2009), in the current study the alpha ranged from .56 to .79 and the glb ranged from .60 to .80. The subscale of emotional exhaustion originally consists of four items (Salmela-Aro & Näätänen, 2005), however, because only three out of four items are available for HS-pre and HS-post we decided to use only those three items for all the transition analyses for consistency. Sensitivity analysis with four items suggested almost identical findings and made no difference to the interpretation of results or effect sizes in any case. At PHS-post the SBI focused on work instead of school related burnout, items changed accordingly (e.g., I feel overwhelmed with my work”).

### **Statistical Analysis**

**Measurement Invariance.** Multiple-group SEM invariance tests were utilized to test differences in parental gender for perceived autonomy support and to test longitudinal measurement invariance for all the variables. First, invariance testing was used for each construct separately, to confirm that the construct was invariant across time, and where relevant, across group (Widaman, Ferrer, & Conger, 2010). Measurement invariance testing starts with the least restrictive configural model (M1), where all model parameters are freely estimated across time and between parental gender independently. This model is then compared to a model (M2) where factor loadings of each indicator were constrained to be equal across time points and for both mother and father. Invariance in the measurement models is an assumption of covariance-based models such as the cross-lagged SEM models analyzed in the current study (Nagengast et al., 2011). These results are provided in the supplementary material and show support for measurement invariance in all cases.

**Structural Invariance.** When considering differences in regression parameters between ratings of mother’s and father’s autonomy support we considered structural invariance. The first model (S1) for structural invariance testing consisted of the full cross-

lagged SEM with factor loadings constrained to be equal across time and parental gender but regression parameters were allowed to vary across groups. This model was then compared to a model (S2) that additionally held regression constant across the groups. Standardized loadings for all transition points have been presented in Table 2. No difference between parental genders in the influence of perceived autonomy supportive parenting on well-being was supported when there is little difference between chi-square values and fit between models.

As explained, evidence of invariance comes from comparing a baseline model with good fit to alternate nested models. Comparisons are made with the corrected difference between chi-square values of the two models. The corrected difference for models using weighted least squared with mean and variance (WLSMV) was based of the *diffest* command in Mplus (Muthén & Muthén, 2015), all other corrected differences use the formula from Satorra and Bentler (2010). We further used the criteria by Cheung and Rensvold (2002) who suggested invariance between the nested models if the difference in Comparative Fit Index (CFI) is  $\leq .01$  (we applied the same criteria for Tucker Lewis Index; TFI), and, as suggested by Chen (2007), that the difference in Root Mean Square Error of Approximation (RMSEA) is  $\leq .015$ .

**Structural Equation Modeling.** Structural equation modeling (SEM) was used to test the predictive pathways between students' perceived autonomy support and well-being across the three transitions (models S1 and S2; see Figure 1). Cross-lagged models allow for analysis of multiple waves of data and allow the researcher to explore plausible alternate explanations for the relationships among the variables, such as reversed or reciprocal effects (Burkholder & Harlow, 2003). Therefore, a cross-lagged model made it possible consider the major hypothesis: that parental autonomy support before the transition enhances well-being and/or protects against declines in well-being. However, in several cases we could also

explore the alternative perspective: that well-being before the transition is associated with changes in the amount of autonomy support parents give to their child.

This study further followed the use of the CFI, TLI, and the RMSEA, in addition to the chi-square value to assess model fit (Hoyle & Panter, 1995), considering its sensitivity to sample size (McDonald & Marsh, 1990). For a model to be considered an excellent fit, both a TLI and CFI of .95 or above are expected, however, values of .90 or higher are also acceptable (Byrne, 2012). Furthermore, RMSEA 'close-fit' to 'acceptable fit' values range from .05 or below to .08 or below respectively (Browne & Cudeck, 1993).

Attrition is common with research that tracks individuals across developmental trajectories, especially with research that involves many participants. To account for such missing data, the full-information maximum likelihood estimator was used. Because the depressive symptoms response scale consisted of only four categories and because the data was not normally distributed and highly skewed, as would be expected from frequency response scale, we treated the items as ordered categorical and used the WLSMV estimator for models using depression. The other well-being factors had indicator items with more than five response categories and thus, consistent with Rhemtulla, Brosseau-Liard, and Savalei (2012), were better suited to being treated as continuous and estimated using maximum likelihood. We have used robust maximum likelihood (MLR) to account for departures from multivariate normality. Last, interdependence due to participants rating both mothers and fathers in a single model was accounted for using cluster robust standard errors (i.e., the TYPE=COMPLEX command in Mplus). Student gender was used as a covariate in all the models. We used Mplus version 7.4 (Muthén & Muthén, 2015) for the main analyses (i.e., invariance testing and cross-lagged SEM) and R version 3.2.0 (R Core Team, 2015) on Windows for descriptive analyses (e.g., reliability, t-tests, and correlations).

## Results

The results section is organized by transition. We first report results for the middle school transition, followed by the high school transition, and then the post high school transition. Within each transition we first report descriptive results, then, where pertinent, test a model in which the effect of perceived maternal and paternal autonomy support on well-being is free to differ versus constrained to be equal. After, we focus on the individual parameters by considering the role that autonomy support plays in changes in well-being and ill-being across the transition. The models we use also allow us to consider the reciprocal path for the high school and post high school transition, in which we consider whether young people's pre-transition well-being/ill-being influences the change in perceived parental autonomy support after the transition. Finally, we consider the correlated residual between change in well-being/ill-being and changes in autonomy support as a proxy for considering the association in change between these variables where possible (see P. Parker, Lütke et al., 2012). Such an association would suggest that some unobserved latent or set of latent variables (i.e., the nature of the transition itself) leads to changes in both the perceived autonomy support parents provide and the well-being/ill-being of the participant themselves.

Regarding missing data, the attrition rate of the middle school transition, high school transition, and post high school transition were respectively 36%, 10%, and 23%, and item-level non-response was very small ranging from 1.6% (PHS-pre) to 6.8% (MS-pre). Such attrition rates are expected for transitional data and are similar to large government run and funded longitudinal databases that also cover transitions (e.g., The Longitudinal Study of Australian Youth). The missing completely at random (MCAR) test (MissMech package in R; Jamshidian, Jalal, & Jansen, 2014) revealed that data was not missing complete at random,  $p < .01$ . This is unsurprising given missing data was typically due to attrition. We next explored potential missing data mechanisms. For the high school and post high school

transitions boys were significantly more likely to drop out of the study than girls at the high school transition ( $t = 2.6, p < .05$ ) and at the post high school transition ( $t = 4.55, p < .00$ ). Participants with lower GPA were also significantly more likely to drop out of the study at the high school transition ( $t = 3.04, p < .01$ ) and the post high school transition ( $t = 2.87, p < .00$ ). Missing data was not associated with autonomy supportive parenting, or any of our key dependent variables.

In all analyses, we operated under the assumption that data were not MCAR but were missing at random. This was a reasonable assumption given longitudinal data provides a good basis for imputing missing data due to attrition. To account for missing we used full-information-maximum-likelihood, which uses all available information (Enders, 2010). In order to provide a coherent and succinct results section we do not report measurement invariance across time and, where relevant, across parents. This information, along with zero-order correlation matrices can be found in the supplementary material. As noted above, in all cases there was convincing evidence of measurement invariance.

### **Middle School Transition**

**Descriptives.** The data from MtG did not include a measure of post-transition autonomy support. As a result, we were unable to include any data on post-transition autonomy support at the middle school transition. Descriptive statistics of the sample used for the middle school transition can be found in Table 2. The descriptive statistics show that reported depressive symptoms decreased across the transition, while on the other hand, life satisfaction decreased and emotional exhaustion increased. Additionally, mothers were found to provide more autonomy support than fathers before the transition with  $t(702) = 6.21, p < .00, 95\% \text{ CI } [0.16, 0.31]$ .

**Structural Invariance testing.** Model invariance results show that there was little difference between the fit of models S1 and S2 for every well-being variable (see Table 3).

This suggested regression coefficients were similar regardless of whether support measures were focused on mothers or fathers. The fit of the model was adequate in all cases (see Table 3).

**Model results.** Having noted the similarity of the models across parents, we now turn our attention to the specific model results in which we considered the potential reciprocal relationships between perceived autonomy support and well-being (i.e., depression, life satisfaction, self-esteem, and emotional exhaustion) over the middle school transition (see Table 4). In only one case was a significant cross-lagged effect observed, with higher levels of autonomy support before the transition significantly predicting a decline in depression as children moved into middle school. Results for  $R^2$  of the endogenous variables are provided in the supplementary material.

### High School Transition

**Descriptives.** Descriptive statistics of the sample used for the high school transition can be found in Table 2. They show that reported depressive symptoms decreased across the transition and life satisfaction and self-esteem increased while emotional exhaustion showed no significant change. Although these changes are not all big, it shows that most students managed the high school transition well. Additionally, mothers were seen as providing more autonomy support than fathers both before and after the transition with  $t(194) = 4.25, p < .00, 95\% \text{ CI } [0.16, 0.43]$  and  $t(221) = 5.12, p < .00, 95\% \text{ CI } [0.20, 0.46]$  respectively.

**Structural Invariance testing.** Invariance testing for SEM worked the same as described for the middle school transition. The model invariance results show that there were again no substantial differences between model fits, apart from the models that test self-esteem (see Table 3). This indicated that perceived autonomy support from mothers and fathers predicted changes in depression, life satisfaction, and emotional exhaustion in a



similar manner across the high school transition, but not self-esteem. The CFI, TLI, and RMSEA fit were adequate for all models (see Table 3).

**Model results.** Having shown invariance in cross-lagged parameters across parents, we next explored the model results. A significant relationship was found between pre-transition autonomy support and a post-transition depression (see Table 4). A reciprocal effect was found for depression, in which higher levels of depression before the transition significantly predicted a decrease in perceived autonomy support after the transition. Higher paternal autonomy support before the transition was significantly related to an increase in self-esteem. This effect on self-esteem was only found for fathers because structural invariance between parents was not found for the self-esteem model. However, this difference between parents was only found because of the parental difference for the relationship between pre-transition well-being and post-transition autonomy support. There was no parental difference for the relationship between pre-transition autonomy support and post-transition well-being. When parental gender invariance was assumed for the self-esteem model, pre-transition autonomy support from both the mother ( $\beta = .14, p < .05$ ) and father ( $\beta = .13, p < .05$ ) was significantly related to an increase in post-transition self-esteem. Results for  $R^2$  of the endogenous variables are provided in the supplementary material.

To provide a proxy for a relationship between change in both perceived autonomy support and well-being we also explored the correlated residuals in the post-transition wave (e.g., Ferrer & McArdle, 2010; Sturaro, Denissen, van Aken, & Asendorpf, 2008; Sutin & Costa, 2010). This provides an opportunity to consider if a common unmeasured variable (e.g., the relative success of the transition) influenced the development of both autonomy support and well-being. Change in perceived maternal autonomy support was positively related to change in life satisfaction ( $r = .40, p < .00$ ), but not related to change in depression ( $r = -.04, ns$ ), self-esteem ( $r = .16, ns$ ), and emotional exhaustion ( $r = .13, ns$ ). Whereas

change in paternal autonomy support was positively related to change in life satisfaction ( $r = .45, p < .00$ ) and self-esteem ( $r = .34, p < .01$ ), but not related to change in depression ( $r = -.14, ns$ ) and emotional exhaustion ( $r = -.04, ns$ ).

### **Post High School Transition**

**Descriptives.** A similar model as for the high school transition was used to explore the post high school transition, but without differentiating gender of perceived parental autonomy support. Descriptive statistics of the sample used for the post high school transition can be found in Table 2. The descriptive statistics showed that autonomy support and depression increase across the transition and that life satisfaction decreases.

**Model results.** Because no parental gender distinction was made for autonomy support at the post high school transition we next explored model results. We found a significant relationship between higher pre-transition perceived autonomy supportive parenting and a decrease in both depression and emotional exhaustion across the transition (see Table 4). A similar pattern occurred for self-esteem, for which pre-transition autonomy support predicted an increase in self-esteem after the transition. The CFI, TLI, and RMSEA fit excellent to the data for all well-being models (see Table 3). Results for  $R^2$  of the endogenous variables are provided in the supplementary material.

Significant reversed effects were also found. Depressive symptoms before the post high school transition significantly predicted a decrease in autonomy support after the transition. Additionally, pre-transition life satisfaction was found to significantly predict an increase in perceived autonomy supportive parenting after the transition.

The residual correlation was tested again in the post-transition wave to provide a proxy for a relationship between change in both perceived autonomy support and well-being. Change in autonomy supportive parenting was negatively related to change in depression

( $r = -.33, p < .00$ ) and emotional exhaustion ( $r = -.24, p < .00$ ), and positively related to change in life satisfaction ( $r = .52, p < .00$ ) and self-esteem ( $r = .37, p < .00$ ).

**Differences between Transition Models.** Although the size of the relationship between pre-transition autonomy support and post-transition depressive symptoms appeared to get stronger throughout the three transitions, z-tests suggested this increase was rarely significant. The difference in effects of autonomy support on depressive symptoms was only found between the high school and post high school transition were they were near significant ( $z = 1.59, p < .10$ ) for maternal parenting and significantly different ( $z = 1.98, p < .05$ ) for paternal parenting.

### Discussion

The current study examined whether perceived autonomy supportive parenting increases well-being across educational transitions surrounding high school (i.e., middle school transition, high school transition, and post high school transition). We focused on whether perceived autonomy support from parents before an educational transition was associated with decreases in depression and emotional exhaustion, and increases in life satisfaction and self-esteem across the transition. We tested whether this relationship existed across all the major transitions of high school in order to identify whether the processes under investigation were generalizable. The results across the transitions provided strikingly similar results indicating that the role of autonomy support was as important for transitions out of high school as it was for transitions into and within high school. We further looked at whether there was a difference between the effects of perceived autonomy support from mothers and fathers. Our research showed that mothers tended to provide more autonomy support than fathers but autonomy support tended to have similar relationships with change in well-being regardless of the gender of the parent. Perceived autonomy support before the transition tended to be an important protective factor in reducing depression across each

transition. Likewise, autonomy support was positively associated with an increase in self-esteem for both the high school and post high school transitions. Moreover, emotional exhaustion was shown to decrease after the transition when autonomy support from parents was perceived, but only at the post high school transition.

### **Autonomy Support a Protective Factor, Promotive Factor, and Consistent?**

In SDT autonomy supportive parenting is associated with well-being (Ryan & Deci, 2017). Well-being is often negatively affected by transition (Eccles et al., 1993), and therefore, general well-being after the transition is an important indicator of a successful transition (Eccles & Midgley, 1989). Educational transitions provide a potent natural experiment to explore how changes in parental support relate to a change in well-being (Dietrich et al., 2012; Eccles & Midgley, 1989).

In support of the literature (Roeser, Eccles, & Freedman-Doan, 1999; Rudolph, Lambert, Clark, & Kurlakowsky, 2001), perceived autonomy support was found to be consistently associated with declines in depression across the three high school transitions. According to SDT, the satisfaction of the autonomy need results in greater intrinsic motivation, leading to reduced depressive symptoms (Chirkov & Ryan, 2001). Additionally, through a similar mechanism as SDT, stage-environment fit shows that even when the child experiences a lack of autonomy need satisfaction in a new educational environment, parents are able to provide autonomy need satisfaction as a substitute (e.g., Midgley et al., 2002).

It is posited in SDT that autonomy support facilitates the construct of a coherent sense of self which in turn leads to a stable self-esteem (Deci & Ryan, 1995). As with depressive symptoms, the idea that satisfaction of the autonomy need leads to greater self-esteem was generally supported by our results, which showed that autonomy support from parents accounted for an increase in self-esteem across both the high school transition and post high school transition. One admittedly speculative possibility, as to why this effect was not

observed for the middle school, is that the middle school transition is a relatively minor transition in Finland, and therefore, may not trigger a major increase in independence. Indeed, this transition usually does not involve a change of school. This may explain the lack of significant effects for this transition and the smallest effect size for depressive symptoms out of the three tested transitions. However, given the difference in samples between this transition and the other transitions (e.g., from a big city compared to country town, and collected years after the other sample), future research is needed to evaluate this interesting possibility.

Emotional exhaustion literature shows that autonomy support, and thus autonomy need satisfaction, decreases emotional exhaustion that is experienced because of greater intrinsic motivation and a resulting feeling of accomplishment (Roth et al., 2007). In accordance with this literature, we found that perceived autonomy support decreased emotional exhaustion, but only for the post high school transition. This specificity of findings could relate to the characteristics of the post high school transition in which many youth will be moving into high stakes university education or the labor market and thus emotional exhaustion becomes increasingly relevant. However, because this effect was only found for a single transition it is important that such interpretations remain tentative until supported by future research.

The consistency of the effects of parental autonomy support on depressive symptoms and self-esteem shows that autonomy support remains important throughout high school and beyond. This is an important finding because adolescence is usually associated with a growing importance of friends – as opposed to parents – as a source of social support (e.g., Conger & Little, 2010; Salmela-Aro & Nurmi, 1997). Arnett (2006) suggests that emerging adulthood is recognized by great change in relationships, specifically with parents. This change however, does not have to be negative; in fact, it can lead to more positive and

supportive relationships (Conger & Little, 2010; P. Parker, Lüdtkke, et al., 2012; Tanner, 2006). The benefit of autonomy supportive parenting seemed to be especially clear for depressive symptoms. The size of the effects appeared to get stronger as adolescents moved through the post-high school transition by which time autonomy from parents may play a more important role (see Zarrett & Eccles, 2007). However, z-tests suggested this increase was rarely significant.

The way in which an individual responds to stressful life events, such as educational transition, may be a result of protective and promotive factors that the individual has at its disposal (Dagenais-Desmarais, Forest, Girouard, & Crevier-Braud, 2014; Patel & Goodman, 2007). Protective factors are factors which decrease psychological distress. Promotive factors in contrast, actively enhance psychological well-being (Patel & Goodman, 2007). The current results however, show that autonomy support may act as both a protective and promotive factor. Perceived parental autonomy support helped lower ill-being and increased well-being across transitions. Our results are consistent with the theory that autonomy support buffers adolescents against the effects of depression, while promoting a sense of self-esteem. Put simply, parental investment in autonomy support before major educational transitions may facilitate their child's ability to flourish in the new environment and to gain from the new affordances offered by transitioning through their educational careers. Receiving autonomy support from parents, while experiencing a mismatch in the need for autonomy from the educational environment after transition, may serve as a substitute for autonomy satisfaction from the direct educational environment (Midgley et al., 2002; Ryan & Deci, 2017).

### **Co-regulation for Autonomy and Well-Being**

Because co-regulation states that the youth and parent relationship is bidirectional (Dietrich et al., 2012), it is likely that autonomy supportive parenting does not only affect the children, but that their children may also affect their approach to parenting. The strength of

the study design allowed us to explore the co-regulation hypothesis by testing directionality of the effects we found. Interestingly, instances were found where well-being affected perceived autonomy support. Depression before the transition predicted a decrease in autonomy support after the transition for both the high school and post high school transition. Additionally, life-satisfaction before the transition predicted an increase in perceived autonomy support after the post high school transition, while autonomy support before transitions was not significantly related to changes in life satisfaction after any transition. Although it is not clear why autonomy support did not predict life satisfaction, it is possible that other environmental factors that play a role in SDT moderate this relationship, such as a structured home environment, parental mental health, and SES (e.g., Conger, Ge, Elder, Lorenz, & Simons, 1994). We suggest that future studies examine what other environmental factors may affect the perceived parental autonomy support and well-being relationship. The bidirectional relationship between well-being and autonomy support is consistent with the idea of co-regulation. Developmental influences are rarely unidirectional, and so it should be considered that parents adapt their parenting approach to how adolescents deal with, and progress with, their development (Dietrich et al., 2012; Nurmi, 2004).

The significant relationship between pre-transition life satisfaction and an increase in post-transition parental autonomy support was only found for the post high school transition, and may have come from life satisfaction being seen as a proxy for general quality of life conditions. Accordingly, when general life conditions and resources are high and satisfaction is therefore high, parents may be more willing to increase autonomy support. Alternatively, low life satisfaction may lead parents to attempt to have more control in their child's life in order to boost satisfaction. Indeed, when a child's life satisfaction is already sufficient in the eyes of a parent, the parents have no reason to be worried about their child's well-being and can thus provide the child with greater flexibility in autonomy. Likewise, parents that have

children with depressive symptoms may feel more of a need to control their child with the thought of helping the child. Whether this is an adaptive or maladaptive response to poor mental health represents an important future research direction. It has to be kept in mind that in the current research we focus on patterns of relationships that were consistent across multiple transitions, as a measure of generalizability. The relationship between pre-transition life satisfaction and post-transition autonomy support was only found for the post high school transition. As such, we would suggest caution in interpreting these results until further research can be done.

### **Differences in Effects between Mothers and Fathers?**

Most of the parental autonomy support research deals with either mothers' autonomy support or a composite of the parents. Little is known or understood about how mothers and fathers differ with regards to the effects of the autonomy support that they offer. Past research does suggest that there might be differences. Specifically, mothers and fathers have been shown to influence adolescents in different areas of their lives. While mothers are more influential on the adolescents' social environment, fathers appear to be more influential for goal oriented activities (e.g., Grolnick et al., 1996). Moreover, there are studies that have recorded differences between the effects of maternal and paternal autonomy support (e.g., Grolnick & Ryan, 1989; Grolnick et al., 1991; Soenens & Vansteenkiste, 2005), but a difference between the effects on well-being has not been tested before.

Our research focused on differences in maternal and paternal autonomy support. We found that autonomy support was similar in structure across mothers and fathers. We also found that mothers tended to provide more autonomy support than fathers. Finally, a similar pattern of relationships between perceived autonomy support and well-being was found regardless of parental gender.



Taken together, the results suggest that adolescents benefit from autonomy support regardless of which parent it comes from. However, the lower mean levels of autonomy support from fathers indicated that this may be a particularly important group to target for parenting interventions. It is possible that lower levels of perceived paternal autonomy support were found because goal oriented activities, for which fathers are more influential, are generally less critical in adolescence than guidance in the social environment, for which mothers are more influential (Grolnick et al., 1996). Although consideration of the phrasing of the autonomy support questions should also be taken into account, the questions provided neutral conditions in which support was provided. Future research should aim to explore whether differentiation between mothers' and fathers' influence on adolescence truly affects the different autonomy need satisfaction across transitions, or whether fathers are simply perceived as less autonomy supportive. Additionally, previous research has found gender differences between effects of maternal and paternal parenting (e.g., Van der Giessen et al., 2014). Although we have controlled for student gender in the current study, future research can look at the differential effects of each parent on their sons and daughters across transitions.

### **Evidence for Relation between Changes?**

Changes in perceived autonomy support and well-being tended to be moderately related during the transition. Specifically, changes in life satisfaction and self-esteem showed changes concurring with the transitions. It is known in the literature that well-being changes with educational transitions (Eccles & Midgley, 1989), and that relationships with parents change during adolescence, particularly as a result of transitions (P. Parker, Lüdtke, et al., 2012). Throughout educational transitions adolescents do not only establish new relationships in the educational environment, but also modify existing relationships in other social environments (J. Parker, Summerfeldt, Hogan, & Majeski, 2004). One of the most prominent

examples of change in existing relationships is with parents. In this relationship greater independence is developed which often leads to an improved relationship, resulting in greater social support from parents (Tanner, 2006). This idea is reflected by the increasing effect of parental autonomy support on depressive symptoms throughout the transitions in the current study. Because both well-being and relationships with parents change with educational transitions, it is reasonable to speculate that the common agent of the change we found in autonomy support and well-being is the transition. Thus further research should gather data on the specifics of the transition, how it was managed, any notable events, and other adjustment indicators to identify the common factors that influence both well-being and the manner in which parents relate to their children.

### **Limitations**

The current research has several strengths, including the use of longitudinal data and a focus on multiple transitions. However, there are also several limitations that readers should consider when interpreting the results. First, as with all longitudinal designs, there is a chance of third variable explanations of our findings (Morgan & Winship, 2007). Although, cross-lagged models are commonly used to provide evidence of causal ordering (Duncan, Duncan, & Strycker, 2006), they cannot rule out unobserved variables that might influence the associations between perceived autonomy support and well-being across the transitions (Clark & Ladd, 2000). We have established the total effect of autonomy support on well-being for the educational transitions. Future research should investigate the potential mechanisms behind this relationship. For example, research has shown that the relationship between autonomy support and well-being is mediated by need satisfaction (e.g., Costa et al., 2015). Further studies can test this mediation at the educational transitions to see whether this is present at all transitions, helping explain mechanisms behind the effect that we have found.

Further limitations are the use of self-report data, making the data subject to social desirability and common variance bias. This is particularly important in relation to autonomy support which was perceived on the part of the child but may not represent objective support the parents actually provide. Indeed, it is unclear whether results that show well-being affects autonomy support indicate an actual change in autonomy support or indicate that children with more depressive symptoms perceive their parents as becoming less autonomy supportive. While measures of objective support are likely to be difficult and costly, future studies could include observational methods and parent's perception of autonomy support. This would provide evidence of general levels of agreement but also provide a means of understanding whether perceptions of the child, regardless of the feelings of the parents or objective reality, are what drive the results observed here. Furthermore, future studies could examine what types of autonomy supportive parenting behaviour (e.g., taking the child's perspective, providing relevant choices) in particular may affect a child's perception of autonomy support.

The current study consisted of secondary data, which can be seen as another limitation. The use of secondary data has both benefits and costs. Because it is secondary data, we had no say in the scales or items that are used for the variables that we used. With no control over available items, it often happens that short scales are used in replacement of long scales. This furthermore resulted in the need to form an *ad hoc* measure of perceived autonomy support. There was inconsistency between items available for the autonomy support index at differing time points. Because of this, we had to create an autonomy support index that was different at each transition (see supplementary material). Although the creation of this index was done through both empirical and qualitative investigation with the help of a leading researcher in the field, the lack of a consistent scale across transitions made it difficult to compare the transition results on a quantitative basis. In all cases, however,

construct validity and reliability was very strong and there was strikingly similar relationships across all three transitions. Similarly, despite differences in the sampling methods of the post high school transition data, the results related to well-being remained remarkably consistent. Based on the work of Shadish et al. (2002) this can be seen as a strength given that consistency in results across transitions rules out several potential confounding explanations including historical or period effects and, to some degree, instrument specific effects.

Given the use of secondary data, there were some differences from transition to transition. In the first transition autonomy supportive parenting was only available for the pre-transition wave. Likewise, autonomy support for the post high school transition did not distinguish between mothers and fathers. These differences meant that we focused exclusively on generalizability across transition in order to identify common processes. A primary study designed using consistent measures and following adolescents across major transitions is an important future step in order to consider differences between transitions. Furthermore, no covariates were available that have previously been associated with quality of the parent-child relationship, such as parent's mental health, family stressors, SES, or youth's temperament.

Although secondary data analysis has limitations, there are considerable benefits. Secondary data analysis made it possible to include three major educational transition points, and compare these transitions in a single study. Data on transition is often scarce, and those that cover multiple transitions are even rarer. In short, while using secondary data provided complications, the current research provides a novel approach to leveraging value from existing data where primary sources are not currently available.

## **Conclusion**

Findings that were statistically significant in at least two studies provide strongest evidence of generalizability and thus have the strongest implications for theory and practice.

In the current study we found that autonomy support from parents accounted for a decrease in depressive symptoms across all high school related educational transitions. In addition, a bidirectional effect was found for the high school and post high school transition for which depressive symptoms before the transition predicted decreased autonomy support across the transitions.

These findings also provide a better understanding of social contextual influences on transition by showing that autonomy support from both mother and father can function equally as a protective factor against ill-being during the educational transitions surrounding high school. Results also provide evidence of co-regulation. Not only does parenting affect the youth's well-being, but youth's well-being also appears to affect parenting. The reaction of parents who lower parental autonomy in response to a child's depression may be well meaning but ultimately maladaptive. Alternatively, knowing whether to change parenting styles at educational transitions, in response to the individual circumstances of the child, could be beneficial. Future research needs to explore this problematic cycle.

The only other consistent finding (significant in high-school and post high-school transition and near significant for one group in the middle school transition) was that pre-transition parental autonomy support predicted increases in self-esteem across the transition. This suggests that autonomy support from parents not only helps prevent ill-being, but also promotes well-being. Based on these results it is important that parents understand the role they play in preparing their adolescents for educational transitions and their autonomy support can provide a platform for adolescents flourishing as they move through their educational careers.

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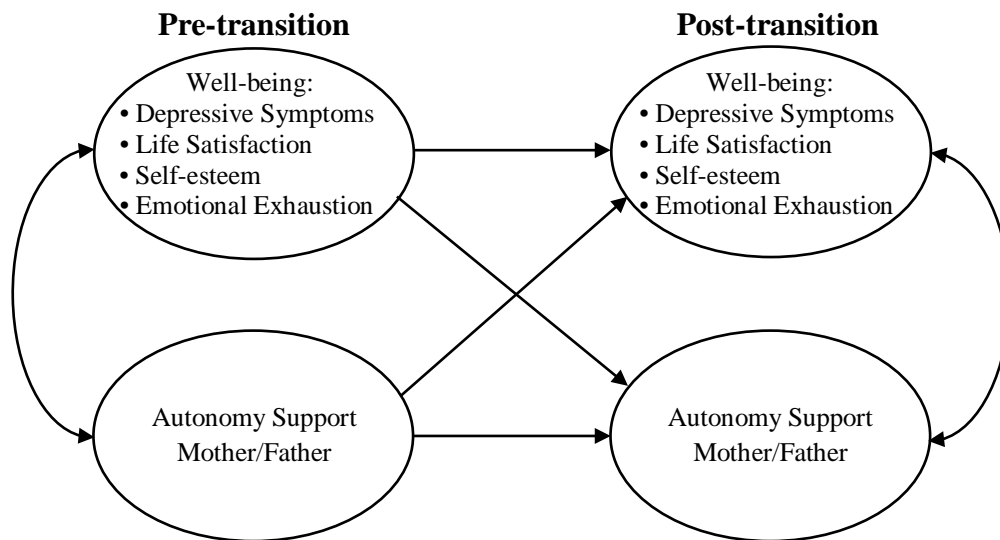
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Table 1

*Overview of Data and the Associated Attributes for Each Transition Wave*

Transition wave	Database	Data collection	Sample use	Sample size	Autonomy measure	Parents	Average age
MS-pre	MtG	2013	Full sample	760	Present	M & F	12
MS-post	MtG	2014	Full sample	483	Absent	n/a	13
HS-pre	FinEdu	2004	Subsample	214	Present	M & F	15
HS-post	FinEdu	2005	Subsample	189	Present	M & F	16
PHS-pre	FinEdu	2006	Full sample	858	Present	Unspecified	18
PHS-post	FinEdu	2008	Full sample	607	Present	Unspecified	21

*Note:* MS-pre = before middle school transition; MS-post = after middle school transition; HS-pre = before high school transition; HS-post = after high school transition; PHS-pre = before post high school transition; PHS-post = after post high school transition; MtG = Mind the Gap database; FinEdu = Finnish Educational Transition database; M = mother; F = father.



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*Figure 1.* Multi-group cross lagged structural equation model of long-term relationships between variables measuring well-being (i.e., depression, life satisfaction, self-esteem, and emotional exhaustion) and perceived parental autonomy support, with the distinction of mother and father autonomy support as groups. Each well-being variable is analysed in a separate model.

*Note:* For the middle school transition this model does not include post-transition autonomy support.

Table 2

*Descriptive Statistics, Differences across the Educational Transitions, and Standardized Factor Loadings of the Cross-Lagged Models for the Well-Being Variables and Perceived Parental Autonomy Support*

	<i>M (SD)</i>		<i>t</i>	95% Confidence Interval		<i>d</i>	Factor Loadings Range	
	Pre-Transition	Post-Transition						
<b>Middle School Transition</b>								
Autonomy Support Mother	5.99 (1.08)	-	-	-	-	-	.71	.72
Autonomy Support Father	5.74 (1.28)	-	-	-	-	-		
Depression	1.62 (0.64)	1.56 (0.62)	-3.66***	0.06	0.19	-0.16	.82	.83
Life Satisfaction	5.21 (1.26)	4.81 (1.34)	-7.41***	0.30	0.52	-0.25	.76	.80
Self-esteem	4.73 (1.12)	4.64 (1.19)	0.80	-0.15	0.06	0.03	.58	.61
Emotional Exhaustion	2.57 (1.10)	2.78 (1.18)	2.81***	-0.28	-0.05	0.11	.62	.68
<b>High School Transition</b>								
Autonomy Support Mother	5.68 (1.09)	5.55 (1.13)	-1.21	0.05	0.23	-0.07	.73	.75
Autonomy Support Father	5.35 (1.26)	5.21 (1.18)	-0.91	-0.09	0.24	-0.06		
Depression	1.61 (0.55)	1.50 (0.52)	-2.16*	0.01	0.18	-0.16	.78	.80
Life Satisfaction	4.79 (1.31)	4.94 (1.06)	2.32*	-0.39	-0.03	0.18	.74	.75
Self-esteem	4.56 (1.09)	4.89 (1.02)	4.47***	-0.41	-0.16	0.25	.60	.63
Emotional Exhaustion	2.77 (0.92)	2.74 (1.05)	-0.67	-0.09	0.19	-0.05	.58	.74
<b>Post High School Transition</b>								
Autonomy Support	5.39 (1.13)	5.65 (1.16)	5.23***	-0.40	-0.18	0.23	.64	.69
Depression	1.57 (0.56)	1.62 (0.58)	2.66***	-0.12	-0.02	0.11	.74	.80
Life Satisfaction	4.88 (1.24)	4.69 (1.25)	-4.26***	0.13	0.34	-0.17	.78	.80
Self-esteem	5.02 (1.16)	4.98 (1.17)	-0.85	-0.05	0.14	-0.03	.67	.72
Emotional Exhaustion	2.65 (1.05)	2.75 (1.06)	0.23	-0.13	0.10	0.01	.67	.77

\*  $p < .05$ , \*\*  $p < .01$ , \*\*\*  $p < .001$

Table 3

*Fit Indices for Cross-Lagged SEM Models for all Transitions Including Structural Invariance Fits Differences Accounting for Student Gender and Interdependence*

	$\chi^2$	<i>df</i>	CFI	TLI	RMSEA
<b>Middle School Transition</b>					
Depression Model					
S1	1446	574	.98	.98	.034
S2	1380	576	.99	.99	.032
Difference	1.10	2	.01	.01	.001
Life Satisfaction Model					
S1	601	164	.95	.94	.045
S2	607	166	.95	.94	.045
Difference	1.92	2	.00	.00	.000
Self-esteem Model					
S1	508	156	.92	.91	.045
S2	602	158	.92	.91	.046
Difference	1.60	2	.00	.00	.001
Emotional Exhaustion Model					
S1	137	74	.98	.97	.025
S2	139	76	.98	.97	.025
Difference	0.01	2	.00	.00	.001
<b>High School Transition</b>					
Depression Model					
S1	1265	940	.97	.97	.037
S2	1233	944	.97	.97	.034
Difference	1.28	4	.00	.00	.003
Life Satisfaction Model					
S1	590	390	.94	.93	.045
S2	597	394	.94	.93	.045
Difference	6.31	4	.00	.00	.000
Self-esteem Model					
S1	613	386	.93	.930	.048
S2	621	390	.93	.930	.048
Difference	11.00*	4	.00	.00	.000
Emotional Exhaustion Model					
S1	313	236	.96	.96	.034
S2	316	240	.96	.96	.035
Difference	7.49	4	.00	.00	.000
<b>Post High School Transition</b>					
Depression Model	1237	395	.95	.95	.053
Life Satisfaction Model	405	145	.95	.94	.049
Self-esteem Model	400	142	.95	.94	.049
Emotional Exhaustion Model	184	81	.96	.95	.041

*Note:* S1 = constrained factor loadings between time waves and parent groups; S2 = constrained factor loadings between time waves and parent groups and constrained regression between parent groups.

\*  $p < .05$

Table 4

*Standardised Beta Coefficients and Standard Error for Multi-Group SEM of the Effect of Autonomy Supportive Parenting on Educational Transition Well-Being Accounting for Student Gender and Interdependence*

	Mother		Father	
	Post-transition Well-Being	Post-transition Autonomy Support	Post-transition Well-Being	Post-transition Autonomy Support
<b>Middle School Transition</b>				
<b>Depression</b>				
Pre-transition Well-Being	.51*** (.05)	-	.51*** (.05)	-
Pre-transition Autonomy Support	-.22*** (.06)	-	-.25* (.05)	-
<b>Life Satisfaction</b>				
Pre-transition Well-Being	.59*** (.05)	-	.60*** (.05)	-
Pre-transition Autonomy Support	.04 (.06)	-	.08 (.07)	-
<b>Self-esteem</b>				
Pre-transition Well-Being	.49*** (.06)	-	.47*** (.06)	-
Pre-transition Autonomy Support	.07 (.06)	-	.11^ (.06)	-
<b>Emotional Exhaustion - School</b>				
Pre-transition Well-Being	.47*** (.07)	-	.46*** (.07)	-
Pre-transition Autonomy Support	.04 (.06)	-	.01 (.06)	-
<b>High School Transition</b>				
<b>Depression</b>				
Pre-transition Well-Being	.44*** (.07)	-.21* (.09)	.45*** (.08)	-.24** (.08)
Pre-transition Autonomy Support	-.24*** (.08)	.64*** (.05)	-.22*** (.07)	.73*** (.04)
<b>Life Satisfaction</b>				
Pre-transition Well-Being	.41*** (.12)	.09 (.11)	.34*** (.13)	-.04 (.11)
Pre-transition Autonomy Support	.09 (.11)	.60*** (.09)	.15 (.12)	.71*** (.11)
<b>Self-esteem</b>				
Pre-transition Well-Being	.67*** (.06)	.13 (.09)	.66*** (.06)	-.06 (.05)
Pre-transition Autonomy Support	.10 (.07)	.61*** (.08)	.16* (.07)	.72*** (.05)
<b>Emotional Exhaustion - School</b>				
Pre-transition Well-Being	.70*** (.09)	-.14 (.09)	.71*** (.08)	-.08 (.09)
Pre-transition Autonomy Support	-.13 (.09)	.63*** (.07)	-.08 (.08)	.71*** (.06)
<b>Post High School Transition</b>				
<b>Combined Parents</b>				
<b>Depression</b>				
Pre-transition Well-Being	.58*** (.04)	-.27*** (.05)	-	-
Pre-transition Autonomy Support	-.39*** (.05)	.52*** (.05)	-	-
<b>Life Satisfaction</b>				
Pre-transition Well-Being	.52*** (.05)	.20** (.07)	-	-
Pre-transition Autonomy Support	.01 (.06)	.38*** (.06)	-	-
<b>Self-esteem</b>				
Pre-transition Well-Being	.60*** (.05)	.10 (.06)	-	-
Pre-transition Autonomy Support	.12* (.05)	.44*** (.06)	-	-
<b>Emotional Exhaustion</b>				
Pre-transition Well-Being	.47*** (.06)	-.04 (.05)	-	-
Pre-transition Autonomy Support	-.12* (.06)	.46*** (.06)	-	-

^  $p < .10$ , \*  $p < .05$ , \*\*  $p < .01$ , \*\*\*  $p < .00$

Note: reporting standardised regression ( $\beta$ ), with standard error in parentheses.