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REVIEW ARTICLE

Parent Autonomy Support, Academic Achievement, and Psychosocial Functioning: a Meta-analysis of Research

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Abstract A meta-analysis of 36 studies examining the relations between parent autonomy support (PAS) and child outcomes indicated that PAS was related to greater academic achievement and indicators of adaptive psychosocial functioning, including autonomous motivation, psychological health, perceived competence, engagement, and positive attitudes toward school, among other outcomes. The strongest relation emerged between PAS and psychological health. Results indicated that the strength of the PAS relation was stronger when PAS was reflective of both parents, rather than of just mothers or just fathers among five of six outcomes for which moderators could be examined. Moderator analyses also suggested that PAS correlations are stronger when the outcome is better aligned to the predictor and the relation between PAS and psychosocial outcomes may vary by grade level. Implications for theory and future research are discussed.

Keywords Parenting · Autonomy support · Academic achievement · Psychological well-being · Meta-analysis

There is a lot of uncertainty about what makes a "perfect parent." One glance at your local bookstore and the plethora of parenting books suggests that everyone seems to have an opinion. From the *Battle Hymn of the Tiger Mother*, by Amy Chua to *Beyond the Sling: a Real-Life Guide to Raising Confident, Loving Children the Attachment Parenting Way*, by Mayim Bialik, one could read endless hours and still not have a clear understanding of what

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makes a good parent. However, many people can agree that parents play an important role in shaping a child's social, psychological, and academic functioning. The relationship between parent and child may be one of the most significant relationships over the course of a person's life. The early attachment an infant establishes with parents serve as the foundation for happy and healthy relationships later in life (Burrow-Sanchez and March 2006; Cox 2002) and predicts later development (Linwood 2006). From background characteristics to parenting style, the literature consistently supports the notion that parents influence children's school performance (Ishak et al. 2012; Rivers et al. 2012). The evidence suggests that children who form a strong, trusting, and warm relationship with their parents exhibit greater curiosity, flexibility, and self-reliance in the classroom, as well as higher self-esteem and fewer behavioral problems (Cox 2002; Linwood 2006).

Parents vary greatly in their parenting styles, as well as the extent to which and ways they become involved in their children's lives (Pomerantz et al. 2007). In particular, a growing body of research has suggested that parents who interact with their children in ways that support their experience of autonomy or feeling that their actions are their own (Deci and Ryan 1987) may be particularly effective in supporting adaptive psychological, social, and academic outcomes, including psychosocial functioning (Chirkov and Ryan 2001; Ferguson et al. 2011) and academic achievement (Strage and Brandt 1999).

Parents may use a number of strategies and practices to support their children's experience of autonomy. Autonomy supportive environments are characterized primarily by parents' acknowledgement of children's perspectives, encouragement of children to experiment, provision of opportunity to make choices, and minimal use of controlling language and contingencies with children (Deci and Ryan 2012). Autonomy supportive parents nurture inner motivational resources, rely on flexible language when communicating with their child, and provide explanatory rationales for why it may be personally important or useful for a child to engage in a behavior (Reeve 2009). In an interaction about homework, for example, an autonomy supportive parent might ask for the child's input, try to understand their child's perspective on approaches for solving the homework assignment, and encourage their child to work in their own way. On the other hand, a controlling parent might tell the child exactly how to do the homework and ask for little, if any, input from the child in the discussion.

Although a considerable amount of research examining the relations between parent autonomy support and child psychological, social, and academic functioning has accumulated, this research has yet to be synthesized in order to assess the magnitude of the relation between this style of parent interaction and child outcomes. Likewise, little research has explored the conditions under which parent autonomy support is more or less related to adaptive outcomes. To address this omission in the literature, we conducted a meta-analysis to examine the relation between parent autonomy support and a variety of outcomes indicative of children's adaptive functioning, including their academic achievement and psychosocial functioning.

The Relations Between Autonomy Supportive Parenting and Child Outcomes

According to self-determination theory, there are three universal and basic psychological needs that underlie human motivation and achievement: autonomy, competence, and relatedness (Deci 1980). The need for autonomy is met when a child feels like their actions are their own. Competence is met when children feel the task before them is within their skill set, and they

can readily master their environment. Relatedness is met when a child feels attached and accepted by a community, group, or family. Self-determination theory hypothesizes that social contexts that satisfy these three needs will enhance intrinsic motivation, well-being, and achievement (Beiswenger and Grolnick 2010; Grolnick et al. 2002; Hui et al. 2011), whereas contexts that undermine these needs will diminish adaptive functioning (Bronstein et al. 2005; Jiang et al. 2011). In particular, autonomy reflects "volitional, harmonious, and integrated functioning" (Joussemet et al. 2008, p. 194) and may be particularly important for motivation and psychological well-being. Self-determination theory has traditionally assumed that feelings of competence and relatedness will not enhance motivation and well-being, unless accompanied by a sense of autonomy (Ryan and Deci 2000).

Given the centrality of these psychological needs for human functioning, it would seem reasonable to assume that when a child's need for autonomy is supported by parents, the child's motivation, psychological well-being, and academic outcomes are likely to be optimally supported. In fact, a great deal of research has supported this notion (Annear and Yates 2010; Grolnick 2009; Joussemet et al. 2008).

Previous scholarship has examined the relation between parent autonomy support and academic achievement. Using a variety of indicators of achievement, including grade point average (GPA), individual course grades (Cooper et al. 2000; Soenens and Vansteenkiste 2005), and standardized test scores (Bronstein et al. 2005; Halpern-Felsher 1994), researchers have suggested that parental autonomy support has a positive relation with academic achievement. Pomerantz et al. (2007) asserted that autonomy supportive parenting may benefit academic achievement because it provides access to motivational and cognitive resources which can enhance positive engagement in school. While many studies have found a strong relation between parental autonomy support and school achievement, still other studies have not revealed significant relations and the strength of the overall relation remains uncertain (Bronstein et al. 2005; Grolnick et al. 2002; Halpern-Felsher 1994). For example, although Grolnick et al. (1991) found small positive correlations between children's perceptions of both maternal and paternal autonomy support and school grades, these correlations were not statistically significant. Conducting a meta-analysis can help determine the magnitude of the relation between parental autonomy support and achievement.

Similarly, research has suggested that parental autonomy support may be related to enhanced psychosocial functioning, including autonomous motivation for school (Bronstein et al. 2005; Dai 1998; Grolnick et al. 2000; Hui et al. 2011), greater psychological health in the form of greater perceived well-being and self-esteem (Beiswenger and Grolnick 2010; Ferguson et al. 2011), greater perceived competence, and control in school related tasks (Grolnick et al. 1991; Soenens and Vansteenkiste 2005), increased engagement and effort (Gagné 2003), more positive attitudes toward school (Annear and Yates 2010), and reduced extrinsic motivation (Dai 1998). For example, Borenstein et al. (2005) found that greater parental autonomy support in 5th grade predicted an enhanced intrinsic motivational orientation toward school in 7th grade. Lekes et al. (2010) found that parental autonomy support was associated with greater psychological well-being among both Chinese and North American adolescents. But again, while much research has supported the positive relation between parental autonomy support and adaptive psychosocial functioning, results have not been ubiquitously supportive (e.g., Purdie et al. 2004; Annear and Yates 2010).

Factors that may Explain Variation in the Relations Between Parental Autonomy Support and Child Outcomes

Given mixed findings, it seems likely that a number of factors might moderate the influence of parental autonomy support and potentially explain contradictory findings. Factors such as the child's grade level, the parent agent of the autonomy support, the domain of the autonomy support and outcome, the autonomy support respondent, and the type of outcome measure may influence the relation between parental autonomy support and students' adaptive functioning.

The effectiveness of various parenting techniques can change with children's age, depending on a child's developmental level (Grolnick et al. 1997). Parenting involvement that begins early in children's lives can extend into the adolescent years (Pomerantz et al. 2007) and have differing impacts on school performance. In particular, adolescence is typically marked as a time during which children develop conceptualizations of the self as an autonomous, efficacious individual (Hill and Tyson 2009), accompanied by a shift in child–parent relationships that includes more conflict and renegotiations of authority (Smetana and Asquith 1994). Looking at grade level as a moderator may shed some light on how the relations between parental autonomy support and child outcomes change across developmental levels.

Understanding who is doing the autonomy support is also critical. Unfortunately, researchers often assess the parenting style of mothers exclusively and assume that fathers parent in the same way or simply do not take into account how the parenting styles of mothers and fathers coexist (Simons and Conger 2007). However, the nature and level of interaction with children may be different across mothers and fathers. According to Collins and Russell (1991), fathers' interaction with children during adolescence tends to be more focused and limited in nature relative to mothers, geared toward school and athletic achievement, whereas mothers' interactions with their children tend to be much more varied. Being able to tease apart the link between parental autonomy support and child outcome when mothers', fathers', or both parents' level of autonomy support was assessed may clarify the question of whether parenting practices have similar relations with child outcomes across the agent of autonomy support. Nonetheless, we would expect that parental autonomy support is more powerful when both parents are autonomy supportive.

The autonomy support respondent may also be an important factor in explaining variation in research findings. That is, self-determination theory assumes that the subjective experiences of parent autonomy from the perspective of the child ultimately determine child motivation and engagement (e.g., Ryan and Grolnick 1986). As such, it might matter who is reporting on the autonomy support of the parent. If parents are self-reporting, they might think they are acting in an autonomy supportive manner, but the child might perceive the actions differently. Ultimately, we might expect that larger relations will be revealed when child perceptions are correlated with outcomes.

Finally, the domain of the autonomy support and outcome may be of particular importance in explaining variation. Autonomy support may be focused on particular domains of parents' interaction with children, for example, when interacting over school matters or matters of the home. As such, we may expect for parental autonomy support to yield particularly strong relations with child outcomes when the outcomes align with the domain in which support was given (or measured). That is, parents may become involved in different ways on the school and home fronts, yielding distinct effects on children across outcomes (Pomerantz et al. 2007). The extent to which more distally aligned relations, for example, the relation between parental autonomy support for home matters and children's educational outcomes or between parental

autonomy support for school matters and children's general psychological well-being, is unclear.

Need for a Synthesis on Parental Autonomy Support

A large body of literature on the parental autonomy support and its relation with children's school and life outcomes has accumulated over the last 25 years, making a synthesis of the findings timely. Given the conflicting findings across the various outcomes, a meta-analysis might begin to clarify how autonomy supportive parenting relates to academic achievement and psychosocial functioning. Further, the literature has suggested that a number of theoretical and methodological factors, described above, may influence the relation between parental autonomy support and students' adaptive functioning. A meta-analysis provides a means to assess the impact of these variations that occur both within and between studies.

The following predictions were made concerning the relations between parental autonomy support, autonomous motivation, psychological health, and academic achievement. Parental autonomy support will have a positive overall relation with both adaptive psychosocial outcomes and academic achievement. Further, given the discussed findings regarding the potential moderators, the positive relation of parental autonomy support on adaptive psychosocial outcomes and academic achievement will be stronger when the following moderators are present: (a) when the grade level is middle or high school, (b) when the agent of support is both parents, (c) when the outcome is well aligned with the domain of support, and (d) when the autonomy support respondent is the student.

Method

Literature Search Procedures

We used an assortment of search strategies to retrieve both published and unpublished work examining the influence of parental autonomy support. First, computer searches of the following electronic reference databases were conducted: PsycINFO, Educational Resources Information Clearinghouse (ERIC), Proquest Dissertations and Theses, and Google Scholar. For each database, a series of search terms was employed: autonom* and (parent* or mother* or father* or patern* or matern*), applying the appropriate truncation and Boolean techniques to achieve an inclusive yet focused search. In addition, Social Sciences Citation Index was searched for documents that had cited seminal articles on parent autonomy support: Grolnick and Ryan (1989), Deci and Ryan (1987), Grolnick and Ryan (1987), and Pomerantz et al. (2007). These searches located a total of 6839 non-duplicate, potentially relevant documents.

To supplement searches of electronic databases and obtain any research that might not be found through computer searches, the reference sections of relevant documents were examined for cited works that also might be applicable to the topic. In addition, two direct contact strategies were employed to ensure items were requested from sources that might have access to parental autonomy support research not included in the reference and citation databases. First, requests for unpublished research were sent through the following listservs: Motivation in Education Special Interest Group from the American Education Research Association, Society for Personality and Social Psychology, Society of Research in Child Development,

and Society of Research in Adolescence. Second, requests were sent via electronic mail to prominent researchers in the motivation and autonomy support areas that had two or more reports on the topic regarding access to any relevant data that were not publicly available.

Each title and abstract was examined by the first and third authors. If either researcher judged the abstract to indicate that the paper contained data relevant to the relation between parental autonomy support and an achievement-related or psychosocial outcome, the full document was obtained for further examination.

Criteria for Including Studies

To be included in the meta-analysis, studies were required to meet several criteria. First, all studies must have examined the relation between parental autonomy support and outcomes related to either educational or psychosocial functioning among students in preschool through college.

Academic achievement was the most commonly examined outcome and was measured in the following ways, performance on a specific academic task, non-standardized test score or scores (i.e., end of unit test scores, researcher developed test, or teacher developed test), standardized test scores, course grades, GPA, homework completion, or homework grades. Psychosocial functioning included assessments of children's motivation and emotion, such as autonomous motivation, psychological health, perceived competence, engagement and effort, perceived control, attitudes toward school, extrinsic motivation, executive functioning, and self-regulation. All psychosocial functioning measures were self-reported, with the exception of engagement and effort measures and executive functioning measures, which also included some behavioral observations. Autonomous motivation included measures of academic intrinsic motivation, identified regulation, and the Relative Autonomy Index (RAI), a measure that weights and subtracts extrinsic forms of motivation from intrinsic and identified regulation. All autonomous motivation measures reflected motivation that is generated from inside the individual. Psychological health included both measures of self-esteem and well-being, which broadly encompassed measures of global life satisfaction, positive attitudes toward self, and positive emotions toward life in general. The very small minority of studies (<2) had a non-general assessment of psychological health. Perceived competence was assessed with measures of whether children feel they are able to succeed at an activity or an academic domain. Engagement and effort captured cognitive engagement or the use of cognitive strategies (i.e., elaboration, linking information to prior knowledge) while engaging in academic and non-academic tasks and overall effort placed on a task or activity through both self-reports and observations of the behavior. Perceived control measured children's understanding of the control they have over their actions and their success or failure, also often in the academic domain. Attitudes toward school measured positive school attitudes and school satisfaction. Extrinsic motivation included measures of academic extrinsic motivation and introjected motivation. That is, motivation that is exclusively generated from outside the individual. Executive functioning included measures of higher-order cognitive processes, such as inhibitory control and working memory, all through observations of certain behavior such as on delay of gratification tasks or a baby Stroop test. The single measure of self-regulation examined five aspects: goal setting, self-efficacy for goal achievement, use of task strategies, self-motivation, self-monitoring, and self-evaluation.

Autonomy support could have been measured in many ways, including through observation or self-report by either the child or parent. Although autonomy support was

operationalized in a variety of ways across research studies, autonomy support was broadly defined as parents encouraging and providing children with opportunities for choice making and opinion exchange.

The studies included in the meta-analysis were all correlational in which the extent of parental autonomy support and the level of the outcome were measured, generally, as they naturally occur. The design of the studies must have involved the calculation of a bivariate correlation coefficient between parental autonomy support and achievement or psychosocial functioning or provided enough information for us to compute this effect.

Finally, one sampling restriction was placed on the included studies. Studies may include non-US participants, but only if the study was written in English, given the language limitations of the research team. All non-English studies were excluded.

Due to the requirements that all studies must include a correlation between a measure of parental autonomy support (previously defined) and outcomes related to education or psychosocial functioning (described above), 36 articles were retained for analysis. Most studies were excluded because they measured some other parenting construct and did not measure specifically autonomy supportive parenting. Some studies were excluded because correlations could not be obtained from the information provided. Several studies were excluded because their outcome did not fit within the previously defined outcome list, for example they may have focused on depressive symptoms. A couple studies were excluded because an experimental design was used in which parents were trained to be autonomy-supportive or parental autonomy support was intentionally manipulated. While we would have liked to include and meta-analyze these studies separately, there were so few studies of this nature that we thought it best to exclude them from the analyses presented here.

Information Retrieved from Studies

Numerous characteristics of each study were coded when available. These characteristics encompassed six broad distinctions among studies: (a) the research report, (b) the study characteristics, (c) the characteristics of the participants, (d) the measure of autonomy support, (e) the measure of achievement or psychosocial functioning, and (f) the estimate of the relation between parental autonomy support and the outcome. We used simple bivariate correlation coefficients, *r*, as measures of the direction and magnitude of the relation. Table 1 presents the characteristics coded.

Coder Reliability

Two of four graduate and undergraduate student coders extracted information from each report selected for inclusion. Discrepancies were noted and discussed by the coders, and if agreement was not reached, the second author was consulted. The agreement between coders averaged 92 % for all the articles coded across all items before discrepancies were resolved. Evidence suggests that the process used results in high reliability (Rosenthal 1987).

Methods of Data Integration

Before conducting any statistical integration of the effect sizes, the number of positive and negative effects was counted and the range of effects was assessed. We examined the distribution of sample sizes and effect sizes to determine whether any studies contained

Table 1 Complete list of information retrieved from studies

Report characteristics

1. Author name
2. Year
3. Type of report (journal article, book, dissertation, thesis, government paper, conference paper, other)
4. Was this peer-reviewed?

Study information

1. Participants location (in the USA, in a country outside the USA)
   a. Specify
2. Community type (urban, suburban, rural, cannot tell)
3. Setting (home, school, lab, sport, other)

Participant and sample characteristics

1. Student labels (gifted, above average ability/achievement, average ability/achievement, at risk, low ability/below grade level, possessing a learning deficit, other)
2. Socioeconomic status (low, low-middle, middle, middle-upper, upper, mixed, no information)
3. Grade level
4. Sex
5. Ethnicities (White, African American, Asian American, Hispanic, Native American, other)
6. Percentages of ethnicities

Parental autonomy support measure characteristics

1. Domain (general, general academics, mathematics, science, English language arts, sports, social studies, music/arts, other)
2. Agent of support (both parents, mother, father)
3. How was autonomy support measured? (observation, child scale, parent scale)
4. Self-report (existing validated scale, created for the study scale)
5. Name of measure, Cronbach's alpha
6. Type of autonomy support (general multidimensional, offering choice, attending to student perspective, creating relevance, providing encouragement, providing rationale, asking what child wants, providing information feedback, offering hints, other)

Outcome measure

1. Outcome
   a. Academic achievement (task performance, non-standardized test score, standardized test score, course grades, GPA, homework completion, homework grades, other)
   b. Psychosocial functioning (intrinsic motivation, identified regulation, integrated regulation, interjected regulation, extrinsic motivation, enjoyment, interest, situational interest, individual interest, positive emotions, negative emotions, perceived competence, expectancies for success, perceived autonomy, cognitive engagement, behavioral engagement, effort, persistence, re-engagement with domain, positive school attitudes, negative school attitudes, task value, intrinsic value, attainment value, utility value, self-esteem/self-worth, self-acceptance, self-concept, creativity, executive functioning)
2. Outcome measured (behavior, self-report)
   a. Behavioral measure (report from student, observed by teacher, observed by parent, observed by researcher)
   b. Self-report (existing scale, created for the study scale)
3. Name of measure, Cronbach's alpha
4. Domain of outcome (general non-school, school in general, math, science, English language arts, social studies, sports, music/arts, other)
5. Delay?
6. Attrition?

Table 1 (continued)

Effect size information
1. Total sample size
2. Direction of the effect
3. Effect size

statistical outliers. Grubbs (1950) test was applied, and if outliers were identified, these values were Winsorized by setting them at the value of their next nearest neighbor.

Both published and unpublished studies were included in the synthesis. There is still the possibility that not all studies investigating the relation between parental autonomy support and achievement or psychosocial functioning were obtained. Therefore, Duval and Tweedie's (2000) trim-and-fill procedure was employed. The trim-and-fill procedure tests whether the distribution of effect sizes used in the analyses was consistent with that expected if the estimates were normally distributed.

The inverse-variance weighting procedure was used to calculate average effect sizes across all comparisons. Ninety-five percent confidence intervals were calculated. If the confidence interval did not contain zero, then the null hypothesis that parental autonomy support had no relation to the achievement-related or psychosocial functioning-related outcome was rejected. Possible moderators of the parental autonomy support relation were tested via homogeneity analyses (Cooper and Hedges 1994; Hedges and Olkin 1985). Meta-regression analysis was conducted to examine the role of Cronbach's alpha as a measure of quality of study in explaining variability in correlations. To hold violations of independence to a minimum while retaining as much information as possible, we used a shifting unit of analysis approach (see Cooper 2010 for a description). In this approach, multiple correlations for the same outcome within a sample are averaged so that each sample contributes only one effect to the overall analysis or each category of a moderator.

All analyses were conducted twice, once using fixed-effect assumptions and once employing random-effect assumptions (Hedges and Vevea 1998). In a fixed-effect model, we assume that the only source of error explaining why the effect size varies from one study to another is due to sampling error or differences among participants across studies. However, it is also possible to view studies as containing other random influences. For example, in a random effect model, a study-level variance component is assumed to be an additional source of random variation. Rather than opt for a single model of error, we chose to apply both models to our data. Through conducting these sensitivity analyses (Greenhouse and Iyengar 1994), we could examine the effects of different assumptions on the outcomes of the synthesis.

To limit our discussion of these results, we focus on those moderator analyses that were significant under both fixed-effect and random-effect assumptions. All statistical analyses were conducted with the comprehensive meta-analysis (CMA) statistical software package (Borenstein et al. 2005). Moderator analysis was conducted only when sufficient moderator information was present. Consequently, some outcomes did not have all moderators analyzed due to a lack of data.

Results

Studies Correlating Parental Autonomy Support and Academic Achievement

The literature search uncovered 20 studies that estimated the correlation between parental autonomy support and a measure of academic achievement. The 20 studies reported 88 separate correlations based on 29 independent samples of students. Of those correlations, 25 measured GPA, 34 measured course grades, 28 measured standardized tests, and 1 measured task performance. Of the 88 correlations, 19 were from an elementary school sample, 30 were from a middle school sample, 22 were from a high school sample, 5 were from a college sample, and 12 were from a mixed grade level sample. Thirty-five of the correlations reported had agent of support as both parents, 16 correlations reported father as agent of support, and 37 reported mother as the agent of support. The characteristics of these studies are listed in Table 2.

The 20 studies were published between the years 1986 and 2011. The sample sizes ranged from 48 to 805, with a median size of 77. The mean sample size was 174.68, with a standard deviation of 190.01, suggesting a normal distribution. Grubbs test did not reveal any significant outliers among sample sizes or correlations. The effect sizes of the correlations ranged from −.33 to .50. There were 72 positive effects, 15 negative effects, and 1 effect for which the correlation was zero.

Overall Correlation The weighted average correlation was r=.11 (95 % CI=.08, .13) under a fixed-error model and r=.12 (95 % CI=.07, .16) under a random-error model (see Table 3 for overall effects), $Q(28)=94$, $p<.001$. Trim-and-fill analyses indicated that the relation between parental autonomy support and achievement would be positive and significantly different from zero, although the magnitude was reduced slightly, even after imputing six missing values under a fixed-effect model and seven missing values under a random-effect model. The results of the trim and fill analysis for achievement, as well as every other outcome, can be found in Table 4. In addition, a moderator analysis indicated that there was no difference between the average effects of published and unpublished reports (see Table 6). Regarding study quality, meta-regressions assessing whether a sample's Cronbach's alpha for the measure of parental autonomy support moderates the correlation with academic achievement were not significant under fixed or random effects (see Table 5).

Moderator Analyses Next, additional moderator analyses were performed on the relation between parental autonomy support and academic achievement using six moderators: grade level, agent of support, autonomy support respondent, domain of autonomy support, outcome, and domain of outcome (see Table 6). Three moderators, autonomy support respondent, agent of support, and domain of autonomy support, were significant under fixed-effect assumptions, but none of the moderators remained significant when a random-effect model was implemented. Autonomy support respondent, agent of support, and domain of autonomy support did not significantly explain variability in the correlations between autonomy support and achievement under either fixed or random-error assumptions.

Table 2 Characteristics of studies correlating parental autonomy support and reported outcomes

Author (year)	Type of document	Sample size	Grade level	Delay in outcome measure	Autonomy support respondent	Agent of support	Domain of autonomy support	Outcome	Domain of outcome	Correlation
Annear and Yates (2010)	Journal article	92	Middle school	No	Parent scale	Mother	General	Positive school attitudes	General academics	+.23
Annear and Yates (2010)	Journal article	92	Middle school	No	Parent scale	Father	General	Positive school attitudes	General academics	+.02
Beiswenger and Grolnick (2010)	Journal article	142	Middle school	No	Child scale	Mother	General	Well-being	Non-school	+.27
Beiswenger and Grolnick (2010)	Journal article	142	Middle school	No	Child scale	Father	General	Well-being	Non-school	+.30
Beiswenger and Grolnick (2010)	Journal article	142	Middle school	No	Child scale	Mother	General	Intrinsic motivation	Non-school	+.06
Beiswenger and Grolnick (2010)	Journal article	142	Middle school	No	Child scale	Mother	General	Identified regulation	Non-school	+.03
Beiswenger and Grolnick (2010)	Journal article	142	Middle school	No	Child scale	Father	General	Intrinsic motivation	Non-school	+.12
Beiswenger and Grolnick (2010)	Journal article	142	Middle school	No	Child scale	Father	General	Identified regulation	Non-school	+.02
Beiswenger and Grolnick (2010)	Journal article	142	Middle school	No	Child scale	Mother	General	Relative Autonomy Index	Non-school	0
Beiswenger and Grolnick (2010)	Journal article	142	Middle school	No	Child scale	Father	General	Relative Autonomy Index	Non-school	+.07
Beiswenger and Grolnick (2010)	Journal article	142	Middle school	No	Child scale	Mother	General	Perceptions of competence	Non-school	+.10
Beiswenger and Grolnick (2010)	Journal article	142	Middle school	No	Child scale	Father	General	Perceptions of competence	Non-school	+.14
Beiswenger and Grolnick (2010)	Journal article	142	Middle school	No	Child scale	Mother	General	Extrinsic motivation	Non-school	−.11
Beiswenger and Grolnick (2010)	Journal article	142	Middle school	No	Child scale	Mother	General	Interjected regulation	Non-school	+.08
Beiswenger and Grolnick (2010)	Journal article	142	Middle school	No	Child scale	Father	General	Extrinsic motivation	Non-school	−.12

Table 2 (continued)

Author (year)	Type of document	Sample size	Grade level	Delay in outcome measure	Autonomy support respondent	Agent of support	Domain of autonomy support	Outcome	Domain of outcome	Correlation
Beiswenger and Grolnick (2010)	Journal article	142	Middle school	No	Child scale	Father	General	Interjected regulation	Non-school	+.03
Bernier et al. (2010)	Journal article	80	None reported	Yes	Observation	Mother	General	Executive functioning	Non-school	+.38
Bernier et al. (2010)	Journal article	80	None reported	Yes	Observation	Mother	General	Executive functioning	Non-school	+.25
Bernier et al. (2010)	Journal article	80	None reported	Yes	Observation	Mother	General	Executive functioning	Non-school	+.13
Bernier et al. (2010)	Journal article	80	None reported	Yes	Observation	Mother	General	Executive functioning	Non-school	+.31
Birman and Espino (2007)	Journal article	120	High school	No	Parent scale	Both parents	General	GPA	General academics	−.33
Blackwelder (2006)	MA Thesis	217	College	No	Child scale	Both parents	General	Course grades	General academics	+.15
Blackwelder (2006)	MA Thesis	217	College	No	Child scale	Both parents	General	Perceptions of control	General academics	+.26
Bronstein et al. (2005)	Journal article	77	Middle school	No	Child scale	Mother	Academics	GPA	General academics	−.03
Bronstein et al. (2005)	Journal article	77	Middle school	Yes	Child scale	Mother	Academics	GPA	General academics	−.07
Bronstein et al. (2005)	Journal article	77	Middle school	No	Child scale	Mother	Academics	Standardized test scores	General academics	−.25
Bronstein et al. (2005)	Journal article	77	Middle school	Yes	Child scale	Mother	Academics	Standardized test scores	General academics	−.02
Bronstein et al. (2005)	Journal article	77	Middle school	No	Child scale	Mother	Academics	GPA	General academics	+.24
Bronstein et al. (2005)	Journal article	77	Middle school	No	Child scale	Mother	Academics	Standardized test scores	General academics	+.18
Bronstein et al. (2005)	Journal article	77	Middle school	No	Child scale, parent scale	Both parents	Academics	GPA	General academics	+.19
Bronstein et al. (2005)	Journal article	77	Middle school	Yes	Child scale, parent scale	Both parents	Academics	GPA	General academics	+.15
Bronstein et al. (2005)	Journal article	77	Middle school	No	Child scale, parent scale	Both parents	Academics	Standardized test scores	General academics	+.25
Bronstein et al. (2005)	Journal article	77	Middle school	Yes	Child scale, parent scale	Both parents	Academics	Standardized test scores	General academics	+.11
Bronstein et al. (2005)	Journal article	77	Middle school	No	Child scale, parent scale	Both parents	Academics	GPA	General academics	+.17

Table 2 (continued)

Author (year)	Type of document	Sample size	Grade level	Delay in outcome measure	Autonomy support respondent	Agent of support	Domain of autonomy support	Outcome	Domain of outcome	Correlation
Bronstein et al. (2005)	Journal article	77	Middle school	No	Child scale, parent scale	Both parents	Academics	Standardized test scores	General academics	+.25
Bronstein et al. (2005)	Journal article	77	Middle school	No	Child scale, parent scale	Both parents	Academics	GPA	General academics	+.15
Bronstein et al. (2005)	Journal article	77	Middle school	Yes	Child scale, parent scale	Both parents	Academics	GPA	General academics	+.17
Bronstein et al. (2005)	Journal article	77	Middle school	No	Child scale, parent scale	Both parents	Academics	Standardized test scores	General academics	+.19
Bronstein et al. (2005)	Journal article	77	Middle school	Yes	Child scale, parent scale	Both parents	Academics	Standardized test scores	General academics	+.21
Bronstein et al. (2005)	Journal article	77	Middle school	No	Child scale, parent scale	Both parents	Academics	GPA	General academics	+.32
Bronstein et al. (2005)	Journal article	77	Middle school	No	Child scale, parent scale	Both parents	Academics	Standardized test scores	General academics	+.42
Bronstein et al. (2005)	Journal article	77	Middle school	No	Child scale	Mother	Academics	Perceptions of competence	General academics	+.23
Bronstein et al. (2005)	Journal article	77	Middle school	Yes	Child scale	Mother	Academics	Perceptions of competence	General academics	+.27
Bronstein et al. (2005)	Journal article	77	Middle school	No	Child scale	Mother	Academics	Perceptions of competence	General academics	+.28
Bronstein et al. (2005)	Journal article	77	Middle school	No	Child scale	Both parents	Academics	Perceptions of competence	General academics	+.27
Bronstein et al. (2005)	Journal article	77	Middle school	Yes	Child scale	Both parents	Academics	Perceptions of competence	General academics	+.21
Bronstein et al. (2005)	Journal article	77	Middle school	No	Child scale	Both parents	Academics	Perceptions of competence	General academics	+.24
Bronstein et al. (2005)	Journal article	77	Middle school	No	Child scale	Both parents	Academics	Perceptions of competence	General academics	+.26
Bronstein et al. (2005)	Journal article	77	Middle school	Yes	Child scale	Both parents	Academics	Perceptions of competence	General academics	+.25

Table 2 (continued)

Author (year)	Type of document	Sample size	Grade level	Delay in outcome measure	Autonomy support respondent	Agent of support	Domain of autonomy support	Outcome	Domain of outcome	Correlation
Bronstein et al. (2005)	Journal article	77	Middle school	No	Child scale	Both parents	Academics	Perceptions of competence	General academics	+.21
Bronstein et al. (2005)	Journal article	77	Middle school	No	Child scale	Mother	Academics	Intrinsic motivation	General academics	+.18
Bronstein et al. (2005)	Journal article	77	Middle school	Yes	Child scale	Mother	Academics	Intrinsic motivation	General academics	+.30
Bronstein et al. (2005)	Journal article	77	Middle school	No	Child scale	Mother	Academics	Intrinsic motivation	General academics	+.29
Bronstein et al. (2005)	Journal article	77	Middle school	No	Child scale, parent scale	Both parents	Academics	Intrinsic motivation	General academics	+.19
Bronstein et al. (2005)	Journal article	77	Middle school	Yes	Child scale, parent scale	Both parents	Academics	Intrinsic motivation	General academics	+.12
Bronstein et al. (2005)	Journal article	77	Middle school	No	Child scale, parent scale	Both parents	Academics	Intrinsic motivation	General academics	+.22
Bronstein et al. (2005)	Journal article	77	Middle school	No	Child scale, parent scale	Both parents	Academics	Intrinsic motivation	General academics	+.19
Bronstein et al. (2005)	Journal article	77	Middle school	Yes	Child scale, parent scale	Both parents	Academics	Intrinsic motivation	General academics	+.19
Bronstein et al. (2005)	Journal article	77	Middle school	No	Child scale, parent scale	Both parents	Academics	Intrinsic motivation	General academics	+.32
Chirkov and Ryan (2001)	Journal article	116	High school	No	Child scale	Both parents	General	Self-esteem	General academics	+.40
Chirkov and Ryan (2001)	Journal article	120	High school	No	Child scale	Both parents	General	Self-esteem	General academics	+.54
Chirkov and Ryan (2001)	Journal article	116	High school	No	Child scale	Both parents	General	Identified regulation	General academics	+.38
Chirkov and Ryan (2001)	Journal article	116	High school	No	Child scale	Both parents	General	Intrinsic motivation	General academics	+.14
Chirkov and Ryan (2001)	Journal article	120	High school	No	Child scale	Both parents	General	Identified regulation	General academics	+.47
Chirkov and Ryan (2001)	Journal article	120	High school	No	Child scale	Both parents	General	Intrinsic motivation	General academics	+.16

Table 2 (continued)

Author (year)	Type of document	Sample size	Grade level	Delay in outcome measure	Autonomy support respondent	Agent of support	Domain of autonomy support	Outcome	Domain of outcome	Correlation
Chirkov and Ryan (2001)	Journal article	116	High school	No	Child scale	Both parents	General	Extrinsic motivation	General academics	−.21
Chirkov and Ryan (2001)	Journal article	116	High school	No	Child scale	Both parents	General	Interjected regulation	General academics	−.26
Chirkov and Ryan (2001)	Journal article	120	High school	No	Child scale	Both parents	General	Extrinsic motivation	General academics	+.06
Chirkov and Ryan (2001)	Journal article	120	High school	No	Child scale	Both parents	General	Interjected regulation	General academics	+.15
Cleveland et al. (2007)	Journal article	28	Pre-K	Yes	Observation	Both parents	General	Engagement	Non-school	+.38
Cooper et al. (2000)	Journal article	709	Mixed	No	Parent scale	Both parents	Academics	Standardized test scores	General academics	+.15
Cooper et al. (2000)	Journal article	709	Mixed	No	Parent scale	Both parents	Academics	Course grades	General academics	+.13
Cooper et al. (2000)	Journal article	709	Mixed	No	Parent scale	Both parents	Academics	Positive school attitudes	General academics	+.02
Dai (1998)	Dissertation	153	High school	No	Child scale	Both parents	General	Course grades	General academics	+.12
Dai (1998)	Dissertation	266	High school	No	Child scale	Both parents	General	Course grades	General academics	+.07
Dai (1998)	Dissertation	153	High school	No	Child scale	Both parents	General	Self-esteem	General academics	+.28
Dai (1998)	Dissertation	266	High school	No	Child scale	Both parents	General	Self-esteem	General academics	+.15
Dai (1998)	Dissertation	153	High school	No	Child scale	Both parents	General	Identified regulation	General academics	+.21
Dai (1998)	Dissertation	153	High school	No	Child scale	Both parents	General	Intrinsic motivation	General academics	+.20
Dai (1998)	Dissertation	266	High school	No	Child scale	Both parents	General	Identified regulation	General academics	+.41
Dai (1998)	Dissertation	266	High school	No	Child scale	Both parents	General	Intrinsic motivation	General academics	+.22
Dai (1998)	Dissertation	153	High school	No	Child scale	Both parents	General	Engagement	General academics	+.19
Dai (1998)	Dissertation	266	High school	No	Child scale	Both parents	General	Engagement	General academics	+.25
Dai (1998)	Dissertation	153	High school	No	Child scale	Both parents	General	Interjected regulation	General academics	−.25
Dai (1998)	Dissertation	266	High school	No	Child scale	Both parents	General	Interjected regulation	General academics	−.31
d'Ailly (2002)	Conference Paper	805	Mixed	No	Child scale	Mother	General	Course grades	General academics	+.05
d'Ailly (2002)	Conference Paper	805	Mixed	No	Child scale	Father	General	Course grades	General academics	−.01

Table 2 (continued)

Author (year)	Type of document	Sample size	Grade level	Delay in outcome measure	Autonomy support respondent	Agent of support	Domain of autonomy support	Outcome	Domain of outcome	Correlation
d'Ailly (2002)	Conference Paper	740	Mixed	No	Child scale	Mother	General	Course grades	General academics	+.01
d'Ailly (2002)	Conference Paper	740	Mixed	No	Child scale	Father	General	Course grades	General academics	−.01
d'Ailly (2002)	Conference Paper	805	Mixed	No	Child scale	Mother	General	Relative Autonomy Index	General academics	+.27
d'Ailly (2002)	Conference Paper	805	Mixed	No	Child scale	Father	General	Relative Autonomy Index	General academics	+.10
d'Ailly (2002)	Conference Paper	740	Mixed	No	Child scale	Mother	General	Relative Autonomy Index	General academics	+.21
d'Ailly (2002)	Conference Paper	740	Mixed	No	Child scale	Father	General	Relative Autonomy Index	General academics	+.07
d'Ailly (2002)	Conference Paper	805	Mixed	No	Child scale	Mother	General	Perceptions of control	General academics	+.24
d'Ailly (2002)	Conference Paper	805	Mixed	No	Child scale	Father	General	Perceptions of control	General academics	+.10
d'Ailly (2002)	Conference Paper	740	Mixed	No	Child scale	Mother	General	Perceptions of control	General academics	+.14
d'Ailly (2002)	Conference Paper	740	Mixed	No	Child scale	Father	General	Perceptions of control	General academics	−.02
d'Ailly (2002)	Conference Paper	805	Mixed	No	Child scale	Mother	General	Effort	General academics	+.06
d'Ailly (2002)	Conference Paper	805	Mixed	No	Child scale	Father	General	Effort	General academics	+.03
d'Ailly (2002)	Conference Paper	740	Mixed	No	Child scale	Mother	General	Effort	General academics	+.03
d'Ailly (2002)	Conference Paper	740	Mixed	No	Child scale	Father	General	Effort	General academics	0
Deslandes et al. (1997)	Journal article	525	High school	No	Child scale	Both parents	Academics	GPA	General academics	+.13
Downie et al. (2007)	Journal article	105	College	No	Child scale	Both parents	General	Well-being	Non-school	+.33
Downie et al. (2007)	Journal article	105	College	No	Child scale	Mother	General	Well-being	Non-school	+.31
Downie et al. (2007)	Journal article	105	College	No	Child scale	Father	General	Well-being	Non-school	+.30
Downie et al. (2007)	Journal article	125	College	No	Child scale	Both parents	General	Well-being	Non-school	+.27
Fei-Yin Ng et al. (2004)	Journal article	121	Elementary school	No	Parent scale	Mother	Academics	Course grades	General academics	−.03
Fei-Yin Ng et al. (2004)	Journal article	121	Elementary school	No	Parent scale	Mother	Academics	Course grades	General academics	+.12
Fei-Yin Ng et al. (2004)	Journal article	110	Elementary school	No	Parent scale	Mother	Other	Task performance	Digit search task	+.39

Table 2 (continued)

Author (year)	Type of document	Sample size	Grade level	Delay in outcome measure	Autonomy support respondent	Agent of support	Domain of autonomy support	Outcome	Domain of outcome	Correlation
Fei-Yin Ng et al. (2004)	Journal article	110	Elementary school	No	Observation	Mother	Other	Engagement	Digit search task	+.21
Ferguson et al. (2011)	Journal article	322	High school	No	Child scale	Both parents	General	Well-being	Non-school	+.59
Ferguson et al. (2011)	Journal article	99	High school	No	Child scale	Both parents	General	Well-being	Non-school	+.48
Ferguson et al. (2011)	Journal article	125	High school	No	Child scale	Both parents	General	Well-being	Non-school	+.46
Ferguson et al. (2011)	Journal article	98	High school	No	Child scale	Both parents	General	Well-being	Non-school	+.48
Ferguson et al. (2011)	Journal article	322	High school	No	Child scale	Both parents	General	Positive school attitudes	General academics	+.37
Ferguson et al. (2011)	Journal article	99	High school	No	Child scale	Both parents	General	Positive school attitudes	General academics	+.45
Ferguson et al. (2011)	Journal article	125	High school	No	Child scale	Both parents	General	Positive school attitudes	General academics	+.22
Ferguson et al. (2011)	Journal article	98	High school	No	Child scale	Both parents	General	Positive school attitudes	General academics	+.16
Fulton and Turner (2008)	Journal article	85	College	No	Child scale	Both parents	General	GPA	General academics	−.03
Fulton and Turner (2008)	Journal article	160	College	No	Child scale	Both parents	General	GPA	General academics	+.23
Fulton and Turner (2008)	Journal article	85	College	No	Child scale	Both parents	General	Perceptions of control	General academics	+.25
Fulton and Turner (2008)	Journal article	160	College	No	Child scale	Both parents	General	Perceptions of control	General academics	+.23
Gagné (2003)	Journal article	118	College	No	Child scale	Both parents	General	Intrinsic motivation	Non-school	+.17
Gagné (2003)	Journal article	118	College	No	Child scale	Mother	General	Intrinsic motivation	Non-school	+.22
Gagné (2003)	Journal article	118	College	No	Child scale	Father	General	Intrinsic motivation	Non-school	+.23
Gagné (2003)	Journal article	118	College	No	Child scale	Both parents	General	Engagement	Non-school	+.05
Gagné (2003)	Journal article	118	College	No	Child scale	Mother	General	Engagement	Non-school	+.22
Gagné (2003)	Journal article	118	College	No	Child scale	Father	General	Engagement	Non-school	+.16
Gonzalez and Wolters (2006)	Journal article	140	High school	No	Child scale	Both parents	General	Relative Autonomy Index	General academics	+.29
Grolnick (1986)	Dissertation	48	Elementary school	No	Observation	Mother	General	Standardized test scores	General academics	+.10

Table 2 (continued)

Author (year)	Type of document	Sample size	Grade level	Delay in outcome measure	Autonomy support respondent	Agent of support	Domain of autonomy support	Outcome	Domain of outcome	Correlation
Grolnick (1986)	Dissertation	48	Elementary school	No	Observation	Mother	General	Course grades	General academics	+.36
Grolnick (1986)	Dissertation	48	Elementary school	No	Observation	Father	General	Standardized test scores	General academics	+.13
Grolnick (1986)	Dissertation	48	Elementary school	No	Observation	Father	General	Course grades	General academics	+.06
Grolnick (1986)	Dissertation	48	Elementary school	No	Observation	Both parents	General	Standardized test scores	General academics	+.30
Grolnick (1986)	Dissertation	48	Elementary school	No	Observation	Both parents	General	Course grades	General academics	+.46
Grolnick (1986)	Dissertation	48	Elementary school	No	Observation	Both parents	General	Perceptions of competence	General academics	+.10
Grolnick (1986)	Dissertation	48	Elementary school	No	Observation	Mother	General	Perceptions of competence	General academics	+.14
Grolnick (1986)	Dissertation	48	Elementary school	No	Observation	Father	General	Perceptions of competence	General academics	+.26
Grolnick (1986)	Dissertation	48	Elementary school	No	Observation	Mother	General	Identified regulation	General academics	+.13
Grolnick (1986)	Dissertation	48	Elementary school	No	Observation	Mother	General	Intrinsic motivation	General academics	+.10
Grolnick (1986)	Dissertation	48	Elementary school	No	Observation	Father	General	Identified regulation	General academics	−.04
Grolnick (1986)	Dissertation	48	Elementary school	No	Observation	Father	General	Intrinsic motivation	General academics	+.15
Grolnick (1986)	Dissertation	48	Elementary school	No	Observation	Both parents	General	Identified regulation	General academics	−.06
Grolnick (1986)	Dissertation	48	Elementary school	No	Observation	Both parents	General	Intrinsic motivation	General academics	+.14
Grolnick (1986)	Dissertation	48	Elementary school	Yes	Observation	Mother	General	Identified regulation	General academics	+.11
Grolnick (1986)	Dissertation	48	Elementary school	Yes	Observation	Mother	General	Intrinsic motivation	General academics	+.14
Grolnick (1986)	Dissertation	48	Elementary school	Yes	Observation	Father	General	Identified regulation	General academics	+.25
Grolnick (1986)	Dissertation	48	Elementary school	Yes	Observation	Father	General	Intrinsic motivation	General academics	+.30
Grolnick (1986)	Dissertation	48	Elementary school	Yes	Observation	Both parents	General	Identified regulation	General academics	+.12
Grolnick (1986)	Dissertation	48	Elementary school	Yes	Observation	Both parents	General	Intrinsic motivation	General academics	+.14
Grolnick (1986)	Dissertation	48	Elementary school	No	Observation	Mother	General	Extrinsic motivation	General academics	−.18
Grolnick (1986)	Dissertation	48	Elementary school	No	Observation	Mother	General	Interjected regulation	General academics	0
Grolnick (1986)	Dissertation	48	Elementary school	No	Observation	Father	General	Extrinsic motivation	General academics	−.17
Grolnick (1986)	Dissertation	48	Elementary school	No	Observation	Father	General	Interjected regulation	General academics	−.12

Table 2 (continued)

Author (year)	Type of document	Sample size	Grade level	Delay in outcome measure	Autonomy support respondent	Agent of support	Domain of autonomy support	Outcome	Domain of outcome	Correlation
Grolnick (1986)	Dissertation	48	Elementary school	No	Observation	Both parents	General	Extrinsic motivation	General academics	−.32
Grolnick (1986)	Dissertation	48	Elementary school	No	Observation	Both parents	General	Interjected regulation	General academics	−.13
Grolnick (1986)	Dissertation	48	Elementary school	Yes	Observation	Mother	General	Extrinsic motivation	General academics	−.28
Grolnick (1986)	Dissertation	48	Elementary school	Yes	Observation	Mother	General	Interjected regulation	General academics	+.06
Grolnick (1986)	Dissertation	48	Elementary school	Yes	Observation	Father	General	Extrinsic motivation	General academics	−.17
Grolnick (1986)	Dissertation	48	Elementary school	Yes	Observation	Father	General	Interjected regulation	General academics	+.10
Grolnick (1986)	Dissertation	48	Elementary school	Yes	Observation	Both parents	General	Extrinsic motivation	General academics	−.27
Grolnick (1986)	Dissertation	48	Elementary school	Yes	Observation	Both parents	General	Interjected regulation	General academics	+.11
Grolnick and Ryan (1989)	Journal article	66	Mixed	No	Observation	Mother	General	Standardized test scores	General academics	+.19
Grolnick and Ryan (1989)	Journal article	66	Mixed	No	Observation	Father	General	Standardized test scores	General academics	+.34
Grolnick and Ryan (1989)	Journal article	66	Mixed	No	Observation	Both parents	General	Standardized test scores	General academics	+.30
Grolnick and Ryan (1989)	Journal article	66	Mixed	No	Observation	Mother	General	Course grades	General academics	+.46
Grolnick and Ryan (1989)	Journal article	66	Mixed	No	Observation	Father	General	Course grades	General academics	+.33
Grolnick and Ryan (1989)	Journal article	66	Mixed	No	Observation	Both parents	General	Course grades	General academics	+.46
Grolnick and Ryan (1989)	Journal article	66	Mixed	No	Observation	Both parents	General	Relative Autonomy Index	General academics	+.36
Grolnick and Ryan (1989)	Journal article	66	Mixed	No	Observation	Mother	General	Relative Autonomy Index	General academics	+.22
Grolnick and Ryan (1989)	Journal article	66	Mixed	No	Observation	Father	General	Relative Autonomy Index	General academics	+.34
Grolnick and Ryan (1989)	Journal article	66	Mixed	No	Observation	Both parents	General	Perceptions of competence	General academics	+.15
Grolnick and Ryan (1989)	Journal article	66	Mixed	No	Observation	Mother	General	Perceptions of competence	General academics	+.31
Grolnick and Ryan (1989)	Journal article	66	Mixed	No	Observation	Father	General	Perceptions of competence	General academics	+.26
Grolnick and Ryan (1989)	Journal article	66	Mixed	No	Observation	Both parents	General	Perceptions of control	Non-school	−.27
Grolnick and Ryan (1989)	Journal article	66	Mixed	No	Observation	Mother	General	Perceptions of control	Non-school	−.19

Table 2 (continued)

Author (year)	Type of document	Sample size	Grade level	Delay in outcome measure	Autonomy support respondent	Agent of support	Domain of autonomy support	Outcome	Domain of outcome	Correlation
Grolnick and Ryan (1989)	Journal article	66	Mixed	No	Observation	Father	General	Perceptions of control	Non-school	−.27
Grolnick et al. (1991)	Journal article	456	Elementary school	No	Child scale	Mother	General	Course grades	General academics	+.06
Grolnick et al. (1991)	Journal article	456	Elementary school	No	Child scale	Mother	General	Standardized test scores	General academics	+.10
Grolnick et al. (1991)	Journal article	456	Elementary school	No	Child scale	Father	General	Course grades	General academics	+.03
Grolnick et al. (1991)	Journal article	456	Elementary school	No	Child scale	Father	General	Standardized test scores	General academics	+.02
Grolnick et al. (1991)	Journal article	456	Elementary school	No	Child scale	Mother	General	Relative Autonomy Index	General academics	+.23
Grolnick et al. (1991)	Journal article	456	Elementary school	No	Child scale	Father	General	Relative Autonomy Index	General academics	+.20
Grolnick et al. (1991)	Journal article	456	Elementary school	No	Child scale	Mother	General	Perceptions of competence	General academics	+.27
Grolnick et al. (1991)	Journal article	456	Elementary school	No	Child scale	Father	General	Perceptions of competence	General academics	+.20
Grolnick et al. (2000)	Journal article	60	Middle school	No	Child scale	Mother	Academics	Course grades	English language arts	+.05
Grolnick et al. (2000)	Journal article	60	Middle school	No	Child scale	Mother	Academics	Course grades	Math	−.18
Grolnick et al. (2000)	Journal article	60	Middle school	Yes	Child scale	Mother	Academics	Course grades	English language arts	−.04
Grolnick et al. (2000)	Journal article	60	Middle school	Yes	Child scale	Mother	Academics	Course grades	Math	0
Grolnick et al. (2000)	Journal article	60	Middle school	No	Child scale	Mother	Academics	Course grades	English language arts	+.47
Grolnick et al. (2000)	Journal article	60	Middle school	No	Child scale	Mother	Academics	Course grades	Math	+.13
Grolnick et al. (2000)	Journal article	60	Middle school	No	Child scale	Mother	Academics	Self-esteem	Non-school	+.14
Grolnick et al. (2000)	Journal article	60	Middle school	Yes	Child scale	Mother	Academics	Self-esteem	Non-school	−.05
Grolnick et al. (2000)	Journal article	60	Middle school	No	Child scale	Mother	Academics	Self-esteem	Non-school	+.22
Grolnick et al. (2000)	Journal article	60	Middle school	No	Child scale	Mother	Academics	Perceptions of competence	General academics	−.15
Grolnick et al. (2000)	Journal article	60	Middle school	Yes	Child scale	Mother	Academics	Perceptions of competence	General academics	+.01
Grolnick et al. (2000)	Journal article	60	Middle school	No	Child scale	Mother	Academics	Perceptions of competence	General academics	−.01
Grolnick et al. (2000)	Journal article	60	Middle school	No	Child scale	Mother	Academics	Perceptions of control	Non-school	+.21
Grolnick et al. (2000)	Journal article	60	Middle school	Yes	Child scale	Mother	Academics	Perceptions of control	Non-school	+.16
Grolnick et al. (2000)	Journal article	60	Middle school	No	Child scale	Mother	Academics	Perceptions of control	Non-school	+.36

Table 2 (continued)

Author (year)	Type of document	Sample size	Grade level	Delay in outcome measure	Autonomy support respondent	Agent of support	Domain of autonomy support	Outcome	Domain of outcome	Correlation
Grolnick et al. (2000)	Journal article	60	Middle school	No	Child scale	Mother	Academics	Autonomous motivation	General academics	+.35
Grolnick et al. (2000)	Journal article	60	Middle school	Yes	Child scale	Mother	Academics	Autonomous Motivation	General academics	+.10
Grolnick et al. (2000)	Journal article	60	Middle school	No	Child scale	Mother	Academics	Autonomous motivation	General academics	+.09
Grolnick et al. (2002)	Journal article	60	Elementary school	No	Observation	Mother	Other (verbal)	Course Grades	General academics	−.33
Grolnick et al. (2002)	Journal article	60	Elementary school	No	Observation	Mother	Other (verbal)	Course grades	General academics	+.37
Grolnick et al. (2002)	Journal article	60	Elementary school	No	Observation	Mother	Other (non-verbal)	Course grades	General academics	−.33
Grolnick et al. (2002)	Journal article	60	Elementary school	No	Observation	Mother	Other (non-verbal)	Course grades	General academics	+.34
Halpern-Felsher (1994)	Dissertation	66	High school	No	Observation	Father	Academics	GPA	General academics	+.34
Halpern-Felsher (1994)	Dissertation	66	High school	No	Observation	Mother	Academics	GPA	General academics	+.50
Halpern-Felsher (1994)	Dissertation	66	High school	No	Observation	Father	Academics	Standardized test scores	Math	+.24
Halpern-Felsher (1994)	Dissertation	66	High school	No	Observation	Mother	Academics	Standardized test scores	Math	+.30
Halpern-Felsher (1994)	Dissertation	66	High school	No	Observation	Father	Academics	Standardized test scores	English language arts	+.19
Halpern-Felsher (1994)	Dissertation	66	High school	No	Observation	Mother	Academics	Standardized test scores	English language arts	−.07
Halpern-Felsher (1994)	Dissertation	66	High school	No	Observation	Father	Academics	GPA	General academics	+.13
Halpern-Felsher (1994)	Dissertation	66	High school	No	Observation	Mother	Academics	GPA	General academics	+.06
Halpern-Felsher (1994)	Dissertation	66	High school	No	Observation	Father	Academics	Standardized test scores	Math	+.27
Halpern-Felsher (1994)	Dissertation	66	High school	No	Observation	Mother	Academics	Standardized test scores	Math	+.21
Halpern-Felsher (1994)	Dissertation	66	High school	No	Observation	Father	Academics	Standardized test scores	English language arts	+.32
Halpern-Felsher (1994)	Dissertation	66	High school	No	Observation	Mother	Academics	Standardized test scores	English language arts	+.19
Halpern-Felsher (1994)	Dissertation	66	High school	No	Observation	Father	Academics	Self-esteem	Non-school	+.20
Halpern-Felsher (1994)	Dissertation	66	High school	No	Observation	Mother	Academics	Self-esteem	Non-school	+.40
Halpern-Felsher (1994)	Dissertation	66	High school	No	Observation	Father	Academics	Self-esteem	Non-school	+.17
Halpern-Felsher (1994)	Dissertation	66	High school	No	Observation	Mother	Academics	Self-esteem	Non-school	+.04
Hui et al. (2011)	Journal article	461	High school	No	Child scale	Mother	General Academics	Perceptions of competence	General academics	+.31
Hui et al. (2011)	Journal article	461	High school	No	Child scale	Both parents	General Academics	Intrinsic motivation	General academics	+.23
Jiang et al. (2011)	Journal article	218	High school	No	Child scale	Both parents	Academics	GPA	General academics	+.10

Table 2 (continued)

Author (year)	Type of document	Sample size	Grade level	Delay in outcome measure	Autonomy support respondent	Agent of support	Domain of autonomy support	Outcome	Domain of outcome	Correlation
Jiang et al. (2011)	Journal article	271	High school	No	Child scale	Both parents	Academics	GPA	General academics	+.22
Jiang et al. (2011)	Journal article	218	High school	No	Child scale	Both parents	Academics	Self-esteem	Non-school	+.33
Jiang et al. (2011)	Journal article	271	High school	No	Child scale	Both parents	Academics	Self-esteem	Non-school	+.18
Jiang et al. (2011)	Journal article	218	High school	No	Child scale	Both parents	Academics	Relative Autonomy Index	General academics	+.23
Jiang et al. (2011)	Journal article	271	High school	No	Child scale	Both parents	Academics	Relative Autonomy Index	General academics	+.35
Joussemet et al. (2005)	Journal article	132	Elementary school	No	Observation	Mother	General	Standardized test scores	Math	−.06
Joussemet et al. (2005)	Journal article	132	Elementary school	No	Observation	Mother	General	Standardized test scores	English language arts	+.16
Lekes et al. (2010)	Journal article	567	High school	No	Child scale	Both parents	General	Well-being	Non-school	+.43
Lekes et al. (2010)	Journal article	515	High school	No	Child scale	Both parents	General	Well-being	Non-school	+.36
Matte-Gagne and Bernier (2011)	Journal article	53	None reported	Yes	Observation	Mother	General	Executive functioning - conflict	Non-school	+.46
Matte-Gagne and Bernier (2011)	Journal article	53	None reported	Yes	Observation	Mother	General	Executive functioning—impulse control	Non-school	+.32
Purdie et al. (2004)	Journal article	214	High school	No	Parent scale	Both parents	General	Perceptions of competence	Non-school	+.17
Purdie et al. (2004)	Journal article	214	High school	No	Child scale	Both parents	General	Perceptions of competence	Non-school	+.04
Purdie et al. (2004)	Journal article	214	High school	No	Child scale	Both parents	General	Self-regulation	General academics	+.26
Purdie et al. (2004)	Journal article	214	High school	No	Parent scale	Both parents	General	Self-regulation	General academics	+.17
Robbins (1995)	Dissertation	177	College	No	Child scale	Both parents	General	Self-esteem	Non-school	+.29
Robbins (1995)	Dissertation	177	College	No	Child scale	Mother	General	Self-esteem	Non-school	+.25
Robbins (1995)	Dissertation	177	College	No	Child scale	Father	General	Self-esteem	Non-school	+.25
Sheldon et al. (2009)	Journal article	1289	High school	No	Child scale	Mother	General	Intrinsic motivation	General academics	+.17
Sheldon et al. (2009)	Journal article	1289	High school	No	Child scale	Father	General	Intrinsic motivation	General academics	+.08
Sheldon et al. (2009)	Journal article	1289	High school	No	Child scale	Mother	General	Perceptions of competence	General academics	+.24
Sheldon et al. (2009)	Journal article	1289	High school	No	Child scale	Father	General	Perceptions of competence	General academics	+.24

Table 2 (continued)

Author (year)	Type of document	Sample size	Grade level	Delay in outcome measure	Autonomy support respondent	Agent of support	Domain of autonomy support	Outcome	Domain of outcome	Correlation
Soenens and Vansteenkiste (2005)	Journal article	328	High school	No	Child scale	Mother	General	GPA	General academics	+.14
Soenens and Vansteenkiste (2005)	Journal article	328	High school	No	Child scale	Father	General	GPA	General academics	+.09
Soenens and Vansteenkiste (2005)	Journal article	285	High school	No	Child scale	Mother	General	GPA	General academics	+.13
Soenens and Vansteenkiste (2005)	Journal article	285	High school	No	Child scale	Father	General	GPA	General academics	+.13
Soenens and Vansteenkiste (2005)	Journal article	328	High school	No	Child scale	Mother	General	Relative Autonomy Index	General academics	+.14
Soenens and Vansteenkiste (2005)	Journal article	328	High school	No	Child scale	Mother	General	Relative Autonomy Index	Non-school	+.15
Soenens and Vansteenkiste (2005)	Journal article	328	High school	No	Child scale	Father	General	Relative Autonomy Index	General academics	+.15
Soenens and Vansteenkiste (2005)	Journal article	328	High school	No	Child scale	Father	General	Relative Autonomy Index	Non-school	+.10
Soenens and Vansteenkiste (2005)	Journal article	285	High school	No	Child scale	Mother	General	Relative Autonomy Index	General academics	+.24
Soenens and Vansteenkiste (2005)	Journal article	285	High school	No	Child scale	Mother	General	Relative Autonomy Index	Non-school	+.26
Soenens and Vansteenkiste (2005)	Journal article	285	High school	No	Child scale	Father	General	Relative Autonomy Index	General academics	+.16
Soenens and Vansteenkiste (2005)	Journal article	285	High school	No	Child scale	Father	General	Relative Autonomy Index	Non-school	+.23
Soenens and Vansteenkiste (2005)	Journal article	328	High school	No	Child scale	Mother	General	Perceptions of competence	General academics	+.14
Soenens and Vansteenkiste (2005)	Journal article	285	High school	No	Child scale	Mother	General	Perceptions of competence	Non-school	+.09
Soenens and Vansteenkiste (2005)	Journal article	328	High school	No	Child scale	Father	General	Perceptions of competence	General academics	+.13

Table 2 (continued)

Author (year)	Type of document	Sample size	Grade level	Delay in outcome measure	Autonomy support respondent	Agent of support	Domain of autonomy support	Outcome	Domain of outcome	Correlation
Soenens and Vansteenkiste (2005)	Journal article	285	High school	No	Child scale	Father	General	Perceptions of competence	Non-school	+.09
Stiller and Ryan (1992)	Conference Paper	624	Middle school	No	Child scale	Both parents	General	Perceptions of control	Non-school	+.22
Stiller and Ryan (1992)	Conference Paper	624	Middle school	No	Child scale	Both parents	General	Engagement	General academics	+.24
Stiller and Ryan (1992)	Conference Paper	624	Middle school	No	Child scale	Both parents	General	Intrinsic motivation	General academics	+.15
Strage and Brandt (1999)	Journal article	236	College	No	Child scale	Both parents	General	Overall GPA	General academics	+.15
Strage and Brandt (1999)	Journal article	236	College	No	Child scale	Both parents	General	Major GPA	General academics	+.03
Wang (2006)	Dissertation	433	Middle school	No	Child scale	Both parents	General	Course grades	General academics	+.14
Wang (2006)	Dissertation	433	Middle school	Yes	Child scale	Both parents	General	Course grades	General academics	+.17
Wang (2006)	Dissertation	433	Middle school	No	Child scale	Both parents	General	Course grades	General academics	+.17
Wang (2006)	Dissertation	373	Middle school	No	Child scale	Both parents	General	Course grades	General academics	+.28
Wang (2006)	Dissertation	373	Middle school	Yes	Child scale	Both parents	General	Course grades	General academics	+.28
Wang (2006)	Dissertation	373	Middle school	No	Child scale	Both parents	General	Course grades	General academics	+.24
Wang (2006)	Dissertation	433	Middle school		Child scale	Both parents	General	Well-being	Non-school	+.47
Wang (2006)	Dissertation	433	Middle school	Yes	Child scale	Both parents	General	Well-being	Non-school	+.45
Wang (2006)	Dissertation	433	Middle school	No	Child scale	Both parents	General	Well-being	Non-school	+.44
Wang (2006)	Dissertation	373	Middle school		Child scale	Both parents	General	Well-being	Non-school	+.47
Wang (2006)	Dissertation	373	Middle school	Yes	Child scale	Both parents	General	Well-being	Non-school	+.50
Wang (2006)	Dissertation	373	Middle school	No	Child scale	Both parents	General	Well-being	Non-school	+.55

Table 3 Results of overall analyses examining the correlation between parental autonomy support and reported outcomes

Outcome	*k*	*r*	95 % confidence interval		*Q*
			Low estimate	High estimate	
Academic achievement	29	.11*** (.12***)	.08 (.07)	.13 (.16)	94.00***
Autonomous motivation	22	.19** (.20**)	.17 (.17)	.21 (.24)	35.88*
Psychological health	21	.38***(.36***)	.36 (.30)	.41 (.42)	98.70***
Perceived competence	10	.21*** (.20***)	.17 (.14)	.25 (.25)	15.92
Engagement and effort	8	.12*** (.16**)	.09 (.07)	.16 (.24)	30.85***
Perceived control	7	.15*** (.16***)	.12 (.09)	.18 (.23)	26.50**
Attitudes toward school	6	.22*** (.23**)	.16 (.08)	.28 (.37)	29.63***
Extrinsic motivation	6	.22*** (.23**)	.16 (.08)	.28 (.37)	29.63***
Executive functioning	2	.32** (.32**)	.16 (.16)	.47 (.47)	.58
Self-regulation	1	.22***(.22***)	.08 (.08)	.34 (.34)	–

Note. Random-effect *Q* values and point estimates are presented in parentheses

*p<.05; **p<.01; ***p<.0001

Studies Correlating Parental Autonomy Support and Autonomous Motivation

The literature search uncovered 16 studies that estimated the correlation between parental autonomy support and autonomous motivation. The 16 studies reported 65 separate correlations based on 22 independent samples of students (see Table 2). Of those correlations, 12 measured identified regulation as the outcome, 30 measured intrinsic motivation as the outcome, and 23 were measured using the RAI, which is a composite of intrinsic and identified motivation weighted against extrinsic motivation. Fourteen of the correlations represented an elementary school sample, 19 represented a middle school sample, 21 represented a high

Table 4 Trim-and-fill results

Outcome	Fixed effects trim-and-fill	Random effects trim-and-fill
Academic achievement	6 missing values	7 missing values
	FE: *r*=.08; CI=.06/.11	FE: *r*=.08; CI=.06/.10
	RE: *r*=.08; CI=.03/.13	RE: *r*=.07; CI=.03/.12
Autonomous motivation	None missing	None missing
Psychological health	None missing	None missing
Perceived competence	None missing	None missing
Engagement and effort	4 missing values	1 missing value
	FE: *r*=.05; CI=.02/.08	FE: *r*=.12; CI=.08/.16
	RE: *r*=.07; CI=−.03/.16	RE: *r*=.15; CI=.06/.23
Perceived control	2 missing values	2 missing values
	FE: *r*=.14; CI=.11/.17	FE: *r*=.14; CI=.11/.17
	RE: *r*=.14; CI=.07/.20	RE: *r*=.14; CI=.07/.20
Attitudes toward school	None missing	None missing
Extrinsic motivation	None missing	None missing

Table 5 Meta-regression analysis for Cronbach's alpha

Outcome	*k*	Fixed effects		Random effects	
		β	CI	*β*	CI
Academic achievement					
Measures of parental autonomy support	13	−.03	−.29/.24	−.13	−.62/.36
Autonomous motivation					
Measures of parental autonomy support	19	−.30*	−.54/−.05	−.17	−.59/.26
Measures of autonomous motivation	13	.28**	.13/.42	.30	−.03/.63
Psychological health					
Measures of parental autonomy support	14	1.77**	1.22/2.31	1.65**	.79/2.5
Measures of psychological health	13	−.36	−1.00/.28	−.05	−1.06/.96
Perceived competence					
Measures of perceived competence	6	−.01	−.22/.20	−.05	−.60/.50
Perceived control					
Measures of parental autonomy support	8	.37*	.001/.73	.37*	.001/.73
Measures of perceived control	10	−.19	−1.28/.91	−.48	−2.37/1.40

*p<.05; **p<.001

school sample, 3 represented a college sample, and 1 represented a mixed grade level sample. Twenty-five of the correlations had both parents as the agent of support, while 17 reported the father and 23 reported the mother. The 16 studies were published between the years 1986 and 2011. The sample sizes ranged from 48 to 1289, with a median size of 120. The mean sample size was 223.80, with a standard deviation of 266.59. Grubbs test revealed a significant sample size outlier (a sample of 1289 was Winsorized to 805). There were no significant outliers among the correlations. The effects sizes of the correlations ranged from −.06 to .47. There were 2 negative effects and 63 positive effects.

Overall Correlation The weighted average correlation was r=.19 (95 % CI=.17, .21) with a fixed-error model and r=.20 (95 % CI=.17, .24) with a random-error model (see Table 3 for overall effects), $Q(21)$=35.88, p=.02. No additional correlations were imputed under either error model for trim-and-fill analyses (see Table 4).There was no difference between the average effects of published and unpublished reports (see Table 7). Meta-regressions (Table 5) examining whether Cronbach's alpha for the measure of parental autonomy support moderated the correlation with autonomous motivation were significant under fixed but not under random effects, suggesting that the correlation decreased with more reliable measurement of parent autonomy support. Results from the meta-regressions assessing the role of Cronbach's alpha for the measures of autonomous motivation were also significant under fixed but not under random effects, but this time suggesting that the correlation increased with more reliable measurement of autonomous motivation.

Moderator Analyses Next seven additional moderator analyses were conducted for grade level, autonomy support respondent, agent of support, domain of autonomy support, outcome, domain of outcome, and predictor-outcome domain alignment.

Table 6 Results of analyses examining the correlation between parent autonomy support and academic achievement

Moderators	*k*	*r*	95 % confidence interval		Q_b
			Low estimate	High estimate	
Publication type					
Published	19	.12*** (.11***)	.08 (.05)	.15 (.17)	.84 (.15)
Unpublished	10	.09*** (.13***)	.06 (.06)	.13 (.19)	
Grade level					
Elementary (K–4)	7	.10*** (.12)	.03 (−.04)	.16 (.26)	6.60 (4.30)
Middle school (5–8)	4	.20*** (.20***)	.14 (.14)	.26 (.26)	
High school (9–12)	10	.11*** (.10**)	.07 (.02)	.15 (.18)	
College	4	.13*** (.13**)	.05 (.03)	.20 (.21)	
Autonomy support respondent					
Child scale	18	.10*** (.11***)	.07 (.07)	.13 (.15)	6.37* (2.18)
Parent scale	3	.07* (−.04)	0 (−.32)	.13 (.23)	
Observation	8	.20*** (.19*)	.12 (.03)	.27 (.35)	
Agent of support					
Both parents	16	.14*** (.14***)	.11 (.08)	.17 (.20)	17.95*** (1.73)
Mother	16	.08*** (.12***)	.05 (.05)	.12 (.18)	
Father	9	.04* (.08*)	.01 (.02)	.08 (.15)	
Domain of autonomy support					
General	16	.08*** (.09***)	.05 (.03)	.11 (.14)	7.79** (3.47)
Academics	10	.15*** (.15***)	.11 (.11)	.19 (.19)	
Outcome					
Course grades/GPA	35	.09*** (.12***)	.07 (.07)	.11 (.17)	2.08 (.11)
Standardized test scores	13	.12*** (.13***)	.08 (.08)	.16 (.18)	
Domain of outcome					
English language arts	4	.18** (.18**)	.07 (.07)	.28 (.28)	1.89 (1.23)
Math	4	.08 (.11)	−.03 (−.07)	.19 (.27)	
General academics	26	.10*** (.11***)	.08 (.06)	.13 (.16)	

Note. Random-effect *Q* values and point estimates are presented in parentheses. Q_b is an index of the heterogeneity between the group mean effect sizes. If Q_b is significant, it indicates that the mean effect sizes across categories differ by more than sampling error; that is there is a statistical difference between groups

*p<.05; **p<.01; ***p<.001

Four moderator analysis were significant under both fixed and random-effect assumptions, agent of support, domain of autonomy support, domain of outcome, and predictor-outcome domain alignment (see Table 7). Pairwise comparisons revealed that the average correlation between parental autonomy support and autonomous motivation for mothers was significantly different from the average correlation for fathers under both fixed, $Q(1)=18.01$, $p<.001$ and random assumptions, $Q(1)=8.56$, $p<.05$. In addition, the average correlation was significantly greater when parental autonomy support reflected both parents' support compared with only mothers (fixed-effect (FE): $Q(1)=5.56$, $p<.05$; random effects (RE): $Q(1)=4.63$, $p<.05$) or only fathers (FE: $Q(1)=33.70$, $p<.001$; RE: $Q(1)=29.28$, $p<.001$). In addition, moderator analyses revealed that the correlation between parental autonomy support and children's

Table 7 Results of analyses examining the correlation between parental autonomy support and autonomous motivation

Moderators	*k*	*r*	95 % confidence interval		Q_b
			Low estimate	High estimate	
Publication type					
Published	16	.19** (.21**)	.16 (.16)	.28 (.25)	.04 (.23)
Unpublished	6	.18** (.19**)	.14 (.14)	.22 (.24)	
Grade level					
Elementary and middle school (K–8)	10	.17** (.17**)	.13 (.13)	.20 (.24)	2.19 (4.04*)
High school (9–12)	10	.20** (.24**)	.17 (.17)	.24 (.30)	
Autonomy support respondent					
Child scale	27	.19** (.20**)	.17 (.16)	.21 (.24)	.28 (.49)
Observation	7	.16** (.16**)	.05 (.05)	.26 (.26)	
Agent of support					
Both parents	13	.26** (.26**)	.22 (.22)	.30 (.30)	37.80** (30.12**)
Mother	13	.20** (.20**)	.17 (.15)	.23 (.24)	
Father	11	.11** (.12**)	.08 (.08)	.14 (.15)	
Domain of autonomy support					
General	29	.18** (.19**)	.16 (.15)	.20 (.22)	7.20** (5.53*)
Academic	5	.28** (.28**)	.21 (.21)	.35 (.35)	
Outcome					
Intrinsic motivation	15	.16** (.16**)	.13 (.13)	.19 (.19)	7.54* (2.53)
Relative Autonomy Index	10	.20** (.20**)	.16 (.15)	.23 (.25)	
Identified regulation	9	.25** (.22**)	.19 (.08)	.31 (.34)	
Domain of outcome					
General	7	.13** (.13**)	.08 (.06)	.18 (.19)	5.58* (5.88*)
Academic	28	.20** (.22**)	.18 (.18)	.22 (.25)	
Predictor-outcome domain alignment					
Both academic	5	.28** (.28**)	.21 (.21)	.35 (.35)	11.01** (10.06**)
Both general	7	.13** (.13**)	.08 (.06)	.18 (.19)	
Unmatched	24	.19** (.20**)	.16 (.16)	.21 (.24)	

*$p<.05$; **$p<.01$

autonomous motivation was greater when parents' support was specific to the academic domain relative to in general. This same pattern held for the domain of the outcome measure, results revealed that the correlation between parental autonomy support and children's autonomous motivation was greater when the autonomous motivation was focused on academics versus life in general, this general grouping included examining autonomous motivation in general life, friendships, work, and non-academic tasks. Moderator analyses revealed that the average correlation between parental autonomy support and children's autonomous motivation varied significantly depending on whether the domain of the predictor and outcome matched. Most commonly, domains were mismatched by the parental autonomy support predictor being for life in general and the autonomous motivation outcome being specific to the academic domain. Pairwise comparisons revealed that the average correlation between parental autonomy support and autonomous motivation when both domains focused on academics was

significantly greater than the average correlation when both domains focused on life in general, under fixed $Q(1)=10.98$, $p<.01$, and random assumptions, $Q(1)=10.01$, $p<.01$. In addition, the average correlation was significantly greater when both the predictor and outcome focused on the academic domain compared with when domains were mismatched (FE: $Q(1)=5.92$, $p<.05$; RE: $Q(1)=3.65$, $p=.05$). Surprisingly, the average correlation was greater when domains were mismatched compared with when both domains focused on life in general (FE: $Q(1)=3.73$, $p=.05$; RE: $Q(1)=3.90$, $p=.05$).

Studies Correlating Parental Autonomy Support and Psychological Health

The literature search uncovered 11 studies that estimated the correlation between parental autonomy support and a measure of psychological health. The 11 studies reported 34 separate correlations based on 21 separate samples. Of those correlations, 18 measured well-being and 16 measured self-esteem. Eleven correlations were from middle school grade levels, 16 were from high school, and 7 were from college. Twenty-one correlations reported the agent of support as both parents, while five correlations were for father as agent of support and eight correlations were for mother as the agent of support. The characteristics of these studies are listed in Table 2.

The 11 studies appeared between the years 1994 and 2011. The sample sizes ranged from 60 to 567, with a median size of 142. The mean sample size was 205.56, with a standard deviation of 148.03, suggesting a normal distribution. The Grubbs test did not reveal any significant outliers in samples sizes or correlations. The effects sizes of the correlations ranged from −.05 to .59. There were 1 negative effect and 33 positive effects.

Overall Correlation The weighted average correlation was $r=.38$ (95 % CI=.36, .41) under a fixed-error model and $r=.36$ (95 % CI=.30, .42) under a random-error model (see Table 3 for overall effects), $Q(20)=98.70$, $p<.001$. Trim-and-fill analyses indicated that no additional correlations were missing. There was no difference between the average effects of published and unpublished reports (see Table 8). Meta-regressions (see Table 5) examining whether a sample's Cronbach's alphas for the measure of parental autonomy support moderated the correlation between parental autonomy support and psychological health were significant under both fixed and random effects, suggesting that the magnitude of the correlation increased with more internally consistent measures of parental autonomy support. Results from the meta-regressions assessing whether a sample's Cronbach's alpha for the measure of psychological health moderated the correlation between parental autonomy support and psychological health were not significant under fixed or random effects.

Moderator Analyses Next, moderator analyses on the relation between parental autonomy support and psychological health were conducted using five moderators: grade level, agent of support, autonomy support respondent, domain of autonomy support, and outcome. All five moderator analyses were significant under fixed-effects assumptions, and three moderators, agent of support, domain of autonomy support, and outcome, remained significant when a random-effect model was implemented (see Table 8). More specifically, moderator analyses revealed that the correlation between parental autonomy support and children's psychological health was greater for psychological well-being relative to self-esteem outcomes. Well-being

Table 8 Results of analyses examining the correlation between parental autonomy support and psychological health

Moderators	*k*	*r*	95 % confidence interval		Q_b
			Low estimate	High estimate	
Publication type					
Published	14	.39*** (.39***)	.36 (.32)	.43 (.45)	1.28 (1.02)
Unpublished	7	.36*** (.31***)	.32 (.18)	.41 (.43)	
Grade level					
Middle school (5–8)	4	.44*** (.38***)	.39 (.25)	.49 (.51)	10.13* (2.9)
High school (9–12)	14	.38*** (.37***)	.35 (.29)	.41 (.45)	
College	3	.28*** (.28***)	.19 (.19)	.37 (.37)	
Autonomy support respondent					
Child scale	19	.39*** (.37***)	.36 (.31)	.41 (.43)	5.03* (2.84)
Observation	2	.21* (.21*)	.03 (.01)	.36 (.39)	
Agent of support					
Both parents	17	.40*** (.39***)	.37 (.33)	.42 (.45)	23.20*** (9.93*)
Mother	6	.25*** (.25***)	.17 (.16)	.32 (.33)	
Father	5	.26*** (.26***)	.18 (.18)	.33 (.33)	
Domain of autonomy support					
General	16	.41*** (.40***)	.38 (.34)	.44 (.46)	22.73*** (10.07**)
Academics	5	.23*** (.23***)	.16 (.14)	.30 (.31)	
Outcome					
Well-being	11	.44*** (.43***)	.41 (.37)	.47 (.49)	39.09*** (9.37*)
Self-esteem	10	.27*** (.28***)	.22 (.19)	.31 (.36)	

*$p<.05$; **$p<.01$; ***$p<.001$

was characterized by global life satisfaction, while self-esteem encompasses more positive attitudes toward the self and feelings of self-wroth. Also in line with our hypotheses, psychological health was greater when support was aligned with the outcome and for the general domain rather than focused on the academic domain and schoolwork. Pairwise comparisons revealed that the average correlation for mothers was not different from the average correlation for fathers under either fixed, $Q(1)=.02$, $p=.88$, or random error assumptions, $Q(1)=.03$, $p=.87$. However, the average correlation between parental autonomy support and psychological health was significantly greater when both parents were reported as the agent of support compared with when only mothers were reported (FE: $Q(1)=14.31$, $p<.001$; RE: $Q(1)=7.25$, $p<.01$) or only fathers were reported (FE: $Q(1)=97.16$, $p<.001$; RE: $Q(1)=6.82$, $p<.01$).

Studies Correlating Parental Autonomy Support and Perceived Competence

The literature search revealed ten studies that estimated the correlation between parental autonomy support and perceptions of competence. The 10 studies reported 31 separate correlations of perceived competence based on 10 samples (see Table 2). Twenty-three of the correlations reported an elementary or middle school sample, and eight reported a high

school sample. For agent of support, 11 correlations reported both parents as the agent of support, while 7 reported the father and 13 reported the mother. The studies were published between 1986 and 2011. The Grubbs test revealed one significant outlier among sample sizes (1289 Winsorized to 461) and one significant outlier among the correlations (correlation of −.15 Winsorized to −.01). The effect sizes ranged from −.15 to .31.

Overall Correlation The weighted average correlation was r=.21 (95 % CI=.17, .25) with a fixed-error model and r=.20 (95 % CI=.14, .25) with a random-error model (see Table 3 for overall effects), $Q(9)$=15.92, p=.07. Trim-and-fill analyses suggest no values were missing. There was no difference between the average effects of published and unpublished reports (see Table 9). Meta-regression results (see Table 5) suggested that the Cronbach's alphas for the measure of perceived competence did not significantly explain variability in the correlation with parental autonomy support under fixed or random effects. Lack of variability limited the ability to run the analysis examining the role of the Cronbach's alphas for the measure of parental autonomy support.

Moderator Analyses Moderator analyses on the relation between parental autonomy support and perceived competence were conducted using two moderators: grade level and agent of support. Moderator tests were conducted despite a non-significant test of heterogeneity, given our moderator findings for other outcomes. However, neither moderator was significant under either model (see Table 9).

Studies Correlating Parental Autonomy Support and Engagement or Effort

The literature search uncovered six studies that estimated the correlation between parental autonomy support and engagement and effort. The 6 studies reported 12 separate correlations based on 8 samples of students (see Table 2). Five of the correlations were from an elementary school sample, one was from a middle school, two were high school, three were college, and one correlation did not report a grade level. For the agent of support, five correlations were for both parents as agent of support, while three were father and four were mother. The six studies were published between 1992 and 2007. The sample sizes ranged from 28 to 805, with a median size of 209.50. The mean sample size was 385.42, with a standard deviation of 322.90. The effect sizes ranged from 0 to .38, all were positive. Grubbs test did not reveal any significant outliers.

Overall Correlation The weighted average correlation was r=.12 (95 % CI=.09, .16) under a fixed-error model and r=.16 (95 % CI=.07, .24) under a random-error model (see Table 3 for overall effects), $Q(7)$=30.85, p<.001. Trim-and-fill analyses suggested 1 value might be missing, though the relation between parental autonomy support and engagement/effort would remain statistically significant (see Table 4). There was no difference between the average effects of published and unpublished reports (see Table 9). It was not possible to run meta-regression moderator analysis on engagement and effort because there were not enough studies for the number of covariates.

Moderator Analyses Two additional moderator analyses were conducted: autonomy support respondent and agent of support (see Table 9). One moderator analysis was significant

Table 9 Results of analyses examining the correlation between parental autonomy support and perceived competence, engagement and effort, and perceived control

Moderators	*k*	*r*	95 % confidence interval		Q_b
			Low estimate	High estimate	
Perceived competence					
Publication type					
Published	9	.21*** (.20***)	.17 (.14)	.25 (.26)	.09 (.04)
Unpublished	1	.17 (.17)	−.12 (−.12)	.43 (.43)	
Grade level					
Elementary and middle (K–8)	6	.20*** (.19***)	.13 (.12)	.26 (.26)	.54 (.03)
High school (9–12)	4	.22*** (.20***)	.19 (.11)	.26 (.29)	
Agent of support					
Both parents	6	.25*** (.24***)	.18 (.15)	.31 (.31)	1.13 (.98)
Father	6	.21*** (.20***)	.17 (.15)	.25 (.25)	
Mother	8	.21*** (.18***)	.17 (.12)	.25 (.25)	
Engagement and effort					
Publication type					
Published	3	.20** (.20**)	.08 (.08)	.31 (.31)	1.65 (.45)
Unpublished	5	.11** (.14*)	.08 (.04)	.15 (.25)	
Autonomy support respondent					
Child scale	6	.12*** (.14**)	.08 (.05)	.15 (.24)	2.21 (1.10)
Observation	2	.24** (.24**)	.08 (.08)	.40 (.40)	
Agent of support					
Both parents	5	.23*** (.23***)	.18 (.18)	.28 (.28)	32.81*** (24.75***)
Father	3	.03 (.05)	−.02 (−.04)	.08 (.13)	
Mother	4	.06* (.06*)	.01 (.01)	.10 (.11)	
Perceived control					
Publication type					
Published	5	.14*** (.13)	.07 (−.01)	.20 (.27)	.20 (.18)
Unpublished	4	.16*** (.17***)	.12 (.09)	.19 (.25)	
Grade level					
Elementary and middle (K–8)	6	.14*** (.12***)	.10 (.04)	.17 (.21)	5.34* (4.13*)
College	3	.25*** (.25***)	.16 (.16)	.33 (.33)	
Agent of support					
Both parents	5	.20*** (.17*)	.15 (.03)	.26 (.29)	26.68*** (4.36)
Father	3	.03 (0)	−.02 (−.12)	.08 (.12)	
Mother	7	.17*** (.15***)	.13 (.05)	.21 (.24)	

*p<.05; **p<.01; ***p<.001

under both fixed and random-effect assumptions, agent of support. Pairwise comparisons revealed that the average correlation between parental autonomy support and engagement and effort for mothers was not different from the average correlation for fathers under either fixed, $Q(1)$=.58, p=.45 or random assumptions, $Q(1)$=.03, p=.86. However, the average correlation was significantly greater when parental autonomy support reflected the support of

both parents compared with just mothers (FE: $Q(1)=22.69$, $p<.001$; RE: $Q(1)=21.66$, $p<.001$) or just fathers (FE: $Q(1)=29.00$, $p<.001$; RE: $Q(1)=12.77$, $p<.001$).

Studies Correlating Parental Autonomy Support and Perceived Control

The literature search uncovered seven studies that estimated the correlation between parental autonomy support and perceived control. The 7 studies reported 15 separate correlations based on 7 samples (see Table 2). Of those correlations, 12 reported correlations relevant to elementary and middle school and 3 reported correlations for a college sample. For agent of support, five correlations reported the agent of support as both parents, while three reported the father and seven reported the mother. The studies were published between 1989 and 2008. The sample sizes ranged from 60 to 805, with a median size of 160. The mean sample size was 342.67, with a standard deviation of 330.79. The effect sizes ranged from −.26 to .36, with four negative-effect sizes and the rest positive. The Grubbs test did not reveal any significant outliers in sample size or correlations.

Overall Correlation The weighted average correlation was $r=.15$ (95 % CI=.12, .18) with a fixed-error model and $r=.16$ (95 % CI=.09, .23) with a random-error model (see Table 3 for overall effects), $Q(8)=26.50$, $p<.001$. Trim-and-fill analyses revealed 2 possible missing values under both error models, though the relation would remain significantly different from zero (see Table 4). In addition, a moderator analysis indicated that there was no difference between the average effects of published and unpublished reports (see Table 9). Meta-regression results (see Table 5) suggested that the correlation between parent autonomy support and perceived control increased as the Cronbach's alpha for the measure of parental autonomy support increased under both fixed and random effects. Results from the meta-regression assessing whether the Cronbach's alpha for the measure of perceived control moderated the correlation were not significant.

Moderator Analyses Next, moderator analyses on the relation between parental autonomy support and perceived control were conducted using three moderators: publication type, grade level, and agent of support (see Table 9). Only one moderator, grade level, remained significant under both fixed-effect and random-effect assumptions. The analysis revealed that the relation between parental autonomy support and perceived control was greater for college students compared with elementary through high school age students.

Studies Correlating Parental Autonomy Support and Other Outcomes

In addition to the outcomes reported previously, several other relevant outcomes were examined, though less frequently, in research studies focused on parents' autonomy support. Meta-analyses of these outcomes indicated that there were small, statistically significant correlations between parental autonomy support and children's positive attitudes toward school, extrinsic motivation, executive functioning, and self-regulation, under both error models (see Table 3). Moderator analyses were not conducted for these outcomes given the small number of independent samples contributing to each outcome (six or fewer).

Discussion

In line with self-determination theory, the results of this meta-analysis suggest that parental autonomy support has a positive relation with a variety of desirable academic and social outcomes including academic achievement, autonomous motivation, psychological health, perceived competence, perceived control, engagement and effort, attitudes toward school, self-regulation, and executive functioning. Surprisingly, parental autonomy support was also positively related to children's extrinsic motivation about as strongly as it is related to their autonomous motivation. That is, the finding of this meta-analysis suggests that autonomy support may more broadly support all forms of motivation and positive functioning, not just motivation that is derived from an individual feeling autonomous. This may conflict with motivation theory to the extent that self-determination theory would hypothesize that autonomy support should be most strongly correlated with autonomous forms of motivation and unrelated or negatively related to extrinsic motivation. We suspect that this result reflects the likelihood that any type of involvement by parents, whether focused on autonomy-support or not, increases all types of motivation. This may be particularly likely when parents' involvement and students' motivation is targeted toward school, a domain that includes many activities for which little autonomous motivation may exist or the tension between extrinsic and intrinsic forms of motivation is apparent. That is, the mere act of parents highlighting their role in supporting students' efforts in school may lead students to focus on extrinsic reasons for engaging in school activities. When that involvement is also autonomy-supportive, it also seems related to students' greater focus on intrinsic reasons for engaging. This possibility is reflected in some research examining parent involvement more broadly than just that which is autonomy supportive. For example, Ginsburg and Bronstein (1993) found that parents who were more involved in their children's academic lives had students who reported being more extrinsically motivated and dependent on external sources of academic guidance and evaluation. It is also worth noting that consistent with our suggestion that involvement is likely to enhance extrinsic motivation particularly in the academic domain, most of the extrinsic motivation outcome measures in this meta-analysis were in the academic domain.

Several patterns emerged from moderator analyses across outcomes. Namely, the trend in average correlations across every outcome suggested that the correlation between parental autonomy support and academic and psychosocial outcomes was stronger when the autonomy support measure reflected the support of both parents versus one or the other. This trend was significant for three out of six outcomes under both error models and for two additional outcomes under fixed effects only. That is, when both parents were simultaneously assessed as agents of support, the relation between autonomy support and achievement was stronger compared with when autonomy supportive of either parent was assessed independently. This is an especially important implication for future research. Researchers often focused on mothers over fathers in many cases, but these findings indicate that both parents are important and the strength of autonomy support is better revealed when the combined support of both parents is assessed. Our observation that the relation between parental autonomy support and students' outcomes is stronger when the measure of parental autonomy support is a reflection of both parents' behavior may emerge for a number of reasons. However, it seems unlikely that the finding is a matter of mere reduction in measurement error, as rarely did the measure of both parents' autonomy support involve multiple informants. Rather, a majority of the articles in this data set had children rate their parents' autonomy support, being instructed to think specifically about their mother, father, or both parents. Improvements in measurement

notwithstanding, we speculate that our findings reflect the likelihood that the effects of autonomy support are more powerful when both parents are consistent in their practice and likewise, that the autonomy supportive efforts of one parent could be undermined if the other is controlling. The additive and interactive effects of mothers and fathers autonomy support would seem to be an important direction for future research to explore. As noted by other scholars, there is very little focus on the ways that mothers' and fathers' parenting styles co-exist and interact (Simons and Conger 2007). However, evidence from the parenting style literature may provide some support for our speculation. For example, in a study examining the parenting style of mothers and fathers separately, Simons and Conger (2007) found that having two authoritative parents was associated with the most positive outcomes in delinquency, depression and commitment to school among adolescents, though having one parent with this style buffered against the negative consequences associated with the second parent having a less optimal parenting style.

The moderating relation between parental autonomy support and grade level also showed a similar pattern across the various outcomes. Across all outcomes (except for psychological health for which there were no studies with elementary school children and engagement and effort for which we could not examine this moderator), the pattern of correlations suggested that autonomy support may have a stronger relation with children's outcomes in middle school and later into high school and college. Unfortunately, it was often not possible to get a clearer picture into the differences between elementary, middle, and high school from the current data. Several studies reported results from mixed grade levels, such as upper elementary and middle school students. For perceived control this trend was statistically significant under both fixed and random effects and for autonomous motivation it was significant under random effects only. Given adolescents' emerging desire to be autonomous individuals, autonomy support would appear to be especially important for supporting autonomous motivation during this developmental period. Interestingly, parent's autonomy support appears to continue to be equally important, or more important in the case of perceived control, even as children leave the home and go off to college.

In addition, it is worth noting that for the three outcomes for which we could examine our hypothesis about alignment between parental autonomy support and outcome domains, we found support for our hypothesis that better aligned parental autonomy support and outcomes would demonstrate stronger relations. That is, the correlation between parental autonomy support and general psychological health was greater when the focus of parental autonomy support was general, rather than specific to academics. Likewise, the correlation between parental autonomy support and academic achievement was greater when the focus of parental autonomy support was academic rather than general; however, this moderator was significant under fixed effects only. In addition, under both fixed and random effects, the correlation between parental autonomy support and autonomous motivation was greater when the focus was academic for both the domain of the autonomy support measure and the domain of the outcome measure. More specifically, our moderator analysis for autonomous motivation examining the alignment between the predictor and outcome variable suggested that the strongest effects emerged when variables were matched in the academic domain specifically, with mismatched relations and matched relations in other domains of life being smaller. Given that autonomous motivation is highly relevant to learning contexts in particular, this finding that the strongest relations emerged for matched relations within the academic domain is hardly surprising.

While the strength of the two moderating factors above consistently tells an interesting story about when the correlation between parental autonomy support and outcomes may be the strongest, the information we received on the strength of the overall correlations is also important to note. Parental autonomy support has the strongest relation with global psychological health. Not surprisingly, the strength of the relation between parental autonomy support and academic achievement was smaller than the motivation and psychosocial functioning outcomes. The reason for this smaller relation could be that academic achievement is determined by a multitude of factors beyond autonomy support. Likewise, the relation between parental autonomy support and academic achievement may be small because achievement, along with engagement during school, is a distal outcome of parents' support that will be mediated by children's own motivation, self-regulation, and cognitive functioning. That said, the results of this meta-analysis suggest that parental autonomy support is a small but likely important contributor to students' success in school. As such, parental autonomy support may be of particular interest for intervention and practice given that it is a strategy that requires few material resources and may be relatively effectively implemented by parents compared with other forms of parent involvement in school that may more readily depend on parents' level of education or academic training.

Future Directions and Limitations

Overall, the information gained from the results of this meta-analysis is important and provides a fuller picture of conditions under which parental autonomy support relates to important child outcomes. However, there are limitations to be considered. An important limitation to note is that some of the findings presented were based on small numbers of independent samples, making it difficult to place a great deal of confidence in the specific magnitude of the estimated effects. This is especially true for the relations with attitudes toward school, extrinsic motivation, executive functioning, and self-regulation. It is also important to note that all studies were correlational in nature and should not be taken to imply a causal relation between parental autonomy support and child outcomes. In our review of the literature of parent autonomy support, we found few experimental studies in which parental autonomy support was intentionally manipulated or parents were randomly assigned to receive training (or not) regarding how to be autonomy-supportive. Interventions that manipulate parents' autonomy-supportive practice would be particularly useful in exploring the causal effects of parent autonomy support on child outcomes (see Su and Reeve 2011 for a synthesis of autonomy support intervention programs).

Along the same lines, our meta-analysis pointed to a number of moderators, such as agent of support and grade level, which appeared to be promising factors related to variation in effects. However again, these factors should not be interpreted to imply causation given that they were not manipulated within studies or across studies included in the meta-analysis. Carefully designed intervention research that conscientiously takes moderators into consideration by, for example, targeting samples that span multiple grade levels and intentionally manipulating which parent receives training or whether both parents receive training, are likely to be particularly helpful in exploring the role of the moderators identified in this meta-analysis. In particular, since there were so few elementary-aged samples, more research needs to be done on the relation between parental autonomy support and academic achievement and psychosocial functioning in the elementary school age range.

For several of the outcomes, moderators could not be tested due to small number of studies with variation on that factor. We were particularly disappointed that it was not possible to test whether the nature of parents' autonomy support was associated with variation in the correlations between parental autonomy support and child outcomes, because many studies did not specify the specific nature of the autonomy supportive practices. Autonomy support across a variety of contexts has been defined in theoretical and empirical literature to reflect a combination of related, yet independent practices, including providing choices and support for independent or collaborative decision-making, perspective-taking, careful listening, provision of rationales that appeal to personal interests and goals, among other practices (Deci and Ryan 1987; Grolnick et al. 1997; Pomerantz et al. 2007). It is possible that these practices are not all equal and that some support autonomy and subsequent child outcomes better than others. Future research should focus on identifying specifically what it is about parental autonomy support that impacts motivation and achievement.

Related to this issue, we collected information about studies along other number of dimensions of theoretical or methodological relevance to explain variability in findings. For example, we coded the ethnicity and socioeconomic status of samples, given research suggesting that the autonomy relevant experiences vary across cultures (e.g., Iyengar and Lepper 1999; Stephens et al. 2007). We coded the ability level of students given the possibility that autonomy support may not be equally effective across different populations of students. We also collected information relevant to the quality of studies, including the appropriateness of conceptual and operational definitions of the parent autonomy support variable, the timing of measurement for outcomes relative to the predictor, and whether attrition occurred in longitudinal research. However, the limited reporting or variability along many of these characteristics prevented us from conducting moderator analyses. In fact, one of the few methodological characteristics relevant to study quality that we were able to assess as a moderator was the internal consistency of measures. Not surprisingly, most of these moderator analyses suggested that studies with poorer measurement might be underestimating correlations between parental autonomy support and student outcomes or that the small amount of variability in internal consistency for some measures did not matter much.

Finally, given our unexpected finding that parent autonomy support was positively correlated with extrinsic motivation, it might be useful for future research to explore not only the relations between parent autonomy support and various indicators of motivation, achievement, and psychological adjustment, but also the relation between parent autonomy support and amotivation (or the lack of motivation). This meta-analysis revealed that parent autonomy support was related to all forms of motivation. However, we would expect that differential effects might emerge when examining various forms of motivation compared with amotivation. Parental autonomy support seems to increase all types of motivation, including extrinsic motivation, and what is lacking in the research is how parental autonomy support may also influence and likely decrease a lack of motivation.

In sum, parent autonomy support seems to be a promising strategy for enhancing children's academic, psychological, and social outcomes. The findings of this research synthesis provide some guidance for future investigations that will be both useful and illuminating of the underlying social and psychological dynamics of parent autonomy support.

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