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Within-Person Configurations and Temporal Relations of Personal and Perceived Parent-Promoted Aspirations to School Correlates Among Adolescents

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Grounded in self-determination theory, this longitudinal study examined the academic correlates of middle and high school students' ($N = 923$; 33.4% male) intrinsic and extrinsic aspirations (i.e., life goals) and the type of aspirations that they perceive their parents to promote to them. Person-centered analysis revealed 3 meaningful groups: a relatively high intrinsic aspiration group, a relatively moderate intrinsic aspiration group, and a relatively high-intrinsic and high-extrinsic aspiration group. Tukey post hoc comparisons indicated that students in the high intrinsic aspiration group scored higher on mastery-approach goals, effort regulation, and grades than students in the other 2 groups and lower on performance-approach goals and test anxiety than students in the high-high aspiration group. A match between learners' own aspiration profile and the perceived parent-promoted aspiration profile did not alter these between-group differences. Further, intrapersonal fluctuations of intrinsic aspirations covaried with mastery-approach goals over a 1-year time interval, while extrinsic aspirations covaried with performance-approach goals and test anxiety in the same period; none of these within-person associations were consistently moderated by between-student differences in perceived parental aspiration promotion. Instead, perceived parent-promoted intrinsic and extrinsic aspirations were, respectively, positive and negative predictors of between-student differences in positive school functioning. The present results highlight the importance of endorsing and promoting intrinsic aspirations for school adjustment.

Keywords: intrinsic and extrinsic aspirations, self-determination theory, achievement goals, motivation, parenting

Adolescents differ in the type of life goals they value and aspire. Some are focused on life goals (i.e., aspirations) that self-determination theory (SDT; Deci & Ryan, 2000) characterizes as intrinsic, such as developing their talents and contributing to the community, while others are focused on aspirations that SDT

characterizes as extrinsic, such as attaining popularity and attractiveness (Kasser & Ryan, 1993, 1996). Adolescents may also differ in the extent to which they believe their parents promote intrinsic and extrinsic aspirations (Duriez, Soenens, & Vansteenkiste, 2007). Past research has shown that endorsing intrinsic, relative to extrinsic, life aspirations relates to higher self-actualization, more vitality, and less depressive symptoms (Kasser, 2002b; Vansteenkiste, Niemiec, & Soenens, 2010), because these aspirations are more attuned with the satisfaction of the basic psychological needs for autonomy, competence, and relatedness (Deci & Ryan, 2000).

Intrinsic and extrinsic life aspirations, which have been studied as part of goal-content theory (Vansteenkiste et al., 2010), SDT's fifth mini-theory, concern the general, long-range goals that individuals set in their lives (Kasser, 2002b). As life aspirations have a motivational basis (Hitlin & Piliavin, 2004) and organize and direct individuals' behavior across life domains (Deci & Ryan, 2000; De Witte, 2004), they orient students toward desirable end states (Husman & Lens, 1999). Thus, as aspirations are presumed to energize motivated behavior, they are expected to induce, among others, the endorsement of mid-range goals such as

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achievement goals (Pintrich, 2000b; Vansteenkiste, Matos, Lens, & Soenens, 2007). Although aspirations and their overarching organizing units, that is, values, have also been studied by social psychologists (e.g., Inglehart & Baker, 2000; S. H. Schwartz, 2006), they barely have been linked with motivational processes and outcomes in the educational domain compared with other types of goals such as achievement goals (Elliot, 2005). More important, few social psychologists make a qualitative distinction between goal-contents (e.g., Headey, 2008), assuming instead that any type of goal yields desirable correlates as long as similar goals are promoted in the immediate environment.

In this study we aimed to examine whether intrinsic relative to extrinsic aspirations are related differentially to achievement goals and learning correlates. Specifically, we explored how intrinsic and extrinsic aspirations are organized within the individual and whether students with a different aspiration profile differ in the achievement goals they pursue and in a number of relevant school-related correlates. We also investigated whether the observed relations of intrinsic and extrinsic aspirations to outcomes would differ depending on the type of aspirations students perceive their parents to promote to them.

Intrinsic and Extrinsic Aspirations and Well-Being

From the goal-content theory (Deci & Ryan, 2000; Vansteenkiste et al., 2010) perspective, intrinsic life aspirations have a focus on attaining self-growth, contributing to the community, and cultivating close and meaningful relationships. They are called “intrinsic” because their pursuit enhances the satisfaction of the inherent psychological needs for autonomy (i.e., to experience a sense of volition and psychological freedom), competence (i.e., to feel effective), and relatedness (i.e., to feel accepted within supportive relationships). Conversely, extrinsic life aspirations have a focus on financial success and materialistic gains, social prominence, and attractive appearance. They are called “extrinsic” because they involve a focus on external sources to attain affirmation, and thus to gain or maintain self-worth (Kasser, 2002b; Kasser & Ryan, 1996; Vansteenkiste, Soenens, & Duriez, 2008).

Previous research has shown that intrinsic, relative to extrinsic, aspirations are related to psycho-social functioning. Since Kasser and Ryan’s (1993) seminal work, a considerable amount of work has evidenced the supremacy of intrinsic, relative to extrinsic, aspirations for well-being and adjustment in (a) various life domains, including exercising (e.g., Sebire, Standage, & Vansteenkiste, 2009), work (e.g., Vansteenkiste et al., 2007), and eating regulation (e.g., Verstuyf, Vansteenkiste, & Soenens, 2012); (b) for a variety of personal well-being and health indicators, including smoking behavior (e.g., Williams, Cox, Hedberg, & Deci, 2000) and post-college life functioning (e.g., Niemiec, Ryan, & Deci, 2009); and (c) in various cultures including South Korea (Kim, Kasser, & Lee, 2003), Germany (Schmuck, Kasser, & Ryan, 2000), and China (Lekes, Gingras, Philippe, Koestner, & Fang, 2010). Further, the negative effects of pursuing extrinsic, relative to intrinsic, aspirations are not limited to personal well-being but have been found to radiate to social and intergroup functioning such as less altruistic behavior (DeVoe & Pfeffer, 2010), more prejudice (Duriez, Soenens, & Vansteenkiste, 2008), and more interpersonal manipulation (McHoskey, 1999). Notably, not only valuing but also attaining extrinsic, relative to intrinsic, aspirations

yields less well-being, both among young adults (e.g., Kasser & Ryan, 2001; Niemiec et al., 2009; Sheldon, Gunz, Nichols, & Ferguson, 2010) and senior adults (Van Hiel & Vansteenkiste, 2009).

Some researchers have also examined perceived parent-promoted aspirations, which refer to the type of aspirations that adolescents believe their parents encourage them to adopt, either implicitly or explicitly. Perceived parent-promoted intrinsic, relative to extrinsic, aspirations were found to relate to adolescents’ well-being and social adjustment (e.g., Duriez, 2011; Duriez et al., 2008). Interestingly however, no previous study has examined to what extent perceived-parent promoted intrinsic and extrinsic aspirations are linked with educational outcomes, and this issue constituted an additional aim in the present research.

Intrinsic and Extrinsic Aspirations and Learning Outcomes

Over the past 5 years, the relation between different aspirations and educational outcomes has received increasing attention (Vansteenkiste, Lens, & Deci, 2006). In a cross-sectional study with undergraduate students, Tabachnick, Miller, and Relyea (2008) reported that intrinsic but not extrinsic aspirations were linked positively with the perception that academic tasks are instrumental for students’ future life and with adaptive task-oriented learning strategies. A recent longitudinal study with adolescent students from two different cultures (i.e., United Kingdom and China) indicated that endorsing materialistic (i.e., extrinsic) aspirations resulted in less mastery strivings, more competitive orientations, and poorer school performance (Ku, Dittmar, & Banerjee, 2012).

Further, several experimental studies have shown that framing a learning task to attain an intrinsic, relative to an extrinsic, aspiration leads to higher mastery orientation, less anxiety, better performance, and more free-choice persistence (Vansteenkiste, Simons, Lens, Sheldon, & Deci, 2004). Interestingly, this line of research has also revealed that inducing intrinsic aspirations results in better outcomes than simultaneously inducing intrinsic and extrinsic aspirations (Vansteenkiste, Simons, Lens, Sheldon, & Deci, 2004) or no aspirations at all (Vansteenkiste, Simons, Soenens, & Lens, 2004), suggesting that the presence of intrinsic aspirations, combined with the absence of extrinsic aspirations, yields the most desirable outcomes.

Additional evidence that intrinsic, relative to extrinsic, aspirations are associated with more adaptive academic outcomes could be provided by studies that examine whether different within-person configurations of intrinsic and extrinsic aspirations are also differentially linked with outcomes; namely, whether, for instance, learners with a high intrinsic–low extrinsic aspiration profile differ from learners with a high intrinsic–high extrinsic aspiration profile. Given the dearth of such studies, we examined this issue herein from a person-centered perspective.

Apart from studying aspirations at the intrapersonal level, the interplay between intrinsic and extrinsic aspirations also deserves further investigation at the interpersonal level—for instance, by examining whether personal aspirations interact with the perceived parent-promoted ones. Indeed, some scholars have provided evidence that experiencing a fit between personal characteristics, such as people’s regulatory focus (Higgins, 2000; Scholer & Higgins, 2012) or their pursued achievement goals (e.g., Barron & Harack-

iewicz, 2001), and the characteristics encouraged by the social environment can be beneficial (see also Chalabaev, Major, Sarrazin, & Cury, 2012). Extrapolating from this work, we were particularly interested in testing whether the hypothesized negative correlation of extrinsic aspirations with adaptive learning outcomes would worsen or, alternatively, would be offset if parents are perceived to favor extrinsic aspirations (see Sagiv & Schwartz, 2000).

Previous studies that addressed the issue of interplay between personal and contextually promoted aspirations have shown that in social contexts where extrinsic aspirations prevail, such as law (Sheldon & Krieger, 2004) and business schools (e.g., Kasser & Ahuvia, 2002), extrinsic, relative to intrinsic, aspirations also yielded a negative relation to well-being. Such a lack of an interaction between personal and context-promoted aspirations was also reported in studies focusing on academic outcomes. For instance, business students, who tend to value extrinsic aspirations more strongly, displayed better educational outcomes when placed in an intrinsic, rather than in an extrinsic, aspiration framing condition (Vansteenkiste, Simons, Lens, Sheldon, & Deci, 2004; Study 2). Likewise, it was shown that only the experimentally induced and the personally endorsed intrinsic aspirations (but not their interaction) predicted intrinsic motivation, conceptual learning, and persistence (Vansteenkiste, Timmermans, Lens, Soenens, & Van den Broeck, 2008). The present study builds on this small body of work by examining the interaction between adolescents' personal aspirations and those favored by their parents in the prediction of learning outcomes.

Present Research

In this research we aimed to extend previous work on intrinsic and extrinsic aspirations by (a) studying their relation to achievement-related strivings (i.e., mastery-approach and performance-approach goals) and learning correlates (i.e., effort regulation, test anxiety, and grades) rather than well-being, (b) adopting both a person-centered (i.e., cluster analysis) and dimensional approach in investigating the correlates of students' intrinsic and extrinsic aspirations, (c) examining the role of perceived parent-promoted intrinsic and extrinsic aspirations in addition to personally held intrinsic and extrinsic aspirations, and (d) studying the relation between intrinsic and extrinsic aspirations and these learning correlates from a longitudinal perspective.

These issues were investigated in a relatively understudied population sample—that is, middle adolescents—as the bulk of previous research on life goal-contents has mainly recruited college students and adults. Studying intrinsic, relative to extrinsic, aspirations among adolescents is especially suitable for our longitudinal analysis because adolescence represents a developmental period during which there is an ongoing process of identity formation and values exploration (Erikson, 1968; S. J. Schwartz, Luyckx, & Vignoles, 2011). Therefore, as adolescents' value system has not been fully crystalized, examining adolescents' values across time could shed more light on the developmental dynamics during this period of life.

In this study we examined associations between personal and parent-promoted aspirations and a variety of learning outcomes. We focused on mastery-approach and performance-approach goals because we considered them as important indicators of students'

academic motivation (Dweck & Leggett, 1988; Harackiewicz, Barron, Carter, Lehto, & Elliot, 1997), on test anxiety because it represents an important negative marker of students' academic functioning (Hembree, 1988), and on effort regulation because it is an important positive aspect of student learning and contributes to academic performance (Pintrich & De Groot, 1990). Students' grades were also included as an objective measure of students' performance. Using these outcome variables, we explored one research question, and we tested three hypotheses.

Regarding the research question, we employed a person-centered approach to explore the naturally occurring combinations of intrinsic and extrinsic aspirations. Person-centered analysis fits a more holistic approach as the person, as an organized whole, constitutes the unit of analysis. The basic idea is to identify groups of students who share a common constellation of characteristics—the degree of endorsement of intrinsic and extrinsic aspirations in our case. Identifying such groups characterized by a divergent aspiration profile is critical as the degree to which individuals prioritize intrinsic above extrinsic aspirations (or vice versa) plays a key role in their functioning (Kasser, 2002b). Unlike Kasser and Ryan (2001), who used median-split analyses to create different aspiration profiles in an a priori fashion, we used cluster analysis as a more inductive and data-driven approach to identify naturally occurring profiles of aspirations. Specifically, we first explored whether we could find at least three distinct groups, being characterized by (a) relative high levels of intrinsic and low levels of extrinsic aspirations (relatively high intrinsic aspiration group), (b) relative low intrinsic and low extrinsic aspirations (relatively low-low aspiration group), and (c) relative high intrinsic and high extrinsic aspirations (relatively high-high aspiration group; Research Question 1a). We considered it less likely to detect a relatively high extrinsic and relatively low intrinsic aspiration group as people who strongly endorse extrinsic aspirations equally adopt intrinsic aspirations (Kasser, 2002b)—possibly because social desirability may trigger intrinsic aspirations. Given the prominent role of parents as determinants of student motivation and learning efforts (Pomerantz, Moorman, & Litwack, 2007), we explored whether a similar pattern of profiles would be detected for perceived parent-promoted aspirations (Research Question 1b).

Second, we examined differences in academic correlates between empirically detected clusters. Based on goal-content theory (Deci & Ryan, 2000; Vansteenkiste et al., 2010), we expected that the relatively high intrinsic group would display the most adaptive pattern of academic correlates (Hypothesis 1). Specifically, we anticipated that compared to students with a relatively low intrinsic or a double aspiration profile, students with an intrinsic aspiration profile would report more mastery strivings, better regulation of their efforts, and lower test anxiety levels. Also, because extrinsic aspirations entail an outward orientation and are tied with contingent self-worth (Kasser & Ryan, 1996), we expected them to avert students' focus from task-absorption toward a competitive (i.e., performance-approach) orientation and to induce higher test anxiety as summative tests would be more easily perceived as a means to validate one's ego. Regarding grades, we anticipated no differences between students with an intrinsic and a double-aspiration profile because intrinsic and extrinsic aspirations seem to enhance, respectively, deep-level and rote learning (Vansteenkiste, Simons, Lens, Sheldon, & Deci, 2004) and because grades may reflect both types of learning (cf. Senko, Hulleman, & Harackiewicz, 2011).

Third, we investigated through dimensional analysis the intrapersonal fluctuation of intrinsic and extrinsic aspirations across time and their covariation with the learning outcomes. The few longitudinal studies that have been conducted so far have shown that intrinsic but not extrinsic aspirations predict well-being in short-term (Sheldon et al., 2010) and long-term periods (Niemiec et al., 2009). In line with these findings, we hypothesized that personal intrinsic aspirations would covary positively with mastery-approach goals and effort regulation and negatively with performance-approach goals and test anxiety. We expected the reverse pattern of relations for personal extrinsic aspirations (Hypothesis 2a). Regardless of the intrapersonal fluctuations, we anticipated that perceived parent-promoted intrinsic aspirations would predict higher levels of mastery-approach goals, effort regulation, and lower levels of performance-approach goals and test anxiety as previous research has shown that perceived parents' intrinsic aspirations enhance children's functioning (Duriez, 2011; Duriez et al., 2008). For similar reasons, we expected the opposite pattern for perceived parent-promoted extrinsic aspirations (Hypothesis 2b).

Fourth, we examined whether the perceived parental environment that emphasizes either intrinsic or extrinsic aspirations would alter the relationships of personal intrinsic and extrinsic aspirations to academic correlates. Although the relevant literature today (e.g., Kasser & Ahuvia, 2002; Sheldon & Krieger, 2004; Vansteenkiste, Timmermans, et al., 2008) provides no convincing support that the context moderates the positive relationship of intrinsic, relative to extrinsic, aspirations to outcomes, it is unknown whether parental aspiration promotion moderates the relation of personal aspirations to motivational processes and outcomes. We examined this question in two different ways. First, from the person-centered (i.e., within-person configuration) perspective, we examined whether the differences among the obtained personal aspiration profiles would be amplified, or reduced, once the profiles of perceived parent-promoted aspirations are also considered (Hypothesis 3a). In essence, we tested whether the degree of match (or mismatch) between personally aspired and perceived contextually promoted profiles would yield any advantages (or disadvantages). Second, from the variable-centered (i.e., longitudinal) perspective, we examined whether perceived parent-promoted aspirations would moderate the covariation between personal aspirations and academic correlates across time. In practice, we tested whether perceived parent-promoted intrinsic and extrinsic aspirations would strengthen the respective relations of personal intrinsic and extrinsic aspirations to the studied outcomes, or whether perceived parent-promoted intrinsic aspirations would buffer the likely negative relations of personal extrinsic aspirations to academic correlates (Hypothesis 3b).

Method

Participants and Procedure

Two hundred ninety male and 590 female students (along with six students who missed reporting their gender) participated in the present research. The data were collected in three waves: Time 1 (T1) at the beginning (i.e., October-November) of the school year, Time 2 (T2) at the end of the same school year (i.e., May-June), and Time 3 (T3) at the beginning of the next school year (i.e.,

October-November). There was some attrition over the course of the study, as some students missed one or two waves while others graduated after T2. As a result, although the sample size was fairly constant at T1 ($N = 886$) and T2 ($N = 885$), it was significantly reduced by T3 ($N = 526$; 28.9% male). At T1, 247 students (26.8%) were in the seventh, 254 (27.5%) in the eighth, 116 (12.6%) in the ninth, 119 (12.9%) in the 10th, 106 (11.5%) in the 11th, and 81 (8.8%) in the 12th grade (last year of high school). All the students attended school in Flanders, Belgium.

The study was approved by the Research Ethics Board of the host university. Upon the agreement of the school principals and the board of teachers and a passive informed consent obtained from students' parents, a team of research assistants visited each class. After briefly explaining the purpose of the study and stressing that participation was voluntary, the research assistants asked students to fill out a battery of questionnaires. They assured students about the confidentiality of their responses, emphasized that there were no right or wrong answers, and ensured that their responses would have no implications for their grades. On all the three waves, students completed the questionnaire during a 1-hr class session. All questions were rated on a 5-point Likert-type scale ranging from 1 (*not at all true of me*) to 5 (*very true of me*).

Measures

Personal intrinsic-extrinsic aspirations. A shortened 18-item Life Goal Aspiration Scale (Kasser & Ryan, 1996), translated in Dutch by Vansteenkiste, Duriez, Simons, and Soenens (2006), was used to assess students' endorsement of intrinsic and extrinsic aspirations. With respect to intrinsic aspirations, students responded how important it was to pursue personal growth (e.g., "It is important to me to develop my personality"), to contribute to the community (e.g., "It is important to me to make the world a better place to live"), and to develop meaningful relationships (e.g., "It is important to me to have friends that I can count on"). Regarding extrinsic aspirations, students indicated the value they placed on acquiring physical attractiveness (e.g., "It is important to me to look attractive and beautiful"), gaining fame and social recognition (e.g., "It is important to me to get recognition and admiration from others for my actions"), and attaining financial success (e.g., "It is important to me to become rich and have a lot of possessions"). Each of these six types of aspirations was assessed with three items. A confirmatory factor analysis (CFA) comprising a model in which the three intrinsic and three extrinsic aspiration latent factors loaded, respectively, on an intrinsic and extrinsic higher order latent factor indicated adequate fit at all three waves (see Table 1, top). As a result, a mean intrinsic and extrinsic aspiration score for each wave was computed by aggregating the scores of the three intrinsic (i.e., self-growth, community contribution, and social relationships) and three extrinsic (i.e., fame, recognition, financial success) types of aspirations. These scales showed acceptable internal consistencies (see Table 3).

Perceived parent-promoted intrinsic-extrinsic aspirations. We used the questionnaire adapted by Duriez et al. (2007) to assess at Time 1 students' perceptions about the aspirations that their parents attempt to convey to them. The same 18 items from the shortened version of Life Goal Aspiration Scale (Kasser & Ryan, 1996) were rephrased to assess students' perceived parental goal promotion. An example item for a perceived parent-promoted

Table 1
Fit Indices of the Confirmatory Factor Analyses of the Scales

Model	<i>N</i>	S-B χ^2	<i>df</i>	<i>p</i>	CFI	SRMR	RMSEA (90% CI)
Intrinsic and Extrinsic Aspirations							
Personal IA & EA (T1)	876	445.04	128	<.01	.930	.064	.053 (.048–.059)
Personal IA & EA (T2)	875	430.05	128	<.01	.948	.058	.052 (0.042–.057)
Personal IA & EA (T3)	514	297.61	128	<.01	.945	.065	.051 (0.043–.058)
Parent-promoted IA & EA (T1)	587	463.58	128	<.01	.907	.071	.067 (.060–.073)
Achievement goals							
M-ap and P-ap goals (T1)	886	33.97	8	<.01	.984	.039	.061 (.040–.082)
M-ap and P-ap goals (T2)	869	19.65	8	.01	.994	.022	.041 (0.018–.064)
M-ap and P-ap goals (T3)	515	80.21	8	<.01	.916	.091	.133 (.107–.159)

Note. S-B = Satorra-Bentler; CFI = comparative fit index; SRMR = standardized root-mean-square residual; RMSEA = root-mean-square error of approximation; CI = confidence interval; IA = Intrinsic Aspirations; EA = Extrinsic Aspirations; T = time; M-ap goals = Mastery-approach goals; P-ap = Performance-approach goals.

intrinsic and extrinsic aspiration reads: “My parents find it important that I develop my personality” and “My parents find it important that I am financially successful in my life.” Similarly to the personal intrinsic and extrinsic aspiration assessment, the CFA for the parent-promoted intrinsic and extrinsic aspirations model yielded reasonable fit (see Table 1, top). Therefore an average score for perceived parent-promoted intrinsic and extrinsic aspirations was computed. These scales also showed acceptable internal consistencies (see Table 3).

Mastery- and performance-approach goals. Participants filled out six items assessing school-related mastery-approach (e.g., “At school, I want to learn as much as possible”) and performance-approach goals (e.g., “At school, I am striving to do well compared to other students”) taken from the Achievement Goal Questionnaire (Elliot & McGregor, 2001). Mastery-approach and performance-approach goals reflect students’ strivings for learning and competition, respectively, and are found to be significant determinants of students’ school related functioning (Senko et al., 2011). These scales showed acceptable internal consistencies (see Table 3) and the theorized two-factor structure was found to yield an acceptable fit across all three waves (see Table 1, bottom).

Effort regulation. We used the four-item subscale from the Motivated Strategies for Learning Questionnaire (Pintrich, Smith, Garcia, & McKeachie, 1991) to assess to what extent students regulated their effort effectively at school (e.g., “Even when course materials are dull and uninteresting, I manage to keep working until I finish”). Considering that two out of the four items were reverse-worded, the subscale exhibited sufficient internal consistency in all three waves (see Table 3).

Test anxiety. Five items taken from the Learning and Study Strategies Inventory (LASSI; 2nd ed.; Weinstein, Palmer, & Schulte, 2002) were used to assess the degree to which students feel anxious when they take a test. A sample item reads, “When I take a test or do an exam, I think about some questions that I cannot solve.” As shown in Table 3, the internal consistency of this scale was acceptable on all three waves.

Grades. On each wave, students reported their previous trimester course grades (average score). This average score was used as an independent measure of students’ school performance.

Results

Plan of Analyses

To examine whether distinct aspiration profiles exist, we conducted cluster analysis. Aligned with Hair and Black (2004), we began with performing a Ward’s hierarchical cluster analysis with an agglomerative (i.e., bottom-up) schedule to examine the range of possible solutions. With this procedure, each subject begins as a cluster and then, in the first step, the two most similar clusters with respect to their scores in the respective dimensions are joined to form a new cluster. This procedure continues in a stepwise fashion until all subjects form a whole, all-inclusive cluster and each time a new cluster is formed, a value of similarity (in terms of Euclidean distances) among members of the cluster is calculated. A steep increase in values of similarity signifies that two relatively dissimilar clusters were merged and thus suggests a potential stop of the merging process.

Nevertheless, the use of hierarchical clustering as a stand-alone procedure may yield suboptimal solutions. This is because each subject that is clustered in a preceding stage remains fused within its cluster throughout the whole process and cannot be reassigned to a new cluster in subsequent stages. To overcome this disadvantage, we employed a K-means clustering as an additional, complementary method. Specifically, in K-means clustering we used as the starting points the number of clusters and their respective centroids that we obtained during Ward’s hierarchical clustering to assign the subjects to the clusters; the assignment was made on the basis of the distances (i.e., similarity measures) of the subjects from the cluster centers that we a priori defined during hierarchical clustering. This two-step procedure was used to detect clusters in participants’ personal and parent-perceived aspiration profiles. Next, we employed multivariate analyses of variance (MANOVAs; and follow-up ANOVAs) to examine cluster differences in the learning outcomes and to examine whether a match between one’s personal and perceived parent-promoted aspiration profile would make a difference irrespective of the aspiration content.

As for the longitudinal analyses, we took into account the nested structure of the data (i.e., repeated measures, nested within students) and set up a series of multilevel models

(Raudenbush & Bryk, 2002) to examine the within-student variances of and between-student differences in the academic correlates. Specifically, we modeled each of the learning outcomes as a function of the within-person variation in personal intrinsic and extrinsic aspirations and of between-person differences in perceived-parent promoted intrinsic and extrinsic aspirations. To properly model the time effects, and because preliminary analyses showed a nonlinear change of correlates across the three waves of assessment, we used a piecewise linear regression approach (Raudenbush & Bryk, 2002) to estimate changes within the same school year (i.e., from T1 to T2) and changes due to grade transition (i.e., from T1 and T2 to T3). In addition, because preliminary analyses uncovered statistically significant differences between males and females (presented below), gender was also included as a covariate at the between-student level.

Preliminary Analyses

As a first step, we examined whether males and females differed in any of the studied variables. A MANOVA in which gender was entered as predictor and all the measured variables for all the three waves were entered as dependent variables was significant, Wilk's $\Lambda = .878$, $F(23, 298) = 1.81$, $p < .05$, multivariate $\eta^2 = .12$. However, because this analysis rendered the sample relatively small due to listwise deletion ($N = 321$), we opted for separate ANOVAs, one for each dependent vari-

able, after adjusting the alpha level according to the Bonferroni correction. Setting the alpha level at $\alpha = .002$ (i.e., $.05/23$), we found statistically significant differences in T1, T2, and T3 personal intrinsic aspirations, T2 extrinsic aspirations, T1 parent-perceived extrinsic aspirations and T2 grades, with females reporting stronger endorsement of intrinsic aspirations across the three waves of assessment and obtaining higher grades at T1 and T2, while reporting lower extrinsic aspirations at T2 and less parent-perceived extrinsic goals. In light of these differences (see Table 2), gender was taken into account in all subsequent analyses. Two-tailed bivariate correlations of the variables are presented in Table 3.

Research Question 1: Within-Person Configurations of Intrinsic and Extrinsic Aspirations

Personal intrinsic and extrinsic aspirations (Research Question 1a). To examine students' aspiration profiles, we used students' intrinsic and extrinsic aspirations at T1. Because outliers may severely distort results in cluster analyses, we first checked for multivariate and univariate outliers. We excluded three univariate outliers (0.33% of the original sample) that exceeded the cutoff value of ± 3.0 standard deviations from the mean (see Cohen, Cohen, West, & Aiken, 2003) and 14 multivariate outliers (1.52% of the initial sample) that exceeded the cutoff values in Leverage distance (as suggested by Cohen et al., 2003). Ward's hierarchical cluster analysis suggested that a

Table 2
Means and Standard Deviations of the Measured Variables of the Total Sample and Broken Down by Gender

Variable	N	Full sample		Male		Female		F	df
		M	SD	M	SD	M	SD		
Time 1									
1. Personal IA	886	4.14	0.50	4.05	0.56	4.19	0.46	14.96**	(1, 878)
2. Personal EA	886	3.12	0.78	3.23	0.83	3.06	0.75	8.47**	(1, 878)
3. Perceived parental IA	598	4.01	0.61	3.96	0.62	4.04	0.60	1.95	(1, 591)
4. Perceived parental EA	598	2.83	0.77	3.00	0.82	2.75	0.74	13.04**	(1, 591)
5. M-ap goals	886	4.06	0.78	3.99	0.84	4.10	0.75	3.45	(1, 878)
6. P-ap goals	886	2.75	1.00	2.87	1.09	2.69	0.95	6.42*	(1, 878)
7. Effort regulation	883	3.56	0.85	3.48	0.89	3.61	0.82	4.71*	(1, 875)
8. Test anxiety	886	3.07	0.87	3.03	0.92	3.10	0.85	1.05	(1, 878)
9. Grades	871	73.51	7.94	71.50	7.82	74.53	7.84	28.74**	(1, 863)
Time 2									
10. Personal IA	885	4.12	0.52	4.01	0.55	4.18	0.49	22.72**	(1, 877)
11. Personal EA	885	3.10	0.78	3.23	0.79	3.04	0.77	11.58**	(1, 877)
12. M-ap goals	885	3.94	0.76	3.85	0.78	4.00	0.74	7.71**	(1, 877)
13. P-ap goals	885	2.37	0.96	2.50	1.00	2.32	0.94	6.94**	(1, 877)
14. Effort regulation	884	3.57	0.83	3.46	0.90	3.63	0.80	7.63**	(1, 876)
15. Test anxiety	884	2.87	0.86	2.83	0.84	2.90	0.87	1.19	(1, 876)
16. Grades	864	69.92	7.68	67.88	7.27	70.95	7.69	31.22**	(1, 856)
Time 3									
17. Personal IA	526	4.09	0.57	3.94	0.69	4.15	0.51	14.55**	(1, 522)
18. Personal EA	526	3.20	0.81	3.33	0.87	3.15	0.78	5.16*	(1, 522)
19. M-ap goals	526	3.84	0.77	3.71	0.80	3.89	0.76	6.00*	(1, 522)
20. P-ap goals	526	2.76	0.83	2.71	0.90	2.77	0.80	0.50	(1, 522)
21. Effort regulation	526	3.45	0.84	3.29	0.87	3.51	0.82	7.18**	(1, 522)
22. Test anxiety	526	2.85	0.82	2.86	0.83	2.85	0.82	0.02	(1, 522)
23. Grades	519	72.88	6.76	71.48	6.12	73.45	6.91	8.79**	(1, 515)

Note. IA = Intrinsic Aspirations; EA = Extrinsic Aspirations; M-ap goals = Mastery-approach goals; P-ap goals = Performance-approach goals. Means within the same row significantly differ at the $\alpha = .002$ level.

* $p < .05$. ** $p < .01$, two-tailed.

Table 3
Bivariate Correlations (Two-Tailed) and Internal Reliabilities (on the Diagonal) of the Study Variables

Variable	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	
Time 1																								
1. Personal IA	.80																							
2. Personal EA	.19**	.88																						
3. Parent-promoted IA	.41**	.08	.85																					
4. Parent-promoted EA	.16**	.54**	.23**	.88																				
5. M-ap goals	.25**	-.09	.23**	-.01	.82																			
6. P-ap goals	.05	.27**	-.03	.22	.10**	.80																		
7. Effort regulation	.13**	-.18**	.20**	-.06	.49**	.02	.77																	
8. Test anxiety	.07*	.19**	-.01	.12	.06	.26**	-.10**	.74																
9. Grades	.09**	-.16**	.15**	-.13**	.34**	-.01	.38**	-.16**	—															
Time 2																								
10. Personal IA	.53**	.01	.28**	.01	.20**	-.01	.13**	.01	.14**	.82														
11. Personal EA	.09*	.70**	.06	.46**	-.04	.24**	-.12	.19**	-.08	.16**	.89													
12. M-ap goals	.16**	-.11**	.14**	-.08	.62**	.08*	.39**	.08*	.30**	.30**	.00	.83												
13. P-ap goals	.05	.28**	-.08	.22**	-.02	.54**	.00	.20**	.01	.06	.38**	.04	.88											
14. Effort regulation	.07*	-.18**	.07	-.09*	.37**	.03	.64**	-.13**	.38**	.16**	-.17**	.43**	.03	.79										
15. Test anxiety	.01	.16**	-.01	.12**	.04	.19**	-.11**	.63**	-.14**	.02	.24**	.09**	.19**	-.17**	.76									
16. Grades	.08*	-.12**	.14**	-.13**	.31**	.01	.39**	-.17**	.78**	.12**	-.08*	.25**	.03	.40**	-.22**	—								
Time 3																								
17. Personal IA	.42**	.02	.25**	.02	.19**	-.05	.13**	-.04	.11**	.53**	.04	.18**	.02	.16**	-.10*	.10*	.84							
18. Personal EA	.09	.58**	.02	.38**	-.12**	.18**	-.13**	.14**	-.11**	.01	.65**	-.08	.28**	-.20**	.11*	-.09*	.25**	.90						
19. M-ap goals	.16**	-.14**	.14**	-.17**	.52**	.03	.37**	.05	.28**	.27**	-.08	.65**	.05	.41**	.01	.30**	.32**	-.10*	.83					
20. P-ap goals	.12**	.24**	.11*	.19**	.17**	.30**	.05	.14**	.01	.06	.23**	.22**	.40**	.06	.19**	.01	.10*	.25**	.30**	.75				
21. Effort regulation	.11*	-.19**	.04	-.19**	.35**	.04	.57**	-.15**	.41**	.19**	-.13**	.40**	.11*	.68**	-.18**	.42**	.24**	-.13**	.45**	.17**	.79			
22. Test anxiety	.06	.17**	-.02	.12*	.03	.20**	-.09*	.49**	-.15**	.05	.21**	.08	.20**	-.12**	.60**	-.18**	.04	.20**	.06	.21**	-.15**	.76		
23. Grades	.08	-.14	.06	-.21**	.30**	.03	.42**	-.14**	.76**	.15**	-.05	.28**	.05	.41**	-.18**	.93**	.12**	-.07	.30**	.02	.44**	-.19**	—	

Note. IA = Intrinsic Aspirations; EA = Extrinsic Aspirations; M-ap goals = Mastery-approach goals; P-ap goals = Performance-approach goals.
* $p < .05$. ** $p < .01$.

three-cluster solution was most appropriate according the Schwarz Bayesian criterion (BIC) as the clustering agglomeration coefficient showed a steep increase in going from three to two clusters. Posterior examination of the three cluster solution showed that it was theoretically sound and parsimonious compared with a two- and four-cluster solution. The initial centers of the resultant three clusters were then used as nonrandom starting points in an iterative *k*-means clustering procedure.

The three-cluster final solution appears in Table 4 (top). The *z* scores represent the means of each cluster from the standardized mean of the whole sample, and they can be used as indicators of effect sizes in a similar way as Cohen's *d* effect sizes with values around 0.2, 0.5, and 0.8 signifying, respectively, small, moderate, and large effects. As can be seen in Table 4 three clusters emerged. A one-way MANOVA with personal intrinsic and extrinsic aspirations as dependent variables and cluster membership as the independent variable indi-

cated that the three groups differed from each other, Wilk's $\Lambda = .167$, $F(4, 1730) = 624.65$, $p < .01$, explaining 59.1% of variance among the two constituting dimensions. The first cluster consisted of students reporting high endorsement of intrinsic and low endorsement of extrinsic aspirations. Taking into account their absolute scores and their scores relative to the others groups, we labeled this cluster the *relatively high intrinsic aspiration group* ($n = 299$; 34.4%). The second cluster ($n = 275$; 31.6%) reported moderate, yet lower compared with the other groups, intrinsic aspirations and was therefore named the *relatively moderate intrinsic group*. Last, the third cluster ($n = 295$; 33.9%) reported relatively high levels of both intrinsic and extrinsic aspirations; we therefore tagged this cluster as the *relatively high-high aspiration group*. Additional analyses showed that males and females were unequally represented in the three groups (Cramer's $V = 17.93$, $df = 2$, $N = 864$, $p < .01$). Males (32.6% of the total sample) were somewhat over-

Table 4

The Three-Cluster Solution of Personal and Perceived Parent-Promoted Intrinsic and Extrinsic Aspirations and Significance Testing of Cluster Differences in the Correlates

Variable	Cluster						ANOVA results	
	Relatively high intrinsic group		Relatively moderate intrinsic group		Relatively high-high group		<i>F</i>	η^2
	<i>M</i>	<i>SD</i>	<i>M</i>	<i>SD</i>	<i>M</i>	<i>SD</i>		
Personal aspirations								
<i>n</i>	299		275		295			
%	34.4%		31.6%		33.9%			
Clustering dimensions								
Z-scores								
Intrinsic aspirations	0.49 _a	0.54	-1.09 _b	0.56	0.58 _a	0.60	<i>F</i> (2, 866)	
Extrinsic aspirations	-0.71 _a	0.69	-0.27 _b	0.69	0.99 _c	0.57	765.40**	.64
Absolute scores								
Intrinsic aspirations	4.39 _a	0.27	3.60 _b	0.28	4.43 _a	0.30	538.82**	.64
Extrinsic aspirations	2.56 _a	0.54	2.91 _b	0.54	3.89 _c	0.45	765.40**	.64
Learning correlates								
M-ap goals	4.23 _a	0.77	3.84 _c	0.75	4.08 _b	0.78	18.77**	.04
P-ap goals	2.56 _a	0.94	2.70 _a	0.91	3.03 _b	1.08	16.85**	.04
Effort regulation	3.71 _a	0.82	3.45 _b	0.79	3.47 _b	0.89	8.60**	.02
Test anxiety	2.96 _a	0.87	2.97 _a	0.79	3.28 _b	0.91	12.82**	.03
Grades	74.55 _a	8.06	72.96 _b	7.63	72.74 _b	7.92	4.53**	.01
Perceived parent-promoted aspirations								
<i>n</i>	180		207		201			
%	30.6%		35.2%		34.2%			
Clustering dimensions								
Z-scores								
Intrinsic aspirations	0.38 _a	0.54	-0.89 _b	0.59	0.72 _c	0.58	<i>F</i> (2, 585)	
Extrinsic aspirations	-0.90 _a	0.59	-0.10 _b	0.69	0.95 _c	0.65	446.58**	.60
Absolute scores								
Intrinsic aspirations	4.25 _a	0.33	3.48 _b	0.36	4.45 _c	0.35	393.51**	.57
Extrinsic aspirations	2.13 _a	0.46	2.75 _b	0.53	3.56 _c	0.50	446.58**	.60
Learning correlates								
M-ap goals	4.22 _a	0.76	3.89 _b	0.81	4.22 _a	0.73	12.60**	.04
P-ap goals	2.50 _a	1.04	2.80 _b	0.91	3.03 _b	1.05	13.05**	.04
Effort regulation	3.72 _a	0.88	3.42 _b	0.80	3.69 _a	0.80	8.04**	.03
Test anxiety	2.97 _a	0.92	3.06 _a	0.79	3.17 _a	0.91	2.47	.01
Grades	76.06 _a	9.15	72.13 _b	8.11	73.77 _b	8.19	10.13**	.03

Note. ANOVA = analysis of variance; M-ap goals = Mastery-approach goals; P-ap goals = Performance-approach goals. Means in the same row with different subscripts significantly differ according to the Tukey test ($\alpha = .05$).

* $p < .05$. ** $p < .01$, two-tailed.

represented in the relatively moderate intrinsic group ($n = 109$; 40.1%) and underrepresented in the intrinsic ($n = 71$; 23.8%) and the high-high aspiration group ($n = 102$; 34.7%).

Parent-promoted intrinsic and extrinsic aspirations (Research Question 1b). We followed the same two-step approach to detect whether similar profiles would emerge when perceived parent-promoted aspirations are considered. Before analyzing these data for which we had information for the parent-promoted aspirations ($N = 598$), we first excluded six univariate (1.00%) and another four (0.67%) multivariate outliers. A similar three-cluster solution was found to be the best option. The MANOVA, Wilk's $\Lambda = .175$, $F(4, 1168) = 405.83$, $p < .01$, multivariate $\eta^2 = .58$, as well as the follow-up ANOVAs on the separate parent-promoted aspirations were significant. Inspection of the means and the z scores of the clusters led us to attribute similar labels to the three clusters. The three clusters significantly differed from each other in both intrinsic and extrinsic aspirations (see Table 4, bottom).

Similar to previous studies (e.g., Asendorpf, Borkenau, Ostendorf, & Van Aken, 2001), we evaluated the replicability of the final solution for both personal and perceived parent-promoted aspirations. To do so, we performed a K-means clustering for personal and perceived parent-promoted aspirations by using as starting points the cluster centers we obtained through K-means clustering for, respectively, perceived parent-promoted and personal aspirations. We compared the agreement of the resultant solution with the original solution by means of Cohen's Kappa (k). An average index of agreement, k above .60 and .80, indicates, respectively, substantial and almost perfect agreement (Landis & Koch, 1977). Our cross-validation test yielded a Cohen's Kappa score of agreement of $k = .87$ between the personal aspirations initial cluster solution and that in which the cluster centers from the perceived parent-promoted aspirations were used as initial starting points. Also, a Cohen's Kappa score of agreement of $k = .99$ was obtained between perceived parent-promoted aspirations initial cluster solution and that in which the cluster centers from the personal aspirations were used as initial starting points.

Hypothesis 1: Between-Group Profile Differences in T1 Academic Correlates

In line with Hypothesis 1, a MANOVA indicated that the three groups with a different personal aspiration profile differed in the learning outcomes, Wilk's $\Lambda = .897$, $F(10, 1688) = 9.46$, $p < .01$, multivariate $\eta^2 = .05$. Follow-up ANOVA on each dependent variable after Bonferroni correction due to multiple comparisons showed significant differences for all the five outcomes (see Table 4, top). Tukey post hoc comparisons showed that the relatively high intrinsic group scored higher on mastery-approach goals, effort regulation, and grades compared to the other two groups; this group reported also less performance-approach goals and test anxiety compared to the high-high aspiration group (see Table 4, top panel). Although the high-high aspiration and the relatively moderate intrinsic group did not differ in effort regulation and grades, the high-high aspiration group reported more performance-approach goals and test anxiety compared with the two other clusters. In terms of mastery approach goals, the high-high aspiration group

scored in between the relatively high intrinsic group and the relatively moderate intrinsic group.

Similarly, the MANOVA including the clusters differing on perceived parent-promoted aspirations was significant Wilk's $\Lambda = .894$, $F(10, 1136) = 6.53$, $p < .01$, multivariate $\eta^2 = .05$. Follow-up ANOVA with alpha level adjusted according to the Bonferroni procedure revealed significant differences in all the outcomes except test anxiety (see Table 4, bottom panel). Specifically, the relatively high intrinsic group endorsed less performance-approach goals and had higher grades compared with the two other groups. This group also endorsed more mastery-approach goals and reported more effective effort regulation than the relatively moderate intrinsic group but did not differ from the relatively high-high aspiration group (see Table 4, bottom).

Hypothesis 2: Variation of Academic Correlates and Intrinsic-Extrinsic Aspirations Across Time

Moving from the person-centered approach to the dimensional analysis, we investigated whether variation in personal intrinsic and extrinsic aspirations coincides with variation in academic correlates (Hypothesis 2a). To do so, we modeled *within-student* differences in mastery-approach and performance-approach goals, effort regulation, test anxiety, and grades as a function of personal intrinsic and extrinsic aspirations (group-mean centered, nonrandomly varying), and within-school year and grade transition changes (both uncentered). Within-school year and grade transition changes were uncentered so that their respective intercepts would represent the expected score for the studied outcomes when within-grade change and grade transition equals 0 (i.e., at T1). Instead, personal intrinsic and extrinsic aspirations were group-mean centered to produce an unbiased estimate of the within-individual relations (Hofmann & Gavin, 1998; Nezlek, 2001) and to more properly examine cross-level effects (Enders & Tofghi, 2007). In the same models we also examined *between-student* differences in academic correlates as a function of gender (uncentered; 0 = male, 1 = female) and perceived parent-promoted intrinsic and extrinsic aspirations (both grand-mean centered; Hypothesis 3b). Gender was entered uncentered so that the intercept would represent the mean score for males. All the models were assessed with restricted maximum likelihood analysis; their slopes were initially estimated as randomly varying but nonsignificantly varying slopes were fixed in the interest of model parsimony, computational stability, and model convergence (Nezlek, 2001; Raudenbush & Bryk, 2002).

The results of the models, including the percentage of variance situated at the two levels and the variance explained by the predictors, are presented in Table 5. At the intrapersonal level, variation in personal intrinsic aspirations covaried with variation in mastery-approach goals (β_{10} [personal IA] = 0.25, $SE = 0.10$, $p < .01$), whereas variation in personal extrinsic aspirations covaried with variation in performance-approach goals (β_{20} [personal EA] = 0.33, $SE = 0.11$, $p < .01$) and test anxiety (β_{20} [personal IA] = 0.21, $SE = 0.08$, $p < .01$). At the interpersonal level, perceived parent-promoted intrinsic aspirations positively predicted mean levels of mastery-approach goals (β_{02} [parental IA] = 0.26, $SE = 0.06$, $p < .01$), effort

Table 5

Unstandardized Coefficient Predictors (and Standard Errors) of the Learning Correlates as a Function of Within-Grade and Between-Grade Changes, Personal Intrinsic and Extrinsic Aspirations (Intrapersonal Variation), Gender, and Perceived Parent-Promoted Intrinsic and Extrinsic Aspirations (Interpersonal Differences)

Variable	Mastery-approach goals	Performance-approach goals	Effort regulation	Test anxiety	Grades
Fixed effects					
Intercept, π_{00}					
Intercept, β_{00}	3.95 (0.07)	2.80 (0.09)	3.48 (0.07)	2.98 (0.07)	71.37 (0.66)
Gender, β_{01}	0.21** (0.08)	0.01 (0.10)	0.17* (0.08)	0.14 (0.08)	3.59** (0.77)
Parental IA, β_{02}	0.26** (0.06)	-0.18* (0.07)	0.25** (0.06)	-0.09 (0.07)	2.46** (0.56)
Parental EA, β_{03}	-0.05 (0.04)	0.32** (0.06)	-0.10* (0.05)	0.17** (0.05)	-1.51** (0.44)
Personal IA slopes, π_{10}					
Intercept, β_{10}	0.25** (0.10)	-0.04 (0.13)	0.07 (0.10)	-0.02 (0.09)	-0.34 (0.65)
Gender, β_{11}	0.10 (0.12)	0.16 (0.15)	0.19 (0.12)	0.09 (0.11)	0.76 (0.78)
Parental IA, β_{12}	-0.04 (0.09)	-0.27* (0.11)	0.04 (0.08)	0.05 (0.09)	0.72 (0.54)
Parental EA, β_{13}	0.13 (0.08)	0.06 (0.10)	-0.02 (0.07)	-0.08 (0.08)	-1.26** (0.47)
Personal EA slopes, π_{20}					
Intercept, β_{20}	0.01 (0.08)	0.33** (0.11)	0.14 (0.08)	0.21** (0.08)	-0.31 (0.51)
Gender, β_{21}	-0.05 (0.09)	0.02 (0.13)	-0.23* (0.09)	-0.12 (0.10)	-0.05 (0.62)
Parental IA, β_{22}	0.01 (0.07)	-0.01 (0.10)	0.05 (0.07)	-0.11 (0.09)	-0.79 (0.52)
Parental EA, β_{23}	-0.06 (0.06)	0.05 (0.07)	0.02 (0.05)	0.15* (0.06)	-0.41 (0.36)
Within-grade slopes, π_{30}					
Intercept, β_{30}	-0.09 (0.06)	-0.28** (0.08)	0.01 (0.06)	-0.13* (0.05)	-3.69* (0.39)
Gender, β_{31}	-0.01 (0.06)	0.13 (0.09)	0.02 (0.07)	-0.10 (0.06)	0.34 (0.48)
Parental IA, β_{32}	-0.06 (0.05)	-0.01 (0.06)	-0.15** (0.05)	0.02 (0.06)	-0.60 (0.37)
Parental EA, β_{33}	-0.03 (0.04)	-0.04 (0.06)	0.02 (0.04)	0.01 (0.04)	0.14 (0.32)
Grade transition slopes, π_{40}					
Intercept, β_{40}	-0.30** (0.08)	-0.04 (0.12)	-0.26** (0.08)	-0.23* (0.11)	-1.66** (0.56)
Gender, β_{41}	-0.07 (0.09)	0.03 (0.13)	0.11 (0.09)	-0.02 (0.12)	-0.66 (0.64)
Parental IA, β_{42}	0.00 (0.06)	0.24** (0.09)	-0.16 (0.06)	0.04 (0.08)	-0.86* (0.43)
Parental EA, β_{43}	-0.12* (0.05)	-0.10 (0.07)	-0.05 (0.05)	-0.04 (0.06)	-0.12 (0.35)
Variance components					
Random effects					
Intercept, r_{0j}	0.35**	0.47**	0.43**	0.47**	47.39**
IA slopes, r_{1j}	0.13**				
Year effect slopes, r_{1j}		0.15**		0.14**	
Level 1, e_{ij}	0.20	0.44	0.23	.26	11.72
Auxiliary statistics					
Variance within-student	41.10%	60.30%	36.09%	42.03%	23.69%
Intrapersonal variance explained	18.65%	22.22%	7.10%	16.75%	23.96%
Interpersonal variance explained	8.70%	10.32%	4.92%	1.89%	10.07%

Note. IA = Intrinsic Aspirations; EA = Extrinsic Aspirations; Gender was dummy-coded (0 = male; 1 = female).

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

regulation (β_{02} [parental IA] = 0.25, $SE = 0.06$, $p < .01$), and grades (β_{02} [parental IA] = 2.46, $SE = 0.56$, $p < .01$) and negatively predicted mean levels of performance-approach goals (β_{02} [parental IA] = -0.18, $SE = 0.07$, $p < .05$). In contrast, perceived parent-promoted extrinsic aspirations negatively predicted mean levels of effort regulation (β_{03} [parental EA] = -0.10, $SE = 0.05$, $p < .05$) and grades (β_{03} [parental EA] = -1.51, $SE = 0.44$, $p < .01$) and positively predicted mean levels of performance-approach goals (β_{03} [parental EA] = 0.32, $SE = 0.06$, $p < .01$) and test anxiety (β_{03} [parental EA] = 0.17, $SE = 0.05$, $p < .01$). These findings support Hypothesis 2b.

In addition, females reported a higher level of mastery-approach goals (β_{01} [gender] = 0.21, $SE = 0.08$, $p < .01$), effort regulation (β_{01} [gender] = 0.17, $SE = 0.08$, $p < .05$), and grades (β_{01} [gender] = 3.59, $SE = 0.77$, $p < .01$) than males. Regarding time effects, a negative grade transition effect was found for mastery-approach goals (β_{40} [grade transition] = -0.30, $SE = 0.08$, $p < .01$), effort regulation (β_{40} [grade

transition] = -0.26, $SE = 0.08$, $p < .01$), test anxiety (β_{40} [grade transition] = -0.23, $SE = 0.11$, $p < .01$), and grades (β_{40} [grade transition] = -1.66, $SE = 0.56$, $p < .01$). These findings imply that students focused less on mastery-approach goals, reported less effort-regulation and more test anxiety, and obtained lower grades when they moved from the lower to the upper grade. A similar decline within the same school year was found for performance-approach goals (β_{30} [within-grade] = -0.28, $SE = 0.08$, $p < .01$), test anxiety (β_{30} [within-grade] = -0.13, $SE = 0.05$, $p < .05$), and grades (β_{30} [within-grade] = -3.69, $SE = 0.39$, $p < .05$).

Interestingly, a cross-level interaction was found between grade transition effects and perceived parent-promoted extrinsic aspirations for mastery-approach goals (β_{43} [parental EA] = -0.12, $SE = 0.05$, $p < .05$). Interpretation of this finding suggests that the decline of mastery-approach goals from the one grade to the next one was steeper for students perceiving their parents to promote extrinsic aspirations. In addition, a cross-level interaction effect was found between perceived parent-promoted intrinsic aspira-

tions and grade transition for performance-approach goals (β_{42} [parental IA] = 0.24, $SE = 0.09$, $p < .01$) and grades (β_{42} [parental IA] = -0.86, $SE = 0.43$, $p < .05$) and between perceived parent-promoted intrinsic aspirations and within school year time effects for effort regulation (β_{32} [parental IA] = -0.15, $SE = 0.05$, $p < .01$). These findings suggest that students who perceived their parents to promote intrinsic aspirations tended to report stronger pursuit of performance-approach goals and lower grades as they moved from one grade to the next one; these students tended to report also less effort regulation within the same school year.¹

Hypothesis 3: Interaction Between Personal and Perceived Parental Aspiration Profiles

Cross-sectional analyses. First, the personal and perceived parent-promoted aspiration clusters were cross-tabulated to form a 3×3 cell matrix. As indicated by the frequencies in Table 6, a significant relation between personal and the corresponding perceived parent-promoted groups was obtained, Cramer's $V(575) = .371$, $p < .01$. We began with investigating to what extent students with a similar ($n = 332$; 57.5%) versus dissimilar ($n = 245$; 42.5%) personal and perceived parent-promoted aspiration profile (i.e., match vs. mismatch) differed in the learning outcomes by performing a MANOVA, thereby inserting the match versus mismatch characteristic as the independent variable. The MANOVA was nonsignificant, Wilk's $\Lambda = .989$, $F(5, 558) = 1.27$, $p = .27$, *ns*, suggesting that students with a matching, relative to a mismatching, aspiration profile did not display better learning outcomes.

In subsequent analyses, we retained only those students who were classified into the corresponding (i.e., matching) perceived parent-promoted aspiration clusters to examine whether any differences would emerge among these three matching groups. The MANOVA was significant: Wilk's $\Lambda = .802$, $F(10, 636) = 7.44$, $p < .01$, multivariate $\eta^2 = .11$, and follow-up ANOVAs with Bonferroni correction indicated significant group differences in all learning outcomes, except for test anxiety. As shown in Table 7, post hoc Tukey comparisons revealed that students in the relatively high intrinsic and high-high aspiration match groups did not differ in terms of mastery-approach goals and effort regulation, but scored significantly higher than students in the relatively moderate intrinsic aspiration match group. Further, students of the high-high aspiration match group more strongly endorsed performance-approach goals than students in the two other matching groups. Finally, students in the relatively high intrinsic match group had higher grades than students of the other two groups, which did not differ from each other. Collectively, these comparisons provided no substantial support for the interaction hypothesis (Hypothesis 3a), as, first, matching and nonmatching groups did not differ from each other and, second, there were differences in the learning outcomes between the three matching groups.

Longitudinal analyses. To examine from the variable-centered approach any likely interaction (i.e., match or mismatch) effects between personal and perceived parent-promoted aspirations across time, we revisited the multilevel models and checked whether (the interpersonal predictors of) perceived parent-promoted aspirations would moderate the (intrapersonal) relationship between personal intrinsic and extrinsic aspirations and the academic correlates. These results failed to provide systematic

support for a moderating role of perceived parental promotion of aspirations (see Table 5). Specifically, no cross-level (i.e., moderating) effect was found for mastery-approach goals or for effort regulation. Notably, perceived parent-promoted extrinsic aspirations moderated the relation between personal extrinsic aspirations and test anxiety (β_{23} [parental EA] = 0.15, $SE = 0.06$, $p < .05$) and the relation between personal intrinsic aspirations and grades (β_{13} [parental EA] = -1.26, $SE = 0.47$, $p < .01$). Interpretation of these findings suggests an even stronger positive relation of personal extrinsic aspirations to test anxiety and a negative relation of personal intrinsic aspirations to grades for students who perceived that their parents promoted extrinsic aspirations. Thus, the positive (i.e., harmful) relation between personal extrinsic aspirations and test anxiety gets amplified in case parents are perceived to promote such aspirations; also, the positive relation between intrinsic aspirations and grades gets canceled out and even becomes negative when parents are perceived to promote extrinsic aspirations. Finally, perceived parent-promoted intrinsic aspirations were found to moderate the relationship between personal intrinsic aspirations and performance-approach goals (β_{12} [parental IG] = -0.27, $SE = 0.11$, $p < .05$), suggesting a negative covariation between personal intrinsic aspirations and performance-approach goals for students who reported that their parents favored intrinsic aspirations.

Discussion

Although abundant research has examined the relation of individuals' aspirations to well-being and adjustment (Kasser, 2002b), their relation to learning outcomes has received less attention. Moreover, few studies have taken a developmental approach to investigate the relation between change in aspirations and change in outcomes, especially among adolescents whose system of values has not been fully crystallized yet (Erikson, 1968; Schwartz et al., 2011). Further, while past work in the parenting literature has considered parenting style (e.g., Baumrind, 1966) or parenting dimensions like autonomy-support, responsiveness or control (e.g., Grolnick & Ryan, 1989), this study focused not so much on *how* parents interact with their children, but on what kind of values (i.e., aspirations) they try to transmit to their offspring, as perceived by children. The present research aimed to fill these lacunae thereby employing both a person-centered and variable-centered analytical strategy to examine a set of distinct, yet interrelated, cross-sectional and longitudinal hypotheses. The discussion is structured around the two employed analytical approaches.

Within-Person Configurations of Intrinsic and Extrinsic Aspirations

Rather than relying on relatively arbitrary methods to classify students in different groups (i.e., median-split analysis), we used

¹ As grades reflected the performance that students have attained in the previous trimester, the between-grade effects (i.e., T2 — T3 or β_{40}) represented in fact the within-grade changes in grades (the grades that students have attained in T1 and T2); likewise, the cross-level effects of perceived parent-promoted intrinsic aspirations and between-grade effects (β_{42}) reflected within-grade (rather than between-grade) changes; also, the within-grade effects represented changes in grades as students moved from the previous grade to the current one.

Table 6

Cross-Tabulation of Personal and Perceived Parent-Promoted Intrinsic and Extrinsic Aspiration Groups

Perceived parental I-E aspiration groups	Personal I-E aspiration groups			Cramer's V
	Relatively high intrinsic (<i>n</i> = 210)	Relatively moderate intrinsic (<i>n</i> = 163)	Relatively high-aspiring (<i>n</i> = 204)	
Relatively high intrinsic (<i>n</i> = 175)	105 (41.3)	33 (-16.4)	37 (-24.9)	.371**
Relatively moderate intrinsic (<i>n</i> = 205)	55 (-19.6)	105 (47.1)	45 (-27.5)	
Relatively high-aspiring (<i>n</i> = 197)	50 (-21.7)	25 (-30.7)	122 (52.4)	

Note. I-E = intrinsic-extrinsic. Adjusted standardized residuals appear in parentheses following group frequencies.

** $p < .01$.

cluster analysis to explore if different combinations of personal intrinsic and extrinsic aspirations naturally occur among adolescents. Our research revealed three distinct aspiration profiles: a relatively high intrinsic aspiration group consisting of students preferring intrinsic above extrinsic aspirations, a relatively moderate intrinsic aspiration group including students who adopt moderate levels of intrinsic and extrinsic aspirations, and a relatively high-high aspiration group encompassing students who strongly endorse both types of aspirations. Cluster-comparisons indicated that students in the relatively high intrinsic group showed the best pattern of learning outcomes. Eventually, it seems logical to infer that students in the relatively high intrinsic aspiration group obtain better grades compared to students with weaker intrinsic aspirations as the latter students fall behind in learning efforts. Also, students with high intrinsic aspirations obtained better grades than students who concomitantly endorse intrinsic and extrinsic aspirations, presumably because the latter students are more anxious and ineffective in regulating their learning efforts, which may be explained by their more pronounced competitive orientation. Thus, the combination of high intrinsic and low extrinsic aspirations makes the difference in learning outcomes that are considered to represent important markers of adaptive school functioning. These findings conform to the goal-content theory (Deci & Ryan, 2000; Vansteenkiste et al., 2010) and confirm our hypothesis that life aspirations not only relate to well-being in general but also to school functioning in particular, presumably because intrinsic aspirations are more attuned to the basic psychological needs for autonomy, competence, and relatedness (Kasser & Ryan, 1993).

Moving to aspirations that adolescents believe their parents make salient to them, the present research revealed three similar profiles, with the intrinsic aspiration group displaying the most

desirable learning outcomes. Interestingly, although previous research has indicated that the aspirations that are made salient by parents relate to the endorsement of the respective aspirations by their offspring (Duriez, 2011), the present findings indicated that approximately 40% of the students had a dissimilar personal and perceived parent-promoted aspiration profile. Subsequent analyses indicated that students with a similar (i.e., a matching) versus dissimilar (i.e., mismatching) personal and perceived parental aspiration profile did not differ in the studied outcomes, which indicates that a personal-parental profile fit cannot by itself promote better learning outcomes. This finding again aligns with goal-content theory (Deci & Ryan, 2000; Vansteenkiste et al., 2010), which indeed would predict that the content of the pursued and promoted aspirations is more crucial than their degree of fit. Indeed, among the three matching groups, students who found themselves in an intrinsic match situation displayed better outcomes compared with students with a high-high or relative low aspiration matching profile.

Temporal Relations Between Intrinsic and Extrinsic Aspirations and Learning Outcomes

The longitudinal analyses indicated that intrapersonal fluctuation in intrinsic aspirations was linked with mastery strivings, while intrapersonal fluctuation in extrinsic aspirations was associated positively with test anxiety and performance-approach goals and negatively (but only for females) with effort regulation. Further, the longitudinal analyses highlighted the key role of parental aspiration promotion, as perceived parent-promoted intrinsic and extrinsic aspirations were, respectively, positive and negative predictors of mean levels of desirable academic outcomes. Perhaps

Table 7

Significance Testing of Cluster Differences in the Correlates for Students With a Match Between Their Own Personal and Perceived Parent-Promoted Aspiration Profile

Correlate	Relatively high intrinsic match group (<i>N</i> = 101)		Relatively moderate intrinsic match group (<i>N</i> = 104)		Relatively high-aspiring match group (<i>N</i> = 120)		<i>F</i> (2, 322)	η^2
	<i>M</i>	<i>SD</i>	<i>M</i>	<i>SD</i>	<i>M</i>	<i>SD</i>		
M-ap goals	4.32 _a	0.73	3.72 _b	0.74	4.21 _a	0.72	20.03**	.11
P-ap goals	2.43 _a	0.93	2.68 _a	0.90	3.11 _b	1.10	13.40**	.08
Effort regulation	3.84 _a	0.80	3.40 _b	0.77	3.67 _a	0.84	8.07**	.05
Test anxiety	2.95 _a	0.92	3.00 _a	0.81	3.23 _a	0.93	3.17*	.02
Grades	76.55 _a	9.14	72.92 _b	8.07	73.31 _b	8.04	5.82**	.04

Note. M-ap goals = Mastery-approach goals; P-ap goals = Performance-approach goals. Means in the same row with different subscripts significantly differ according to the Tukey test ($\alpha = .05$).

one might be tempted to think that favoring the extrinsic aspirations of popularity, attractiveness, and wealth might have some gains; for instance, it might mobilize a student to try harder or to get better grades to fulfill such aspirations. One might also argue that such gains could offset the likely costs (e.g., adoption of performance-approach goals, increased anxiety during exams) that are accompanied with the promotion of extrinsic aspirations. However, our findings hardly provide support for such a cost-effect reasoning because perceived parent-promoted extrinsic aspirations failed to predict any single positive outcome, while they were still positive predictors of test anxiety and the more controversial performance-approach goals (Brophy, 2005). Further, perceived parent-promoted extrinsic aspirations strengthened the positive (and harmful) relation between personal extrinsic aspirations and test anxiety, while they turned the otherwise nonsignificant relation between personal intrinsic aspirations and grades into a negative one. Also, they aggravated students' decreases in mastery strivings as students move to a higher grade, suggesting that social contexts that favor extrinsic aspirations have a persisting negative effect on students' academic functioning.

In contrast, perceived parent-promoted intrinsic aspirations appear to have a lasting positive effect on students' adaptive functioning. For instance, the relation between personal intrinsic aspirations and performance-approach goals was negative for students perceiving their parents to promote intrinsic aspirations. Yet, these students also endorsed more performance-approach goals and performed worse when they changed grade level; they also reported less effort regulation within the same schooling year. At first glance, these findings denote a negative effect of social contexts that encourage intrinsic aspirations, but, when all intrapersonal and interpersonal predictors are jointly considered, the net effect of perceived parent-promoted intrinsic aspirations remains positive. Possibly, regression toward the mean (Nesselrode, Stigler, & Baltes, 1980) may have caused these unexpected cross-level effects, as the initially estimated mean levels pinpoint that performance-approach goals were lower and effort regulation and grades were higher for students who perceived their parents to favor intrinsic aspirations.

Although not of primary interest, our research uncovered some gender and time effects. Regarding gender, extrinsic aspirations were negatively associated with effort regulation for females but not for males. Also, consistent with some previous studies (e.g., Kenney-Benson, Pomerantz, Ryan, & Patrick, 2006), females appeared to focus more on mastery-approach goals, to regulate better their efforts, and to obtain higher grades compared with males. Concerning the changes across time, our research revealed that students reported lower levels in adaptive (i.e., mastery-approach goals, effort regulation, and grades), controversial (i.e., performance-approach goals), and maladaptive (i.e., test anxiety) motivational processes and outcomes across time, a finding that perhaps suggests a general decline in students' interest and commitment at school as they grow older (Lepper, Corpus, & Iyengar, 2005; Pintrich, 2000a; Yeung, Lau, & Nie, 2011).

Implications and Future Research

The present article denotes that intrinsic and extrinsic aspirations, which represent more distant future-oriented goals (Kasser & Ryan, 1993), relate to the middle-range goals, such as achieve-

ment goals (see Pintrich, 2000b; Vansteenkiste et al., 2007; for a similar view, see Vallerand, 1997). Future intrinsic and extrinsic aspirations thus may be conceived of as energizers of more immediate achievement goals. Presumably, researchers coming from the achievement goal tradition could enrich the hierarchical model (Elliot, 1999) by including these aspirations next to other already tested antecedents of achievement goals (e.g., need for achievement and fear of failure). Future research may also inform us about the sequence of relations between type of life aspirations and avoidance achievement goals, as the present work was limited to approach achievement goals. For instance, one may wonder whether mastery-avoidance goals are more strongly associated with intrinsic aspirations (because they both share the mastery component) or extrinsic aspirations (because a focus on avoiding failure may entail also contingent self-worth concerns). Also, we should note that more immediate extrinsic aspirations might serve as a means to attain future intrinsic goals (Lens, Simons, & Dewitte, 2002)—for example, when a person aims to make a lot of money to help other people. In such instances however, the ostensibly extrinsic aspirations would take an "intrinsic" meaning and thus would be better conceived as intrinsic rather than extrinsic aspirations. Obviously, this is another research direction which deserves further investigation in the future.

From a methodological standpoint, the present research indicates how dimensional and person-centered analytical approaches can complement each other in addressing a common set of hypotheses. However, we need to underscore two additional issues. First, as we assessed parent-promoted aspirations through students' reports, it is unknown whether students' perceptions were distorted by their own aspirations. Although previous research has shown parents' reports and children's perceptions to correlate (Duriez, 2011), future studies need to replicate the present findings by involving parents as an independent source of information. Second, similar to most of the previous studies (e.g., Grouzet et al., 2005), participants were found to ascribe higher importance to intrinsic than to extrinsic aspirations. Future research would do well to detect a group of students displaying low intrinsic and high extrinsic aspiration scores in the absolute sense. Such a group could then be compared against the relatively high-high group to inform us whether extrinsic aspirations have negative implications on schooling and whether concomitant endorsement of intrinsic aspirations partly buffers the likely negative effects of extrinsic aspirations. Probably, detecting individuals with actual high extrinsic relative to intrinsic aspirations requires sampling people from contexts where extrinsic aspirations are strongly emphasized (e.g., business and law schools; Kasser & Ahuvia, 2002; Sheldon & Krieger, 2004).

From a practical viewpoint, the present study shows that fostering intrinsic aspirations also has multiple advantages in a specific life domain (i.e., schooling). Parents, teachers, and education policy makers may need to bear in mind the beneficial effects of intrinsic aspirations and thus try to highlight the virtue of an inward orientation (Kasser & Ryan, 1996) or to provide a nurturing and need-supportive climate that supports the formation of intrinsic aspirations. In contrast, endorsement of extrinsic aspirations, next to intrinsic ones, seems to add little, if anything, to students' academic functioning, suggesting that "less is sometimes more" (Vansteenkiste, Simons, Lens, Soenens, et al., 2004). Probably, this is because intrinsic and extrinsic aspirations lie on opposite,

competing poles of a continuum such that the pursuit of one type of aspiration interferes with the pursuit of the other type of aspiration (Grouzet et al., 2005). Therefore, we need to do more than simply promoting intrinsic aspirations. To fully actualize the benefits of intrinsic aspirations, we may need to downplay the importance of extrinsic aspirations as the latter seem to reflect extrinsic signs of one's self-worth (Kasser & Ryan, 1996). Obviously, this is a difficult endeavor, especially in Western societies, where materialism and consumerism prevail (Kasser, 2002a) and where extrinsic values relative to intrinsic ones are on the rise (Twenge, Campbell, & Freeman, 2012).

Limitations

Our study has several limitations, three of which we briefly mention here. First, caution is required when generalizing the present findings into other cultures, population samples (e.g., vocational students), and academic outcomes. Second, to examine to what extent personal and perceived parent-promoted aspirations interact to each other we relied on a trimmed sample (67.5% and 59.4%, of the entire sample, respectively) that was found to differ slightly from students who did not report perceived parent-promoted aspirations.² Consequently, a potential selection bias might have occurred for these analyses. Finally, as we exclusively relied on students' reports, our approach may have introduced mono-method bias. Certainly, future studies need to replicate and extend the present findings by using parents as an independent source of informants about the aspirations that they try to convey to their children.

Conclusion

Not all aspirations (i.e., life goals) seem to carry equal benefits (Ryan, Sheldon, Kasser, & Deci, 1996). The type of aspirations (i.e., intrinsic and extrinsic) students endorse and bring to school relate not only to their well-being (Kasser, 2002b) but also to their academic functioning. The present results suggest that students might benefit more if they focus exclusively on intrinsic aspirations at the expense of extrinsic ones, that the perceived type of parental aspirations relates to students' academic functioning and that the undesirable academic correlates associated with extrinsic aspirations are not offset if students perceive their parents to emphasize a similar set of extrinsic aspirations.

² Protected contrast tests in which the three clusters were compared to a group consisted of missing data (see Cohen et al., 2003) showed that the group with missing data in perceived parent-promoted aspirations was somewhat inferior compared to the relatively high intrinsic group (as students in this group scored higher in extrinsic aspirations and lower in all the others outcomes except test anxiety). However, this group was similar to the other two groups as students in the missing data group reported more personal intrinsic aspirations than their counterparts in the relatively moderate intrinsic group and less personal extrinsic aspirations, mastery-approach goals, performance-approach goals, and effort regulation than the relatively high-aspiring perceived parent-promoted group.

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