Different Ways to Support and Thwart Autonomy:

Parenting Profiles and Adolescents' Career Decision Making

Jiseul Sophia Ahn, André Plamondon, & Catherine F. Ratelle

Faculty of Educational Sciences, Université Laval

This is a post-peer-review, pre-copyedit version of the following manuscript:

Ahn, J.S., Plamondon, A., & Ratelle, C.F., Duchesne, S., Litalien, D., & (in press). Different ways to support and thwart autonomy: Parenting profiles and adolescents' career decision-making. *Journal of Family Psychology*. https://doi.org/10.1037/fam0000982

Author Note

This study was supported by the Canada Research Chair Program and the Social Sciences and Humanities Research Council of Canada (grants # 410-2010-0902 and 435-2013-0467). The authors have no conflict of interest to disclose. The ideas and data appearing in the manuscript have not been presented nor disseminated prior to the publication at the Journal of Family Psychology.

Data is available upon request to the third author (C.F.R.). Study materials including the analysis syntaxes can be found in the Online Supplemental Materials. The study is not preregistered.

Correspondence concerning this article should be addressed to Jiseul Sophia Ahn, Department of Foundation and Practices in Education, Faculty of Educational Sciences, Université Laval, Québec, G1K 7P4, Canada. Email: jee-seul.ahn.1@ulaval.ca

Abstract

Grounded in self-determination theory, this study aimed to (1) identify profiles of parental autonomy support and control and (2) examine how these profiles predict indicators of adolescents' career development (i.e., autonomy and competence in career exploration, and indecision). To this end, we used three annual waves of data covering the postsecondary transition: the last two years of secondary school (T1 and T2) and one year after graduation (T3). The sample included 637 French-Canadian adolescents (54% girls; M_{age} at T1 = 14). Latent profile analyses were conducted to identify parenting profiles at T1 and T2, which were then associated with the indicators of career development at T2 and T3, respectively, while controlling for their autoregressive effects and sociodemographic information. Four comparable profiles were identified at both waves (i.e., *Autonomy Supported*, *Generally Controlled*, *Mixed*, and *Guilt Induced*), with a fifth profile (i.e., *High Expectations*) emerging only at T2. As expected, *Autonomy Supported* adolescents reported the highest levels of autonomy and competence, and the lowest levels of indecision at both T2 and T3. The expected maladaptive nature of the *Generally Controlled* profile, however, was found only at T3, when this profile of adolescents became clearly differentiated from the autonomy supported profile on their career development outcomes. Regardless of the saliency of one specific controlling strategy, parental control hampered adolescents' career development, undermining autonomy and competence in career decision making. These findings reiterate the benefits of autonomy support and the costs of parental control in adolescents' career development particularly in the long run.

Keywords: Parental autonomy support and control, adolescents' career development, postsecondary transition, latent profile analysis, emerging adulthood

The postsecondary transition is a critical period in which adolescents make their first consequential career choice—whether to go into the job market or pursue higher education. Parents continue to be a proximal source of support and guidance in this process of decision making (Dietrich & Kracke, 2009). One important role played by parents is to support and encourage adolescents' autonomy. Parental autonomy support helps adolescents to be self-directed and confident in exploring their self and the world of work (Kush & Cochran, 1993; Taveira & Moreno, 2003), which in turn equips them with the necessary skills and knowledge to make an optimal career choice.

While robust findings speak for the benefits of parental autonomy support and detriments of parental control on adolescents' well-being and career development (Cordeiro et al., 2018; Guay et al., 2006; Guay et al., 2003; Katz et al., 2018; Luyckx et al., 2007), most studies used a variable-oriented approach, which may not accurately capture the reality of parents. In real life, *not all* parents are absolutely autonomy supportive, or controlling (Grolnick, 2002). Rather, parents differ in the degree to which they engage in autonomy-supportive and controlling behaviors, with some parents combining these two styles of parenting while others showing a clearer dominance of one style. Person-oriented approaches can capture how different parenting behaviors combine within a person, which in turn allows us to answer questions, which are of central interest to this study: Are there different ways to be autonomy-supportive and controlling? Are such differences associated differentially with indicators adolescents' career development?

Guided by self-determination theory, this study attempted to fill this gap by identifying parenting profiles based on combinations of dimensions underlying autonomy support and control. By focusing on the postsecondary transition, we aimed to derive practical and theoretical implications about how parents can support and guide adolescents in this critical period of career development.

Self-Determination Theory

Self-determination theory (SDT; Ryan & Deci, 2017) is a theory of motivation and human development that views basic psychological needs (for autonomy, competence, and relatedness) as essential “nutrients” to growth, wellness, and integration of the self. In this view, the satisfaction of these needs underpins the motivational foundation of optimal human development. That is, to the extent that adolescents experience need satisfaction in their career search, they are better positioned to actively explore and make a career choice that best expresses themselves (La Guardia, 2009). This optimal career development, however, does not happen in a vacuum but is heavily dependent on the quality of the social environment, one of which is their parents.

Parental autonomy support and control are two parenting styles that create a proximal context for adolescents’ need satisfaction and career development (Joussemet et al., 2008; La Guardia, 2009). Autonomy support creates a climate of understanding where adolescents are encouraged to explore and make a career choice in line with their personal values and interests (Assor et al., 2020). Its dimensions include (1) acknowledging the child’s feelings and perspective, (2) offering meaningful choices and opportunities for exploration and self-expression, and (3) providing rationales when making demands and implementing limits. In contrast, controlling parenting creates a climate of coercion where adolescents feel pressured to make a career choice that is in line with parents’ expectations. Its dimensions include (1) using external motivations for compliance (e.g., rewards or threats of punishment), (2) inducing guilt or shame, and (3) imposing performance pressures upon which depends parental love. An increasing number of studies consistently report associations between autonomy-related parenting and adolescent career developmental outcomes. When parents were autonomy-supportive, adolescents showed greater engagement in exploration and a stronger commitment to their career choices (Assor et al., 2020; Cordeiro et al., 2018; Luyckx et al., 2007); they also experienced greater autonomy toward career activities and choices (Guay et al., 2003; Katz et al., 2018). On the contrary, controlling parenting predicted chronic career indecision and low self-efficacy (Guay, 2006).

Person-Oriented Approach to Parenting

Despite the mounting literature on autonomy-supportive and controlling parenting, most of the prior studies employed a variable-oriented approach, which does not accurately capture the reality of parents. In real life, not all parents are absolutely autonomy supportive or controlling (Grolnick, 2002). Rather, parents differ in the degree to which they engage in autonomy-supportive and controlling behaviors, with some parents combining these two styles while others showing a clearer dominance of one style. At times, their well-meant intentions may come out—or are perceived by adolescents—as controlling. The variable-oriented approach, however, focuses on associations between variables and isolates the variance of autonomy support from the variance of controlling parenting to arrive at a single averaged estimate. While variable-oriented approaches can model co-occurrence of more than one parental behavior using interactions or moderations, they do so less efficiently when the goal of the study is to examine co-occurring patterns of *multiple* dimensions of parental behaviors within a person.

A person-oriented approach (Magnusson & Stattin, 2006) assumes that there are subgroups within a population that show heterogeneity in how a variable (e.g., autonomy support) relates to another (e.g., controlling parenting). For instance, in one group, two variables may be negatively associated, while in another group, they may show positive associations, thereby showing different directions of associations between the variables of interest. Moreover, the strength of the associations between the variables may differ by subgroups, with one group showing moderate associations, while another group showing weaker associations. Building upon this assumption, a person-oriented approach aims to group people based on how autonomy support and controlling parenting combine within a person as they naturally occur and co-occur.

Soenens et al. (2009)'s seminal work on a person-oriented approach to parenting found four profiles, which all showed contrasting patterns (negative associations) between autonomy support and controlling parenting. A recent study with Italian adolescents (Liga et al., 2018), however, showed a

slightly different picture. While two out of the four profiles showed contrasting patterns of autonomy support and control (i.e., high autonomy support and low control, and vice versa), the two other profiles showed an average level of autonomy support accompanied by different levels of control, one showing a moderately low level and another showing a moderately high level. Other studies on teaching styles in sport and classrooms found profiles similar to the ones reported in Liga et al.'s study, suggesting that these two behaviors can indeed co-occur (Amoura et al., 2015; Haerens et al., 2017; Matosic & Cox, 2014). One explanation for this co-occurrence is that some parents engage in a mixture of different autonomy-supportive and controlling behaviors. Recall that autonomy support and controlling parenting are two opposing interpersonal climates (of understanding and coercion), which are created by *specific* behaviors that parents manifest in their interaction with their adolescent child (e.g., providing rationales or using threats of punishment). Rather than using global levels, using dimensions of autonomy support and controlling parenting can help identify subgroups of parents displaying different ways of supporting and thwarting their child's autonomy.

Different ways to support and thwart autonomy

A recent study among primary school students (Levitt et al., 2020) identified clusters of parents characterized by different types of controlling parenting, namely internally and externally controlling behaviors. Internally controlling behaviors are a covert form of control that involves manipulating the child's inner world by inducing guilt or withdrawing love; externally controlling behaviors are overt forms of control that involves threats of punishment or promises of rewards. Consistent with previous studies, Levitt et al. found that children in the low control profile showed less internalizing and externalizing problems and more autonomous self-regulation compraed to those in the high contorl profile. An interesting finding was the comparison of the children in profiles high in all vs. high in some controlling behaviors, who did not show any systematic differences in their outcomes. While Levitt et al.'s study included controlling behaviors only, a cluster analysis on sports coaches' behaviors (Matosic &

Cox, 2014) included the controlling behaviors as well as the global level of autonomy support. Matosic & Cox found four clusters of coaches characterized by different combinations of autonomy support and controlling behaviors: one autonomy-supportive profile (high in autonomy support, low in all controlling behaviors), a mixed profile (that reported the same level of autonomy support but with average levels of controlling behaviors and a distinctly high level in the use of rewards), and one controlling profile (high in all controlling behaviors, and low in autonomy support). As expected, the autonomy-supportive profile showed the most optimal outcomes in need satisfaction and motivation qualities, followed by the Mixed profile, with the controlling profile showing the lowest levels. While autonomy support was not distinguished by its dimensions, the findings from this study suggest that autonomy support and controlling behaviors can co-occur in different combinations, and these combinations show differential associations to adolescent outcomes.

Despite some recent findings suggesting the unique role of fathers in adolescents' career choices (Dietrich et al., 2011; Soenens & Vansteenkiste, 2005), in this study, we examined *maternal* behaviors only as a proxy of parenting. The findings on the differential contributions of mothers and fathers on adolescents' career choices are not conclusive yet. Moreover, despite the increasing participation of fathers in childcare, mothers continue to play the primary role in providing help and care to their child (Statistics Canada, 2017). Given the complex and novel analyses in this study, we opted to focus on mothers who spend more time with their child and, hence, are expected to provide a more proximal context for adolescent development.

The Present Study

Two specific goals guided this study. The first goal was to identify distinct patterns in which specific behaviors of autonomy support and control combine. Based on findings from previous studies (Liga et al., 2018; Soenens et al., 2009), we expected to find at least two profiles that would show contrasting patterns of global autonomy support and control: one profile characterized by high

autonomy support and low control, and another profile characterized by high control and low autonomy support (Hypothesis 1). We also expected to find at least two additional profiles characterized by specific behaviors of autonomy support and control, reflecting different ways to support and thwart adolescents' autonomy (Hypothesis 2). More specifically, in line with extensive research about internally and externally controlling parenting (Soenens & Vansteenkiste, 2010; Levitt et al. 2020), we expected to find at least two profiles that are mainly characterized by internal and external controlling behavior, respectively, with different levels of autonomy-supportive behaviors. While no solid evidence exists to suggest different ways a parent supports autonomy, we would empirically test in an exploratory manner if two additional profiles would emerge reflecting the two subareas of autonomy support suggested by Aelterman et al. (2019)'s circumplex model of teachers' motivating style: participative (offering choices and inviting inputs from the child) and attuning (acknowledging feelings and providing rationales).

The second goal of the study was to compare indicators of adolescents' career development as a function of parenting profiles. One consistent finding from previous person-centered research (Soenens et al., 2009; Liga et al., 2018; Haerens et al., 2017; Amoura et al., 2015; Matosic & Cox, 2014) is that adolescents in highly autonomy supportive profiles showed optimal outcomes, compared to adolescents in highly controlling profiles. Based on this robust body of evidence, we expected that adolescents perceiving high autonomy support and low control would show optimal outcomes of career development, compared to adolescents perceiving low autonomy support and high control (Hypothesis 3). We also hypothesized that adolescents perceiving average levels of both autonomy support and control would show better outcomes than those perceiving high control (because of the buffering role of autonomy-supportive parenting) yet worse than those perceiving high autonomy support (because of the undermining role of controlling parenting; Hypothesis 4). However, we did not have specific hypotheses about how adolescents in profiles characterized by specific behaviors of autonomy support and control would compare on their outcomes (e.g., would adolescents in the high internal control fare

better or worse than those in the high external control profile?). Gender, academic achievement, and other sociodemographic variables (e.g., mother's educational level) were used as predictors of the obtained profiles and as control variables in the prediction of adolescent outcomes. This study was not preregistered.

Method

Participants and Procedure

Participants were French-Canadian adolescents who participated in a longitudinal study on the role of parents in adolescents' career decision making and postsecondary transition. The study followed adolescents, their mothers, and fathers when the adolescents were in Secondary 3 in the Quebec education system[1], corresponding to Grade 9 in other systems. The sample came from a random list of students provided by the Quebec Ministry of Education and is stratified based on gender, region of residence, type of school (private vs. public), and socioeconomic status. Of the 1,109 families who answered positively to the invitation to participate in the longitudinal study, 840 participated by having at least one member (i.e., mother, father, or adolescent) individually filling out an online questionnaire (paper format available) at least once over the 6 years of the study. Data collection occurred each Fall semester. Ethical approval was obtained from the Ethics Review Board of Université Laval. For this study, we used adolescent reports from Secondary 3 (Time 0; T0[2]), Secondary 4 (T1), Secondary 5 (T2), and one year after graduation (T3). Participants with data at least at one of the four time points were included in the analysis.

The sample included 637 adolescents (54% girls; M_{age} at T1 = 14.24 years, *SD* = .51). The majority spoke French at home (94%), attended a public school (78%), lived with both their parents (65%), and

[1] In Quebec, six years of elementary education is followed by five years of secondary education. Upon earning a high school diploma, students can either enter the job market or go to college or CEGEP (either for a 2-year pre-university program or a 3-year for technical program). College is prerequisite to admissions to university.

[2] Data from T0 were not included in the main analyses, but they were included in preliminary analyses to derive more reliable factor scores. Refer to the Data Analyses section for more details.

attended college at T3 (79%). Most mothers earned a high school diploma or more (95%) and the average family income ranged from $60,000 to $69,000, which compares to the average household income in the province of Quebec at the time of the data collection (Statistics Canada, 2013). The data is not publicly available, but only upon request to the third author (C.F.R.).

Measures

Maternal Autonomy Support and Control

Adolescent perception of maternal autonomy support (AS) and controlling parenting (CON) were assessed by the Perceived Parental Autonomy Support Scale at T1 and T2 (Mageau et al., 2015). This scale contains three subscales of AS and CON, respectively (with four items each subscale). AS subscales are (1) acknowledgment of child's feelings (ω = .87 and .82 at T1 and T2, respectively; e.g., "My mother is open to my thoughts and feelings even when they are different from hers."), (2) provision of choice (ω = .81 and .77; e.g., "My mother gives me many opportunities to make my own decisions about what I am doing."), and (3) provision of rationales for demands and limits (ω = .85 and .85; e.g., "When my mother asks me to do something, she explains why she wants me to do it."). CON subscales are (1) threats to punish (ω = .87 and .88; e.g., "When I refuse to do something, my mother threatens to take away certain privileges in order to make me do it."), (2) guilt induction (ω = .88 and .91; e.g., "When my mother wants me to act differently, she makes me feel ashamed in order to make me change."), and (3) performance pressures (ω = .85 and .88; e.g., "In order for my mother to be proud of me, I have to be the best."). Participants indicated the extent to which they agreed that each item described their mother, using a 7-point scale ranging from 1 (do not agree at all) to 7 (very strongly agree).

Adolescent Career Development Indicators

Autonomy in Career Exploration. At T2 and T3, adolescents completed the Career Decision-Making Autonomy Scale (Guay, 2005), a multidimensional scale assessing adolescents' four types of motivation toward career-related activities (i.e., intrinsic motivation and identified, introjected, and

external regulations) that can be grouped into two categories: (1) controlled motivation (16 items; ω = .94 and .93 at T2 and T3, respectively; e.g., “because somebody else wants me to do it or because I would get something from somebody if I do it—rewards, praise, or approval”; “because I would feel guilty and anxious if I did not do this activity”) and (2) autonomous motivation (16 items; ω = .91 and .89; e.g., “because I believe that this activity is important”; “for the pleasure of doing it”). Participants indicated the extent to which each item corresponds to reasons why they were engaging in various activities related to career exploration (e.g., find information on careers) using a 7-point scale ranging from 1 (does not correspond at all) to 7 (corresponds completely). The scores for items in each broad category were averaged to represent controlled and autonomous motivations.

Competence in Career Exploration. Adolescents completed the Short Form of the Career Decision-Making Self-Efficacy Scale at T2 and T3 (Betz et al., 1996), indicating the extent to which they felt confident in successfully completing the tasks necessary to make career decisions (25 items; ω = .96 and .93; e.g., “I am able to make a plan of my goals for the next 5 years.”) on a 5-point scale ranging from 1 (no confidence at all) to 5 (complete confidence). An average score was used for the analysis.

Career Indecision. Adolescents completed the Vocational Identity Scale at T2 and T3 (Holland et al., 1980), indicating the extent to which they were indecisive about their career decision (9 items; ω = .90 and .92; e.g., “I’m mixed up about this whole career choice issue”) using a 5-point scale ranging from 1 (doesn’t apply to me) to 5 (completely applies to me). An average score was used for the analysis.

Data Analyses

Missing Data

A longitudinal research design inevitably entails missing data across measurement points. Missing data rates varied across waves (i.e., 18%, 41%, 36%, and 64% for T0, T1, T2, and T3, respectively). Participants with available data at T3 were more likely to be girls, $\chi^2(1) = 10.259$, $p = .001$, $OR = 0.54$, and to live with two parents, $\chi^2(1) = 9.887$, $p = .002$, $OR = 0.57$. They were also more likely to

come from families with higher household income, $t(542) = -4.10$, $p < .000$, $d = 0.36$, and higher level of maternal education, $t(539) = -2.38$, $p < .000$, $d = 0.21$. Those who participated vs. dropped out at T3 did not show any statistically significant differences in the main variables of interest (parenting and career development outcomes). To avoid the loss of statistical power and reduce the bias that a listwise case deletion would induce, we used the full-information robust maximum likelihood (MLR) available in Mplus 8.3 (Muthén & Muthén, 1998-2017) to handle missingness in the dataset.

Preliminary Analysis: Bifactor Measurement Model of AS and Control

In person-oriented analysis, it is a recommended practice to test preliminary measurement models on the profile indicators (Morin et al., 2016). In this study, we estimated a bifactor model of parenting to model AS and CON. A bifactor model allows decomposition of the variance of AS and CON into two respective components: (1) a *global* factor capturing shared variance across all specific parenting behaviors, and (2) three *specific* factors capturing variance unique to each behavior (Morin et al., 2015). To illustrate, a global factor of AS (G-AS) would represent what is common across its three specific behaviors (i.e., for acknowledging feelings, giving choices, and providing rationales), whereas the three specific factors of AS (S-AS) would represent what is unique to the dimension (e.g., providing rationales), over and above the common variance shared with other dimensions (e.g., providing choices and acknowledging feelings). Estimating global and specific factors allows us to disentangle level effects (i.e., a person's tendency to be high or low across *all* dimensions) from shape effects (i.e., a person's tendency to be high or low on *one* specific dimension; Morin et al., 2016). This in turn contributes to identifying parenting profiles that may differ not only on the general level of AS and CON, but also on the salience of specific behaviors.

We first tested the longitudinal invariance of the first-factor CFA models of AS and CON, separately. We found evidence for configural, metric, and scalar invariance of both AS and CON first-order CFA models (see Section S1 of the Online Supplemental Materials for more details). Then, we

proceeded to estimate the bifactor measurement model while controlling for the nested nature of the data (i.e., data points nested within individuals) using the COMPLEX option in Mplus. The measurement model fit the data well, χ^2 (212) = 665.99, $p < .05$, CFI = .98, TLI = .97, RMSEA = .04, allowing for the derivation of factor scores, which were used as profile indicators (See Section S1 for more details).

Latent Profile Analyses (LPA)

Identifying an Optimal Profile Solution. Using the factor scores saved from the measurement models, we conducted a series of LPA (solutions including 1 to 6 latent profiles) for T1 and T2, separately. Analyses were conducted in Mplus 8.3 using 5,000 random starts, 200 iterations, and the 300 best solutions retained for final stage optimization. Models were estimated with MLR, which provides robust estimates correcting for non-normality and missing data.

The decision on the number of optimal profiles was guided by substantive meaning and theoretical conformity of the profiles (Marsh et al., 2009) as well as the statistical adequacy of the solution (Bauer & Curran, 2004). Some of the statistical indices that support this decision include the Akaike information criterion (AIC), the Consistent AIC (AICC), the Bayesian information criterion (BIC), the sample-size adjusted BIC (ABIC), the adjusted Lo, Mendell, and Rubin LRT (aLMR), and the Bootstrap likelihood ratio test (BLRT). A lower value on the AIC, AICC, BIC, and ABIC suggests a better fitting model, and a statistically significant *p* value on the aLMR and BLRT supports a model with one less profile. In cases where these indicators keep suggesting the addition of profiles without ever reaching a minimum, the indicators were graphically presented through elbow plots in which the plateau (i.e., the point after which the slope flattens) indicates the optimal number of profiles.

Comparing Adolescent Career Development Outcomes. An important assumption for estimating LPA models with predictors and outcomes is that the nature of the profiles should not be changed by the inclusion of these distal variables. To prevent profile shifting, we used the starting values from the final unconditional LPA solution and fixed them at the exact values before integrating

predictors and outcomes (Morin & Litalien, 2019). To test how adolescents' profile membership at T1 and T2 predicted their subsequent career development indicators one year later (at T2 and T3), we used the MODEL CONSTRAINT command in Mplus to systematically test mean-level differences across pairs of profiles (multivariate delta method; Raykov & Marcoulides, 2004). We also inspected the 95% CI of the estimates for overlaps. To substantiate the findings on the mean-level comparisons between profiles, standardized mean differences were used as an index of effect sizes (d = 0.10, 0.30, and 0.50, as small, medium, and large differences; Cohen, 1992). All outcome indicators were standardized, and the sociodemographic variables, achievement, and autoregressive effects of career development variables were statistically controlled for (See the Section S2 in the Online Supplemental Materials for the full description of the statistical controls). Analytical codes for the preliminary and main analyses are available in Section S3 in the Online Supplemental Materials.

Results

Identifying Profiles of Parenting

We ran a series of LPA using eight parenting factors derived from the measurement model: four AS factors (i.e., one G-AS and three S-AS) and four CON factors (i.e., one G-CON and three S-CON) for T1 and T2 (see Table 1 for the fit indices). Although the aLMR pointed to a 3-class solution, all the other indices kept decreasing with the addition of latent profiles. An elbow plot (in Figure S1 of the Online Supplemental Materials), however, showed the presence of a plateau around four to five profiles with a diminishing improvement after the 4- and 5-profile solutions. Based on this information, we decided to more carefully examine the 4-profile solution and the adjacent 3- and 5-profile solutions.

The 3- and 4-profile solutions were similar at both waves. In the 3-profile solution, there was one profile characterized by G-AS and two profiles characterized by distinct combinations of S-CON (i.e., *Generally Controlled* and *Mixed*). In the 4-profile solution, a well-defined, qualitatively distinct, and

theoretically meaningful profile of CON emerged (i.e., *Guilt Induced*). Thus, the 4-profile solution was deemed preferable relative to the 3-profile solution.

The 5-profile solution differed across waves. At T1, the 5-profile solution resulted in a fifth profile with few cases (1% of the sample) and was thus deemed inadmissible. At T2, the 5-profile solution resulted in a large profile (32%) characterized by a moderate level of performance pressures. The emergence of this profile at T2 (the last year of secondary school) made sense theoretically since this is the time when pressure for decision making is most intensified. Hence, the 4-profile solution was retained for T1 (see Figure 1, upper panel) and the 5-profile solution (see Figure 1, lower panel) for T2.

The first "Generally Controlled" profile included adolescents who perceived their mother as high in G-CON and low in G-AS (T1 = 27% of the sample; T2 = 14%). Its counterpart, the "Autonomy Supported" profile showed an opposite pattern, with adolescents reporting high maternal G- AS and low G-CON (T1 = 33%; T2 = 25%). The two other profiles characterized by configurations of specific dimensions were "Mixed" and "Guilt Induced": The *Mixed* profile (T1 = 20%; T2 = 17%) included adolescents who perceived their mother as average in G-AS and G-CON, but high in threats (S-CON) and moderately high in acknowledging feelings (S-AS), while slightly low in performance pressures (S-CON); the *Guilt Induced* profile (T1 = 20%; T2 = 12%) included adolescents whose mother was perceived as moderately high in G-CON, exceptionally high in guilt induction (S-CON), while low in G-AS and S-AS. At T2, the newly emerged "High Expectations" profile, which is average in all general and specific dimensions but with a marked elevation in performance pressures (S-CON), was the largest of the five profiles (T2 = 32%).

Comparing Adolescent Career Development Outcomes as a Function of Profiles

Four career development indicators were added to the final LPA solutions as covariates: autonomous motivations, competence, controlled motivations, and indecision. Profile memberships at T1 and T2 were associated with outcomes measured one year later at T2 and T3, respectively.

Integrating the four indicators, their autoregressive effects, sociodemographic variables (e.g., child's sex, age, mother's education), and self-reported school grades did not substantially change the size or the nature of the profiles. Figure 2 represents the profile-specific mean-level changes in the career development outcomes at both waves (see Table S5 for the estimates and the 95% CI; see Table S6 for the effect sizes of the between-profile differences and their statistical significance).

Time 2 Outcomes

Controlling for the T1 levels, change in the mean levels of adolescents' outcomes at T2 (the last year of secondary school) was compared as a function of T1 profile membership (see Figure 2, left panel). The mean-level increase in **autonomous motivations** was biggest in the *Autonomy Supported* profile (*AS*), followed by *Generally Controlled* (*GenCon*), then by *Mixed*, with the smallest increase in *Guilt Induced* (*Guilt*). The *AS* profile showed small to medium differences against the *Guilt* and *Mixed* profiles, d = 0.35 and 0.15, and a negligible difference against *GenCon*, d = 0.09. The *Guilt* profile showed small differences against *GenCon* and *Mixed*, d = 0.26 and 0.20. The only statistically significant difference was *Guilt* vs. *AS*, p = .039 (see Table S5 and S6 for more details). The mean-level increase in **competence** was bigger in *Mixed* and *AS* than in *GenCon* and *Guilt*. The differences between *Mixed* and *AS*, and between *GenCon* and *Guilt* are negligible, while all the other differences were moderate, d = 0.30–0.37. The only statistically significant differences were *GenCon* vs. *AS*, p = .041, and *Guilt* vs. *AS*, p = .043. The mean-level increase in **controlled motivations** was biggest in *Mixed*, followed by *GenCon* and *Guilt*, with the smallest increase in *AS*. *AS* showed a large difference against *Mixed*, d = 0.57, and moderate differences against *GenCon* and *Guilt*, d = 0.39 and 0.38. These differences were all statistically significant, *GenCon* vs. *AS*, p = .024; *Guilt* vs. *AS*, p = .033; and *Mixed* vs. *AS*, p = .013. The differences between *GenCon* and *Mixed*, and between *Guilt* and *Mixed*, were small, d = 0.19 and 0.19, and not statistically significant. The mean-level increase in **indecision** was bigger in *Guilt* and *GenCon*

than in *Mixed* and *AS*. The differences between the higher indecision profiles (*Guilt* and *GenCon*) and lower indecision profiles (*Mixed* and *AS*) were small, *d* = 0.14–0.19, and were not statistically significant.

Time 3 Outcomes

Controlling for the T2 levels, change in the mean levels of adolescents' outcomes at T3 (after the postsecondary transition) were compared as a function of T2 profile membership (see Figure 2, right panel). The mean-level increase in **autonomous motivations** was biggest in the *Autonomy Supported* profile (*AS*) and the new *High Expectations* profile (*Expect*), followed by *Guilt Induced* (*Guilt*) and *Mixed*, with the smallest change in *Generally Controlled* (*GenCon*). *Expect* and AS, these two comparable profiles showed moderate differences against *GenCon*, *d* = 0.42 and 0.40, and small differences against *Guilt* and *Mixed*, *d* = 0.11–0.21. *GenCon* showed small differences against *Guilt* and *Mixed*, *d* = 0.29 and 0.22. However, none of the differences were statistically significant. **Competence** followed a similar pattern. The mean-level increase in competence was biggest in *AS*, followed by *HighExpect*, then by *GenCon* and *Guilt*, with the smallest increase in *Mixed*. *AS* showed moderate differences against all profiles, *d* = 0.35–0.49, except for a small difference against *HighExpect*, *d* = 0.12. *HighExpect* showed small to moderate differences against *GenCon*, *Guilt*, and *Mixed*, *d* = 0.27–0.37. The differences between these three latter profiles were small to negligible, *d* = 0.04–0.14). The only statistically significant difference was *Mixed* vs. *AS*, *p* = .031. The mean-level increase in **controlled motivations** was highest in *GenCon*, followed by *Guilt*, then by *Mixed*, then by *HighExpect*, with the smallest increase in *AS*. *AS* showed large differences against *GenCon* and *Guilt*, *d* = 0.74 and 0.59, and small to moderate differences against *Mixed* and *HighExpect*, *d* = 0.28 and 0.46. *GenCon* showed moderate differences against *Mixed* and *HighExpect*, *d* = 0. 28 and 0.46, and a small difference against *Guilt*, *d* = 0.15. The differences between *GenCon*, *Guilt*, and *HighExpect* were small to moderate, *d* = 0.13–0.31. The only statistically significant differences were between AS, on one hand, and *GenCon*, *Guilt*, and *HighExpect*, on the other hand, *p* = .018, .034, and .030, respectively. The mean-level increase in **indecision** was

biggest in *GenCon*, followed by *Mixed*, *Guilt*, and *GenCon*, *Guilt*, and *HighExpect*, with the smallest increase in *AS*. *GenCon* showed a large difference against *AS*, $d = 0.71$, and moderate differences against all the other profiles, $d = 0.34–0.44$. *AS* showed small to moderate differences against *Guilt*, *Mixed*, and *HighExpect*, $d = 0.27–0.37$. Differences between these three latter profiles were small to negligible, $d = 0.01–0.11$. The only statistically significant differences were GenCon vs. AS, $p = .008$, and Mixed vs. *AS*, $p < .001$.

Discussion

The purpose of this study was to examine different ways by which mothers support and thwart adolescents' autonomy, and how such manifestations of autonomy support and control relate to adolescents' career decision making. This study builds on existing studies using the person-oriented approach (Levitt et al., 2020; Liga et al., 2018; Matosic & Cox, 2014; Soenens et al., 2009) in two significant ways. First, this study took into account both the global levels and the specific dimensions of autonomy support and controlling parenting, using a bifactor modeling. This methodological approach allowed for the identification of subgroups of parents who engage in different controlling behaviors (e.g., internal vs. external control), a finding that can be useful in future parent-targeted interventions. Second, this study focused on adolescents' career-related outcomes, an aspect of adolescent development that is less studied but is becoming increasingly important (Savickas, 2013). We examined their level of indecision as well as the quality of their motivations—how autonomous (vs. controlled) and competent they feel—toward career decision making. While controlling for their autoregressive effects (their initial level) and other sociodemographic variables, we examined how membership in the parenting profile predicted the *change* in the mean level of the aforementioned career outcomes. Lastly, this study zoomed in on the postsecondary transition (i.e., one year before and after the secondary school graduation) to empirically test the parental contributions during this critical period of adolescent career development.

Are There Different Ways to Support and Thwart Autonomy?

Based on global and specific dimensions of autonomy support and controlling parenting, four comparable profiles emerged during the last two years of secondary school (T1 and T2). In line with Hypothesis 1, two of the four profiles were characterized by global levels of autonomy support and control: *Generally Controlled* and *Autonomy Supported*. The next two profiles were characterized by combinations of specific dimensions of autonomy support and control: *Guilt Induced* (high in guilt-induction) and *Mixed* (moderately high in threats and acknowledging of feelings). A fifth profile emerged only at the last year of secondary school (T2): *High Expectation* (moderately high in performance pressures only). These findings lend partial support to Hypothesis 2: While we identified profiles reflecting different ways that mothers are controlling, we did not find any profiles reflecting different patterns of autonomy support, consistent with the findings from Matosic and Cox's (2014) study on coaches. This finding points to a fundamental difference in the origin of these two parenting styles.

Most of the variance in the specific autonomy-supportive behaviors are captured by its global factor (see Table S1 in the Online Supplemental Materials), which represents the basic attitude that parents take toward the child—the attitude of understanding and respect for the child's volitional functioning (Soenens et al., 2017). When parents adopt this attitude, they engage in all three behaviors: They acknowledge the child's feelings and perspective, offer choices and opportunities for exploration and self-expression, and provide meaningful rationales when setting rules. These behaviors likely co-occur and are cumulatively perceived by adolescents as supportive of their autonomy (Reeve & Cheon, 2021). In contrast, finding multiple profiles characterized by specific controlling behaviors suggests that the global factor of parental control—representing the basic attitude of coercion toward the child—cannot account for all the variances in the specific controlling behaviors parents engage in. Some controlling parents do engage in all three behaviors (using threats of punishment, inducing guilt, and imposing performance pressures) as evidenced by the *Generally Controlled* profile (accounting for only

27% and 14% of the sample at T1 and T2, respectively). A greater number of parents show salience in one specific behavior (e.g., inducing guilt) more than others. Different factors may explain this variability in the behavioral manifestations of CON, one of which is pressure from above, such as work-family conflicts and time pressures from eminent school transitions, among others (Grolnick et al., 2007).

The emergence of the *High Expectations* profile at T2 may be an example of how "pressure from above" may relate to behavioral manifestations of CON. It is plausible that parents explicitly communicate their expectations for high performance to their child during the last year of secondary school, a period when adolescents implement their career choice (e.g., applying for college). To better understand this potential contextual influence, we conducted an exploratory latent transition analysis (see Table S7 for the full results) and found that not only did adolescents in the controlling profiles (21%, 39%, and 47% from the *Mixed*, *Guilt Induced*, and *Generally Controlled* profiles, respectively) move to the *High Expectations* profile, but a considerable percentage of adolescents in the AS profile (23%) did too. This suggests that parents not only increase in their support but also in their control during a critical period in adolescents' career choice, a finding also reported in a diary study (Dietrich et al., 2011). Future studies can further investigate how situational factors interact with other child-specific factors ("pressure from below"; e.g., amotivated adolescents) and parent-specific factors ("pressure from within"; e.g., parental separation anxiety and perfectionism; Soenens et al., 2010) to determine behavioral manifestations of parental control.

How do AS and CON Contribute to Adolescents' Career Development?

Adolescents in the identified profiles were differentiated in the mean-level change in their career development outcomes measured a year later at T2 (last year of secondary school) and at T3 (one year after the postsecondary transition), lending partial support for Hypotheses 3 and 4. Adding to the robust evidence from variable-oriented studies (Luyckx et al., 2007; Cordeiro et al., 2018; Guay et al., 2003; Guay, 2006; Katz et al., 2018), parental autonomy support has long-term implications for

adolescents' career development during this postsecondary transition. The *Autonomy Supported* adolescents (perceiving high autonomy support and low control) showed the most adaptive pattern of change in all indicators of career development (i.e., they became more autonomous and competent, but less controlled and less indecisive about their career choice), followed by those in specific profiles of control (i.e., *Mixed, Guilt Induced*, and *High Expectations*). One mechanism by which the benefits of parental autonomy support unfold is that parental autonomy support fosters the development of "authentic inner compass" (Assor et al., 2020) in adolescents, which buffers them from internal and external pressures, such as contingent self-worth and performance standards, and in turn allows them to choose a career choice that best expresses their interests and values.

Unexpectedly, the *Generally Controlled* profile showed relatively adaptive outcomes at T2, even leaning quite close to the *Autonomy Supported* profile in autonomous motivations. After the postsecondary transition, however, this profile of adolescents became clearly differentiated from the *Autonomy Supported* profile, showing more maladaptive outcomes in career development. Generally controlled adolescents became less autonomous and competent, but more controlled and indecisive, with most of the differences becoming more pronounced at T3. These findings highlight the importance of employing a longitudinal design to study the contribution of autonomy support and parental control on adolescent outcomes. As seen in T2 outcomes, the maladaptive nature of parental control—whose goal is to elicit immediate compliance to situational or parental demands—may not be captured concurrently, but is likely to have a long-term role in adolescent development.

Whether one specific type of parental control (internal vs. external) is more harmful than others cannot be clearly answered in this study. Whereas the *Guilt Induced* (i.e., internally controlled) adolescents seem to show more maladaptive functioning than the *Mixed* (i.e., externally controlled) adolescents during the last year of secondary school (T2), these differences mostly disappeared after the postsecondary transition. Except for a bigger increase in controlled motivations among the *Guilt*

Induced, the *Guilt Induced* and *Mixed* adolescents did not show differences in their levels of autonomy, competence, and indecision, judging by the large overlaps in the confidence intervals and small to negligible effect sizes. This may be a case of equifinality (Cicchetti & Rogosch, 1996) where different experiences of parental control may lead to similar outcomes (of low competence and autonomy toward career search). Future studies with longer periods can test this equifinality hypothesis about internal and external forms of parental control.

A related question is whether weak CON (in terms of quantity) can be harmless—or even helpful—for adolescents' career development. One can argue that, sometimes, using rewards and threats of punishment is inevitable to get adolescents to act upon the situational demands. Our findings seem to contradict such an assumption. Compared to the *Autonomy Supported* adolescents, those in the *Guilt Induced, Mixed,* and *High Expectations* profiles still showed more maladaptive outcomes. These small-to-moderate differences at T2 became larger at T3. One exception is for the *Mixed* profile, in which *Mixed* adolescents showed an increase in competence at T2 that is comparable to that of the *Autonomy Supported* adolescents. The benefit of being in the *Mixed* profile, however, disappeared after the postsecondary transition, with their competence falling to a level comparable to those in the *Generally Controlled* profile at T3.

Altogether, these findings suggest that (1) parental control has negative implications for adolescent career development, regardless of the saliency of one specific behavior or type of control; but (2) adolescents may react to (or cope with) controlling strategies differently (Skinner & Zimmer-Gembeck, 2007): *Mixed* profiles with submission (rigid perseverance/compulsive compliance), and *Guilt Induced* profiles with helplessness (confusion/exhaustion). When threatened and demanded immediate actions, *Mixed* adolescents may have felt pressured to foreclose on a career choice without much exploration (Kroger et al., 2010), as evidenced by a big increase in T2 controlled motivation vis-à-vis their peers in other profiles. Consequently, these adolescents may not have gained sufficient knowledge

about their self or the world of work, nor developed decision-making skills to continue their career search, resulting in lower competence after the postsecondary transition. On the contrary, guilt induction and other internally controlling behaviors can leave adolescents feeling unmotivated and anxious, as shown in the small decrease in autonomomy and competence at T2, which in turn can contribute to increased controlled motivations after their postsecondary transition. Future studies can unravel other coping strategies employed by adolescents in response to parental control and other situational pressures, such as oppositional defiance and negotiation (Flamant et al., 2020; Skinner & Zimmer-Gembeck, 2007; Van Petegem et al., 2015).

How and When of Parent Interventions and Career Counseling

Findings from this study have implications for *how* and *when* career counseling and interventions should be implemented. First, counselors may use these findings to plan tailored interventions for adolescents and parents depending on the profile they belong to. For instance, for *Mixed* adolescents, counselors can encourage them to explore and reflect more deeply on their career choices to see if their choice expresses and integrates different aspects of their self (i.e., their values, skills, and interests). Also, when intervening with parents belonging to this profile, counselors can help parents implement structure in an autonomy-supportive way (i.e., communicating clear and consistent guidelines, providing rationales for demands and requests, and providing informational feedback and scaffolding; Cheon et al., 2020; Ratelle, Duchesne, et al., 2018) as an alternative to their carrots-and-sticks motivational strategy.

Second, findings from the LTA also suggest that the last year of secondary school may be an important time for interventions. Not only did substantial percentages of participants in controlling profiles move to the new *High Expectations* profile at T2, but so did a considerable percentage of adolescents in the *Autonomy Supported* profile. As the deadline for career decision making is approaching and the pressure is intensified, adolescents and parents may be more vulnerable to

perceiving and using controlling strategies. School programs can help parents support adolescents' autonomy (i.e., acknowledging the pressures that adolescents experience in terms of career choices and encouraging their exploration and self-expression) and competence (i.e., providing clear and consistent expectations with meaningful rationales behind and providing information and assistance in their career search). Existing intervention studies show us that these autonomy-supportive and competence-supportive behaviors can be taught (Cheon et al., 2020 for teachers; Joussemet et al., 2018 for parents).

Lastly, different dynamics among the dimensions of autonomy support and control also have implications for measurement and assessment. Using a 5-item short form to measure the general perception of autonomy support (e.g., Parents as Social Context Questionnaire, Skinner et al., 2005) may be justifiable, while for controlling parenting, a multidimensional scale that assesses specific dimensions may be necessary.

Strengths, Limitations, and Future Directions

One strength of this study is considering the multidimensions of autonomy support and control in the person-oriented approach, which allowed us to identify profiles that reflect different ways parents may be controlling toward their child. Disentangling the level and shape effects in profiles, this study identified profiles that otherwise would have been masked and showed the predictive utility of these profiles for indicators of career development. Moreover, by using a three-wave data set that covers a critical period of adolescent career development during which the "first career choice" is being made, this study demonstrated longitudinal associations between parenting profiles and adolescents' exploration and commitment, traversing two developmental periods of late adolescence and emerging adulthood.

Five aspects of the investigation, however, limit the conclusions from this study. First, there was a high drop-out rate (64%) at T3, particularly of participants who were boys and from families with lower SES. This made the T3 sample relatively homogeneous, with most of them living with their parent/s

(87%) and in higher education (79%). This homogeneity in the sample alongside the selective dropout may limit the generalizability of the current findings to adolescents who do not follow the conventional career trajectory (e.g., high school drop-out, starting a job rather than pursuing higher education). While we opted for a statistical approach to handle missingness (i.e., FIML) rather than a list-wise deletion to reduce biases in our results, our findings may not sufficiently represent the career experiences of a population of young men from the lower SES. Future studies are needed to test the generalizability of the findings to the less-represented population.

Second, our measures of autonomy support and control were based on adolescents' perceptions. While adolescents' perceptions of parenting are directly linked to adolescent outcomes (Hou et al., 2020), they are partial representations of parental behaviors. Past findings show that parents' self-reports of parental behaviors predicted adolescent outcomes over and beyond the child's perceptions of parental behaviors (Ratelle et al., 2017; Ratelle, Morin, et al., 2018). In addition, some studies reported positive or null correlations between autonomy support and control in parents' self-reports, suggesting that parents' reports of their own behaviors might show different interactions and combinations. Future studies can employ multi-informant approaches to examine how the profiles of self-reported parenting behaviors predict adolescent outcomes. Another important area of research for future interventions is understanding antecedents of parenting profiles—the pressures from within (parents' personality traits), from above (contextual/situational factors), and from below (child-specific characteristics).

Third, our study did not consider other parenting dimensions that play an important role in adolescents' career decision making, such as parental involvement and structure. Involvement refers to parents' display of affection and interest in their child's life. It helps adolescents form a secure attachment to their parents, thus providing them a secure base for explorations of their self and their surrounding (Blustein et al., 1995). Structure refers to parents' provision of clear guidelines, feedback,

and scaffolding (Dietrich & Kracke, 2009; Ratelle, Duchesne, et al., 2018). It nurtures adolescents' sense of competence and their self-regulation capacity, important resources for career exploration and decision making. Future studies can examine not only autonomy support but also parental structure, warmth, and their interactions to provide a more comprehensive picture of parents' role in adolescents' career decision making. Related to this issue is the unique and joint role of fathers and mothers. Given some recent findings suggesting that fathers' parenting has a salient role in goal-oriented activities such as career decisions (Dietrich et al., 2011; Soenens & Vansteenkiste, 2005), future studies are needed to better understand the role played by each parent and in adolescents' career choices.

Fourth, in this study, parenting was measured in a general context, rather than in a context more proximal to the outcomes under study. Future studies can assess parental behaviors in the specific context of parent-child discussions about career choices. While aligning the specificity of the context in the assessment between parenting and adolescent outcomes is important, our study found that mothers' *general* autonomy support and control are still important predictors of adolescents' career-related outcomes. This is in line with past findings that reported a high association between adolescents' general perceptions of parenting and the situation-specific appraisals of their parents' behaviors (Van Petegem et al., 2017). Examining the interaction between context-specific and general parenting behaviors can be another avenue of future research. Lastly, given the nature of mixture models, no causal inference is possible, and our analyses were somewhat exploratory, even though some hypotheses guided the study. Particularly, given the emergence of the *High Expectations* profile only at one wave, it is questionable whether this profile is specific to the critical decision period (i.e., the last year of secondary school) or a manifestation of durable developmental changes in adolescents' cognitive ability to distinguish each of the controlling parental behaviors. Future studies are needed to replicate the profiles at this age as well as at different developmental periods.

Conclusions

"*All happy families are alike; each unhappy family is unhappy in its own way."* Jointly examining parents' autonomy-supportive and controlling behaviors in a person-centered approach, we found that autonomy-supportive behaviors tend to occur together, which is not the case for controlling behaviors. That is, autonomy-supportive parents act in one uniform way; they take the child's perspective, offer choices and opportunities for exploration and self-expression, *and* provide rationales for demands and requests. Adolescents whose autonomy is supported by these parental behaviors feel autonomous and competent in their career search and feel more certain about their career choice. In contrast, there is more than one way for parents to thwart their child's autonomy—using threats, inducing guilt, *and/or* imposing performance pressures. But the bottom line is that irrespective of the salience of one controlling behavior over the others, parental control in any form undermines adolescents' autonomy and competence in their career search, preventing them from committing to a career choice that best expresses their self. The illusionary "benefit" of parental control is likely short-lived and temporary. Altogether, the findings emphasize the importance of parents' role in supporting autonomy and reducing any form of parental control—be it internal or external—in facilitating optimal career development in adolescents.

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Table 1

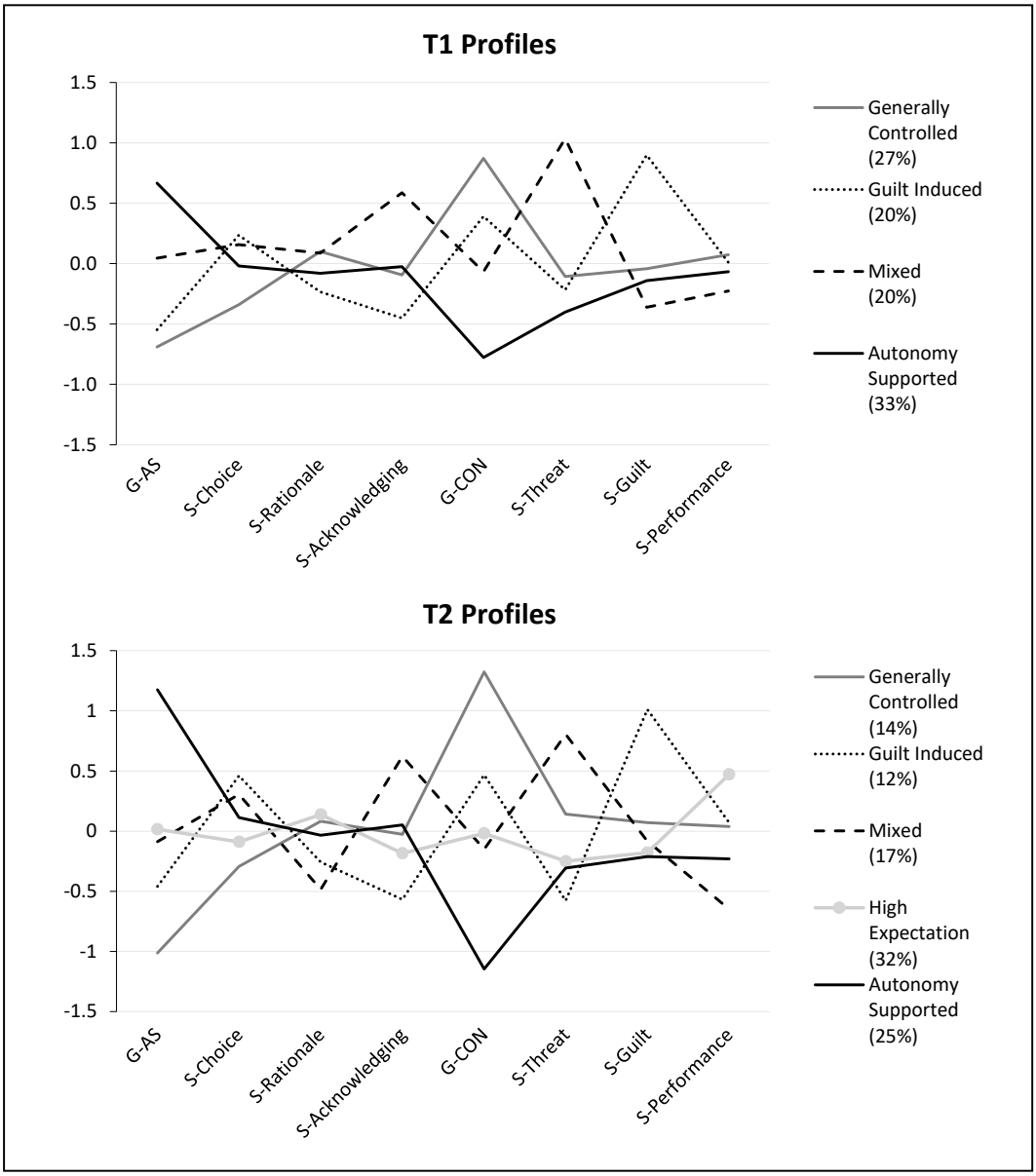
Comparison of Fit Indices of the LPA Models Estimated Separately at Each Wave

Model	AIC	AICC	BIC	ABIC	Entropy	aLMR	BLRT
Secondary 4 (*n* = 378)							
1 profile	6666.46	6667.96	6729.42	6678.65	—	—	—
2 profiles	6481.96	6485.65	6580.33	6501.01	0.684	0.015	≤0.001
3 profiles	6348.85	6355.79	6482.63	6374.76	0.731	0.001	≤0.001
4 profiles	6269.81	6281.13	6439.01	6302.58	0.746	0.340	≤0.001
5 profiles	6220.24	6237.20	6424.85	6259.87	0.795	0.035	≤0.001
6 profiles	6173.19	6197.12	6413.21	6219.68	0.821	0.130	≤0.001
Secondary 5 (*n* = 402)							
1 profile	7193.67	7195.08	7257.61	7206.84	—	—	—
2 profiles	6957.72	6961.18	7057.63	6978.31	0.705	0.001	≤0.001
3 profiles	6787.50	6793.99	6923.38	6815.50	0.738	0.009	≤0.001
4 profiles	6702.24	6712.81	6874.09	6737.64	0.758	0.614	≤0.001
5 profiles	6618.61	6634.40	6826.43	6661.42	0.768	0.337	≤0.001
6 profiles	6565.57	6587.81	6809.35	6615.79	0.792	0.526	≤0.001

Note. AIC = Akaike information criterion; AICC = Consistent AIC; BIC = Bayesian information criterion; ABIC = the sample-size Adjusted BIC; aLMR = Adjusted Lo, Mendell, and Rubin LRTs; BLRT = Bootstrap Likelihood Ratio Test.

Figure 1

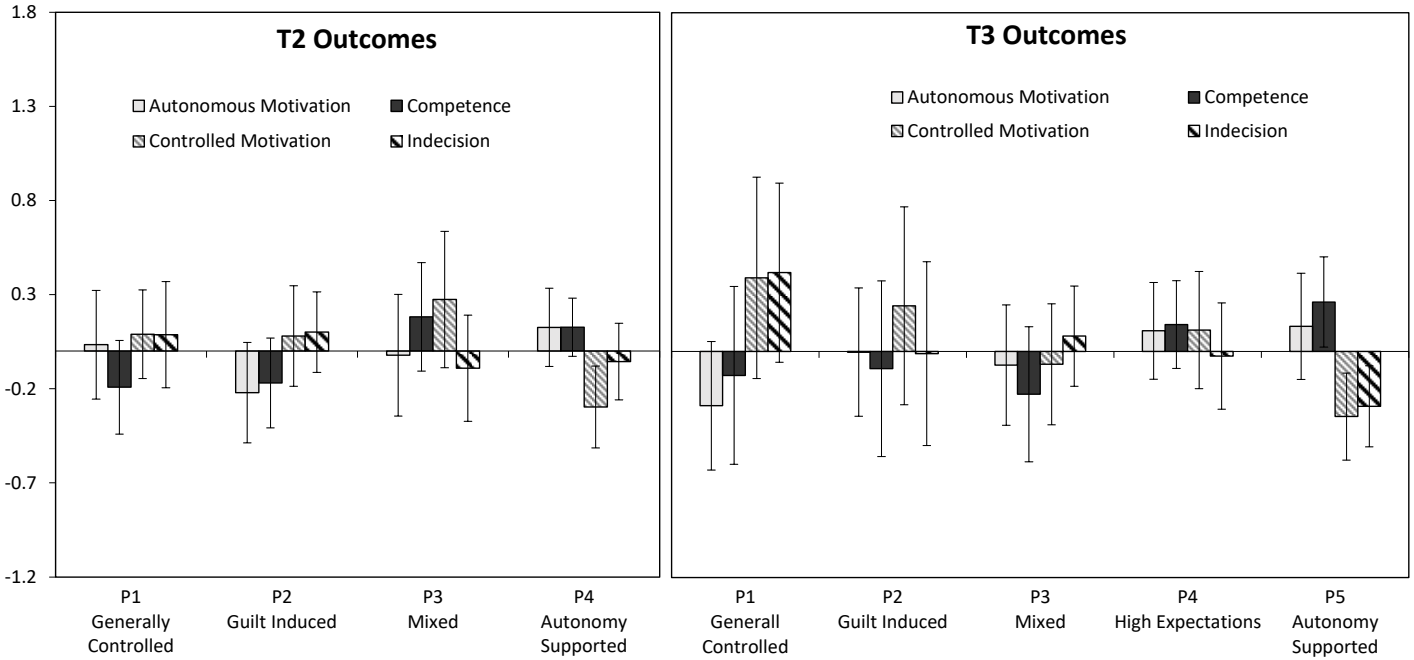
Final Profile Solutions at Time 1 and Time 2



Note. The upper panel shows the final 4-profile solution at Time 1 (Secondary 4) while the lower panel shows the final 5-profile solution at Time 2 (Secondary 5, the last year of secondary education). The lines represent the profile-specific means of parenting behaviors expressed in *z* scores ($M = 0$, $SD = 1$). The percentages in the legends represent the proportion of the sample belonging to the profile. G = global factor; S = specific factor; AS = autonomy support; CON = control.

Figure 2

Profile-Specific Change in the Mean Levels of Adolescent Career Development Outcomes



Note. The left panel compares Time 2 outcomes (Secondary 5) as a function of Time 1 profiles, while the right panel compares Time 3 outcomes (after the postsecondary transition) as a function of Time 2 profiles. The bars represent the change in the profile-specific change in mean levels expressed in z scores (M = 0, SD = 1) after controlling for their autoregressive effects, sociodemographic variables, and academic achievement. Error bars denote 95% confidence intervals.

Online Supplemental Materials for

Different Ways to Support and Thwart Autonomy:

Parenting Profiles and Adolescents' Career Decision Making

Authors' Note:

These online supplemental materials were developed to disclose all pertinent information on the analyses and to keep the manuscript from becoming needlessly long.

Table of Contents

Section S1. Preliminary Measurement Model

Due to convergence issues in testing the longitudinal invariance of bifactor models, we conducted two separate tests of measurement models. First, we tested the longitudinal invariance (i.e., configural, metric, and scalar invariance) of the first-order CFA models for AS and CON using data from three waves (T0, T1, and T2). The invariance testing was considered acceptable if the deteriorations in the model fits are not substantial, based on the cut-off values of -.01 for ΔCFI and +.015 for ΔRMSEA (Chen, 2007). The configural invariant model for both models showed a good fit, $\chi 2$ (522) = 828.46, $p < .05$, CFI = .953, RMSEA = .031 for the AS model; $\chi 2$ (522) = 815.82, $p < .05$, CFI = .960, RMSEA = .030 for the CON model. Imposing equality constraints on the factor loadings did not worsen, if not improved, the model fit, ΔCFI = +.001, ΔRMSEA = -.001 for the AS model; ΔCFI = +.001 and ΔRMSEA = .000 for the CON model, thereby providing support for the metric invariance. Imposing equality constraints on the intercepts did not bring a substantial worsening of the model, ΔCFI = -.003, ΔRMSEA = +.001 for the AS model; ΔCFI = -.003 and ΔRMSEA = .000 for the CON model.

Once preliminary evidence for longitudinal invariance was obtained in a first-factor model, we estimated a bifactor measurement model using all observations from all participants between T0 and T2. To obtain more reliable factor structure, we (1) included data from T0 even though data from this wave was not used in the main analysis and (2) treated the observations as separate but used the COMPLEX option in Mplus to deal with their non-independence (i.e., participants could provide more than one observation). The model estimation was conducted using Exploratory Structural Equation Modeling (ESEM)-within-Confirmatory Factor Analysis (CFA) (Morin & Asparouhov, 2018). ESEM-within-CFA starts with an ESEM model from which starts values are generated and re-expressed in CFA. This approach is useful to circumvent identification issues in complex models, which was the case in this analysis (i.e., a bifactor model with two general factors).

Using WLSMV (weighted least square with mean and variance adjusted) to deal with the categorical nature of the data, the model showed an excellent fit, $\chi 2$ (212) = 666.03, $p < .05$, CFI = .98, TLI = .97, RMSEA = .04. After having ensured an excellent model fit using WLSMV, we used

MLR, an alternative estimator more robust to missing data (Lei & Shiverdecker, 2019) to derive factor scores. The bifactor model of parenting fit the data well, $\chi 2$ (212) = 665.99, $p < .05$, CFI = .98, TLI = .97, RMSEA = .04. Table S1 presents the factor loadings of the model.

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Chen, F. F. (2007). Sensitivity of Goodness of Fit Indexes to Lack of Measurement Invariance. *Structural Equation Modeling: A Multidisciplinary Journal, 14*(3), 464-504. https://doi.org/10.1080/10705510701301834

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Lei, P.-W., & Shiverdecker, L. K. (2019). Performance of estimators for confirmatory factor analysis of ordinal variables with missing data. Structural Equation Modeling: A Multidisciplinary Journal, 27(4), 584-601. https://doi.org/10.1080/10705511.2019.1680292

Section S2. Sociodemographic Variables and Achievement as Statistical Controls

At the onset of the study, adolescents reported on their age, gender (boys = 0; girls = 1), type of school (public = 0; private = 1) and living arrangement (living with both parents = 1; other arrangements = 0). Their mothers provided information on their household income and highest level of education. An aggregate score reflecting the socioeconomic status was created by summing up scores on living arrangement, household income, and mother's level of education, with higher scores indicating higher socioeconomic status (see Ratelle et al., 2020 for a similar procedure). Achievement was assessed by adolescents' self-reported grades in Language and Mathematics using a scale ranging from 1 to 100 from T0 to T2. These scores were averaged to form a composite score of achievement.

In summary, a total of 5 variables were used as predictors of profile membership and as statistical controls in comparing profile-specific mean levels in career outcomes. These five variables are child's age, gender, type of school, SES, and school grades. All these scores were standardized for easier interpretation (M = 0 and SD = 1). Tables S3 and S4 present the results of the multinomial logistic regression in which these sociodemographic variables predicted profile memberships.

References:

Ratelle, C. F., Duchesne, S., Litalien, D., & Plamondon, A. (2020). The role of mothers in supporting adaptation in school: A psychological needs perspective. Journal of Educational Psychology, 113(1). https://doi.org/10.1037/edu0000455

Section S3. Analysis Code in Mplus

Preliminary Analysis: Bifactor Measurement Model of Autonomy Support and Control

```
DATA: FILE = parenting_long_format.dat;
VARIABLE:
NAME=  id wave choice1-choice4 ration1-ration4 recog1-recog4
        threat1-threat4 guilt1-guilt4 perform1-perform4;
CATEGORICAL = choice1-choice4 ration1-ration4 recog1-recog4
        threat1-threat4 guilt1-guilt4 perform1-perform4;
USEVARIABLES = choice1-choice4 ration1-ration4 recog1-recog4
        threat1-threat4 guilt1-guilt4 perform1-perform4;
AUXILIARY = wave;
CLUSTER = id;
MISSING = all(-999);

ANALYSIS:
TYPE = complex;
MODEL = nocov;
ESTIMATOR = mlr;
LINK = logit;
ALGORITHM = integration;
INTEGRATION = montecarlo;

MODEL:
        ! measurement model of autonomy support
        g-as BY choice1* choice2-choice4 ration1-ration4 recog1-recog4;
        s-as1 BY choice1* choice2-choice4;
        s-as2 BY ration1* ration2-ration4;
        s-as3 BY recog1* recog2-recog4;
        ! measurement model of control
        g-con BY threat1* threat2-threat4 guilt1-guilt4 perform1-perform4;
        s-con1 BY threat1* threat2-threat4;
        s-con2 BY guilt1* guilt2-guilt4;
        s-con3 BY perform1* perform2-perform4;
        ! estimate covariance between g and s factors of different parenting behavior
        g-as WITH g-con s-con1 s-con2 s-con3;
        s-as1 WITH g-con s-con1 s-con2 s-con3;
        s-as2 WITH g-con s-con1 s-con2 s-con3;
        s-as3 WITH g-con s-con1 s-con2 s-con3;
        ! estimate the intercepts of each indicator
        [ choice1-choice4 ];
        [ ration1-ration4 ];
        [ recog1-recog4 ];
        [ threat1-threat4 ];
        [ guilt1-guilt4 ];
        [ perform1-perform4];
        ! fix the variance of the latent variables to 1 for model identification
        g-as@1;
        s-as1@1;
        s-as2@1;
```

```
        s-as3@1;
        g-con@1;
        s-con1@1;
        s-con2@1;
        s-con3@1;

OUTPUT: sampstat stdyx svalues modindices (3.84) fsdeterminacy;

SAVEDATA:
File = fscores_long.dat;
FORMAT = free;
MISSFLAG=-999;
Save = fscores;
! this dataset was then converted into a wide format to be used for the main analysis
```

Latent Profile Analysis: Identifying an Optimal Profile Solution

```
DATA: FILE = complete_data.dat;
VARIABLE:
NAME=  id g-as1 choice1 ration1 recog1 g-con1 threat1 guilt1 perform1
        g-as2 choice2 ration2 recog2 g-con2 threat2 guilt2 perform2
        mcon2 mauto2 indeci2 comp2
        mcon3 mauto3 indeci3 comp3
        sex age schlype ses grade;

USEVARIABLES =
        g-as1 choice1 ration1 recog1 g-con1 threat1 guilt1 perform1; ! for T1 profiles
        ! for T2 profiles, the following variables were used
        ! g-as2 choice2 ration2 recog2 g-con2 threat2 guilt2 perform2;

CLASS = c1(4);
        ! for T2, c2(5) was used in the syntax instead
MISSING = all(-999);

ANALYSIS:
TYPE = mixture;
ESTIMATOR = mlr;
STARTS = 5000 300;
STITERATIONS = 200;
LRTSTARTS = 0 0 500 200;

MODEL:

OUTPUT: sampstat stdyx svalues modindices (3.84) fsdeterminacy;
PLOT: TYPE = plot3;
SERIES = g-as1-perform1 (*);
        For T2, g-as2-perform2 (*) was used instead
```

Latent Profile Analysis: Comparing Adolescent Career Outcomes

```
DATA: FILE = complete_data.dat;
VARIABLE:
NAME=  id g-as1 choice1 ration1 recog1 g-con1 threat1 guilt1 perform1
        g-as2 choice2 ration2 recog2 g-con2 threat2 guilt2 perform2
        mcon2 mauto2 indeci2 comp2
        mcon3 mauto3 indeci3 comp3
        sex age schltype ses grade;

USEVARIABLES =
        g-as1 choice1 ration1 recog1 g-con1 threat1 guilt1 perform1
        mcon1 mauto1 indeci1 comp1
        mcon2 mauto2 indeci2 comp2
        sex age schltype ses grade;

CLASS = c1(4);
MISSING = all(-999);

ANALYSIS:
TYPE = mixture;
ESTIMATOR = mlr;
STARTS = 0;
ALGORITHM = integration;
INTEGRATION = montecarlo;

DEFINE:
        STANDARDIZE mcon2 mauto2 indeci2 comp2 sex age schltype ses grade;

MODEL:

        %OVERALL%
        sex age schltype ses grade;
        mcon2 ON mcon1 sex age schltype ses grade;
        mauto2 ON mauto1 sex age schltype ses grade;
        indeci2 ON indeci1 sex age schltype ses grade;
        comp2 ON comp1 sex age schltype ses grade;

        %C1#1% !generally controlled

        [ g-as1@-0.69089 ];
        [ choice1@-0.34020 ];
        [ ration1@0.09978 ];
        [ recog1@-0.09360 ];
        [ g-con1@0.87131 ];
        [ threat1@-0.10842 ];
        [ guilt1@-0.04274 ];
        [ perform1@0.07357 ];

        g-as1@0.54572 (9);
        choice1@0.32155 (10);
```

```
ration1@0.51137 (11);
recog1@0.14475 (12);
g-con1@0.40000 (13);
threat1@0.42515 (14);
guilt1@0.17355 (15);
perform1@0.60910 (16);

 [indeci2] (1a);
 [comp2] (1b);
 [mcon2] (1c);
 [mauto2](1d);

%C1#2% !guilt-induced

[ g-as1@-0.54758 ];
[ choice1@0.23373 ];
[ ration1@-0.23475 ];
[ recog1@-0.45140 ];
[ control1@0.39108 ];
[ threat1@-0.21818 ];
[ guilt1@0.89887 ];
[ perform1@0.00756 ];

g-as1@0.54572 (9);
choice1@0.32155 (10);
ration1@0.51137 (11);
recog1@0.14475 (12);
control1@0.40000 (13);
threat1@0.42515 (14);
guilt1@0.17355 (15);
perform1@0.60910 (16);

[indeci2] (2a);
[comp2] (2b);
[mcon2] (2c);
[mauto2](2d);

%C1#3% !mixed

[ g-as1@0.04415 ];
[ choice1@0.15677 ];
[ ration1@0.08578 ];
[ recog1@0.58596 ];
[ control1@-0.06736 ];
[ threat1@1.03455 ];
[ guilt1@-0.36161 ];
[ perform1@-0.22588 ];

g-as1@0.54572 (9);
choice1@0.32155 (10);
ration1@0.51137 (11);
```

```
        recog1@0.14475 (12);
        control1@0.40000 (13);
        threat1@0.42515 (14);
        guilt1@0.17355 (15);
        perform1@0.60910 (16);

        [indeci2] (3a);
        [comp2] (3b);
        [mcon2] (3c);
        [mauto2](3d);

        %C1#4% !autonomy supported

        [ g-as1@0.66665 ];
        [ choice1@-0.01928 ];
        [ ration1@-0.08092 ];
        [ recog1@-0.02607 ];
        [ control1@-0.77775 ];
        [ threat1@-0.40246 ];
        [ guilt1@-0.14237 ];
        [ perform1@-0.06688 ];

        g-as1@0.54572 (9);
        choice1@0.32155 (10);
        ration1@0.51137 (11);
        recog1@0.14475 (12);
        control1@0.40000 (13);
        threat1@0.42515 (14);
        guilt1@0.17355 (15);
        perform1@0.60910 (16);

        [indeci2] (4a);
        [comp2] (4b);
        [mcon2] (4c);
        [mauto2](4d);

Model constraint:
        new(indeci12);
        indeci12 = 1a-2a;
        new(indeci13);
        indeci13 = 1a-3a;
        new(indeci14);
        indeci14 = 1a-4a;
        new(indeci23);
        indeci23 = 2a-3a;
        new(indeci24);
        indeci24 = 2a-4a;
        new(indeci34);
        indeci34 = 3a-4a;

        new(comp12);
```

```
comp12 = 1b-2b;
new(comp13);
comp13 = 1b-3b;
new(comp14);
comp14 = 1b-4b;
new(comp23);
comp23 = 2b-3b;
new(comp24);
comp24 = 2b-4b;
new(comp34);
comp34 = 3b-4b;

new(mcon12);
mcon12 = 1c-2c;
new(mcon13);
mcon13 = 1c-3c;
new(mcon14);
mcon14 = 1c-4c;
new(mcon23);
mcon23 = 2c-3c;
new(mcon24);
mcon24 = 2c-4c;
new(mcon34);
mcon34 = 3c-4c;

new(mauto12);
mauto12 = 1d-2d;
new(mauto13);
mauto13 = 1d-3d;
new(mauto14);
mauto14 = 1d-4d;
new(mauto23);
mauto23 = 2d-3d;
new(mauto24);
mauto24 = 2d-4d;
new(mauto34);
mauto34 = 3d-4d;

OUTPUT: sampstat stdyx svalues modindices (3.84) fsdeterminacy;
PLOT: TYPE = plot3;
SERIES = g-as1-perform1 (*);
```

Table S1

Results From a Bifactor Measurement Model of Parenting

Item Labels	Factor loadings							
	Autonomy Support				Control			
	G-factor	S-factor	S-factor	S-factor	G-factor	S-factor	S-factor	S-factor
Choice 1	0.71	0.26						
Choice 2	0.76	0.11						
Choice 3	0.65	0.54						
Choice 4	0.74	0.21						
Rationale 1	0.62		0.36					
Rationale 2	0.68		0.38					
Rationale 3	0.69		0.52					
Rationale 4	0.76		0.42					
Feeling 1	0.78			0.26				
Feeling 2	0.79			0.05				
Feeling 3	0.85			-0.16				
Feeling 4	0.87			0.11				
Threat 1					0.50	0.70		
Threat 2					0.59	0.64		
Threat 3					0.61	0.46		
Threat 4					0.71	0.53		
Guilt 1					0.78		0.26	
Guilt 2					0.86		0.43	
Guilt 3					0.90		-0.07	
Guilt 4					0.87		0.09	
Perform 1					0.51			0.40
Perform 2					0.52			0.64
Perform 3					0.67			0.62
Perform 4					0.68			0.61

Note. The factor loadings are standardized coefficients. The model was estimated within the ESEM-within-CFA framework. G-factor = global factor; S-factor = specific factor.

Table S2

Correlations Among All Study Variables (n = 637)

	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17
1. G-AS	-	0.10	0.13	0.10	**-0.68**	-0.11	**-0.36**	-0.04	0.27	-0.06	-0.19	0.10	0.03	0.06	-0.05	0.11	-0.02
2. S-Choice	0.05	-	-0.13	0.06	-0.11	0.09	0.19	0.04	0.10	-0.06	0.00	0.00	0.10	0.03	0.00	0.07	0.06
3. S-Rationale	0.11	-0.17	-	-0.11	0.09	0.10	-0.28	0.13	0.06	-0.08	0.08	0.00	-0.16	0.00	-0.05	0.00	-0.02
4. S-Feeling	0.02	0.10	-0.29	-	-0.13	**0.56**	**-0.46**	**-0.34**	0.23	-0.07	-0.12	0.13	0.02	0.04	-0.01	-0.09	-0.08
5. G-CON	**-0.75**	-0.15	0.09	-0.13	-	0.12	0.18	0.13	-0.09	0.01	0.28	-0.04	-0.06	-0.07	0.07	-0.03	0.05
6. S-Threat	-0.18	0.06	0.02	**0.55**	0.12	-	-0.18	-0.05	0.12	-0.07	0.08	0.04	0.00	-0.03	-0.06	-0.20	-0.08
7. S-Guilt	**-0.36**	0.25	-0.25	**-0.43**	0.23	-0.15	-	-0.18	-0.19	0.07	0.08	-0.12	0.17	-0.11	-0.01	0.03	0.06
8. S-Performance	-0.08	-0.07	0.18	**-0.40**	0.15	-0.10	-0.12	-	0.06	-0.07	0.10	0.05	-0.11	0.01	0.00	0.07	-0.02
9. Competence	**0.38**	0.03	0.06	-0.07	-0.23	-0.15	-0.27	0.21	-	**-0.43**	-0.17	**0.50**	0.10	0.07	-0.05	0.07	-0.06
10. Indecision	-0.28	0.12	-0.02	0.01	0.28	0.14	0.15	-0.06	**-0.61**	-	0.18	-0.16	0.06	-0.03	0.01	-0.02	-0.02
11. Con Motiv	**-0.36**	-0.01	0.12	0.02	**0.47**	0.15	0.11	0.10	**-0.32**	**0.33**	-	-0.16	-0.06	-0.05	0.05	-0.04	0.11
12. Auto Motiv	0.20	-0.08	0.08	0.04	-0.16	-0.04	-0.07	-0.04	**0.44**	**-0.33**	-0.29	-	0.14	0.05	0.01	0.07	-0.05
13. Gender[a]	0.03	0.06	-0.09	0.04	0.00	-0.05	0.09	-0.07	-0.02	0.12	-0.15	0.19	-	-0.09	0.06	0.18	0.00
14. Age	0.00	0.03	0.03	-0.03	-0.02	0.00	-0.05	0.08	0.15	0.01	-0.10	0.07	-0.08	-	-0.09	-0.20	-0.18
15. School type[b]	-0.04	0.10	-0.03	-0.04	0.09	-0.02	0.08	0.05	0.01	-0.01	0.06	0.00	0.06	-0.08	-	0.19	0.24
16. Grade	0.13	0.12	-0.01	-0.10	-0.06	-0.10	0.08	-0.03	0.04	0.06	0.01	0.09	0.17	-0.21	0.19	-	0.21
17. SES	-0.01	0.01	-0.01	-0.02	0.06	0.02	-0.01	-0.01	-0.07	0.11	0.08	-0.08	0.00	-0.18	0.24	0.21	-

Note. Coefficients above the diagonal show correlations among T1 profiles, T2 career outcomes, and T0 sociodemographic variables, while those below the diagonal show correlations among T2 profiles, T3 career outcomes, and T0 sociodemographic variables. G = global factor; S = specific factor; AS = autonomy support; CON = parental control; Con Motiv = controlled motivation; Auto Motiv = autonomous motivation. The first set of four variables (#1 – #4) are AS factors; the next four (#5 – #8) are CON factors; the next four (#9 – #12) are career outcomes; and the last five (#13 – #17) are statistical controls. Correlations greater than 0.30 are bolded. [a] 0 = boys and 1 = girls. [b] 0 = public and 1 = private.

Table S3

Results of Multinomial Logistic Regressions of Sociodemographic Predictors Predicting Profile Memberships (in Reference to the Autonomy Supported Profile)

	Relative to Autonomy Supported							
	Generally Controlled		Mixed		Guilt Induced		Overly Expected	
Predictors	OR	[95% CI]	OR	[95% CI]	OR	[95% CI]	OR	[95% CI]
Girls								
T1	0.57	[0.29, 1.10]	0.89	[0.44, 1.79]	1.65	[0.78, 3.48]	—	—
T2	1.02	[0.48, 2.18]	1.17	[0.56, 2.46]	1.28	[0.53, 3.11]	0.50	[0.25, 0.99]
Age								
T1	1.04	[0.55, 1.94]	0.90	[0.43, 1.85]	**0.36**	**[0.17, 0.78]**	—	—
T2	0.52	[0.22, 1.26]	0.84	[0.33, 2.10]	0.84	[0.33, 2.10]	1.07	[0.55, 2.05]
School Type[a]								
T1	1.62	[0.74, 3.58]	1.15	[0.48, 2.78]	0.47	[0.18, 1.24]	—	—
T2	2.00	[0.72, 5.56]	2.35	[0.84, 6.56]	**3.14**	**[1.08, 9.16]**	2.06	[0.81, 5.22]
SES								
T1	1.00	[0.91, 1.10]	1.00	[0.91, 1.11]	1.02	[0.93, 1.11]	—	—
T2	1.06	[0.96, 1.17]	0.98	[0.88, 1.09]	1.01	[0.91, 1.12]	1.02	[0.93, 1.12]
Grades								
T1	0.97	[0.91, 1.03]	0.97	[0.92, 1.02]	1.01	[0.95, 1.08]	—	—
T2	0.93	[0.87, 1.00]	0.98	[0.92, 1.04]	0.97	[0.91, 1.03]	0.99	[0.94, 1.06]

Note. OR = odds ratio; CI = confidence intervals; T1= parenting profiles at T1; T2 = parenting profiles at T2; SES = socioeconomic status. Estimates whose CI does not include 1 are bolded. [a]0 = public, 1= private.

Table S4

Results of Multinomial Logistic Regressions of Sociodemographic Predictors Predicting Profile Memberships (in Reference to the Generally Controlled Profile)

	Relative to Generally Controlled							
	Autonomy Supported		Mixed		Guilt Induced		High Expectations	
Predictors	OR	[95% CI]	OR	[95% CI]	OR	[95% CI]	OR	[95% CI]
Girls								
T1	1.77	[0.29, 1.10]	1.57	[0.76, 3.28]	**2.92**	**[1.27, 6.71]**	—	—
T2	0.98	[0.48, 2.18]	1.15	[0.50, 2.63]	1.26	[0.47, 3.39]	0.49	[0.22, 1.09]
Age								
T1	0.97	[0.55, 1.94]	0.86	[0.43, 1.72]	**0.35**	**[0.15, 0.80]**	—	—
T2	1.92	[0.22, 1.26]	1.38	[0.54, 3.52]	1.60	[0.53, 4.81]	2.04	[0.84, 4.97]
School Type[a]								
T1	0.62	[0.74, 3.58]	0.71	[0.28, 1.83]	**0.29**	**[0.10, 0.87]**	—	—
T2	0.50	[0.72, 5.56]	1.17	[0.39, 3.56]	1.57	[0.48, 5.16]	1.03	[0.35, 3.02]
SES								
T1	1.00	[0.91, 1.10]	1.01	[0.90, 1.12]	1.02	[0.91, 1.13]	—	—
T2	0.95	[0.96, 1.17]	0.93	[0.83, 3.52]	0.95	[0.84, 1.08]	0.97	[0.86, 1.09]
Grades								
T1	1.03	[0.91, 1.03]	1.00	[0.93, 1.07]	1.05	[0.96, 1.14]	—	—
T2	1.07	[0.87, 1.00]	1.05	[0.97, 1.13]	1.04	[0.96, 1.12]	1.07	[0.99, 1.16]

Note. OR = odds ratio; CI = confidence intervals; T1= parenting profiles at T1; T2 = parenting profiles at T2; SES = socioeconomic status. Estimates whose CI does not include 1 are bolded. [a]0 = public, 1= private.

Table S5

Profile-Specific Mean-Level Changes and the 95% Confidence Intervals of the Career Development Outcomes

	P1 Generally Controlled		P2 Guilt Induced		P3 Mixed		P4 Autonomy Supported		P5 High Expectations		Summary of significant differences
Outcomes	*M*	[95% CI]	*M*	[95% CI]	*M*	[95% CI]	*M*	[95% CI]	*M*	[95% CI]	
At T2											
Auto Motiv	0.03	[-0.25, 0.32]	-0.22	[-0.49, 0.05]	-0.02	[-0.35, 0.30]	0.13	[-0.08, 0.33]	-	-	P2 < P4
Competence	-0.19	[-0.44, -0.06]	-0.17	[-0.41, 0.07]	0.18	[-0.11, 0.48]	0.13	[-0.03, 0.28]	-	-	P1, 2 < P4
Con Motiv	0.09	[-0.15, 0.32]	0.08	[-0.19, 0.35]	0.27	[-0.09, 0.64]	-0.30	[-0.52, -0.08]	-	-	P1, 2, 3 > P4
Indecision	0.09	[-0.20, 0.37]	0.10	[-0.11, 0.32]	-0.09	[-0.37, 0.19]	-0.06	[-0.26, 0.15]	-	-	none
At T3											
Auto Motiv	-0.29	[-0.63, -0.05]	-0.00	[-0.35, 0.34]	-0.07	[-0.39, 0.25]	0.13	[-0.15, 0.42]	0.11	[-0.15, 0.37]	none
Competence	-0.13	[-0.60, 0.35]	-0.09	[-0.56, 0.38]	-0.23	[-0.59, 0.13]	0.26	[0.02, 0.50]	0.14	[-0.09, 0.38]	P3 > P4
Con Motiv	0.39	[-0.14, 0.93]	0.24	[-0.28, 0.77]	-0.07	[-0.39, 0.26]	-0.35	[-0.58, -0.11]	0.11	[-0.20, 0.43]	P1, 2, 5 > P4
Indecision	0.42	[-0.06, 0.90]	-0.01	[-0.50, 0.48]	0.08	[-0.19, 0.35]	-0.29	[-0.51, -0.08]	-0.02	[-0.31, 0.26]	P1, 3 > P4

Note. P1-P5: Profile 1 to Profile 5; CI = confidence intervals; Auto Motiv = autonomous motivations; Con Motiv = controlled motivations. T1 Profile (Secondary 4) predicted the T2 outcomes (Secondary 5), while T2 profiles (Secondary 5) predicted the T3 outcomes (one year after graduation). The estimates represent mean-level changes after controlling for their autoregressive effects, sociodemographic variables, and academic achievement.

Table S6

Effect Sizes of the Between-Profile Differences in the Career Development Outcomes

	Autonomous Motivation	Controlled Motivation	Competence	Indecision
T1 Profiles predicting T2 outcomes				
P1 vs. P2	0.255	0.009	0.023	0.014
P1 vs. P3	0.056	0.185	0.374	0.178
P1 vs. P4	0.092	0.386*	0.319*	0.143
P2 vs. P3	0.199	0.194	0.351	0.192
P2 vs. P4	0.347*	0.377*	0.296*	0.157
P3 vs. P4	0.148	0.571*	0.055	0.035
T2 Profiles predicting T3 outcomes				
P1 vs. P2	0.285	0.148	0.036	0.430
P1 vs. P3	0.216	0.459	0.100	0.337
P1 vs. P4	0.422	0.736*	0.390	0.710**
P1 vs. P5	0.398	0.277	0.270	0.443
P2 vs. P3	0.069	0.311	0.136	0.093
P2 vs. P4	0.137	0.588	0.354	0.280
P2 vs. P5	0.113	0.129	0.234	0.013
P3 vs. P4	0.206	0.277	0.490*	0.373***
P3 vs. P5	0.182	0.182	0.370	0.106
P4 vs. P5	0.024	0.459*	0.120	0.267

Note. Coefficients reflect between-profile differences in the standardized mean-level changes in the career development outcomes and thus can be interpreted as an index of effect sizes (d = 0.10, 0.30, and 0.50 as small, medium, and large differences). Cells are color-coded to indicate effect sizes (no shade = trivial difference; light green = small difference; green = medium difference; dark green = large difference). P1 – P5: Profile 1 to Profile 5; P1 = Generally Controlled; P2 = Guilt Induced; P3 = Mixed; P4 = Autonomy Supported; P5 = High Expectations at T2.

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

Table S7

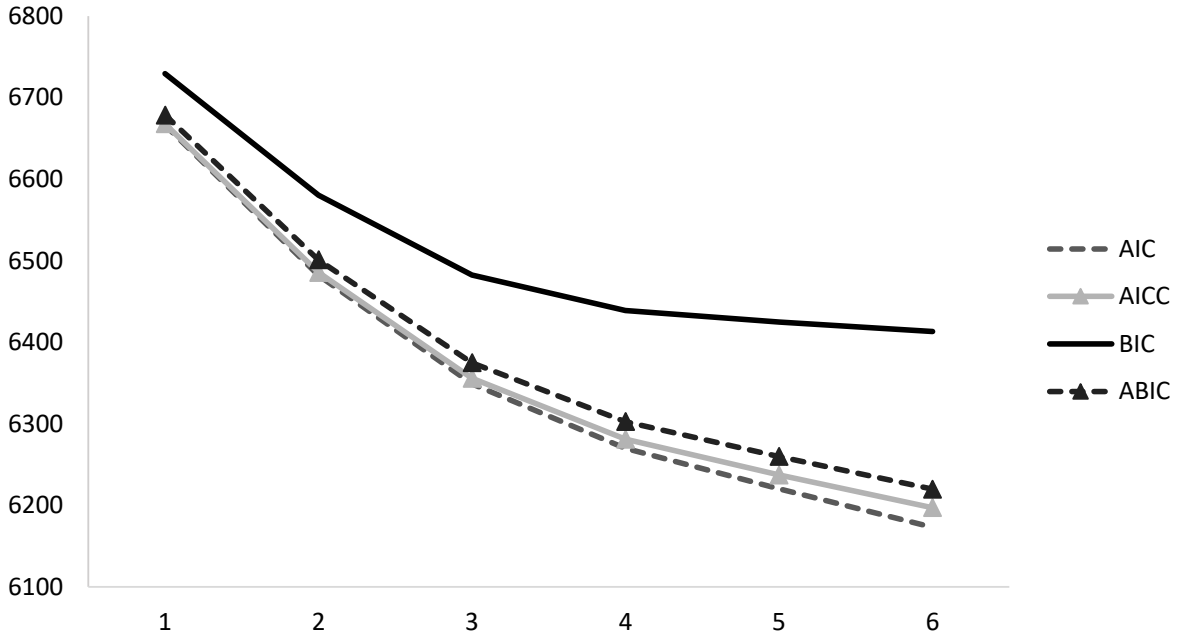
Transition Probabilities for Exploratory Latent Transition Analysis

	Transition Probabilities to T2 profiles				
T1 Profiles	Controlled	Mixed	Guilt	AS	Expectation
Controlled	**41%**	0%	11%	0%	48%
Mixed	11%	**62%**	2%	3%	21%
Guilt	8%	20%	**29%**	4%	39%
AS	0%	0%	8%	**70 %**	23%

Note. Bolded numbers represent within-person stability, that is, the percentages of individuals who stayed in the same profile from Time 1 (T1) to Time 2 (T2). Controlled = Generally Controlled; Guilt = Guilt Induced; AS = Autonomy Supported; Expectation = High Expectations.

Figure S1

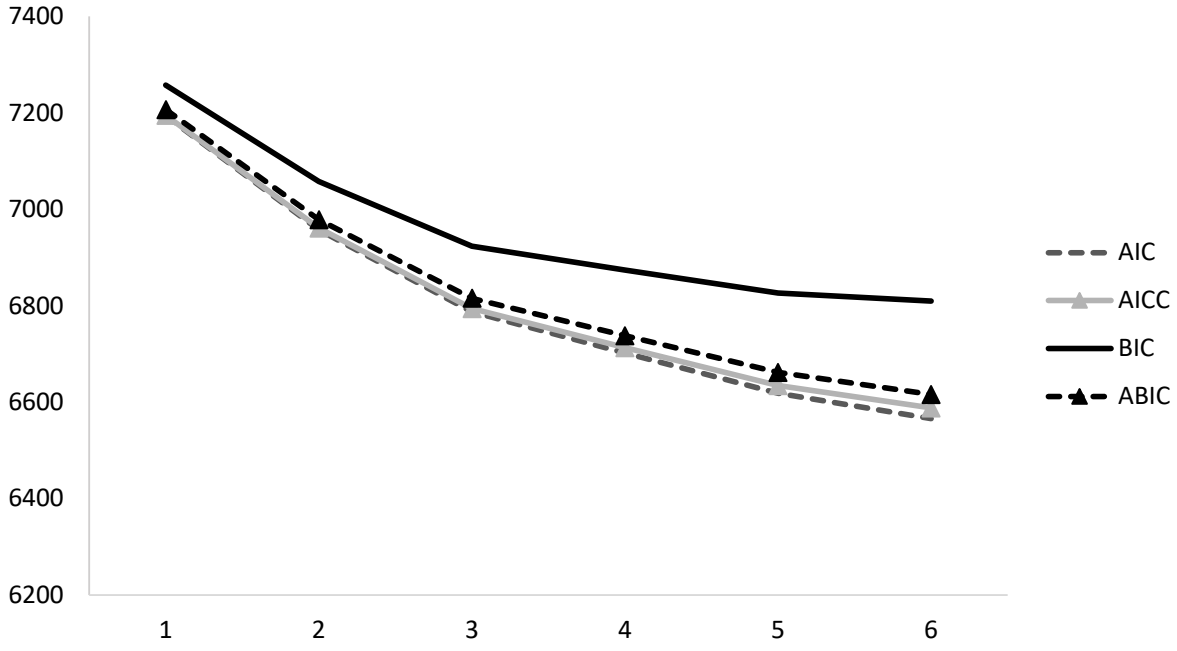
Elbow Plot of the Information Criteria for the Latent Profile Analysis at Time 1



Note. AIC = Akaike information criterion; AICC = Consistent AIC; BIC = Bayesian information criterion; ABIC = Sample-size adjusted BIC.

Figure S2

Elbow Plot of the Information Criteria for the Latent Profile Analysis at Time 2



Note. AIC = Akaike information criterion; AICC = Consistent AIC; BIC = Bayesian information criterion; ABIC = Sample-size adjusted BIC.