



The Longitudinal Associations Between Parental Autonomy Support, Autonomy and Peer Resistance

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Abstract

Adolescents' autonomy is considered to be shaped within family and peer contexts. However, the specific dynamics of the within-person associations between parental autonomy support, adolescents' general autonomy, and peer resistance over time remain unclear. To address this, random-intercept cross-lagged panel models were employed in a sample of 290 Dutch youth in early adolescence ($M_{age} = 11.58$, $SD = 0.44$ at T1; 49.3% boys) and 220 Dutch youth in middle to late adolescence ($M_{age} = 17.79$, $SD = 1.47$ at T1; 25.0% boys), who were followed over two years across four time points. Results showed that changes in adolescents' general autonomy were concurrently associated with changes in their parental autonomy support and peer resistance at the within-person level. However, these associations were not observed longitudinally over a six-month period. These findings suggest that increases in supportive parenting and peer resistance co-occur with increases in adolescents' autonomy within individuals.

Keywords Parental autonomy support · Peer resistance · Adolescents' autonomy · Longitudinal study

Introduction

Autonomy is a critical task during adolescence (Soenens et al., 2017), and is essential for personal growth, cultivating positive relationships, and enhancing overall well-being (Deci & Ryan, 2000; Kiang & Bhattacharjee, 2019). Autonomy is multifaceted, encompassing emotional, behavioral, and cognitive dimensions (Jackson & Goossens, 2007). Autonomy also manifests differently across different contexts, such as in general situations and in relational contexts of parents and peers (Spear & Kulbok, 2004). During adolescence, the increasing importance of peers may pose challenges to the development of adolescents' cognitive and behavioral autonomy (Giletta et al., 2021; Laninga-Wijnen & Veenstra, 2023), as adolescents may experience pressures to conform to peers to fit in with the group (Bell & Baron, 2015; Laursen & Veenstra, 2023). One aspect of autonomy in peer contexts is the extent to which adolescents can resist peer influences and act upon their own preferences. Adolescents' autonomy in peer contexts, as

well as their general autonomy, are thought to be promoted by parental autonomy support (Fousiani et al., 2014; Ravindran et al., 2020). Therefore, this study aimed to examine bidirectional associations between parental autonomy support, adolescents' general autonomy and peer resistance across a 2-year period during both early and middle to late adolescence.

Bidirectional Associations Between General Autonomy and Peer Resistance

General autonomy refers to one's overall sense of volitional functioning or perceived psychological freedom in relation to their life, and denotes the extent to which individuals align their choices and actions with their own wants and beliefs (Jackson & Goossens, 2007; Ryan & Deci, 2000). Peer resistance involves thinking and acting based on one's own preferences and values, rather than being swayed by the opinions and behaviors of peers (Bell & Baron, 2015; DiGuseppi et al., 2018). These two concepts both reflect individuals' agency and independence in different contexts. In essence, general autonomy prominently manifests through an individual's internal processes, such as their feelings and cognitions, whereas peer resistance is more predominantly displayed through outward behaviors. Indeed, general autonomy and peer resistance exhibited a

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moderate correlation, implying their interrelatedness while also underscoring their distinctive nature as separate constructs (Bernasco et al., 2023). This study aimed to further explore the interplay between general autonomy and peer influence, considering both between-person differences, and within-person processes.

To what extent adolescents can resist peer influence might depend on their general autonomy, as one's general sense of volitional functioning can be regarded as the internal mechanism behind autonomous behaviors (Beck & Young, 1985; Jackson & Goossens, 2007). Adolescents who are more generally autonomous might be more capable of adhering to their own attitudes and mastering their behaviors even under peer pressure, and tend to base actions on their own thoughts and feelings rather than those of others. Additionally, these adolescents may have a clearer sense of their values and beliefs and be more confident in their ability to make decisions and act on them (Chan & Chan, 2013). Indeed, adolescents possessing a strong internal compass are less susceptible to external factors or influences. A study indicated that adolescents who have lower self-concept clarity than others, a concept often associated with autonomy, are more susceptible than others to their friends' delinquent behaviors (Levey et al., 2019). However, from a developmental change perspective, it is important to understand whether this effect extends beyond a mere comparison with their peers to a comparison with their own average level of autonomy, such that when adolescents become more autonomous in general they can also resist peer influence compared to before. Research has shown that adolescents who actively explore and define their own values and beliefs are more likely to adhere to their own attitudes and avoid engaging in delinquent activities over time (Mercer et al., 2017).

Peer resistance might not only be predicted by general autonomy, but might be *bidirectionally* related to it: Practicing autonomous behaviors in the peer context might transfer to adolescents' overarching perception of psychological freedom. Given that peer interactions are opportunities to practice autonomous behavior (Allen & Loeb, 2015), adolescents might become more self-determined in a broader context through the experience of volitional or self-selected actions and decision-making in peer groups. Such experiences involve resisting peer pressure or going against the collective desires of their peers, such as refusing to do what their peers want to do when they do not want to. These experiences may potentially internalize into one's internal perceptions and cognitions of autonomy. When adolescents actively engage in navigating these external autonomous behaviors, their personal values and beliefs may gradually strengthen. Consequently, this process can lead to an increase in their

general autonomy, both in comparison to their peers and their own average level.

The Role of Parental Autonomy Support in Adolescents' Autonomy and Peer Resistance

Parental autonomy support may be bidirectionally associated with adolescents' general autonomy and peer resistance, and general autonomy may play a mediating role between parental autonomy support and behavioral autonomy. Parental autonomy support reflects the extent to which parents encourage their children to express their own perspectives and engage in decision-making processes (Soenens & Vansteenkiste, 2010). Adolescents tend to form relationship models based on experiences in relationships with parents and use these models to construct their relationships with peers (Defoe et al., 2013; Kerr & Stattin, 2000). When adolescents learn how to think and behave autonomously in the family, this can be transferred to peer interactions (Allen & Loeb, 2015). In addition, parental autonomy support might indirectly affect peer resistance through adolescents' general autonomy. Parents can shape adolescents' general autonomy by valuing their adolescents' ideas, encouraging them to think independently and to make individual decisions about activities and behavior (Van der Giessen et al., 2014; Van der Graaff et al., 2012). Adolescents who are in such autonomous supportive home environments likely develop general autonomy more easily, which might in turn be associated with adolescents' autonomy in the peer context.

Parents might also adjust their approach to parenting to adapt to their children's developmental needs, suggesting that changes in adolescents' autonomy affect parental autonomy support. From a developmental perspective, adolescents' agency in shaping relationships develops continuously, and the parent-child relationship gradually becomes more horizontal over time (Branje, 2018). When adolescents increase in general autonomy reflected by making autonomous decisions, parents might trust their children's abilities to deal with responsibilities, and therefore adopt more autonomous supportive parenting approaches. In line with this, adolescents who are more "immune" to peer influence and demonstrate greater capacity for independent thought and volition may lead their parents to trust them more, resulting in granting their children more space and freedom to think and act independently. To support this, some longitudinal studies found that when children exhibit more problem behaviors, parents tend to reduce their autonomy support and warmth (Kaufman et al., 2019; Van Petegem et al., 2015). Similarly, this may extend to positive developments in adolescents, specifically increases in adolescents' general autonomy prompting corresponding increases in parental autonomy support.

Age Differences

Considering the different stages of adolescence is crucial for understanding the dynamics of parental autonomy support, adolescents' autonomy and peer resistance. Younger adolescents may be at a stage where they are still exploring their own identity and values (Meeus et al., 2012), and thus may be more responsive to autonomy-supportive parenting practices that encourage them to make their own decisions and express their own opinions. In contrast, older adolescents may have already established a more stable sense of self (Meeus et al., 2012), and rely less on their parents for support and guidance in developing cognitive autonomy. Therefore, they may not benefit as much from autonomy-supportive parenting. Additionally, as adolescents get older, they become more independent and may be more influenced by experiences outside the family context, which may override the influence of parents (De Goede et al., 2009). Research provided evidence that both warm and harsh parenting had weaker impacts on adolescent well-being in late adolescence than in early and middle adolescence (Ren et al., 2023). Consequently, this study aimed to explore whether the associations between parental autonomy support, adolescents' general autonomy, and peer resistance would be different among adolescents at different stages of development.

Inter-Individual and Intra-Individual Changes

Bidirectional associations among variables may occur at both the inter-individual and intra-individual levels. Previous research has primarily concentrated on the inter-individual level, emphasizing rank-order comparisons (e.g., Fousiani et al., 2014). These studies indicated that adolescents who report higher levels of parental autonomy support compared to their peers also demonstrate higher levels of both general autonomy and peer resistance compared to their peers. Research conducted at this level aids in identifying who among adolescents might need targeted interventions. However, in the context of developmental processes, it is theorized that transactional effects between parents and adolescents occur within individuals. This implies that individual adolescents will exhibit greater general autonomy and peer resistance compared to their own average levels when their perceived parental autonomy support increases compared to their average levels. Indeed, adolescents' intraindividual changes in individual characteristics can be longitudinally associated with changes in their parents' autonomy-supportive parenting practices. For example, when adolescents reported greater emotion regulation than usual, this predicted more maternal autonomy support than usual (Van Lissa et al., 2019, Keskin & Branje, 2022). Studies at this level of analysis are more suitable for elucidating the within-person mechanisms that link need-supportive processes to each other, on the level such

processes are theorized to take place. By distinguishing between inter-individual associations and intra-individual effects, the current study aimed at offering more precise insights for comprehending the bidirectional associations between general autonomy, peer resistance, and parental autonomy support.

Current Study

Much of extant research on the links between parental autonomy support, adolescents' general autonomy, and peer resistance has employed cross-sectional designs, and was mostly focused on comparing individual adolescents with other adolescents instead of with changes within themselves. The current study used a longitudinal design aimed at shedding light on both interindividual and intraindividual associations between parental autonomy support, adolescents' general autonomy, and peer resistance. It was hypothesized that there would be positive associations between general autonomy, peer resistance and parental autonomy support, at both the between-person and within-person level. Specifically, regarding the between-person associations, adolescents with higher levels of general autonomy were expected to exhibit greater peer resistance compared to those with lower general autonomy (Hypothesis 1). Moreover, adolescents with greater parental autonomy support were expected to exhibit higher levels of general autonomy (Hypothesis 2), and greater peer resistance (Hypothesis 3) compared to those with lower autonomy support. Regarding within-person cross-lagged effects, increased general autonomy was hypothesized to be bidirectionally associated with increased peer resistance over time (Hypothesis 4), and increased parental autonomy support was hypothesized to be bidirectionally associated with increased general autonomy (Hypothesis 5) as well as increased peer resistance (Hypothesis 6). Moreover, it was expected that adolescents' general autonomy would mediate the longitudinal association between parental autonomy support and peer resistance at the within-person level (Hypothesis 7). Furthermore, differences in the associations between parental autonomy support, adolescents' general autonomy, and peer resistance were anticipated between early and middle adolescence (Hypothesis 8). The current study was pre-registered at <https://osf.io/b6zfq>. A conceptual representation of the proposed model is illustrated in Fig. 1.

Methods

Participants and Procedure

This study used data from the INTRANSITION project, which focuses on adolescents' development during school

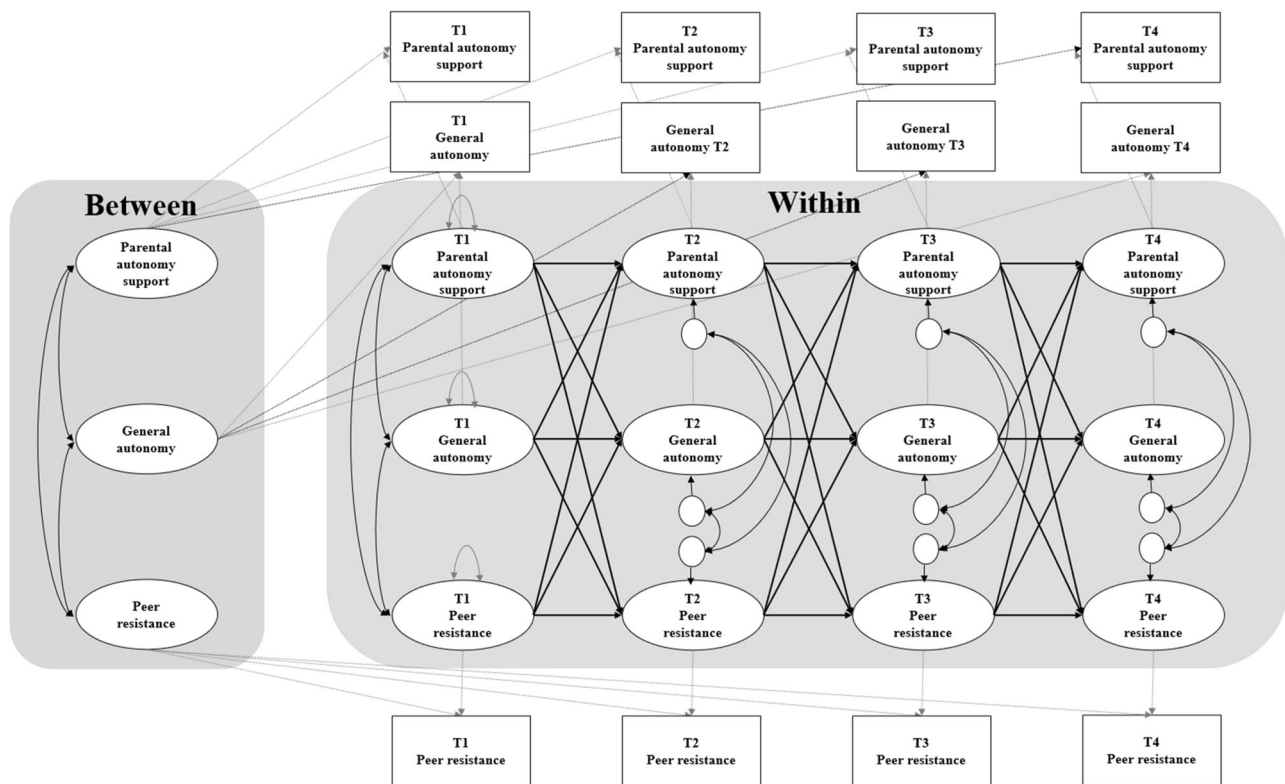


Fig. 1 Conceptual Representation of RI-CLPM of Parental Autonomy Support, General Autonomy, and Peer Resistance

transitions in the Netherlands. The project utilized a longitudinal design with four time points within a two-year period. Two cohorts were included in the study: the “younger” cohort consisted of 290 early adolescents who were in the transition to secondary school ($M_{age} = 11.58$, $SD = 0.44$ at T1; 49.3% boys), and the “older” cohort consisted of 220 middle to late adolescents who were close to the transition to tertiary education ($M_{age} = 17.79$, $SD = 1.47$ at T1; 25.0% boys).

Of the 290 early adolescents, 275 adolescents (96.5%) primarily identified themselves as Dutch. Of the remaining 3.5%, 2 (0.7%) adolescents primarily identified themselves as Moroccan and Turkish respectively, 1 (0.4%) adolescent identified themselves as Antillean, and 5 (1.8%) adolescents reported another ethnicity. Most ($N = 228$, 78.6%) adolescents lived in a two-parent household. The perceived socioeconomic status of adolescents was at a relatively high level. Adolescents perceived their SES as $M = 7.74$, $SD = 1.09$, on a 1–10 scale. SES was assessed using a 10-step ladder scale, where the top of the ladder represented individuals considered to be the most advantaged, characterized by higher financial resources, best education and jobs. Conversely, the bottom of the ladder denoted individuals perceived as the least advantaged, marked by the least amount of money, lower educational attainment, and the worst jobs or those who are unemployed.

Of the 220 middle to late adolescents, 203 adolescents (95.3%) primarily identified themselves as Dutch. Of the remaining 4.7%, 4 (1.9%) adolescents primarily identified themselves as Moroccan, 1 (0.5%) adolescent identified themselves as Turkish, 2 (0.9%) adolescents identified themselves as Antillean, and 3 (1.4%) adolescents reported another ethnicity. Most ($N = 159$, 72.3%) adolescents lived in a two-parent household. The perceived socioeconomic status of adolescents was at a relatively high level. Adolescents perceived their SES as $M = 7.10$, $SD = 1.37$, on a 1–10 scale.

This procedure was approved by the local faculty ethical review board at Utrecht University. Before the data collection, participants and one of their parents signed informed consent. Adolescents completed self-report online questionnaires and received €10 for each completed measurement wave. Measurement waves were six months apart and took place in the spring and the fall of each year.

Missing Data

Of the initial sample of 290 early adolescents who agreed to participate in Wave 1, 234 adolescents (80.7%) completed the questionnaires at T2, 230 adolescents (79.3%) completed them at T3, and 205 adolescents (70.7%) completed them at T4. Of the 220 middle to late

adolescents who agreed to participate in Wave 1, 185 adolescents (84.1%) completed the questionnaires at T2, 163 adolescents (74.1%) completed them at T3, and 124 adolescents (56.4%) completed them at T4. Little's (1988) missing completely at random (MCAR) test indicated that data were missing at random for the younger group, $\chi^2_{\text{young}}(199) = 193.93$, $p = 0.588$, and the older group, $\chi^2_{\text{old}}(131) = 119.59$, $p = 0.753$. Additionally, as indicated by attrition analyses, no significant differences were observed between early adolescents who participated in all time points and those who did not, in terms of adolescents' general autonomy, $F(1, 279) = 2.08$, $p = 0.151$, peer resistance, $F(1, 269) = 1.00$, $p = 0.319$, and parental autonomy support, $F(1, 271) = 2.08$, $p = 0.150$, at the first time point. Similarly, no significant differences were found among middle to late adolescents who participated at all time points and those who did not in relation to adolescents' general autonomy, $F(1, 210) = 0.36$, $p = 0.551$, peer resistance, $F(1, 208) = 0.01$, $p = 0.996$, and parental autonomy support, $F(1, 208) = 0.27$, $p = 0.602$, at the first time point. Therefore, adolescents were included in the analysis, regardless of missing data or attrition, using Full Information Maximum Likelihood (FIML; Muthén & Muthén, 1998–2020).

Measures

Parental Autonomy Support

The mean of the 8-items Parental Autonomy Support scale was used to measure adolescents' perceived autonomy support from their parents (Silk, 2003), which includes decision-making, independent thinking, and activity choices. The items were rated on a 5-point Likert scale, ranging from 1 (none) to 5 (always). Sample items of parental autonomy support are, "My parents encourage me to think independently", "My parents let me make my own plans for things I want to do". Internal consistency was good across waves, with Cronbach's α ranging from 0.79 to 0.87.

Autonomy

The mean of the 5-item Perceived Choice subscale from the Perceived Choice and Awareness Scale was used to assess adolescents' autonomy (Sheldon et al., 1996). It has been verified to have good reliability and validity (Lisinskiene et al., 2020; Sheldon et al., 1996). The items were rated on a 7-point Likert scale, ranging from 1 (never) to 7 (always). A sample item is, "I always feel like I choose the things I do." Internal consistency was good at every timepoint; Cronbach's α ranged from 0.83 to 0.89.

Peer Resistance

Peer resistance was measured by the mean of the 14-item Resistance to Peer Influence questionnaire designed by Steinberg and Monahan (2007). This scale included various aspects of pressure experienced from the broader peer group. Adolescents rated the extent to which the 14 items applied to them using a 5-point Likert scale, ranging from 1 (completely disagree) to 5 (completely agree). A sample item is, "When my friends ask me something, I find it hard to say no". Reverse coding was applied to these items to reflect peer resistance. Reliability across waves was good; Cronbach's α ranged from 0.90 to 0.91 across the measurement waves.

Analytic Plan

A multigroup random intercept cross-lagged panel model (RI-CLPM; Hamaker et al., 2015) was employed to examine the hypotheses, using Mplus Version 8.6 (Muthén & Muthén, 1998–2020). The RI-CLPM includes a random intercept for each construct, namely parental autonomy support, adolescents' autonomy and peer resistance, which can capture stable between-person differences. The multigroup RI-CLPM model included: (1) within-person stability paths from one time point to the next, for three study variables; (2) within-person cross-lagged paths from parental autonomy support T to adolescents' autonomy T_{+1} and peer resistance T_{+1} , also from adolescents' autonomy T to peer resistance T_{+1} , and possible reverse paths; (3) within-person concurrent correlations or residual covariances between all variables; and (4) correlations between the random intercepts of the three variables.

Mean scores were calculated for parental autonomy support, adolescents' autonomy and peer resistance in all models. A model with parameters constrained across time was initially evaluated, in which all parameters were estimated freely across the two age groups. To assess whether autoregressive paths, cross-lagged paths and concurrent associations could be constrained to be equal across different timepoints, a series of Wald tests were conducted through releasing these paths separately within each age group. Following this, additional Wald tests were conducted to examine the potential constraints on autoregressive paths, cross-lagged paths, concurrent associations and correlations between random intercepts across the two age groups. The constraints were added if the Wald test was not significant at $p < 0.01$ (adjusted p -value to correct for multiple testing), otherwise, the path was freely estimated across the different time points or age groups.

The indirect effect of general autonomy was calculated using the MODEL INDIRECT command in the final most

Table 1 Descriptive Statistics and Independent Samples *t* Tests

Variables	n	<i>M</i>	<i>SD</i>	<i>t</i> -test	<i>df</i>	<i>p</i>
1. Parental autonomy support T1	273 (210)	3.60 (3.68)	0.63 (0.68)	−1.38	481	0.170
2. Parental autonomy support T2	231 (184)	3.68 (3.69)	0.75 (0.77)	−0.13	413	0.890
3. Parental autonomy support T3	229 (162)	3.76 (3.76)	0.74 (0.69)	0.02	389	0.980
4. Parental autonomy support T4	204 (124)	3.67 (3.68)	0.78 (0.68)	−0.22	326	0.830
5. General autonomy T1	281 (212)	5.63 (5.61)	0.91 (0.85)	0.21	491	0.830
6. General autonomy T2	234 (185)	5.82 (5.54)	0.88 (0.91)	3.10	417	0.002
7. General autonomy T3	230 (163)	5.84 (5.57)	0.85 (0.92)	3.04	391	0.003
8. General autonomy T4	205 (124)	5.67 (5.62)	0.97 (0.79)	0.52	327	0.600
9. Peer resistance T1	271 (210)	4.18 (4.03)	0.62 (0.62)	2.58	479	0.010
10. Peer resistance T2	237 (183)	4.20 (4.06)	0.63 (0.61)	2.28	418	0.020
11. Peer resistance T3	224 (158)	4.21 (4.12)	0.64 (0.59)	1.47	380	0.140
12. Peer resistance T4	201 (127)	4.16 (4.09)	0.68 (0.61)	0.89	326	0.370

n, *M* and *SD* of old group are presented in parentheses

parsimonious RI-CLPM, bootstrapping with $n = 1000$ iterations (Cheung & Lau, 2008). Gender, age and the starting year were included as covariates of the random intercepts for all constructs, and continuous variables were standardized. Full Information Maximum Likelihood was used to handle missing data (FIML; Muthén & Muthén, 1998–2020), and Maximum likelihood estimation with robust standard errors to correct for non-normally distributed data (MLR; Satorra & Bentler, 2010). The acceptability of model fit was assessed using convergence across multiple fit indices and criteria, including the root mean square error of approximation (RMSEA) and the standardized root mean square residual (SRMR) at <0.08 (Browne & Draper, 2006), and the comparative fit index (CFI) and the Tucker – Lewis index (TLI) at >0.90 (Fan et al., 1999; Marsh et al., 2004).

Results

Preliminary Analyses

The means, standard deviations, and bivariate correlations for the variables among the younger and older groups are presented in Table 1 and Table 2. There were positive and mostly significant correlations among general autonomy, peer resistance, and parental autonomy support across the four time points for both groups. The results of the independent samples *t*-tests are also presented in Table 1, indicating that the younger group reported significantly higher scores of general autonomy at T2 and T3 compared to the older group. Furthermore, the younger group reported significantly higher scores of peer resistance at T1 and T2 when compared to the older group.

First, a series of Wald tests were conducted to determine whether stability paths, cross-lagged paths, and

within-time paths could be constrained over time in the multigroup RI-CLPM for younger and older groups separately. Table S1 in the Supplemental Material presents the results of Wald tests, which indicated that all paths could be constrained to be equal across different time points in both the younger and older age groups. The model fit of the multigroup model was good, with $\chi^2(147) = 199.27$, CFI = 0.966, TLI = 0.953, RMSEA = 0.038, 90% RMSEA = 0.023–0.050, and SRMR = 0.071.

Next, Wald tests were conducted to examine which paths significantly differed across age groups. Table S2 in the Supplemental Materials presents the results of Wald tests, which indicated that all models fit well (CFIs and TLIs >0.90 , RMSEAs <0.08) and the most appropriate model for explaining the associations among variables was the fully constrained model. Therefore, all the paths were constrained to be equal across the two age groups. The model fit of the final model with all paths constrained across time and age was good, with $\chi^2(162) = 213.70$, CFI = 0.967, TLI = 0.958, RMSEA = 0.036, 90% RMSEA = 0.021–0.048, and SRMR = 0.071.

Associations among General Autonomy, Peer Resistance, and Parental Autonomy Support

Table 3 and Fig. 2 presents both between- and within-person associations among parental autonomy support, general autonomy, and peer resistance. At the between-person level, the results indicated significant and positive correlations between parental autonomy support, general autonomy and peer resistance, standardized effect sizes ranging from moderate to strong. At the within-person level, autoregressive paths revealed that the fluctuations in parental autonomy support and peer resistance

Table 2 Correlations Between General Autonomy, Peer Resistance, and Parental Autonomy Support

Variables	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15
1. Parental autonomy support T1	–	0.70 ^{***}	0.70 ^{***}	0.71 ^{***}	0.43 ^{***}	0.39 ^{***}	0.23 ^{**}	0.28 ^{**}	0.17 [*]	0.24 ^{**}	0.12	0.17	0.08	–0.12	–0.23 ^{***}
2. Parental autonomy support T2	0.41 ^{***}	–	0.82 ^{***}	0.70 ^{***}	0.33 ^{***}	0.31 ^{***}	0.25 ^{**}	0.26 ^{**}	0.22 ^{**}	0.29 ^{**}	0.25 ^{**}	0.23 [*]	0.05	–0.15 [*]	–0.23 ^{***}
3. Parental autonomy support T3	0.35 ^{***}	0.42 ^{***}	–	0.68 ^{***}	0.26 ^{***}	0.28 ^{**}	0.25 ^{**}	0.17 [*]	0.17 [*]	0.30 ^{***}	0.23 ^{**}	0.16	–0.10	–0.13	–0.35 ^{***}
4. Parental autonomy support T4	0.20 ^{**}	0.24 ^{***}	0.53 ^{***}	–	0.34 ^{***}	0.21 [*]	0.23 [*]	0.30 ^{***}	0.07	0.15	0.04	0.12	0.07	–0.16	–0.32 ^{***}
5. General autonomy T1	0.20 ^{**}	0.26 ^{***}	0.10	0.09	–	0.57 ^{***}	0.41 ^{***}	0.56 ^{***}	0.34 ^{***}	0.40 ^{***}	0.29 ^{***}	0.33 ^{***}	0.08	–0.09	–0.13
6. General autonomy T2	0.20 ^{**}	0.35 ^{***}	0.19 ^{**}	0.07	0.35 ^{***}	–	0.72 ^{***}	0.70 ^{***}	0.32 ^{**}	0.37 ^{***}	0.36 ^{***}	0.52 ^{***}	0.02	–0.02	–0.02
7. General autonomy T3	0.19 ^{**}	0.31 ^{***}	0.32 ^{***}	0.17 [*]	0.28 ^{***}	0.45 ^{***}	–	0.63 ^{***}	0.23 ^{**}	0.32 ^{***}	0.35 ^{***}	0.40 ^{***}	0.02	–0.07	–0.10
8. General autonomy T4	0.13	0.23 ^{**}	0.22 ^{**}	0.33 ^{***}	0.32 ^{***}	0.33 ^{***}	0.48 ^{***}	–	0.42 ^{***}	0.42 ^{***}	0.38 ^{***}	0.54 ^{***}	0.10	–0.11	–0.10
9. Peer resistance T1	0.19 ^{**}	0.20 ^{**}	0.25 ^{**}	0.18 [*]	0.31 ^{***}	0.31 ^{***}	0.26 ^{**}	0.18 ^{**}	–	0.69 ^{***}	0.62 ^{***}	0.56 ^{***}	0.11	–0.10	0.01
10. Peer resistance T2	0.16 [*]	0.20 ^{**}	0.20 ^{**}	0.25 ^{***}	0.25 ^{***}	0.33 ^{***}	0.27 ^{***}	0.28 ^{***}	0.58 ^{***}	–	0.68 ^{***}	0.61 ^{***}	–0.03	–0.13	–0.01
11. Peer resistance T3	0.13 [*]	0.08	0.11	0.18 [*]	0.25 ^{***}	0.21 ^{**}	0.31 ^{***}	0.32 ^{***}	0.46 ^{***}	0.43 ^{***}	–	0.69 ^{***}	0.09	–0.09	–0.09
12. Peer resistance T4	0.17 [*]	0.15 [*]	0.15 [*]	0.15 [*]	0.30 ^{***}	0.19 [*]	0.33 ^{***}	0.37 ^{***}	0.45 ^{***}	0.51 ^{***}	0.62 ^{***}	–	0.18 [*]	–0.06	–0.10
13. Gender	–0.01	0.09	0.13	0.11	–0.02	–0.05	–0.09	0.03	0.11	0.04	0.04	0.05	–	–	–
14. Starting year	0.01	0.18 ^{**}	0.12	0.07	0.03	0.01	–0.03	0.01	–0.02	–0.03	–0.02	–0.09	–	–	–
15. Age	–0.07	–0.05	0.01	–0.13	–0.02	–0.03	–0.01	0.04	0.03	–0.05	0.04	–0.01	–	–	–

Correlations for the younger group are reported below the diagonal, and correlations for the older group are reported above the diagonal

* $p < 0.05$; ** $p < 0.01$; *** $p < 0.001$

demonstrated weak to moderate levels of stability within individuals over time, whereas fluctuations in adolescents’ autonomy were not stable over time. Concurrent associations showed that higher levels of general autonomy were significantly correlated with higher levels of parental autonomy support at T1–T4, with standardized effect sizes from 0.12 to 0.31, and with higher levels of peer resistance at T2–T4, with standardized effect sizes from 0.11 to 0.22. There were no statistically significant associations between parental autonomy support and peer resistance. Additionally, no significant cross-lagged paths were found, and general autonomy did not mediate the effects of parental autonomy support on the next two waves of peer resistance ($B = 0.01$, $S.E. = 0.01$, $p = 0.434$, 95% CI = -0.01 to 0.02).

Discussion

Previous studies on the links between parental autonomy support, adolescents’ general autonomy, and peer resistance mostly used cross-sectional designs and often mixed group-level differences with within-individual fluctuations. Consequently, it remains uncertain whether the findings from cross-sectional designs extend to within-person processes. To address this gap, the current longitudinal study comprehensively examined both stable between-person differences and within-person fluctuations. By distinguishing these aspects, the findings of this study provide insights into the dynamic associations between parental autonomy support, adolescents’ general autonomy and peer resistance during adolescence.

Parental Autonomy Support, Adolescents’ General Autonomy, and Peer Resistance

At the between-person level, adolescents who reported higher levels of autonomy were more likely to report higher level of parental autonomy support and peer resistance, and adolescents who reported higher levels of parental autonomy support were also more likely to resist peer influence compared to other adolescents. Adolescents who experienced more general autonomy also reported more autonomy support by their parents and more resistance to peer influence compared to their peers, which is in line with previous studies (Bernasco et al., 2023; Fousiani et al., 2014). This implies that adolescents with a strong sense of autonomy are generally more likely to uphold their own values and beliefs in the face of peer pressure (Chan & Chan, 2013), and parental autonomy support may play a role in fostering a sense of self-determination and independent decision-making in adolescents (Soenens & Vansteenkiste, 2010). Also, adolescents who reported higher levels of parental

Table 3 Parameter Estimates for Associations among Parental Autonomy Support, Peer Resistance, and General Autonomy

	<i>B</i>	<i>S.E.</i>	95% CI	<i>p</i>	β
Autoregressive paths					
Parental autonomy support $T \rightarrow T + 1$	0.31***	0.08	[0.15, 0.48]	0.000	[0.26, 0.41]
General autonomy $T \rightarrow T + 1$	0.17	0.09	[-0.02, 0.35]	0.073	[0.15, 0.23]
Peer resistance $T \rightarrow T + 1$	0.22**	0.07	[0.08, 0.36]	0.002	[0.20, 0.24]
Cross-lagged paths					
Parental Autonomy support $T \rightarrow$ General autonomy $T + 1$	0.11	0.08	[-0.05, 0.27]	0.165	[0.07, 0.11]
General autonomy $T1 \rightarrow$ Parental autonomy support $T + 1$	0.03	0.04	[-0.05, 0.11]	0.473	[0.03, 0.05]
Peer resistance $T1 \rightarrow$ General autonomy $T + 1$	0.06	0.09	[-0.12, 0.25]	0.498	[0.04, 0.06]
General autonomy $T1 \rightarrow$ Peer resistance $T + 1$	0.04	0.04	[-0.03, 0.12]	0.253	[0.06, 0.07]
Parental autonomy support $T \rightarrow$ Peer resistance $T + 1$	-0.03	0.04	[-0.11, 0.05]	0.467	[-0.04, -0.03]
Peer resistance $T \rightarrow$ Parental autonomy support $T + 1$	0.08	0.06	[-0.04, 0.20]	0.177	[0.05, 0.08]
Concurrent associations					
Parental autonomy support $T1 -$ General autonomy $T1$	0.05*	0.02	[0.01, 0.10]	0.036	[0.12, 0.21]
Parental autonomy support $T2-T4 -$ General autonomy $T2-T4$	0.07***	0.02	[0.03, 0.11]	0.000	[0.12, 0.31]
Peer resistance $T1 -$ General autonomy $T1$	0.04	0.02	[-0.01, 0.08]	0.107	[0.11, 0.14]
Peer resistance $T2-T4 -$ General autonomy $T2-T4$	0.04*	0.02	[0.01, 0.07]	0.014	[0.11, 0.22]
Parental autonomy support $T1 -$ Peer resistance $T1$	0.01	0.01	[-0.02, 0.03]	0.706	[0.02, 0.03]
Parental autonomy support $T2-T4 -$ Peer resistance $T2-T4$	0.02	0.01	[-0.01, 0.04]	0.081	[0.06, 0.15]
Between-person associations					
Parental autonomy support $-$ General autonomy	0.10***	0.03	[0.05, 0.15]	0.000	[0.32, 0.59]
Peer resistance $-$ General autonomy	0.15***	0.03	[0.10, 0.20]	0.000	[0.54, 0.68]
Parental autonomy support $-$ Peer resistance	0.07***	0.02	[0.03, 0.10]	0.000	[0.29, 0.46]
Gender \rightarrow Parental autonomy support	0.07	0.06	[-0.06, 0.19]	0.273	[0.10, 0.11]
Gender \rightarrow General autonomy	-0.07	0.08	[-0.23, 0.08]	0.371	[-0.07, 0.10]
Gender \rightarrow Peer resistance	0.08	0.06	[-0.05, 0.18]	0.221	[0.09, 0.17]
Starting year \rightarrow Parental autonomy support	0.15	0.08	[-0.01, 0.31]	0.061	[0.01, 0.16]
Starting year \rightarrow General autonomy	-0.01	0.10	[-0.21, 0.19]	0.933	[-0.01, 0.01]
Starting year \rightarrow Peer resistance	-0.08	0.09	[-0.26, 0.10]	0.358	[-0.07, 0.04]
Age \rightarrow Parental autonomy support	-0.11	0.07	[-0.25, 0.03]	0.122	[-0.31, -0.14]
Age \rightarrow General autonomy	-0.02	0.10	[-0.21, 0.18]	0.878	[-0.10, -0.01]
Age \rightarrow Peer resistance	0.02	0.08	[-0.13, 0.18]	0.762	[-0.02, 0.02]

* $p < 0.05$; ** $p < 0.01$; *** $p < 0.001$

autonomy support were more likely to align with their own values and beliefs within peer groups, even when facing peer pressure, compared to their peers.

At the within-person level, the substantial concurrent associations suggest that changes in general autonomy were simultaneously and positively related to changes in parental autonomy support and resistance to peer influence. This extends beyond previous between-person research findings by highlighting that when adolescents experience higher levels of general autonomy, they are also more likely to perceive increased parental autonomy support and peer

resistance compared to their own average level. However, changes in individual adolescents' parental autonomy support were not associated with changes in individual adolescents' peer resistance at the same time points. This lack of within-person associations among parental autonomy support and peer resistance is inconsistent with the between-person positive association. Therefore, whereas adolescents who report relatively more parental autonomy support also tend to report relatively higher peer resistance, within-person fluctuations of these two are not associated to each other. This finding highlights the importance of considering

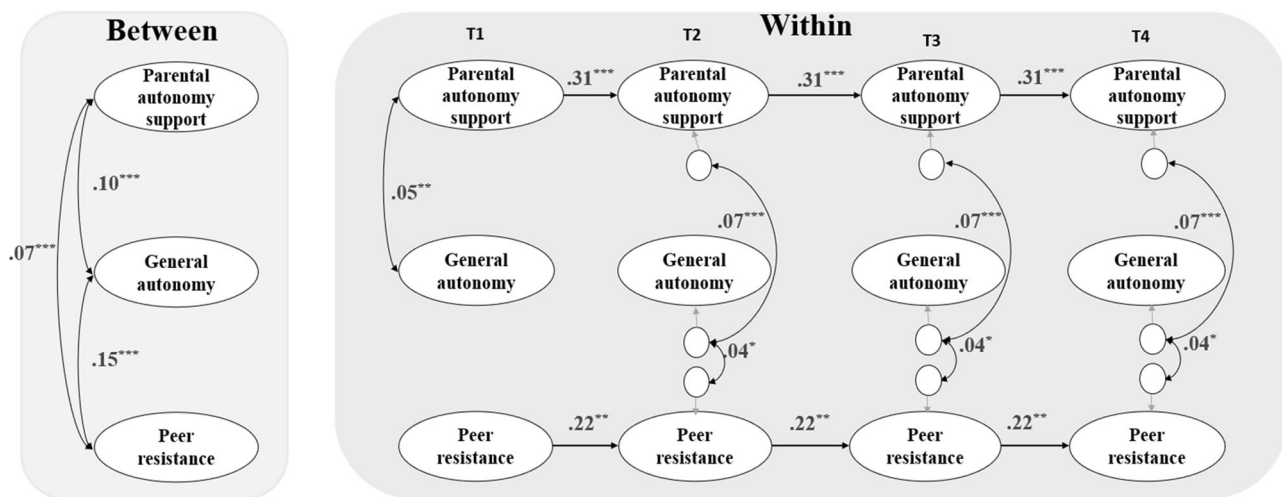


Fig. 2 RI-CLPM standardized estimates (standard errors) for Parental Autonomy Support, General Autonomy, and Peer Resistance. *Note.* The model controlled for starting year, gender and age. These associations are reported in Table 3. * $p < 0.05$; ** $p < 0.01$; *** $p < 0.001$

within-person processes, and provides insights into the nuanced nature of these associations.

In contrast to the hypotheses, there was no evidence for any significant differences between early and middle to late adolescence in the associations between parental autonomy support, adolescents' general autonomy, and peer resistance, which suggests that these associations may be relatively stable across these two developmental stages of adolescence. Furthermore, this study did not find any evidence suggesting that any of the three constructs affected changes in the other constructs over six-month intervals, nor did it reveal a mediating effect of general autonomy. A reason for the occurrence of concurrent change and the absence of predictive associations among our study variables may be that the six-month intervals are too long to capture the over-time effects of these fluctuations around adolescents' average autonomy and autonomy support. That is, the effects may be more immediate and transient and operate within shorter time intervals. During adolescence, changes occur at varying rates as a result of rapid biological and psychosocial development (Crone et al., 2016). Within-person interactions are likely to reciprocally influence each other on a relatively shorter timescale, such as a few days, weeks, or months, yet might bounce back to one's general level after some time. When employing longer time lags, these effects might show as correlated change. Therefore, it might be advisable to employ shorter time intervals between assessments when conducting the RI-CLPM to be able to observe lagged effects (Masselink et al., 2018; Orth et al., 2021). Future research could consider employing shorter time intervals to capture these temporal dynamics and explore the potential short-term bidirectional associations among parental autonomy support, adolescents' general autonomy and peer resistance.

Another potential explanation for the lack of significant lagged effects between parental autonomy support, general autonomy and peer resistance might be that negative experiences have a stronger effect than positive experiences (Baumeister et al., 2001). Parenting practices that undermine adolescent autonomy may have a greater impact than parental autonomy support. Previous research showed that increases in early adolescents' autonomy predicted decreases in parental psychological control after six months (Wang et al., 2023). Comparably, parents may exhibit stronger reactions to their adolescents' negative changes rather than to their positive changes (Baumeister et al., 2001). For instance, when adolescents experience heightened emotion dysregulation, mothers show less autonomy support over time (Keskin & Branje, 2022). Similarly, increased parent-adolescent conflict has been shown to predict subsequent increases in parental psychological control (Sun et al., 2021).

Although the results suggest that trait-like, time-invariant factors may play a role in the associations observed between parental autonomy support and peer resistance, it is important to avoid characterizing between-person differences as fixed or stable, as often assumed within the RI-CLPM framework. Further research may benefit from the application of the Autoregressive Latent Trajectory Model (ALT), a statistical model tailored for analyzing mean-level changes, or changes in the average level of a variable within individuals or groups over a specified period (Curran & Bollen, 2001). The ALT model considers variations in individuals' initial trait levels and accounts for different rates of change or trajectories over time. By recognizing the potential fluctuations at both the individual and group levels, researchers can gain insights into the dynamic nature of variables and the average patterns of changes. After all, it

is important to not only understand why adolescents reveal minor fluctuations in behavior around general stable traits, but also whether and how interindividual differences in these traits change with age. However, the implementation of the ALT model in this study was limited due to its inherent complexity and its need for a larger sample size.

Strengths, Limitations and Further Directions

This study used an advanced analytic method to separate within- from between-person associations and, thereby, provided a more comprehensive understanding of how parental autonomy support, adolescents' autonomy and peer resistance are associated with each other. However, this study also has its limitations. First, our sample consisted primarily of Dutch adolescents with relatively high levels of perceived socioeconomic status. Adolescents from individualistic cultures or higher socioeconomic status are more likely to receive autonomy support from their parents and to be encouraged to behave autonomously (Pan et al., 2013; Shi & Tan, 2021). Future research is needed to extend the generalizability of these findings to more diverse samples, including adolescents from different cultural backgrounds and varying socioeconomic status.

Second, our study employed a combined assessment of adolescent perceptions of autonomy support from both fathers and mothers. However, research has demonstrated that mothers' and fathers' autonomy-related behaviors might have different roles in the development of adolescents (Vrolijk et al., 2020). Future studies could consider examining the unique contributions of mothers and fathers separately, in order to gain the deeper understanding of the differential roles played by each parent in influencing adolescents' autonomy and their resistance to peer influence.

Third, the data after the first time point were collected during the COVID-19 outbreak. Adolescents were in partial lockdown while completing some of the questionnaires. Being in lockdown might increase time adolescents spend with parents and decrease time adolescents spend with peers face-to-face. As a result, it is possible that peer resistance and adolescents' general autonomy were not predictively associated with each other during the lockdown period. However, Wald tests did not reveal any significant differences in the associations between peer resistance and general autonomy across different time points in this study, which suggests the COVID-19 pandemic did not have a strong impact on the overall research findings.

Fourth, all constructs in this study were solely assessed through adolescents' self-reports, which may cause potential common method variance and reporting bias. Future research would benefit from adopting a more comprehensive strategy, such as employing multi-method assessments

and incorporating multiple informants to enhance the robustness of the findings.

Finally, the associations among parental autonomy support, adolescents' general autonomy and peer resistance were likely influenced by additional factors that were not examined in this study. Adolescence can be characterized by a notable development of cognitive and social abilities (Steinberg & Morris, 2001), and the exploration of identity (Branje et al., 2021; Meeus, 2018). This gradual maturation enables adolescents to better understand and define themselves in relation to their personal values, beliefs, and social roles. These self-perceptions and self-awareness may substantially contribute to how adolescents perceive and respond to various situations such as peer pressures, interactions with parents, and decision-making. Therefore, an intriguing direction for further research lies in the realm of self-perception and self-awareness, such as identity, self-esteem, and self-efficacy, which may potentially explain the observed simultaneous changes in our study variables. Another direction for further research could be to consider characteristics of peer groups or specific behaviors of peers including both negative and positive peer influence. As adolescents do not exist in isolation, they are inherently embedded within peer groups characterized by unique dynamics and norms, which may play a role in shaping adolescent autonomy.

Conclusion

Previous research on the links between parental autonomy support, adolescents' general autonomy, and peer resistance has predominantly focused on comparing individual adolescents with other adolescents, rather than assessing changes within the same individuals over time. This study provides insights into the associations among parental autonomy support, general autonomy and peer resistance during adolescence by distinguishing between-person differences from within-person fluctuations. The findings showed that changes in general autonomy happened simultaneously with changes in parental autonomy support and peer resistance, implying that adolescents' general autonomy may co-develop with supportive and autonomy-promoting parenting and adolescents' autonomous functioning in the peer context. These findings highlight that adolescents' general autonomy is possibly concurrently interconnected with their immediate and broader social systems, such as the family and peer contexts. However, the absence of significant cross-lagged paths suggests that changes in these variables have no long-term effects over six months. Further research is needed to better understand the nuanced interplay between parental autonomy support, adolescents' autonomy, and peer resistance, and how

adolescents' general autonomy is associated with interactions with family and peers. Furthermore, the absence of significant differences in the associations among study variables between early and middle to late adolescence implies that interventions or policies aimed at fostering adolescent autonomy through parenting may be applicable across different developmental stages within adolescence.

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Authors' contributions J.W. conceived of the study, performed the statistical analyses, interpreted the results, and drafted the manuscript; T.K. guided the data analysis, reviewed and edited the manuscript; S.M. helped revising and editing the manuscript; S.B. designed the larger project, provided feedback on the research questions, hypotheses and analyses, and critically revised the manuscript. All authors read and approved the final manuscript.

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Data Sharing and Declaration Data used in this study will not be deposited. The scripts for data analyses and analyses for sensitivity analyses are shared on the project OSF page (<https://osf.io/b6zfq>). This study was preregistered at <https://osf.io/b6zfq>.

Compliance with ethical standards

Conflict of interest The authors declare no competing interests.

Ethical approval Data collection procedures were approved by the Faculty Ethics Review Board of the Faculty of Social & Behavioral Sciences of Utrecht University. All procedures performed in this study involving human participants were in accordance with the ethical standards of the institutional committee and with the 1964 Helsinki Declaration.

Informed consent All participants and their parents gave their informed consent to participation.

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