



Associations between young adult romantic relationship quality and problem behaviors: An examination of personality–environment interactions



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ABSTRACT

This longitudinal study examined person–environment interplay by testing interaction effects between adolescent personality type (i.e., overcontrollers, undercontrollers, and resilient) and young adult romantic relationship quality on young adult delinquency and anxiety. The study employed six waves of longitudinal questionnaire data collected across 10 years from Dutch youths. Results showed that support from romantic partner was related to a relatively stronger decrease in anxiety in young adulthood for overcontrollers than for resilient. Moreover, higher negative interaction with romantic partner was related to a relative increase in delinquent behaviors for undercontrollers, while no such links emerged for overcontrollers and resilient. This study highlights the importance of considering the interplay between personality characteristics and environmental–relational factors when examining young adults' developmental outcomes.

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1. Introduction

Personality characteristics may predispose individuals to certain problem behaviors, such as delinquency and anxiety (Caspi & Shiner, 2006; Tackett, 2006). These problem symptoms are persistent forms of maladjustment but they show developmental changes (Campbell, 1995). Delinquency peaks around age 17 and declines as individuals enter into adulthood (Bongers, Koot, Van der Ende, & Verhulst, 2003; Farrington, 1986; Piquero, 2008). Concerning anxiety symptoms, recent research suggests an increasing trend when individuals transit from late adolescence to young adulthood (Leadbeater, Thompson, & Gruppuso, 2012). It seems that emerging adulthood is a sensitive developmental period for changes in these problem symptoms. This life phase may afford new social contexts and roles thereby allowing for turning points in developmental pathways (Arnett & Tanner, 2006). When individuals enter into adulthood, the quality of romantic relationships becomes very salient (Collins & Van Dulmen, 2006; Erikson, 1968; Rauer, Pettit, Lansford, Bates, & Dodge, 2013). Prior research has suggested that a high-quality romantic relationship might be linked to relative decreases in problem behaviors,

such as antisocial behavior and emotional maladjustment (e.g., Meeus, Branje, Van der Valk, & De Wied, 2007; Roisman, Masten, Coatsworth, & Tellegen, 2004). However, there might be also personality differences in the association between quality of romantic relationships and relative changes in problem behaviors. An interactionist perspective would propose that individuals' developmental outcomes depend on the interplay between individual characteristics and environmental factors (Magnusson & Stattin, 2006). Thus, it is plausible that the interactions between personality characteristics and relational environment predict individuals' problem behavior pathways. Nevertheless, although interactions between personality and social relationships are frequently suggested in theories of individual development (e.g., Barber, 1992; Caspi, 2000; Magnusson & Stattin, 2006), relatively few empirical studies have been conducted in the context of romantic relationships. The present study tested the interaction effects between adolescent personality types and young adulthood romantic relationship quality on young adults' relative changes in delinquency and anxiety.

1.1. Personality types and problem behaviors

1.1.1. Personality types

There is a growing recognition of the need for a person-centered approach to understand personality and its associations with

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individuals' developmental outcomes. It is important to examine the links with a person-centered approach as it is noted by Robins and Tracy (2003), "it is unlikely that environmental events and contexts ever influence a single trait in isolation." The focus of this study is examining the association between personality and features of romantic relationship. It is more likely that romantic partner interacts with the whole person, not with one trait at a time. Thus, a person centered-approach is adopted in the current study.

Many studies have consistently distinguished three personality types: resilient, undercontrollers and overcontrollers (e.g., Caspi & Shiner, 2006; Robins, John, Caspi, Moffitt, & Stouthamer-Loeber, 1996). This typology is based on Block and Block's (1980) theory of ego-control and ego-resiliency and has been considered as an important and necessary complement to the dimensional approach that currently dominate personality psychology (Donnellan & Robins, 2010). Ego-control refers to containing vs. expressing emotional and motivational impulses, and ego-resiliency refers to the dynamic capacity of individuals to adjust their modal levels of ego-control, depending on environmental demands (Block & Block, 1980). Resilients are characterized by a high level of ego-resiliency and a medium level of ego-control. Overcontrollers and undercontrollers both have a low level of ego-resiliency, but differ on ego-control. Overcontrollers have a high level of ego-control and undercontrollers have a low level of ego-control (e.g., Robins et al., 1996). These three personality types have been consistently identified across cultures, ethnic groups, and ages using different methods (e.g., Alessandri et al., 2014; Asendorpf, Borkenau, Ostendorf, & Van Aken, 2001; Caspi & Silva, 1995; Chapman & Goldberg, 2011; Klimstra, Hale, Raaijmakers, Branje, & Meeus, 2010). Moreover, studies have showed that these three personality types can be reliably constructed using Big Five personality traits (Asendorpf & van Aken, 1999; Dubas, Gerris, Janssens, & Vermulst, 2002; Klimstra et al., 2010). Undercontrollers are characterized by low conscientiousness and agreeableness, resilient have generally high scores on all Big Five dimensions, and overcontrollers typically have low emotional stability, low extraversion, and are comparably agreeable as resilient (Klimstra et al., 2010; Robins et al., 1996).

Prior research has consistently shown that adolescents with these three personality types have different levels of problem behaviors. In general, resilient can respond adaptively and flexibly toward situational demands and are relatively free from problem behaviors, and thus are relatively well adjusted. Overcontrollers and undercontrollers, in contrast, exhibit little adaptive flexibility when encountering environmental challenges and are often considered as more maladjusted than resilient (Block & Block, 1980). In general, overcontrollers are more prone to internalizing problems such as anxiety, while undercontrollers exhibit higher risk of externalizing problems such as delinquency (e.g., Akse, Hale, Engels, Raaijmakers, & Meeus, 2007; De Fruyt, Mervielde, & Van Leeuwen, 2002; Van Aken, Van Lieshout, Scholte, & Haselager, 2002; Van Leeuwen, Mervielde, Braet, & Bosmans, 2004).

1.1.2. Romantic relationship and problem behaviors

Personality types are not the only factor important for understanding youths' problem behaviors. During young adulthood, romantic relationships become more salient (Collins & Van Dulmen, 2006) and, bonds to romantic partners may be linked to decreases in problem behaviors (Furman & Wehner, 1994; Laub & Sampson, 2001). Indeed, a good romantic relationship might provide an important source of support that may be associated with a relative decrease in individuals' insecure feelings such as anxiety. In contrast, negative interactions with a romantic partner could create frustration and hurt, resulting in anger and distrust, which

may be associated with increased antisocial behavior (Larson, Clore, & Wood, 1999). At the same time, young adults that have been able to decrease their problem behaviors might be able to form high quality romantic relationships, characterized by high levels of support and low levels of negative interaction.

Empirical research has shown significant associations between quality of romantic relationships and problem behaviors. For instance, high attachment and support in a romantic relationship appears to be linked with decreases in youths' antisocial behaviors (Meeus, Branje, & Overbeek, 2004; Roisman et al., 2004; Sampson & Laub, 2005). In addition, higher support from a romantic partner proved to be associated with lower social anxiety (La Greca & Harrison, 2005) and high commitment in a romantic relationship in young adulthood was associated with a relative decrease in emotional adjustment (Meeus et al., 2007). In sum, these studies suggest that high-quality romantic relationships in early adulthood are associated with low levels and relative decreases in problem behaviors.

1.1.3. Adolescent personality types, young adulthood romantic relationship quality, and young adults' problem behaviors

Apart from main effects that personality types and romantic relationship may have on young adults' problem behaviors, they may also reinforce each other through a developmental interplay. According to person–environment interaction theory, the interaction between individual characteristics (i.e., personality) and environment (i.e., romantic relationship) contributes to the development of individuals' problem behaviors (Barber, 1992; Caspi, 2000; Magnusson & Stattin, 2006). In line with this theory, differential susceptibility theory (Belsky, Bakermans-Kranenburg, & Van IJzendoorn, 2007) proposes that environments might differently affect the development of youths with different personality characteristics. That is, some individuals are more susceptible to environmental influences than others are.

Empirical research using a person-centered approach to personality, mostly cross-sectional in nature, supports this theoretical notion in the context of family and peer relationships. Specifically, undercontrollers with highly restrictive vs. less restrictive parents showed greater differences in depressed affect and internalizing behaviors than did resilient and overcontrollers (Dubas et al., 2002). Another study reported that parents of undercontrollers rated their children as significantly higher on externalizing behavior than parents of resilient, with the greatest difference occurring for undercontrollers exposed to high levels of negative parental control, whereas the difference in externalizing behavior between undercontrollers and resilient faded when the level of negative parental control was low (Van Leeuwen et al., 2004). In addition, parents of overcontrollers rated their children significantly higher on internalizing behavior than did parents of resilient, with overcontrollers in negative control families showing the highest levels of internalizing problem behavior. However, high or low negative parental control did not make a difference for the resilient (Van Leeuwen et al., 2004). Further, the positive associations between family and peer coercion and both internalizing and externalizing problem behaviors were stronger for undercontrollers than for overcontrollers and resilient (Van Aken & Dubas, 2004). The same study reported that the effects of family and peer support on internalizing and externalizing problem behaviors were stronger for overcontrollers than for undercontrollers and resilient (Van Aken & Dubas, 2004).

Interaction effects between personality types and parent–child relationships on developmental outcomes have not appeared in all existing studies, however. In the studies by Dubas et al. (2002) and Van Leeuwen et al. (2004), cross-sectional examinations showed no interaction effects between personality types and positive parental control on problem behaviors. Moreover, a

longitudinal study showed that personality types only moderated the initial association between mother–child relationship quality and adolescent depressive symptoms, with stronger associations for overcontrollers and undercontrollers than for resilient. Personality types did not moderate the initial associations between father–child relationship quality and depressive symptoms, the overtime associations between mother–child relationship quality and depressive symptoms, or the links between father–child relationship quality and depressive symptoms (Branje, Hale, Frijns, & Meeus, 2010).

Taken together, the majority of studies regarding personality–environment interaction in family and peer contexts suggest that adolescents low in resiliency are generally more vulnerable to negative relational environments than those who are high in resiliency. Prior research suggests that the associations between both internalizing and externalizing problem behaviors and family or peer coercion and control are generally stronger for undercontrollers than for the other personality types. For overcontrollers, findings are more mixed. The effects of negative parental control on problem behaviors were stronger for overcontrollers than for resilient in Van Aken and Dubas' (2004) and Van Leeuwen et al.' (2004) studies, but not in the Dubas et al. (2002) study.

Although the personality–environment interaction perspective has received some empirical support in family and peer contexts, it has been understudied in the context of romantic relationships. There has been no person-centered research on personality–romantic relationship interactions. Such interactions might occur, as compared to resilient, both overcontrollers and undercontrollers are more rigid and extreme in response to environment stresses. Thus, interpersonal challenges such as romantic relationship conflicts might be more likely to be associated with overcontrollers' and undercontrollers' increase in the problem behaviors, than with that of resilient.

Variable-centered research has provided some support for undercontrollers' higher sensitivity to environmental contexts with regard to externalizing problem behaviors. For instance, one study showed that a better romantic relationship, higher cohesiveness, intimacy, and shared interests predicted a larger decrease in delinquent behavior in young adulthood, particularly for individuals with low flexibility (e.g., low self-control; Wright, Caspi, Moffitt, & Silva, 2001). In addition, negative associations between romantic involvement and antisocial behaviors were stronger for those with pre-existing antisocial behaviors and personality traits of impulsivity and thrill seeking (Eklund, Kerr, & Stattin, 2010; Roisman et al., 2004). Among individuals with different personality types, undercontrollers in particular lack control of their emotional and behavioral impulses, and generally score the highest on delinquent and antisocial behaviors (e.g., Asendorpf et al., 2001; Hart, Hofmann, Edelstein, & Keller, 1997). Hence, it is plausible that the association between quality of romantic relationships and delinquency is stronger for undercontrollers than for overcontrollers and resilient. The present study will test this hypothesis using a person-centered approach.

Overcontrollers, in contrast, are particularly prone to anxiety symptoms (Akse et al., 2007; De Fruyt et al., 2002), and they may therefore exhibit a stronger susceptibility to environmental contexts when it comes to the development of internalizing problems. We therefore expect that, for overcontrollers, the associations between quality of romantic relationships and anxiety symptoms are stronger than for undercontrollers and resilient. To the best of our knowledge, no previous studies have empirically examined this hypothesis.

1.1.4. The present study

In sum, the aim of the current study was to examine personality–environment interaction effects in predicting youth

problem behaviors, using a person-centered approach to personality. We investigated interaction effects between adolescent personality types (i.e., overcontrollers, undercontrollers, and resilient) and quality of young adult romantic relationships (i.e., perceived support and negative interaction) on young adults' delinquent behaviors and anxiety symptoms. We expect significant personality type–romantic relationship interaction effects on youths' problem behaviors, with overcontrollers' and undercontrollers' problem behaviors more strongly associated with their romantic relationship quality than resilient's.

2. Method

2.1. Participants

Participants were 523 Dutch youths who had a romantic relationship during young adulthood. They were part of the ongoing Conflict and Management of Relationships longitudinal study (CONAMORE; Meeus et al., 2010), which in total consists of 1313 participants divided into two age cohorts. To date, they have been participating for 10 years. The younger cohort has been followed from 12 to 21 years ($n = 923$), and the older cohort has been followed from 16 to 25 years ($n = 390$). For the current study, we used data from the first five measurements of adolescent personality and problem behaviors (i.e., Wave 1 to Wave 5), collected annually from 2001 to 2005, and data from the sixth measurement of romantic relationship quality and problem behaviors (i.e., Wave 6), collected in 2010. Since the aim of the current study was to examine the interaction effects between adolescent personality types and romantic relationship quality in young adulthood, only participants who reported on their romantic relationship quality at Wave 6 were included ($N = 523$). That is, 343 participants (65.6%; 227 girls [66.2%]) out of the initial 923 participants from the younger cohort, and 180 participants (34.4%; 111 girls [61.7%]) out of the initial 390 participants from the older cohort were included. The mean ages of these subsamples at Wave 1 were 12.36 years ($SD = 0.57$) for the younger cohort and 16.59 years ($SD = 0.74$) for the older cohort. The ethnic compositions were 91.8% Dutch and 9.2% ethnic minorities. Please see detailed information on the usage of these six waves of data in Sections 2.3 and 2.3.5.

Sample attrition was 1.2% across the first five annual waves and 22.3% from Wave 5 to Wave 6 over 5 years. The current sample partly overlapped with the original total sample. In comparison to the original total sample, the selected participants ($N = 523$) were more likely to be girls ($\chi^2 [N = 1836, 1] = 26.13, p < .001, \phi = .12$) and from the older age cohort ($\chi^2 [N = 1836, 1] = 3.88, p = .04, \phi = .05$). These two samples were not different in the mean levels of anxiety and delinquency across the first five waves. The distribution of personality types was not different between the selected sample and the original total sample ($\chi^2 [N = 1836, 2] = 3.70, p = .16, \phi = .05$). However, there was a significant difference in the distribution of personality types among those who had a relationship at Wave 6 and those who did not ($\chi^2 [N = 1005, 2] = 6.11, p = .04, \phi = .08$). In particular, resilient were significantly more likely to have a romantic relation at Wave 6 ($\chi^2 [N = 1005, 1] = 5.70, p = .02, \phi = .08$). Regarding the pattern of missing data among the 523 young adults, Little's Missing Completely At Random Test (Little, 1988) revealed a normed χ^2 (χ^2/df) of 1.92 which, according to guideline by Bollen (1989), indicates that the pattern of the missing data was not meaningfully different from a Missing Completely At Random pattern. Therefore, we applied Full Information Maximum Likelihood (FIML) in *Mplus* for our model estimations.

2.2. Procedure

We included participants from 12 randomly selected high schools in the province of Utrecht, The Netherlands. We sent participants and their parents an invitation letter, describing the research project and goals, and giving the option of not participating in the study. Confidentiality of participants' responses was assured explicitly before participation. More than 99% of the approached adolescents at these schools decided to participate in our study. From Wave 1 to Wave 5, our participants annually filled out various questionnaires at school after school hours. Participants who were not present at school during measurement of Wave 1 to Wave 5 and participants at Wave 6 filled out the questionnaires at their homes. Trained assistants gave verbal instructions to participants in addition to written instructions in the questionnaires. Participants received €10 (approximately US \$13) from Wave 1 to Wave 5 and €30 (approximately US \$39) at Wave 6 as a reward for their participation.

2.3. Measure

2.3.1. Adolescents' personality types

Adolescents' personality was assessed annually in the first five measurements with the Quick Big Five questionnaire (Goldberg, 1992; Vermulst & Gerris, 2005). Thirty personality markers were used to assess five personality dimensions (each with 6 items): Extraversion (e.g., "talkative"), Agreeableness (e.g., "sympathetic"), Conscientiousness (e.g., "systematic"), Emotional stability (e.g., "worried", reverse-scored), and Openness to experience (e.g., "creative"). Adolescents reported on their personality on a 7-point Likert scale ranging from 1 (*very untrue*) to 7 (*very true*). Psychometric properties of this scale are good (e.g., Branje, Van Lieshout, & Gerris, 2007). In the present study, across Wave 1 to Wave 5, Cronbach's alphas ranged from .80 to .87 for Extraversion, from .81 to .87 for Agreeableness, from .85 to .90 for Conscientiousness, from .80 to .83 for Emotional stability, and from .75 to .77 for Openness to experience. Prior studies have shown that Block and Block's (1980) three personality types (i.e., overcontrollers, undercontrollers, and resilient) can be constructed directly from the Big Five dimensions (Klimstra et al., 2010; Meeus, Van de Schoot, Klimstra, & Branje, 2011; Robins et al., 1996). An earlier study constructed personality types with Latent Class Growth Analysis (LCGA; Nagin, 2005) on the first five annual measurement data from the original 1313 cases divided into two age cohorts, including the current sample (Branje et al., 2010). In the current study, we adopted that study's classification of personality types. In our sample, there were 176 overcontrollers, 131 undercontrollers, and 212 resilient. There were no age cohort differences in number of adolescents classified as overcontrollers, undercontrollers, and resilient ($\chi^2 [N = 523, 2] = 2.91, p = .23, \phi = .08$). Compared to boys, girls were more likely to be classified as overcontrollers ($\chi^2 [N = 523, 1] = 10.03, p < .001, \phi = .14$), and less likely to be classified as undercontrollers ($\chi^2 [N = 523, 1] = -15.05, p < .001, \phi = .17$).

2.3.2. Romantic relationship quality

Participants' romantic relationship quality during young adulthood (i.e., the sixth measurement) was assessed with the Network of Relationships Inventory (NRI; Furman & Buhrmester, 1992). This inventory measures participants' perceptions of support from, and negative interaction with, their romantic partner. Support was assessed with twelve items tapping into instrumental aid and reliable alliance in romantic relationships. A sample item was "How often do you turn to this person for support with personal problems?" Negative interaction was measured with six items tapping conflict and antagonism. A sample item was "How much do you

and this person get upset with or mad at each other?" Participants reported their romantic relationship quality on a 5-point Likert scale, ranging from 1 (*never*) to 5 (*always*). The NRI has good predictive, factorial, and construct validity (Furman, 1996). In the current study, Cronbach's alphas were .91 for perceived support from romantic partner and .90 for negative interaction with romantic partner.

2.3.3. Delinquent behaviors

Youths' delinquent behaviors were assessed in all six measurements with a self-report questionnaire measuring the frequency of minor offences (Baerveldt, Van Rossem, & Vermande, 2003). Youths reported on how many times they had committed 14 minor offences in the past year, such as stealing a bike and deliberately damaging or breaking something in the street. The items were scored on a four-point scale, ranging from 0 (*never*) to 3 (*four times or more*). The use of self-report instruments is widespread in criminology, and it is a valid measure when restricted to minor offences (Baerveldt, 2000). In the current study, the Cronbach's alphas of the scale from Wave 1 to Wave 6 were good, ranging from .82 to .87. Mean level of delinquency across the first five measurements was calculated and employed as a control variable. Wave 6 delinquency level was an outcome in the regression models described in Section 2.3.5, ranging from 0.93 to 3.29 with a skewness of 5.64 and a kurtosis of 47.50. The values of the skewness and kurtosis were higher than the cutoff scores of normal distribution (West, Finch, & Curran, 1995), indicating non-normal distribution of data on delinquency.

2.3.4. Anxiety disorder symptoms

Anxiety disorder symptoms were measured in all six measurement waves, by the Dutch version of the original 38-item Screen for Child Anxiety Related Emotional Disorders (SCARED; Birmaher et al., 1997; Hale, Raaijmakers, Muris, & Meeus, 2005). The SCARED taps into five dimensions of anxiety disorder, including generalized anxiety disorder, panic disorder, separation anxiety disorder, social anxiety disorder, and school anxiety symptoms. Psychometric properties of the SCARED have shown to be good in several studies (Birmaher et al., 1999; Hale, Crocetti, Raaijmakers, & Meeus, 2011). In the current study, the Cronbach's alphas of the scale from Wave 1 to Wave 6 were good, ranging from .91 to .94. Mean level of anxiety symptoms across the first five measurements was calculated and employed as a control variable. Wave 6 anxiety level was an outcome in the regression models described in Section 2.3.5, ranging from 2.0 to 2.41 with a skewness of 1.51 and a kurtosis of 2.41. The value of the skewness indicated significant non-normal distribution of data on anxiety (West et al., 1995).

2.3.5. Statistical analyses

We conducted multiple regression analyses to answer our research questions. Separate models for young adulthood delinquency and anxiety were examined. Before the examinations of interaction effects, we assessed the main effects of adolescent personality types and young adult romantic relationship quality on young adult problem behaviors. In the regression models, we included independent variables adolescent personality types and young adult romantic relationship quality. The three personality types were represented by two dummy variables. In the analyses with delinquency as the dependent variable, we adopted dummy variables with undercontrollers as a reference category (i.e., undercontrollers vs. overcontrollers and undercontrollers vs. resilient). In the analyses with anxiety as the dependent variable, we adopted dummy variables with overcontrollers as a reference category (i.e., overcontrollers vs. undercontrollers and overcontrollers vs. resilient). These choices were based on prior research showing that

overcontrollers scored the highest in anxiety and undercontrollers scored the highest in delinquency among the three personality types (Asendorpf et al., 2001; De Fruyt et al., 2002; Van Leeuwen et al., 2004). In addition, young adult romantic relationship quality includes perceived support from and negative interaction with romantic partner. As these two dimensions represent independent domains of romantic relationship quality (Laursen & Mooney, 2008), the effects of these two dimensions were estimated in separate models. Thus, in total we ran four models to examine the main effects: Two on delinquency and two on anxiety, with separate models for the effects of support and negative interaction. After examining the main effects, we tested the interaction effects by subsequently including personality type \times quality of romantic relationship interactions into the existing regression models. Hence, another four models were conducted. In all models, we controlled for mean levels of adolescent problem behaviors (i.e., delinquency or anxiety) across Wave 1 to Wave 5, to predict the *relative changes* in problem behaviors from adolescence to young adulthood (i.e., between Wave 5 and Wave 6 five-year's time lag). Moreover, gender differences were controlled across models. As participants were from two age cohorts, they were combined together in the analyses with the effects of age cohort controlled in the models. All regression analyses were conducted within Mplus 7.0 (Muthén & Muthén, 1998–2012), as it features FIML which enabled use of all available data points in the current sample, even for cases with some missing responses. In addition, since the dependent variables delinquency and anxiety were not normally distributed, we adopted a robust maximum likelihood estimator (MLR; Satorra & Bentler, 2001) in Mplus which allowed us to take the non-normal distribution of the data into account.

3. Results

Table 1 presents the means and standard deviations of adolescent and young adult problem behaviors and young adult romantic relation quality for each adolescent personality type (i.e., overcontrollers, undercontrollers, and resilients). There were significant differences between adolescent personality types in youths' delinquency ($F [2,520] = 8.24, d = .24, p < .001$) and anxiety ($F [2,520] = 49.93, d = .18, p < .001$) from adolescence to young adulthood. Specifically, undercontrolling adolescents ($M = 1.16, SE = .02$) scored significantly higher in delinquency than overcontrollers ($M = 1.08; SE = .01$) and resilients ($M = 1.09; SE = .01$). Moreover, overcontrolling adolescents [$M = 1.39; SE = .01$] scored the highest in anxiety symptoms, compared to undercontrollers ($M = 1.25; SE = 0.01$) and resilients ($M = 1.20; SE = 0.01$). Table 1 also presents the intercorrelations among adolescent delinquency, adolescent anxiety symptoms, perceived support and negative interaction in young adult romantic relationships, and delinquency and anxiety symptoms in young adulthood.

3.1. Main effects of adolescent personality types and young adulthood romantic relationship quality on young adults' delinquent behaviors

We examined the main effects of personality types and young adulthood romantic relationship quality on young adult problem behaviors, controlling for effects of problem behaviors in adolescence, age cohort, and gender. In the two models predicting young adulthood delinquency, the only significant predictor was delinquency level in adolescence ($N = 523/519, B = 0.09, \beta = .48, ps = .00$). The sample sizes differed across models, because 523 youths filled out the romantic relationship support scale and 519 filled out the romantic relationship negative interaction scale. Adolescent personality types did not predict the relative changes in delinquency from adolescence to young adulthood (i.e., overcontrollers vs. undercontrollers [$N = 523/519, B = -0.03, \beta = -.08, p = .20/B = -0.04, \beta = -.09, p = .15$]; resilients vs. undercontrollers [$N = 523/519, B = -0.02, \beta = -.05, p = .48/B = -0.01, \beta = -.04, p = .53$]). In addition, young adult romantic relationship quality did not significantly relate to the relative changes in delinquency (i.e., support [$N = 523, B = -0.01, \beta = -.06, p = .23$]; negative interaction [$N = 519, B = 0.03, \beta = .14, p = .07$]). Adolescent personality types and young adult romantic relationship quality were not significantly related to relative changes in delinquency from adolescence to young adulthood, above and beyond the significant stability in adolescent delinquency.

3.2. Main effects of adolescent personality types and young adulthood romantic relationship quality on young adults' anxiety symptoms

In the models predicting young adulthood anxiety symptoms, significant predictors were: level of anxiety symptoms in adolescence ($N = 523/519, B = 0.15, \beta = .58, p < .001/B = 0.14, \beta = .56, p < .001$), young adult romantic relationship quality (i.e., support [$N = 523, B = -0.03, \beta = -.13, p < .001$], negative interaction [$N = 519, B = 0.05, \beta = .20, p < .001$], and gender (girls vs. boys; $N = 523/519, B = 0.06, \beta = .12, p < .001/B = 0.07, \beta = .13, p < .001$). Adolescent personality types did not predict the relative changes in anxiety symptoms from adolescence to young adulthood (i.e., undercontrollers vs. overcontrollers [$N = 523/519, B = -0.00, \beta = -.00, p = .96/B = -0.00, \beta = -.01, p = .88$]; resilients vs. overcontrollers [$N = 523/519, B = -0.02, \beta = -.04, p = .38/B = -.02, \beta = -.03, p = .44$]). Hence, adolescent anxiety symptoms predicted young adult anxiety symptoms. Moreover, both perceived support and negative interaction in young adult romantic relationships, but not adolescent personality types, were significantly related to relative changes in anxiety symptoms from adolescence to young adulthood.

Interaction Effects between Adolescent Personality Types and Young Adult Romantic Relationship Quality on Young Adults' Delinquent Behaviors.

Table 1

Descriptive statistics and intercorrelations among problem behaviors in adolescence, and quality of romantic relationships and problem behaviors in young adulthood.

Measure	M (SD) ^a			Correlations					
	Overcontrollers	Undercontrollers	Resilients	1	2	3	4	5	6
1. Adolescent Delinquency	–0.11 (0.78)	0.28 (1.33)	–0.07 (0.90)	–	.01	–.04	.09	.50**	–.07
2. Adolescent Anxiety	0.60 (1.12)	–0.16 (0.91)	–0.39 (0.66)		–	–.01	.16**	.06	.63**
3. Support	–0.02 (0.93)	–0.02 (0.93)	0.10 (0.95)			–	–.24**	–.08	–.12**
4. Negative Interaction	0.07 (1.03)	0.07 (0.99)	–0.10 (0.98)				–	.18**	.28**
5. Young Adult Delinquency	–0.14 (0.59)	0.23 (1.52)	–0.03 (0.83)					–	.08
6. Young Adult Anxiety	0.40 (1.14)	–0.10 (0.96)	–0.27 (0.77)						–

^a Z score standardized on the total sample. M (SD) = mean (standard deviation).

** $p < .01$.

Table 2
Interaction effects between adolescent personality types and young adult romantic relationship quality on young adults' delinquency.

	<i>B</i> (<i>SE</i>)	β	r^2		<i>B</i> (<i>SE</i>)	β	r^2
<i>Young adult delinquency</i>							
Intercept	1.10 (0.02)				1.09 (0.02)		
Age cohort	−0.02 (0.01)	−.05	.00	Age cohort	−0.02 (0.01)	−.06	.00
Gender	−0.01 (0.02)	−.02	.00	Gender	−0.01 (0.02)	−.03	.00
A. delinquency	0.09 (0.02)	.49***	.20	A. delinquency	0.09 (0.01)	.46***	.20
O vs. U	−0.03 (0.03)	−.08	.01	O vs. U	−0.03 (0.02)	−.07	.00
R vs. U	−0.02 (0.03)	−.05	.00	R vs. U	−0.01 (0.02)	−.03	.00
Support	−0.02 (0.03)	−.13	.00	Neg. Int.	0.09 (0.05)	.52*	.09
(O vs. U) × support	0.02 (0.03)	.07	.00	(O vs. U) × Neg. Int.	−0.10 (0.05)	−.31*	.05
(R vs. U) × support	0.01 (0.03)	.05	.00	(R vs. U) × Neg. Int.	−0.09 (0.05)	−.31*	.05

Note: O vs. U = overcontrollers compared to undercontrollers; R vs. U = resilients compared to undercontrollers. *SE* = standard error. A. delinquency = Adolescent delinquency mean score across Wave 1–5. Neg. Int. = Negative Interaction.

* $p < .05$.
*** $p < .001$.

Table 2 presents the results of the interaction effects between adolescent personality types and young adulthood romantic relationship quality on young adulthood delinquent behaviors, while controlling for the effects of age cohort, gender, and adolescent delinquency. In the models linking support from romantic partners with young adult delinquent behaviors, we did not observe significant interaction effects between adolescent personality types and young adulthood romantic support in predicting young adult delinquency. That is, the magnitude of associations between perceived support in romantic relationships and relative changes in delinquency was not significant for all youths, regardless of their personality types.

A different pattern emerged in models linking negative interactions with romantic partners and young adult delinquent behaviors. There were significant interaction effects between adolescent personality types (i.e., overcontrollers vs. undercontrollers; resilients vs. undercontrollers) and young adult romantic negative interactions in predicting young adult delinquency ($N = 519$, $B = -0.09/0.10$, $\beta s = .31$, $ps = .01$). For undercontrollers, the link between negative interaction in romantic relationships and relative changes in delinquency was stronger than for overcontrollers and also stronger than for resilients. Follow-up simple slope analyses indicated that undercontrollers' higher negative interaction with their romantic partner was significantly associated with a stronger relative increase in delinquency level ($n = 131$, $B = 0.09$, $\beta = .33$, $p = .04$). For overcontrollers and resilients, this association was not found ($n = 176$, $B = 0.00$, $\beta = .04$, $p = .58$ and $n = 212$, $B = 0.00$, $\beta = .03$, $p = .48$, respectively). Overall, we found that the magnitude of the associations between negative interaction with romantic partner and delinquency were significantly stronger for undercontrollers than for overcontrollers and resilients.

Interaction Effects between Adolescent Personality Types and Young Adult Romantic Relationship Quality on Young Adults' Anxiety Symptoms.

Regarding the prediction of young adults' anxiety symptoms, the main effect of support on the relative changes in anxiety was qualified by a significant interaction effect between adolescent personality types (i.e., resilients vs. overcontrollers) and young adult romantic relationship support in predicting young adults' anxiety symptoms ($N = 523$, $B = 0.06$, $\beta = .16$, $p = .01$; see Table 3). For overcontrollers, the association between perceived support and relative changes in anxiety symptoms was stronger than for resilients, but was not significantly different from that for undercontrollers. Follow-up simple slope analyses indicated that, for overcontrollers, higher perceived support from romantic partner was significantly linked to a stronger relative decrease in their anxiety symptoms ($n = 177$, $B = -0.07$, $\beta = -.22$, $p < .001$). Such a

linkage was not found for resilients ($n = 215$, $B = -0.01$, $\beta = -.07$, $p = .32$). For undercontrollers, the link between perceived support in romantic relationships and relative changes in anxiety was not significant ($n = 131$, $B = -0.03$, $\beta = -.13$, $p = .11$), although this association was not significantly different from that for overcontrollers. Overall, we found that the magnitude of the relations between perceived support from romantic partner and relative changes in anxiety symptoms were significantly stronger for overcontrollers than for resilients, but not significantly different between overcontrollers and undercontrollers. In contrast to the significant interaction effects between adolescent personality types and perceived romantic support, we did not observe any significant interaction effects between adolescent personality types and negative interaction in young adult romantic relationships on the relative changes in anxiety symptoms from adolescence to young adulthood. That is, the magnitude of the positive associations between perceived negative interaction in romantic relationships and relative increases in anxiety symptoms was equally strong and positive for youths with different personality types.

4. Discussion

In this study, we examined interaction effects between adolescent personality types and young adulthood romantic relationship quality on young adults' anxiety symptoms and delinquent behaviors. Before studying interaction effects, we examined the effects of adolescent personality types and young adult romantic relationship quality on young adult problem behaviors. Adolescent personality types were significantly related to the mean levels of, but not the relative changes in, problem behaviors from adolescence to young adulthood. In predicting young adult delinquency, support from romantic partner was not related to relative changes in delinquency in youths' delinquency, regardless of personality type. However, higher negative interaction with romantic partner was related to a stronger relative increase in delinquent behaviors for undercontrollers, while no such links emerged for overcontrollers and resilients. In predicting anxiety, negative interaction with romantic partner was significantly and positively related to relative changes in anxiety symptoms for all youths, regardless of personality types. Support from romantic partner was related to decreased anxiety symptoms only for overcontrollers.

Adolescents with different personality types differed in the mean levels of anxiety symptoms and delinquent behaviors. During both adolescence and young adulthood, overcontrolling adolescents had the highest mean score in anxiety symptoms and undercontrolling adolescents had the highest mean level in delinquency. These findings are consistent with previous studies (e.g., [Donnellan & Robins, 2010](#); [Scholte, Van Lieshout, De Wit, &](#)

Table 3

Interaction effects between adolescent personality types and young adult romantic relationship quality on young adults' anxiety.

	<i>B</i> (<i>SE</i>)	β	r^2		<i>B</i> (<i>SE</i>)	β	r^2
<i>Young adult anxiety</i>							
Intercept	1.23 (0.02)				1.22 (0.02)		
Age cohort	0.01 (0.02)	.02	.00	Age cohort	0.01 (0.02)	.01	.00
Gender	0.06 (0.02)	.12***	.02	Gender	0.07 (0.02)	.13***	.03
A. Anxiety	0.15 (0.01)	.59***	.31	A. anxiety	0.14 (0.01)	.55***	.29
U vs. O	0.00 (0.02)	.00	.00	U vs. O	−0.01 (0.02)	−.01	.00
R vs. O	−0.01 (0.02)	−.04	.00	R vs. O	−0.02 (0.02)	−.03	.00
Support	−0.07 (0.02)	−.27***	.04	Neg. Int.	0.05 (0.02)	.19**	.02
(U vs. O) × support	0.03 (0.03)	.06	.00	(U vs. O) × Neg. Int.	0.02 (0.03)	.03	.00
(R vs. O) × support	0.06 (0.02)	.16**	.02	(R vs. O) × Neg. Int.	−0.01 (0.02)	−.01	.00

Note: U vs. O = undercontrollers compared to overcontrollers; R vs. O = resilients compared to overcontrollers. *SE* = standard error. A. anxiety = Adolescent anxiety mean score across Wave 1–5. Neg. Int. = Negative Interaction.

** $p < .01$.

*** $p < .001$.

Van Aken, 2005). However, although we replicated previous findings of personality differences in the mean levels of anxiety and delinquency, the current study revealed that the three personality types did not differ in the relative changes of these problem behaviors from adolescence to young adulthood. These findings suggest stable associations between personality types and anxiety and delinquency, respectively. That is, the differences in levels of delinquency and anxiety between personality types are comparable from adolescence to young adulthood.

However, when it comes to persistence of problem behaviors from adolescence to young adulthood, person–environment interactions seem play a role. Although not all interaction effects were significant, we found some evidence for significant interaction effects between adolescent personality types and young adult romantic relationship quality in predicting young adult problem behaviors. Mainly among overcontrollers, perceived support from romantic partner was linked to relative decreases in anxiety symptoms from adolescence to young adulthood. Moreover, only for undercontrollers, we found a relation between negative interaction with romantic partner and relative increases in delinquent behaviors from adolescence to young adulthood. These interaction effects between personality and romantic relationship are in accordance with prior studies in family and peer contexts, showing adjustments of individuals low in resiliency were generally more strongly associated with their relational environments such as parenting practice and quality of family and peer relationships (Dubas et al., 2002; O'Connor & Dvorak, 2001; Van Aken & Dubas, 2004). Our findings provide further support for the differential susceptibility theory in the context of romantic relationships. That is, developmental outcomes of individuals with different personality characteristics were differentially associated with quality of romantic relationships.

Overcontrollers' and undercontrollers' higher susceptibilities to romantic relationship quality might be due to their typical vulnerability, namely inflexible and heightened reactivity toward environments. More specifically, their rigid, reactive tendencies and the dynamic features of romantic relationships may create a mismatch between the person and the environment. Person–environment mismatch can be stressful and might exacerbate problem behaviors to which individuals are prone. Overcontrollers are vulnerable for anxiety symptoms and undercontrollers for delinquent behaviors (e.g., Block & Block, 1980; Van Leeuwen et al., 2004). Therefore, overcontrollers' relative changes in anxiety symptoms and undercontrollers' relative changes in delinquent behaviors were associated with their perceived romantic relationship quality. In addition, their greater susceptibility might be due to their heightened reactivity toward environments (Pluess & Belsky, 2009). Overcontrollers and

undercontrollers are relatively extreme in their responses to the world around them. Overcontrollers' over-inhibited responses and undercontrollers' over-impulsive reactions to their relationships might lead them not only to become easily overwhelmed in relatively modest environments, but also to benefit disproportionately from care in supportive environments that enable them to regulate their proneness to distress.

In addition to the tendency of overcontrollers and undercontrollers to respond to environmental challenges with their own prototypical problem behaviors, we also found that developmental outcomes of individuals with certain personality types were more strongly associated with particular characteristics of romantic relationships. That is, the interaction effects between personality and indicators of romantic relationship quality were of different magnitudes. Compared to resilients, overcontrollers' relative decreases in anxiety symptoms were more strongly linked to perceived support from romantic partner, but were not more strongly linked to perceived negative interactions. Perhaps, as also suggested in another study on family and friends (Van Aken & Dubas, 2004), support from, but not negative interaction (i.e., coercion) with, important others is more relevant for overcontrollers than for others.

A differential pattern was evident for undercontrollers. Compared to overcontrollers and resilients, undercontrollers' relative increases in delinquency were more strongly associated with negative interaction in romantic relationships, but were not more strongly linked to perceived support. This is in agreement with findings from several studies indicating that undercontrollers, maybe due to their disruptive and aggressive characteristics, might be particularly more sensitive to the coercive elements of their social relationships (Dubas et al., 2002; Van Aken & Dubas, 2004; Van Leeuwen et al., 2004). These findings add to the literature that often focuses on relationships with parents and peers, by demonstrating similar effects in romantic relationships. However, the mechanism behind these personality types' differential sensitivities to different elements of relationship quality is not yet clear. In addition, it is not clear why the three personality types showed equal associations between individuals' relative changes in delinquency and perceived support from romantic partner, as well as equal associations between individuals' relative changes in anxiety and perceived negative interaction in romantic relationships.

The difference between overcontrollers and resilients in the associations between perceived romantic support and anxiety symptoms is smaller than that between undercontrollers and resilients in the associations between perceived negative interaction with romantic partner and delinquency. These results might suggest that although both overcontrollers and undercontrollers might be more susceptible to quality of romantic relationship than

resilients, differential susceptibilities of personality types are relatively more indicated in delinquency than in anxiety symptoms.

Our findings also provided evidence for external validity of the three personality types. Specifically, in both adolescence and young adulthood, overcontrollers were characterized by higher anxiety symptoms, undercontrollers were significantly more delinquent, and resilient types were relatively free from these problem symptoms. Moreover, resilient types' problem behaviors were not affected by their perceived romantic relationship quality. These results confirmed external validity of three prototypes of personality, suggesting that the individual difference in problem behaviors by these types are robust over time and providing further support for the utility of typological approach to personality in the study of youths' developmental outcomes.

Finally, we noticed that the significant effects of perceived negative interaction with romantic partner on problem behaviors occurred more frequently than significant effects of perceived support from romantic partner. Among the associations between perceived support from romantic partner and anxiety or delinquent behaviors by three personality types, only one of the six associations was significant. That is, perceived romantic support was related only to overcontrollers' relative changes in anxiety symptoms. However, the associations between negative interaction with romantic partner and the relative changes in anxiety symptoms were equally significant for three personality types. Moreover, negative interaction with romantic partner was significantly linked to undercontrollers' relative changes in delinquency. Thus, four out of six associations were significant. The reason for this difference might be that negatively-valenced interaction is more likely to be associated with negatively-valenced behaviors such as anxiety and delinquency. If the developmental outcomes are positive behaviors instead of problem behaviors, perceived support that represents the positive side of a relationship might be more frequently associated with positive developmental outcomes. Future studies are encouraged to explore this possibility.

4.1. Limitations and strengths

Some limitations of the current study need to be considered.

The present study found some evidence for explaining individuals' problem behaviors by the interaction of inner vulnerability (i.e., adolescent personality) and environmental factors (i.e., romantic relationship quality). Although our findings suggest the possibility that, for overcontrollers and undercontrollers, a high-quality romantic relationship might contribute to relative decreases in problem behaviors, we cannot sort out the direction of effects given the design of our study. We measured romantic relationship quality and problem behaviors concurrently, while controlling for earlier problem behaviors. Therefore, we cannot rule out the possibility that the relative decreases in problem behaviors of overcontrollers and undercontrollers go together with more positive romantic relationship quality. In particular, overcontrollers who are able to overcome their anxiety problems and undercontrollers who are able to overcome their antisocial problems might be able to develop adaptive relationships. Prior research has suggested unidirectional longitudinal effect of romantic relationship quality on problem behaviors. For instance, adolescents' perceived support from romantic partner was found to have an effect on young adult delinquent behavior, but the reverse was not true (Meeus et al., 2004). Combining these findings with the theoretical account of the salience of emerging adult romantic relationship on individuals' development (Havighurst, 1972; Van Dulmen, Goncy, Haydon, & Collins, 2008), these results suggest that the first possibility is more likely. That is, a high-quality romantic relationship (i.e., high support, low negative interaction)

might lead to relative decreases in problem behaviors for overcontrollers and undercontrollers.

Second, the current study could not take into account potential personality-relationship transactions. Research has suggested that personality might be predictive of romantic relationship changes, and romantic relationship might predict personality changes (Neyer & Asendorpf, 2001; Mund & Neyer, 2014). That is, the relations between personality and romantic relationship might be corresponsive. Personality might "select" people into specific romantic relationship which might in turn change personality. In relation to the results from the current results, we cannot exclude the possibility, although small indicated by previous research (Meeus et al., 2011), that some of those undercontrollers and overcontrollers who have better relationship quality might be changed to the more mature personality type, the resilient.

Another limitation lies in the use of single-informant data, which might introduce reporter bias leading to overestimations of correlations between variables. Future research could explore the relationships between these variables using data from both participant and romantic partner.

In addition, resilient adolescents in our study were found to be more likely to be in a romantic relationship in young adulthood than the others, this is in accordant with prior studies (Asendorpf, Denissen, & Van Aken, 2008; Newman, Caspi, Moffitt, & Silva, 1997). However, this might imply that some caution is needed in interpreting our results. The overcontrollers and undercontrollers in this study might be better adjusted than their counter partners who had the same personality type, as they managed to have a romantic relationship.

Finally, we did not test our hypotheses with a variable-centered approach. Investigating the interaction effects between all Big Five personality traits and romantic relationship indicators would increase the complexity of the model and we are limited by the sample size in testing such a model. In addition, running separate models with interactive terms between each personality traits and romantic relationship quality would not have been informative of the interaction between a within-person personality structure and quality of a romantic relationship.

Despite of these limitations, this study followed youths over a period of ten years, and the prospective design of the longitudinal study allowed us to examine the relative changes instead of mean levels of problem behaviors from adolescence to young adulthood. Further, the current study extends previous person-centered research on person-social relationship interactions from the contexts of family and peer relationships to romantic relationships.

5. Conclusion

Taken together, our study showed some evidence for interaction effects between adolescent personality types and young adult romantic relationship quality in predicting young adult problem behaviors. Findings suggest that although certain personality types might predispose individuals to certain problem behaviors, a good romantic relationship in young adulthood may be implicative for decreases in those problem behaviors, particularly for non-resilient individuals. The present study highlights the importance of considering the interaction between individuals' personality characteristics and their social relationships in the development of problem behaviors.

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