# Personality and Relationship Quality During the Transition From High School to Early Adulthood

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**ABSTRACT**    The post–high school transition period is believed to be associated with considerable changes in social networks, yet longitudinal studies documenting these changes are scarce. To address this gap, the current research explored 3 relevant issues. First, changes in participants' relationship characteristics during the transition from high school were examined. Second, the roles of personality traits as antecedents of these changes were studied. Third, the association between change in relationship characteristics and personality during the transition was explored. A sample of over 2,000 German emerging adults, surveyed before leaving school and then 2 years after the transition from high school, was assessed on personality traits and a multidimensional assessment of the quality of their relationships. Findings indicated that participants experienced mostly positive changes in relationship quality during the transition from high school and that antecedent personality at school was an important predictor of the nature of this change. Finally, change in relationship quality was found to be associated with personality change during the post-school transition. Findings indicated that personality traits may influence transition success and that change in relationships during this

transition may influence personality development. The implications of the research for post-school transition success are discussed.

The transition to post–high school life is a major developmental milestone marking the beginning of emerging adulthood and is associated with greater independence from parents and considerable change in established social networks (Arnett, 2000, 2006; Côté, 2006; Oswald & Clark, 2003; Zarrett & Eccles, 2006). In particular, young people are faced with developing new social networks and the need to restructure existing networks formed during high school (Aquilino, 2006; Berzonsky & Kuk, 2000; Conger & Little, 2010; Fromme, Corbin, & Kruse, 2008; J. Parker, Summerfeldt, Hogan, & Majeski, 2004; Salmela-Aro & Nurmi, 1997; Tanner, 2006). This transition provides a context in which to explore several questions about young people's response to the relationship challenges of this major life transition. First, how do relationship characteristics change as individuals leave school? Second, do personality traits predict change in social networks during the transition from high school? Third, are changes in relationship characteristics associated with personality change in line with the social investment principle (Roberts, Wood, & Smith, 2005)?

## Relationships in the Post–High School Transition Period

The move out of high school represents the beginning of emerging adulthood, and it is associated with a number of demands, opportunities, and stresses (Arnett, 2000, 2006; Fromme et al., 2008; J. Parker et al., 2004; P. Parker, Martin, Martinez, Marsh, & Jackson, 2010; Roberts, Caspi, & Moffitt, 2001). This developmental period has come into prominence in the last 50 years, where young people from 18 to 30 show less commitment to long-term roles and relationships and considerably more identity exploration (Arnett, 2000, 2004). Drawing on Erikson's (1968/1994; see also Côté, 2006) concept of institutionalized moratorium and Levinson's (1978) concept of the novice phase of development, the period that commences after leaving school is characterized by extensive identity exploration, traditionally thought to be the remit of adolescence (Erikson, 1968/1994). This identity exploration is marked by an increase in agency as young people are given greater latitude to formulate their own plans for future roles, try different career paths, and take increasing control over the structure and nature of their

social networks and intimate relationships (Arnett, 2000, 2006; Tanner, 2006).

Previous research suggests that, on average, young people negotiate changes in social networks quite well. This research, however, is largely cross-sectional in nature and therefore subject to potential selection effects. Nevertheless, Furman and Buhrmester (1992) found that relationship characteristics among university students were more positive than those in late high school students. For example, relationship power was found to be higher and conflict lower in university students than in high school students. Support gained from relationships was also higher in university students than students in late high school (Furman & Buhrmester, 1992). These results are consistent with theories suggesting that this transition period provides an important opportunity for young people to restructure their existing social networks to be closer and more positive (Aquilino, 2006; Arnett, 2000; Conger & Little, 2010; Tanner, 2006).

### Relationship Quality With Parents, Siblings, and Friends

Past research has highlighted the importance of considering not just entire social networks but also key relationships such as those with parents, siblings, and friends (Furman & Buhrmester, 1992). For example, relationships with family were found to be more supportive and associated with less conflict and greater relationship power among university than high school students. Such differences are important, as one of the major developmental tasks during this period is the establishment of independence from one's natal family, culminating in a process of restructuring relationships with parents (Aquilino, 2006; Arnett, 2004; Tanner, 2006; Zarrett & Eccles, 2006). This may result from young people leaving home or because young people who stay home renegotiate expectations and living arrangements (see Aquilino, 2006, and Arnett, 2000, for a review).

The restructuring of social networks that results from the post–high school transition is also associated with changes in the importance and nature of relationships with siblings (Goetting, 1986). Goetting notes that as individuals move away from home and experience important life events (e.g., entering university, getting married), the dynamics of the relationship between siblings change. These events change the relationship roles where youths who leave high school have increasing choice over how to structure the nature of their relationship with their siblings (Aquilino, 2006; Conger &

Little, 2010). This generally takes the form of relationships becoming more adult-to-adult and communication and social interactions becoming less frequent and intense. As with parents (see Arnett, 2000), less contact with siblings is associated with closer relationships and less conflict (Conger & Little, 2010).

The post–high school life is thought to be associated with nonfamily relationships, such as friends becoming increasingly important sources of social support (Berzonsky & Kuk, 2000; Conger & Little, 2010; Oswald & Clark, 2003; Salmela-Aro & Nurmi, 1997). Unlike changes with family that are associated with a restructuring of relationships, the post–high school transition is frequently associated with the need to establish new friendship networks (J. Parker et al., 2004). Indeed, Oswald and Clark (2003) observed that friendships established in high school typically become less important and less close during the first year at university. The development of new, stable, and close networks during this period is critical, as failure to do so can negatively affect well-being, self-esteem, and university retention (see Kantanis, 2000, and J. Parker et al., 2004).

### Personality as a Predictor of Change in Relationship Quality

Although a longitudinal account of changes in social networks from high school to post-school life is needed, research also needs to identify the factors that predict these changes. Empirical research suggests that personality traits, as relatively enduring cross-time determinates of behavior, are associated with how well individuals manage changes in social networks (e.g., Asendorpf & Wilpers, 1998; Lehnart, Neyer, & Eccles, 2010; Neyer & Asendorpf, 2001; Neyer & Lehnart, 2007; Selfhout et al., 2010). Little research, however, has directly explored the association between personality traits and relationship change during the critical post–high school transition. Personality traits are likely to be important for this period because they predict the type of environments individuals choose and how they orientate themselves within them (Caspi & Bem, 1990). For example, individuals high on Extraversion and Agreeableness seek out new relationships and find it easier to make friends (Selfhout et al., 2010). Likewise, those high on Conscientiousness are more effective at maintaining positive relationships with parents, whereas those high on Neuroticism find it more difficult to maintain positive relationships over time (Robins, Caspi, & Moffitt, 2002; Selfhout et al., 2010).

Although little research has been conducted on the clear contextual change of the post–high school transition, empirical findings in other contexts indicate that personality traits do predict subsequent changes in relationship characteristics (e.g., Asendorpf & Wilpers, 1998; Neyer & Asendorpf, 2001; Neyer & Lehnart, 2007; Selfhout et al., 2010). In particular, research has found that Extraversion, Neuroticism, and Agreeableness are important for predicting change in importance, conflict, and closeness in social relationships (Asendorpf & Wilpers, 1998; Neyer & Asendorpf, 2001; see also Neyer & Lehnhart, 2007). However, prior research has examined social network changes that are more gradual (e.g., relationships that change during the course of university; Asendorpf & Wilpers, 1998; Neyer & Asendorpf, 2001; Selfhout et al., 2010), or focus on changes in a single relationship type (e.g., starting or discontinuing a romantic relationship; Robins et al., 2002). Leaving high school, however, is associated with extensive changes to individuals' entire social networks, including key relationships with parents, siblings, and friends (Aquilino, 2006; Furman & Buhrmester, 1992; Oswald & Clark, 2003). As such, this period is critical for research exploring the role of basic personality traits in predicting relationship characteristics during major life transitions.

## Personality Change During the Post–High School Transition

The post-school transition provides a potent natural experiment to explore how changes in social networks relate to changes in personality traits. Although personality traits are relatively stable over time, human personality is not fixed. There is now considerable evidence that personality does change across the life span, with most of the normative changes in personality happening in late adolescence and emerging adulthood (Roberts, Walton, & Viechtbauer, 2006). Thus, one key question is whether personality traits change in response to the post–high school transition. Significant change in personality has been observed in the current sample during this transition, with increases in Openness, Agreeableness, and Conscientiousness and declines in Neuroticism observed (Lüdtke, Trautwein, & Husemann, 2009). The current research goes one step further to test whether this personality trait change is related to changes in relationship characteristics during this transition.

Intraindividual assessments of change have been used to study the association between change in relationship characteristics and

changes in personality in other contexts, and thus provide a basis for forming hypotheses in the current research (e.g., Branje, van Lieshout, & van Aken, 2004; Neyer & Lehnart, 2007; Roberts & Chapman, 2000; Robins et al., 2002; Scollon & Diener, 2006; Sturaro, Denissen, van Aken, & Asendorpf, 2008; van Aken, Denissen, Branje, Dubas, & Goossens, 2006). Research in this area has often focused on general relationship characteristics, like support or satisfaction, suggesting that changes in these factors are associated with changes in Neuroticism, Extraversion, and Agreeableness, and to a lesser extent, Conscientiousness and Openness (Branje et al., 2004; Scollon & Diener, 2006). More specifically, research has shown that increases in insecurity with family and friends are associated with increases in Neuroticism (Neyer & Lehnart, 2007; Roberts & Chapman, 2000). Similar research has also found an association between conflict and increases in Neuroticism and decreases in Agreeableness (Robins et al., 2002; Sturaro et al., 2008).

Although little research in this area has explored the post–high school transition, it is expected that the current research will observe significant associations between change in personality and relationship characteristics during the post–high school transition on the basis of the social investment principle (see Roberts et al., 2005). This principle suggests that individuals of similar ages tend to share many similar developmental challenges and that investments in age-graded tasks (e.g., beginning work or getting married) are important in providing a framework for explaining personality trait development. When engaging in the social roles, individuals confront expectations about appropriate behavior. These expectations result from investments in age-appropriate tasks. In turn, society, through the actions of individuals in social networks, rewards the meeting of expectations while punishing deviations. As such, expectations encountered after investment in new social roles generally encourage behavior that is more agreeable and conscientious and less neurotic, thus promoting development in those traits. For example, empirical research has shown that key relationship transitions, such as marriage or beginning a serious romanticrelationship, are associated with personality maturation (e.g., Lehnart et al., 2010; Neyer & Lehnart, 2007; Roberts & Bogg, 2004; Robins et al., 2002).

The post–high school transition provides a pertinent context from which to explore this framework as it is associated with a number of expectations about the restructuring of relationships, including the

development of greater independence, more adult-to-adult relationships, and more equitable bidirectional support with parents (Conger & Little, 2010; Salmela-Aro & Nurmi, 1997; Sturaro et al., 2008; Tanner, 2006). This is likely to take the form of reduced conflict and insecurity, and increased closeness, which may be associated with personality maturity, resulting in higher levels of Agreeableness and Conscientiousness as well as lower Neuroticism (see Roberts et al., 2005).

## Present Study

The current research explored change in relationship characteristics during the post–high school transition using longitudinal data and an extensive multidimensional measure of relationship characteristics. These relationship characteristics were explored for participants' total reported social networks and then separately for parents, siblings, and friends. For total networks, it was expected that intraindividual change in relationships would, on average, be positive. More specifically, given that friends were expected to become more important sources of social support, it was expected that they would increase in importance, closeness, and contact. Second, we expected that antecedent personality traits would predict changes in subsequent relationship characteristics. It was hypothesized that lower Neuroticism and higher Extraversion, Agreeableness, and Conscientiousness would predict decreases in conflict and more positive changes in other relationship characteristics. Third, in keeping with social investment theory, it was expected that change in relationship characteristics during the post–high school transition would be associated with change in personality. In particular, change in relationship characteristics, including conflict, insecurity, and closeness, was expected to be associated with change in Neuroticism, Extraversion, Conscientiousness, and Agreeableness. This was assessed using latent change score models (see Figure 2).

## METHOD

*Participants*

Data for this research came from the Transformation of the Secondary School System and Academic Careers (TOSCA) project conducted in

Germany (see Köller, Watermann, Trautwein, & Lüdtke, 2004; Lüdtke et al., 2009; Trautwein, Lüdtke, Marsh, & Nagy, 2009). The data were obtained from students in 149 randomly selected upper secondary schools in a single German state, which were university or college track (Gymnasium). Ninety-nine percent of the schools approached took part in the research, and a participation rate of 80% was achieved at the student level during the first time wave ($n = 4,730$). At Time 1, the students were in their final year of upper secondary schooling; their mean age was 19.51 years ($SD = 0.77$) and 63% of the sample were women. At the second time wave, 2,173 participants, or 46% of the original sample, completed the survey, which included the instruments used in this research. Of these, the majority of participants were in university ($n = 1,658$, or 76%). However, a significant minority were not on this stereotypical developmental pathway. Of those not on the stereotypical pathway, 14% were in vocational training and 3% entered the labor force. The remaining participants were either on a "gap year" or were not otherwise engaged in employment or education. This group of 2,173 participants formed the analysis sample in the current research.

At Time 1, two trained research assistants administered materials in each school between February and May 2002. Students participated voluntarily, without any financial incentive, and completed the research during a specially assigned in-class session during school hours. During this session, all students were asked to provide written consent and contact information to take part in subsequent waves of data collection. Approximately 3,000 of the original sample provided such information. Some of the missing contact information was due to a number of students not completing the survey in the time allotted. As noted above, of the participants who gave contact information, 2,173 agreed to participate in the second wave of the research. They were contacted two years after high school: first by mail and then again by mail and phone. Participants completed a questionnaire of approximately two hours in their own time, which they returned by mail in prepaid envelopes in exchange for a financial reward of €10.

The rate of attrition from Time 1 to Time 2 was moderately large but was not surprising, given that students must be tracked after they exited school, with many moving away from the original center of testing. However, attrition was not simply due to logistics but was at least in part associated with variables of interest to this study. Previous research on the selection effects of this sample indicated that those who participated in both time periods had higher grade point averages and were more likely to be female (see Lüdtke et al., 2009). Relevant to the current study, continuers were observed to have higher Conscientiousness ($d = .16$) and Agreeableness scores ($d = .12$) than dropouts. Selection effects in relation-

ship characteristics have not yet been tested and as such are reported here. Significant ($p < .05$) selection effects consisted of continuers reporting less contact ($d = -.08$) and closeness ($d = -.10$) and greater insecurity ($d = .13$) in their social network at Time 1. When considered by relationship type, continuers were higher on contact with parents ($d = .10$), and insecurity ($d = .14$) and closeness ($d = .15$) with friends. They were also lower on conflict with siblings ($d = -.07$) and contact with friends ($d = -.08$). Although those who remained in the study were significantly different from those who dropped out, these differences were small and indicated only moderate selection effects.

## Materials

*Personality traits.*    The Big Five personality traits of Extraversion, Agreeableness, Conscientiousness, Neuroticism, and Openness to Experience were measured using the German version (Borkenau & Ostendorf, 1993) of the NEO-FFI (Costa & McCrae, 1992). Extensive work on the German translation has demonstrated the instrument's high reliability, validity, and comparability with the English original (e.g., Borkenau & Ostendorf, 1993). Items were rated on a 4-point scale with poles of 1 (*strongly disagree*) and 4 (*strongly agree*; see Lüdtke, Trautwein, Nagy, & Köller, 2004).

Personality trait scores were estimated using latent variable modeling, which has the advantage of controlling for unreliability (Kaplan, 2000; Raykov, 1992). Four-item parcels were created for each personality factor consisting of every fourth item. Numerous authors (e.g., Bagozzi & Heatherton, 1994; Floyd & Widaman, 1995; Hull, Lehn, & Tedlie, 1991; West, Finch, & Curran, 1995) have noted the advantages of using item parcels in that they (a) are more normally distributed, (b) are more reliable, (c) are less influenced by idiosyncratic characteristics of individual items, and (d) necessitate the estimation of fewer parameters.

*Social network questionnaire.*    The social network questionnaire was an adaptation of the social relationship inventory used by Asendorpf and Wilpers (1998; see also Neyer & Asendorpf, 2001). Participants were asked to consider significant persons whom they had had contact with in the last three months. Participants were given a table of 25 rows in which they were asked to fill out the initials of each of these people, the person's gender and age, and what their relationship to the person was. In order to maximize the number of relationships that participants reported, we used primer categories of partner, ex-partner, parent, sibling, grandparents, other relative, friend, and acquaintance. Participants then rated each relationship on a series of 5-point scales including the amount of contact

(1 = *less than once a month*, 5 = *daily*), importance (1 = *it would be better for me to end this relationship*, 5 = *ending this relationship would be stressful for me*), conflict (1 = *never*, 5 = *nearly whenever we are together*), closeness (1 = *very far*, 5 = *very close*), and insecurity (1 = *never*, 5 = *nearly whenever we are together*) in the relationship. Internal consistency for the participants' total social network ranged from .75 for contact to .90 for uncertainty at both time periods.

This idiographic approach to measuring relationship characteristics has been used in a number of studies where it has been shown to be consistently associated with personality, and the developmental trajectory found with this method is relatively consistent with other approaches (e.g., Furman & Buhrmester, 1992). One of the major advantages of this idiographic approach is that research can focus on different levels of aggregation and thus provide both a general perspective of social networks and a specific picture of central elements in this network. In the current research, we focused on the total network level, where we explored relationship characteristics across all the relationships participants considered to be significant. We also considered specific types of relationships, separately including parents, siblings, and friends.

*Statistical Analysis*

To explore the antecedent effects of personality on change in relationship characteristics, the current research used a set of longitudinal panel models (see Figure 1) in which the association between each personality construct and each relationship characteristic was analyzed separately. This model provided an assessment of the antecedent effects of one variable on change in another variable via cross-lagged paths, while controlling for construct stability over time (Duncan, Duncan, & Strycker, 2006). Associations in change have typically been assessed within the longitudinal panel model framework utilizing correlated residuals (see Figure 1, path [d]; e.g., Neyer & Asendorpf, 2001; Sturaro et al., 2008). However, correlated residuals not only include information on associations in change, but also contain all of the variance not explained by Time 1 variables (see Figure 2; Ferrer & McArdle, 2010; Sutin & Costa, 2010). In the current research, we use latent change score models as a more direct approach to assessing change in personality and relationship characteristics (Ferrer & McArdle, 2010; McArdle & Hamagami, 2001; Raykov, 1992; see also Allemand, Zimprich, & Martin, 2008).

Analyses explored relationship characteristics (e.g., conflict, closeness) of participants' entire social networks and then for parents, friends, and siblings separately. This resulted in a large number of models submitted to the data, including 25 separate models (five personality × five relationship characteristics) for participants' entire social networks and 75 models (five
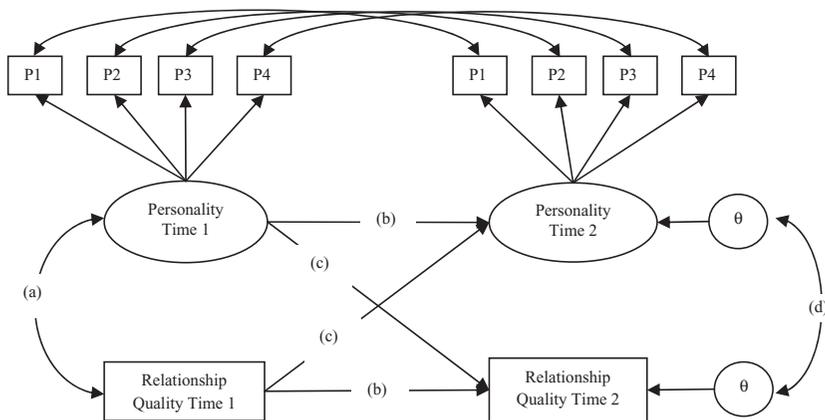
**Figure 1**
**Longitudinal panel design model: (a) concurrent correlations, (b) autoregression effects, (c) cross-lagged effects, and (d) correlated residuals.**
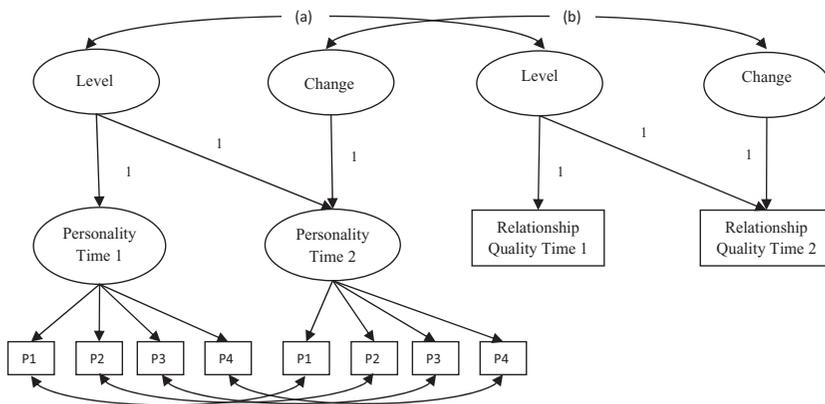


**Figure 2**
**Latent change model: (a) concurrent correlations and (b) correlated change.**

personality × five relationship characteristics for parents, siblings, and friends) for both the longitudinal panel and the latent change models. As such, inflation of type I error was a potential concern. In order to account for this, effects were only considered if they were statistically significant at $p < .01$ and if standardized regression coefficients were $|\beta| \geq .10$, consistent with the approach typically taken in research of this kind (see Neyer

& Asendorpf, 2001; Roberts, Caspi, & Moffitt, 2003; Sutin & Costa, 2010). The latent variable modeling software Mplus (Muthén & Muthén, 1998–2006) was used for estimating the longitudinal panel and latent change score models. Full information maximum likelihood estimation was used to account for missing data (see Enders, 2010).

Model fit was judged on conventional criteria: the CFI and the RMSEA. The practical fit indexes were employed because the $\chi^2$ statistic is known to be problematic in the context of very large data sets (e.g., Hoyle, 1995). Several guidelines for cut-off values have been suggested. CFI values greater than .90 are typically taken to reflect an acceptable fit to the data (Marsh, Hau, & Grayson, 2005). RMSEA values lower than .05 and .08 reflect a close fit and a reasonable fit, respectively. Correlated uniquenesses were included for the matching personality and relationship quality measures at Time 1 and Time 2, and factor loadings were constrained to be equal over time, reflecting longitudinal measurement invariance (Raykov, 2004).

## RESULTS

The analyses were conducted in three steps. The first step explored the stability and change in relationship characteristics during the post–high school transition via rank-order consistency and mean-level changes.[1] The second step consisted of a series of longitudinal panel models, which explored the predictive effects of personality and relationship characteristics, controlling for construct stability. In the final step, the association between latent change in personality and relationship characteristics was explored using latent change score models. All steps were investigated for both participants' total reported social network (relationship characteristics for participants' social network) and then for parents, siblings, and friends separately.

*Rank-Order Consistency and Mean Stability in Relationship Characteristics*

Participants provided information on 18,473 (*M* = 8.51, *SD* = 4.41) relationships at Time 1 and 23,220 at Time 2 (*M* = 10.69, *SD* = 5.37). The results reported in Table 1 provide an indication of the change

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1. Stability and change in personality traits for the current sample are covered in detail elsewhere (Lüdtke et al., 2009).

**Table 1**
Means, Standard Deviations, Reliability, and Stability Estimates for Relationship Characteristics

| Relationship Type | Time 1 | | Time 2 | | Rank-order Consistency | Mean-Level Change[a] | Gender Differences Time 1[b] | Gender Differences Time 2[b] |
|---|---|---|---|---|---|---|---|---|
| | Mean | SD | Mean | SD | | | | |
| All relationships | 8.51 | 4.41 | 10.69 | 5.37 | **.41** | **.41** | .01 | **-.15** |
| Parents | 1.90 | .58 | 1.92 | .48 | **.24** | .03 | -.17 | **-.24** |
| Siblings | 1.47 | .78 | 1.52 | .81 | **.77** | .09 | -.08 | -.04 |
| Friends | 3.50 | 2.48 | 4.50 | 3.03 | **.34** | **.32** | -.06 | **-.17** |

*Note.* The findings for all relationships are based on the total size of the social network reported by the individual, not just parents, siblings, and friends. Values in bold indicate statistically significant effects at $p < .01$.
[a]Mean-level change represented by Cohen's $d$, corrected for the correlation between Time 1 and Time 2 data in line with Morris and DeShon's (2002) recommendations for paired samples. [b]Women coded as 1, men as 0; Cohen's $d$ is used as the measure of effect size.

in the number of relationships from school to post-school life. There was a statistically significant increase in the total number of relationships reported, which largely consisted of reports of more friends. The rank-order consistency of the number of relationships reported was moderate, indicating considerable change in the relative ordering of participants from Time 1 to Time 2. There was also some evidence of gender differences at Time 2, with women reporting fewer relationships in general than men, particularly with family.

We next examined relationship characteristics in terms of contact, importance, closeness, conflict, and insecurity (see Table 2). For participants' entire social networks, insecurity and conflict displayed moderate levels of rank-order consistency and decreased over time. Contact displayed weaker rank-order consistency and a greater decrease, whereas importance displayed low rank-order consistency and little change. Ratings of closeness displayed relatively low rank-order consistency, and it was the only relationship characteristic to increase over time. As with the quantity of relationships, ratings of relationship characteristics differed slightly for key relationships (see Table 2). However, the pattern across contact, importance, closeness, conflict, and insecurity was relatively similar for each relationship type.[2] In line with predictions, contact, conflict, and insecurity with parents and siblings declined while importance increased. Relationships with friends did not increase in closeness, importance, or contact, and in the case of importance a statistically significant, though small, decline was observed.

Differences in gender were also observed at the total social network level, with women (coded 1) reporting higher levels of relationship importance at both time periods (Time 1: $d = .20$; Time 2: $d = .21$), and greater conflict at Time 1 ($d = .18$) and closeness at Time 2 ($d = .33$) than men (coded 0). A number of gender effects were also found in relationship characteristics when results were explored by relationship type. Again, the majority of these effects were greater in

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2. When interpreting the rank-order consistency coefficients, it should be kept in mind that the measures of relationship quality for relationship type were achieved by aggregating ratings of similar relationships for each participant (e.g., all ratings of conflict with friends made by a participant). In contrast to traditional scale score indicators, measures of relationship quality differed in the number of relationships used to form them. This can affect the reliability of the average score and thus the rank-order consistency (Lüdtke & Trautwein, 2007).

**Table 2**
**Stability Estimates for Relationship Characteristics**

| Relationship Type | Contact | | Importance | | Closeness | | Conflict | | Insecurity | |
|---|---|---|---|---|---|---|---|---|---|---|
| | Rank-Order Consistency | Mean-Level Change | Rank-Order Consistency | Mean-Level Change | Rank-Order Consistency | Mean-Level Change | Rank-Order Consistency | Mean-Level Change | Rank-Order Consistency | Mean-Level Change |
| All Relationships | **.26** | **-.67** | **.27** | **-.07** | **.22** | **.23** | **.39** | **-.22** | **.45** | **-.15** |
| Parents | **.29** | **-.77** | **.33** | **.09** | **.50** | **.09** | **.46** | **-.28** | **.41** | **-.13** |
| Siblings | **.52** | **-.62** | **.42** | **.11** | **.44** | **.12** | **.48** | **-.23** | **.40** | -.05 |
| Friends | **.15** | **-.65** | **.29** | **-.09** | **.26** | .03 | **.32** | **-.17** | **.37** | **-.14** |

*Note.* The findings for all relationships are based on the total size of the social network reported by the individual, not just parents, siblings, and friends. Numbers in bold indicate statistically significant effects at $p < .01$. Mean-level change represented by Cohen's *d* corrected for the correlation between Time 1 and Time 2 data in line with Morris and DeShon's (2002) recommendations for paired samples.

women than men. Thus, women reported higher levels of importance (Time 1: $d = .24$; Time 2: $d = .25$), greater closeness with friends (Time 1: $d = .26$; Time 2: $d = .30$), and greater conflict with parents (Time 1: $d = .21$; Time 2: $d = .16$) and siblings (Time 1: $d = .21$; Time 2: $d = .16$) at both time periods. Women also reported greater insecurity with siblings at Time 2 ($d = .17$).

*Antecedent Effects of Personality on Change in Relationship Characteristics*

In order to test the effect of personality traits at Time 1 on change in relationship characteristics, a total of 25 (five relationship characteristics dimensions × five personality traits) models were estimated. The fit of all models was satisfactory (RMSEA: $M = .04$, $SD = .02$; CFI: $M = .99$, $SD = .01$). In line with hypotheses, higher Neuroticism at Time 1 predicted increases in relationship insecurity ($\beta = .16$, $p < .001$). Agreeableness predicted declines in conflict ($\beta = -.13$, $p < .001$), Extraversion predicted greater closeness ($\beta = .10$, $p < .001$), and Conscientiousness predicted declines in conflict ($\beta = -.11$, $p < .001$) and insecurity ($\beta = -.11$, $p < .001$). Openness to experience predicted a statistically significant decline in contact ($\beta = -.16$, $p < .001$). In line with expectations, antecedent relationship characteristics did not predict changes in personality traits.

We then tested the association between personality traits and change in relationship characteristics by relationship type. A total of 75 (five relationship characteristics dimensions × three relationship types × five personality traits) models were estimated; again, the fit of the models was satisfactory (RMSEA: $M = .03$, $SD = .02$; CFI: $M = .99$, $SD = .01$). Consistent with hypotheses, Neuroticism predicted increasing insecurity with parents ($\beta = .16$, $p < .001$), siblings ($\beta = .15$, $p < .001$), and friends ($\beta = .19$, $p < .001$). Extraversion predicted increasing closeness with siblings ($\beta = .10$, $p < .01$), Agreeableness predicted decreasing insecurity with siblings ($\beta = -.10$, $p < .001$), and Conscientiousness predicted decreasing insecurity with parents ($\beta = -.18$, $p < .001$). Although not hypothesized, Openness to Experience predicted decreasing levels of contact with parents ($\beta = -.15$, $p < .001$), siblings ($\beta = -.11$, $p < .001$), and friends ($\beta = -.11$, $p < .001$). Consistent with expectations, no statistically significant cross-lagged effects from relationship characteristics to personality traits were observed.

*Associations Between Personality Trait and Relationship Characteristics Change*

After exploring the cross-lagged effects, a set of latent change models was calculated in order to investigate whether changes in relationship characteristics from school to post-school life were associated with changes in personality traits. Analyses were run for both the participants' entire social network and then separately for parents, siblings, and friends. For relationship characteristics of participants' entire social network, the fit of the latent change models was satisfactory (RMSEA: $M = .04$, $SD = .02$; CFI: $M = .98$, $SD = .01$).

For participants' entire social network, five statistically significant associations during the post–high school transition were observed (see Table 3). Changes in relationship insecurity were positively associated with change in Neuroticism and negatively associated with change in Extraversion and Agreeableness. There were also statistically significant associations between change in conflict and importance with changes in Agreeableness (see Table 3).

Out of the 75 latent change correlations explored for the association between change in relationship characteristics, and change in

### Table 3
#### Associations of Change in Personality and Change in Relationship Characteristics

|  | Contact | Importance | Conflict | Closeness | Insecurity |
|---|---|---|---|---|---|
|  | Concurrent Correlations | | | | |
| Neuroticism | −.11* | −.05 | .23** | −.13** | .40** |
| Extraversion | .07 | .11** | −.05 | .22** | −.19** |
| Openness | −.17** | −.02 | .06 | −.02 | .14** |
| Agreeableness | .09 | .20** | −.28** | .24** | −.17** |
| Conscientiousness | .06 | .04 | −.19** | .08 | −.14** |
|  | Correlated Change | | | | |
| Neuroticism | .01 | −.01 | .09 | −.03 | .19** |
| Extraversion | −.03 | .02 | −.06 | .04 | −.10** |
| Openness | −.05 | −.07 | .01 | −.05 | .06 |
| Agreeableness | −.01 | .11* | −.20** | .06 | −.12** |
| Conscientiousness | −.03 | .01 | −.05 | .01 | −.02 |

*Note.* *$p < .01$. **$p < .001$.

personality by key relationship types, 10 were statistically significant (see Table 4), and centered on the personality factors of Neuroticism or Agreeableness. In particular, change in Neuroticism was positively associated with change in insecurity with parents and friends, and conflict with parents. Likewise, change in Neuroticism was observed to be negatively associated with change in closeness with parents. Change in Agreeableness was negatively associated with change in conflict with parents, friends, and siblings and positively associated with change in closeness with parents. Finally, change in Conscientiousness was negatively associated with change in conflict with parents, and change in Openness was positively associated with change in the importance of siblings.

## DISCUSSION

The current research provided answers to three research questions pertinent to changes in social networks that occur during the post–high school transition. First, results provided evidence that changes in relationship characteristics over this transition period were on average positive, with conflict and insecurity decreasing over time and closeness increasing. Second, cross-lagged analysis indicated that personality at school was an important antecedent predictor of changes in relationship quality from school to further education. Third, latent change score models indicated that changes in relationship characteristics from school to further education or the workplace were associated with changes in personality during the same period.

### Relationship Change During the Post–High School Transition

The post–high school transition represents the beginning of emerging adulthood, a developmental period that is characterized by a number of changes in a variety of life domains (Arnett, 2006). In terms of relationships, this includes not only establishing new friendship circles after school, but also learning to manage existing relationships with the family, which are altered by this transition (J. Parker et al., 2004). The challenges of this period were reflected in the current research, where considerable mean-level change was observed during this transition period for both relationship characteristics and social network composition. This dramatic

## Table 4
### Associations of Change in Personality and Change in Relationship Characteristics

| | Contact | | | Importance | | | Conflict | | | Closeness | | | Insecurity | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | Par | Sib | Fri | Par | Sib | Fri | Par | Sib | Fri | Par | Sib | Fri | Par | Sib | Fri |
| **Concurrent Correlations** | | | | | | | | | | | | | | | |
| Neuroticism | -.02 | -.09 | -.09 | -.03 | .02 | -.02 | .25** | .10** | .10** | -.14** | -.05 | -.03 | .25** | .24** | .37** |
| Extraversion | .03 | .04 | .11** | .04 | .11** | .10** | .00 | -.03 | -.07 | .16** | .13** | .14** | -.12** | -.13** | -.21** |
| Openness | -.11** | -.07 | -.10** | -.07 | -.01 | .04 | .11** | .05 | .04 | -.08 | -.03 | .11** | .12** | .15** | .04 |
| Agreeableness | .06 | .12 | .02 | .11** | .13** | .13** | -.19** | -.08 | -.22** | .18** | .14** | .14** | -.12** | -.12** | -.10** |
| Conscientiousness | .05 | .15** | .00 | .02 | .03 | -.01 | -.19** | .00 | -.12** | .10** | .08 | .00 | -.08 | -.12** | -.12** |
| **Correlated Change** | | | | | | | | | | | | | | | |
| Neuroticism | -.05 | -.03 | -.02 | -.07 | .01 | .01 | .12** | .02 | .04 | -.10** | -.03 | .00 | .15** | .07 | .17** |
| Extraversion | .03 | -.06 | .07 | .01 | -.01 | .03 | -.01 | .04 | -.01 | .05 | .00 | .05 | -.08 | -.02 | -.09 |
| Openness | .00 | .00 | .03 | -.03 | .11** | -.04 | -.04 | .02 | -.01 | .00 | -.01 | .02 | .01 | .00 | -.01 |
| Agreeableness | -.01 | -.04 | .01 | .06 | .03 | .02 | -.12* | -.13* | -.13** | .10* | .03 | .02 | -.09 | -.09 | -.09 |
| Conscientiousness | .00 | .01 | .00 | .06 | .03 | -.02 | -.12** | .00 | -.03 | .05 | .03 | -.07 | -.06 | .00 | -.09 |

*Note.* Par = parents; Sib = siblings; Fri = friends.
*$p < .01$. **$p < .001$.

change supports Arnett's (2006) suggestion that emerging adulthood is defined by dramatic changes in relationships, particularly with parents.

These relationship changes are not necessarily negative, however, as changes tended to be more positive on average with family (Conger & Little, 2010; Tanner, 2006). Given the importance of family in later life, the improvement in family relationship characteristics represents an important potential increase in social support resources. These positive changes in relationship characteristics occurred in the context of significantly less contact with family. Indeed, it is possible that the increase in quality and the decrease in contact with family is connected. Arnett (2000), in his review of the literature on emerging adulthood, notes that either moving away from home or developing greater independence from parents during this period is associated with greater psychological health. Although the improvement in relationships with family was supported by this research, the theoretical increase in the importance of friendships during this transition period was not observed (Berzonsky & Kuk, 2000; Conger & Little, 2010; Oswald & Clark, 2003; Salmela-Aro & Nurmi, 1997).

*The Antecedent Effects of Personality on Changes in Relationship Characteristics*

The changes in relationship characteristics in the current research were on average positive, yet this obscured considerable variability in relationship change within the sample (Arnett, 2000; Conger & Little, 2010). We hypothesized that personality would therefore be an important predictor of how well young people navigate changes in social networks in the post–high school transition. Consistent with these hypotheses lower Neuroticism and higher Extraversion, Agreeableness, and Conscientiousness were associated with positive change in several relationship characteristics as participants moved out of high school. Although exploring intervening mechanisms was outside the scope of this research, these personality traits may be associated with individuals who are more successful in coping with the social network changes that occur during this transition period. Indeed, in research on first-year university students, Selfhout et al. (2010) found that Agreeableness and Extraversion were important in establishing and maintaining new social networks.

An interesting finding of note in the current research was that Openness to Experience predicted lower levels of later contact, particularly with family. Such a relationship has not been observed in research in other contexts. This may reflect the unique context of the post–high school transition. Openness to Experience represents intellect, educational aptitude, and openness to new ideas, experiences, and thoughts (Bergeman et al., 1993). Presumably, such factors are likely to be associated with a greater probability that individuals will undertake studies or employment that takes them further from the family home, and thus results in less contact with individual family members. Supporting this assumption, research suggests that Openness to Experience is related to having more, and more varied, life experiences, including moving out of the home (Lüdtke, Roberts, Trautwein, & Nagy, 2011). Given that moving from the parental home to attend university has many benefits, and is an important step in developing independence (see Arnett, 2000; Conger & Little, 2010; Turley, 2006), higher Openness to Experience may predict more adaptive post-school transitions. Alternatively, parents and siblings represent critical and ongoing sources of social support, and moving away from home may introduce difficulties in accessing material and emotional resources from family. Thus, a greater understanding of how this transition is related to personality traits such as Openness to Experience and the experiences of emerging adults (e.g., experiences relating to social support, well-being, and self-esteem) is needed in order to understand transition success and the relationship between person and context.

*The Association Between Personality and Relationship Characteristics Change*

In the current research, latent change scores provided an opportunity to explore the association between changes in relationship characteristics and changes in personality traits during the critical post–high school transition. Results suggested that changes in relationship characteristics, particularly with the family, were associated with changes in Neuroticism, Agreeableness, and Extraversion. These results illustrate that personality in emerging adulthood is not fixed. Indeed, consistent with previous research, the findings of this research indicate that life transitions, such as the post-school transition, present external conditions that are associated with personality

development. It was clear from the results that not all personality traits were related to all relationship characteristics. This is consistent not only with previous literature in this area but also with personality theory. In particular, it would not be expected that an environmental change would be associated with change in an individual's entire personality system. Rather, certain types of experiences are likely to be pertinent for particular traits to which they are most logically associated with (Lüdtke et al., 2011). In the case of the current research, changes in relationship characteristics were associated with traits that are most clearly interpersonal in nature.

From a social investment principle perspective (Roberts et al., 2005), change in personality is often due to changes in the expectations and experiences particular to young adulthood. For example, transitions such as entering the workforce or getting married have been found to be associated with personality maturation. The post–high school transition is associated with a number of expectations and experiences, including a move toward independence, the development of more adult-to-adult relationships, and the requirement to provide more equitable bidirectional support (Conger & Little, 2010; Salmela-Aro & Nurmi, 1997; Tanner, 2006). Given that emerging adulthood has become increasingly defined by instability in work and relationship commitments, this transition may provide an important and clear contextual change that can be used in future research on the role of life experiences in personality trait change.

*Limitations and Future Research*

Although the current research had a number of key strengths, there are several limitations that should be noted. First, the current research consisted of self-report data. Self-report data hold a number of advantages and may even be the method of choice for exploring intrapsychic factors (Crockett, Schulenberg, & Petersen, 1987; Howard, 1994); however, it does have several notable limitations (Schmitt, 1989, 1994). Of particular significance to the current research is that relationship characteristics were addressed via self-report measures as well. It is thus likely that participants' personalities may have influenced assessments of their relationships. Efforts were made to reduce this bias by asking participants to rate each relationship individually. Clearly, however, other methods, such as direct observation of relationship characteristics (as well as multiple

raters of personality), would complement the current findings. Second, our study has a limitation common to practically all real-world, nonexperimental research: the possibility of third-variable explanations (Morgan & Winship, 2007). Although cross-lagged models are typically utilized to provide evidence of causal ordering (Duncan et al., 2006), it cannot be ruled out that unobserved variables were responsible for the associations between personality and relationship characteristics over the two years (e.g., changes in circadian typologies; Tonetti, Fabbri, & Natale, 2009). Further, evidence for a causal interpretation of the reported findings would be provided by identifying the mechanisms that, for example, lead persons high in particular personality characteristics to have certain types of relationship experiences. In addition, the initial wave of data collection did not represent a zero time point and, as such, a complex system of causation and reciprocal relationships between personality and relationship characteristics may have occurred before this period (Neyer & Asendorpf, 2001). For instance, the literature indicates that relationship attachment in childhood is an important determinant of personality and behavior pattern development (e.g., Fraley, 2007; J. Parker, Rubin, Erath, Wojslawowicz, & Buskirk, 2006). Thus, results are consistent with the social investment principle, yet many alternative causal factors cannot be ruled out.

As is common with research that tracks individuals across a major life transition, particularly where the transition involves many participants moving from the original place of testing, attrition was moderately large. Although selection effects were relatively small, readers are advised to take into account the issue of longitudinal attrition when interpreting these results. Furthermore, the current research focused on a relatively restricted sample of those in the university track school system in Germany. Research is thus needed to see whether the current findings replicate in post–high school transitions more generally. Indeed, although only very small differences were observed in individuals who had different transition destinations (e.g., university or the workplace),[3] there is a need to

3. It was possible that the relationship between personality and relationship characteristics noted in this research might vary by transition pathways (i.e., those on a stereotypical university pathway or nonstereotypical pathway to vocational education or the workforce). Multigroup analysis was used to explore whether the association between personality and relationship characteristics differed across stereotypical or nonstereotypical developmental pathway. This was done by con-

explore the different psychological and developmental processes for young people who transition to university versus those who do not. As Hamilton and Hamilton (2006; see also Arnett, 2000, 2006) note, the post–high school transition is highly heterogeneous. Most research, however, continues to focus primarily on those who transition to university at the cost of a more robust understanding of emerging adulthood.

## CONCLUSION

The current research suggested that the post–high school transition period is associated with significant changes in relationship characteristics, which were on average positive, particularly in relation to family. Results also indicated that lower Neuroticism and higher Agreeableness, Conscientiousness, and Extraversion in high schools predicted positive changes in relationship characteristics. Moreover, latent change models indicated that change in conflict, insecurity, closeness, and importance in relationships may also have implications for changes in personality during the same period. Taken together, the research indicates that personality may be an important determinate of how individuals navigate the changes to relationships that occur during the post-school transition. In addition, these dramatic changes have important implications for personality development.

## REFERENCES

Allemand, M., Zimprich, D., & Martin, M. (2008). Long-term correlated change in personality traits in old age. *Psychology and Aging*, **23**, 545–557.
Aquilino, W. S. (2006). Family relationships and support systems in emerging adulthood. In J. Arnett & J. Tanner (Eds.), *Emerging adults in America:*

ducting a series of $\chi^2$ difference tests and comparing a model in which key parameters were held invariant across groups and a model in which these parameters were free to vary across groups. In all analyses (cross-lagged or latent change score models) there was little difference observed in the associations between personality and relationship quality. Indeed, in all the models tested, by both entire social network and by relationship type, only two significant differences between traditional and nontraditional pathways were observed. On both occasions, however, the differences were in the strengths of the relationships rather than the direction.

*Coming of age in the 21st century* (pp. 193–217). Washington, DC: American Psychological Association.

Arnett, J. (2000). Emerging adulthood: A theory of development from the late teens through the twenties. *American Psychologist*, **55**, 469–480.

Arnett, J. (2004). *Emerging adulthood: The winding road from the late teens through the twenties*. New York: Oxford University Press.

Arnett, J. (2006). Emerging adulthood: Understanding the new way of coming of age. In J. Arnett & J. Tanner (Eds.), *Emerging adults in America: Coming of age in the 21st century* (pp. 3–19). Washington, DC: American Psychological Association.

Asendorpf, J. B., & Wilpers, S. (1998). Personality effects on social relationships. *Journal of Personality and Social Psychology*, **74**, 1531–1544.

Bagozzi, R. P., & Heatherton, T. F. (1994). A general approach to representing multifaceted personality constructs: Application to state self-esteem. *Structural Equation Modeling*, **1**, 35–67.

Bergeman, C. S., Chlpuer, H. M., Plomin, R., Pedersen, N. L., McClearn, G. E., Nesselroade, J. R., et al. (1993). Genetic and environmental effects on openness to experience, agreeableness, and conscientiousness: An adoption/twin study. *Journal of Personality*, **61**, 159–179.

Berzonsky, M., & Kuk, L. (2000). Identity status, identity processing style, and the transition to university. *Journal of Adolescent Research*, **15**, 81–98.

Borkenau, P., & Ostendorf, F. (1993). *NEO-fünf-faktoren inventar nach Costa und McCrae*. [NEO Five Factor Inventory from Costa and McCrae]. Göttingen: Hogrefe.

Branje, S. J., van Lieshout, C. F., & van Aken, M. A. (2004). Relations between Big Five personality characteristics and perceived support in adolescents' families. *Journal of Personality and Social Psychology*, **86**, 615–628.

Caspi, A., & Bem, D. J. (1990). Personality continuity and change across the life course. In L. Pervin (Ed.), *Handbook of personality: Theory and research* (pp. 549–575). New York: Guilford Press.

Conger, K., & Little, W. (2010). Sibling relationships during the transition to adulthood. *Child Development Perspectives*, **4**, 87–94.

Costa, P., & McCrae, R. (1992). *Professional manual: Revised NEO Personality Inventory (NEO-PI-R) and NEO Five-Factor Inventory (NEO-FFI)*. Odessa, FL: Psychological Assessment Resources.

Côté, J. E. (2006). Emerging adulthood as institutionalized moratorium: Risks and benefits to identity formation. In J. Arnett & J. Tanner (Eds.), *Emerging adults in America: Coming of age in the 21st century* (pp. 85–116). Washington, DC: American Psychological Association.

Crockett, L., Schulenberg, J., & Petersen, A. (1987). Congruences between objective and self-report data in a sample of young adolescents. *Journal of Adolescent Research*, **2**, 383–392.

Duncan, T., Duncan, S., & Strycker, L. (2006). *An introduction to latent variable growth curve modeling*. Mahwah, NJ: Erlbaum.

Enders, C. K. (2010). *Applied missing data analysis*. New York: Guilford Press.

Erikson, E. H. (1968/1994). *Identity: Youth and crisis*. New York: Norton.

Ferrer, E., & McArdle, J. J. (2010). Longitudinal modeling of developmental changes in psychological research. *Current Directions in Psychological Science*, **19**, 149–154.

Floyd, F. J., & Widaman, K. F. (1995). Factor analysis in the development and refinement of clinical assessment instruments. *Psychological Assessment*, **7**, 286–299.

Fraley, R. (2007). A connectionist approach to the organization and continuity of working models of attachment. *Journal of Personality*, **75**, 1157–1180.

Fromme, K., Corbin, W. R., & Kruse, M. I. (2008). Behavioral risks during the transition from high school to college. *Developmental Psychology*, **44**, 1497–1504.

Furman, W., & Buhrmester, D. (1992). Age and sex differences in perceptions of networks of personal relationships. *Child Development*, **63**, 103–115.

Goetting, A. (1986). The developmental tasks of siblingship over the life cycle. *Journal of Marriage and the Family*, **48**, 703–714.

Hamilton, S. F., & Hamilton, M. A. (2006). School, work, and emerging adulthood. In J. Arnett & J. Tanner (Eds.), *Emerging adults in America: Coming of age in the 21st century* (pp. 257–277). Washington, DC: American Psychological Association.

Hoyle, R. H. (1995). *Structural equation modeling*. Thousand Oaks, CA: Sage.

Howard, G. (1994). Why do people say nasty things about self-reports? *Journal of Organizational Behavior*, **15**, 399–404.

Hull, J. G., Lehn, D. A., & Tedlie, J. C. (1991). A general approach to testing multifaceted personality constructs. *Journal of Personality and Social Psychology*, **61**, 932–945.

Kantanis, T. (2000). The role of social transition in students' adjustment to the first year of university. *Journal of Institutional Research*, **9**, 100–110.

Kaplan, D. (2000). *Structural equation modeling*. Newbury Park, CA: Sage.

Köller, O., Watermann, R., Trautwein, U., & Lüdtke, O. (2004). *Wege zur hochschulreife in Baden-Württemberg* [Paths to college entry in Baden-Württemberg]. Berlin: Leske und Budrich.

Lehnart, J., Neyer, F. J., & Eccles, J. (2010). Long-term effects of social investment: The case of partnering in young adulthood. *Journal of Personality*, **78**, 639–670.

Levinson, D. J. (1978). *The seasons of a man's life*. New York: Ballantine.

Lüdtke, O., Roberts, B., Trautwein, U., & Nagy, G. (2011). A random walk down university avenue: Life paths, life events, and personality trait change at the transition to university. *Journal of Personality and Social Psychology*, **101**, 620–637.

Lüdtke, O., & Trautwein, U. (2007). Aggregating to the between-person level in idiographic research designs: Personal goal research as an example of the need to distinguish between reliability and homogeneity. *Journal of Research in Personality*, **41**, 230–238.

Lüdtke, O., Trautwein, U., & Husemann, N. (2009). Goal and personality trait development in a transitional period: Assessing change and stability in personality development. *Personality and Social Psychology Bulletin*, **35**, 428–441.

Lüdtke, O., Trautwein, U., Nagy, G., & Köller, O. (2004). Eine validierungsstudie zum NEO-FFI in einer stichprobe junger erwachsener: Effekte des itemformats, faktorielle validität und zusammenhänge mit schulleistungsindikatoren [A validation of the NEO-FFI in a sample of young adults: Effects of the response format, factorial validity, and relations with indicators of academic achievement]. *Diagnostica*, **50**, 134–144.

Marsh, H. W., Hau, K.-T., & Grayson, D. (2005). Goodness of fit evaluation in structural equation modeling. In A. Maydeu-Olivares & J. McArdle (Eds.), *Contemporary psychometrics: A festschrift to Roderick P. McDonald* (pp. 275–340). Mahwah, NJ: Erlbaum.

McArdle, J. J., & Hamagami, F. (2001). Latent difference score structural models for linear dynamic analyses with incomplete longitudinal data. In L. M. Collins & A. G. Sayer (Eds.), *New methods for the analysis of change* (pp. 139–175). Washington, DC: APA Press.

Morgan, S. L., & Winship, C. (2007). *Counterfactuals and causal inference: Methods and principles for social research*. Cambridge: Cambridge University Press.

Morris, S. B., & Deshon, R. P. (2002). Combining effect size estimates in meta-analysis with repeated measures and independent-groups designs. *Psychological Methods*, **7**, 105–125.

Muthén, L. K., & Muthén, B. O. (1998–2006). *Mplus user's guide*. Los Angeles: Muthén & Muthén.

Neyer, F., & Asendorpf, J. (2001). Personality-relationship transaction in young adulthood. *Journal of Personality and Social Psychology*, **81**, 1190–1204.

Neyer, F., & Lehnart, J. (2007). Relationships matter in personality development: Evidence from an 8-year longitudinal study across young adulthood. *Journal of Personality*, **75**, 535–568.

Oswald, D. L., & Clark, E. M. (2003). Best friends forever? High school best friendships and the transition to college. *Personal Relationships*, **10**, 187–196.

Parker, J., Rubin, K., Erath, S., Wojslawowicz, J., & Buskirk, A. (2006). Peer relationships, child development, and adjustment: A developmental psychopathological perspective. In D. Cicchetti & D. Cohen (Eds.), *Developmental psychopathology: Theory and methods* (pp. 419–493). New York: Wiley.

Parker, J., Summerfeldt, L., Hogan, M., & Majeski, S. (2004). Emotional intelligence and academic success: Examining the transition from high school to university. *Personality and Individual Differences*, **36**, 163–172.

Parker, P. D., Martin, A. J., Martinez, C., Marsh, H. W., & Jackson, S. (2010). Longitudinal approaches to stages of change measurement: Effects on cognitive and behavioral physical activity factors. *Measurement and Evaluation in Counseling and Development*, **43**, 108–120.

Raykov, T. (1992). Structural models for studying correlates and predictors of change. *Australian Journal of Psychology*, **44**, 101–112.

Raykov, T. (2004). Behavioral scale reliability and measurement invariance evaluation using latent variable modeling. *Behavior Therapy*, **35**, 299–331.

Roberts, B. W., & Bogg, T. (2004). A 30-year longitudinal study of the relationships between conscientiousness-related traits and the family structure and health-behavior factors that affect health. *Journal of Personality*, **72**, 325–354.

Roberts, B., Caspi, A., & Moffitt, T. (2001). The kids are alright: Growth and stability in personality development from adolescence to adulthood. *Journal of Personality and Social Psychology*, **81**, 670–683.

Roberts, B., Caspi, A., & Moffitt, T. (2003). Work experiences and personality development in young adulthood. *Journal of Personality and Social Psychology*, **84**, 582–593.

Roberts, B. W., & Chapman, C. N. (2000). Change in dispositional well-being and its relation to role quality: A 30-year longitudinal study. *Journal of Research in Personality*, **41**, 26–41.

Roberts, B. W., Walton, K. E., & Viechtbauer, W. (2006). Patterns of mean-level change in personality traits across the life course: A meta-analysis of longitudinal studies. *Psychological Bulletin*, **132**, 1–25.

Roberts, B., Wood, D., & Smith, J. (2005). Evaluating five factor theory and social investment perspectives on personality trait development. *Journal of Research in Personality*, **39**, 166–184.

Robins, R., Caspi, A., & Moffitt, T. (2002). It's not just who you're with, it's who you are: Personality and relationship experiences across multiple relationships. *Journal of Personality*, **70**, 925–964.

Salmela-Aro, K., & Nurmi, J. (1997). Goal contents, well-being, and life context during transition to university: A longitudinal study. *International Journal of Behavioral Development*, **20**, 471–491.

Schmitt, N. (1989). Editorial. *Journal of Applied Psychology*, **74**, 843–845.

Schmitt, N. (1994). Method bias: The importance of theory and measurement. *Journal of Organizational Behavior*, **15**, 393–398.

Scollon, C. N., & Diener, E. (2006). Love, work, and changes in extraversion and neuroticism over time. *Journal of Personality and Social Psychology*, **91**, 1152–1165.

Selfhout, M., Burk, W., Branje, S., Denissen, J., van Aken, M., & Meeus, W. (2010). Emerging late adolescent friendship networks and Big Five personality traits: A social network approach. *Journal of Personality*, **78**, 509–538.

Sturaro, C., Denissen, J. J., van Aken, M. A., & Asendorpf, J. B. (2008). Person-environment transactions during emerging adulthood. *European Psychologist*, **13**, 1–11.

Sutin, A., & Costa, P., Jr. (2010). Reciprocal influences of personality and job characteristics across middle adulthood. *Journal of Personality*, **78**, 257–288.

Tanner, J. L. (2006). Recentering during emerging adulthood: A critical turning point in life span human development. In J. Arnett & J. Tanner (Eds.), *Emerging adults in America: Coming of age in the 21st century* (pp. 193–217). Washington, DC: American Psychological Association.

Tonetti, L., Fabbri, M., & Natale, V. (2009). Relationship between circadian typology and Big Five personality domains. *Chronobiology International*, **26**, 337–347.

Trautwein, U., Lüdtke, O., Marsh, H. W., & Nagy, G. (2009). Within-school social comparison: How students' perceived standing of their class predicts academic self-concept. *Journal of Educational Psychology*, **101**, 853–866.

Turley, R. (2006). When parents want children to stay home for college. *Research in Higher Education*, **47**, 823–846.

van Aken, M. A. G., Denissen, J. J. A., Branje, S. J. T., Dubas, J. S., & Goossens, L. (2006). Midlife concerns and short-term personality change in middle adulthood. *European Journal of Personality*, **20**, 497–513.

West, S. G., Finch, J. F., & Curran, P. J. (1995). Structural equation models with non-normal variables: Problems and remedies. In R. H. Hoyle (Ed.), *Structural equation modelling: Concepts, issues and applications* (pp. 56–75). Newbury Park, CA: Sage.

Zarrett, N., & Eccles, J. S. (2006). The passage to adulthood: Challenges of late adolescence. In S. Piha & G. Hall (Eds.), *New directions for youth development* (pp. 13–28). Hoboken, NJ: Wiley.