Personality–Relationship Transaction in Adolescence: Core Versus Surface Personality Characteristics

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ABSTRACT Personality effects on perceived support from social relationships and vice versa were longitudinally studied over adolescence. Within personality, core (Big Five personality traits) and surface characteristics (global self-worth, perceived peer acceptance, and loneliness) were distinguished. Core, but not surface, characteristics at age 12 predicted support from both parents and peers at age 17 after controlling for support at age 12. Support at age 12 predicted surface, but not core, characteristics at age 17 after controlling for personality at age 12. These findings are interpreted within a dual model of personality–relationship transaction. Core characteristics are relatively stable traits that are largely immune against experiences in relationships and continuously influence their flux and flow. Surface characteristics are more open to relationship influences, and are therefore less stable.

The present study is guided by the theoretical framework of dynamic interactionism. It is generally assumed that individuals develop through a dynamic, continuous, and reciprocal transaction with

their environment (Caspi, 1998; Magnusson, 1990; Sameroff, 1983). Reciprocal causal effects are expected over development not only between personality and the environment but also between personality and the quality of important social relationships. This is because one's relationship quality is partly determined by social-environmental factors such as the personality of the relationship partners and external influences on the relationship. Thus, from a dynamic-interactionistic point of view, one would not be surprised by, and may even expect, reciprocal influences between personality and relationships.

However, empirical studies of personality influences on relationships and vice versa that meet strict methodological standards are rare, and therefore not much is known about the relative strength of these influences over development. Building on earlier studies of personality–relationship transaction in adulthood (Asendorpf & Wilpers, 1998; Neyer & Asendorpf, 2001), the aim of the present study was to test hypotheses about personality–relationship transactions that occur over adolescence.

Two Approaches to the Study of Personality–Relationship Transaction

Two different approaches to the study of personality–relationship transaction are used in the present study. First, later relationship quality can be predicted from earlier personality, and vice versa, in a correlational, longitudinal study. As Rogosa (1980, 1988) has pointed out, cross-lagged correlations cannot be directly interpreted as influences of the earlier-assessed variable on the later-observed one because they may be due to an association between both variables at Time 1 that is carried forward by the stability of the later-observed variable. For example, it is tempting to interpret a correlation between sociability at Time 1 and perceived peer support at Time 2 in such a way that more sociable children found it easier to establish and maintain supportive peer relationships between Time 1 and Time 2, that is, as a causal effect of sociability on peer relationships. However, this predictive correlation between sociability and peer support could be alternatively due to a concurrent correlation between sociability and peer support at Time 1 plus a significant stability of peer support between Time 1 and Time 2.

The methodology of path analysis (Campbell & Kenny, 1999; Rogosa, 1988) overcomes this problem in the interpretation of cross-lagged correlations and provides a useful tool for disentangling effects of personality on relationships and vice versa. Consider the example in Figure 1 where a personality trait at Time 1 (P1, e.g., sociability) shows a cross-lagged correlation of .32 with relationship quality at Time 2 (R2, e.g., peer support), and relationship quality at Time 1 (R1) correlates also .32 with personality at Time 2 (P2). From these cross-lagged correlations, many would infer a reciprocal transaction between personality and relationships. However, when the whole correlational pattern is examined (i.e., the correlations between P1, P2, R1, R2), the correlation from R1 to P2 is spurious because it is completely explained by the indirect path $R1 \rightarrow P1 \rightarrow P2$, whereas the correlation of .32 from P1 to R2 is fully preserved as a path coefficient because the indirect path $P1 \rightarrow R1 \rightarrow R2$ is zero. Thus, in this example, only personality shows an influence on relationships, and not vice versa, although the cross-lagged correlations are identical. Technically speaking, the path coefficients are standardized regression coefficients in a multiple regression of the later-assessed variable on the earlier assessment of the same variable and the predictive variable.

Whereas cross-paths capture causal effects of a variable at Time 1 on the change of another variable between Time 1 and Time 2, the two variables can be causally linked in different ways that induce correlated change. For example, an increase in sociability (P2-P1) may be correlated with an increase in peer support (R2-R1) because (a) sociability increased, which led to an increase in peer support, (b) peer support increased, which led to an increase in sociability, or (c) a third variable exerted similar influences on both sociability and peer support, for example, increasing athletic ability in adolescent males. Although correlated change is more ambiguous with regard to the underlying causal processes than cross-paths, it conveys additional information about causal linkages that is not captured by cross-paths. Therefore, studying correlated change is a second, independent approach to personality–relationship transaction. Because correlated change can be indirectly caused by correlations between initial status and change in the two variables, it has been suggested to infer correlated change from residual change score analysis; that is, from the correlation between the residuals of personality and relationships at Time 2 (i.e., U and V in Fig. 1),

which controls for all antecedent paths (Rogosa, 1988; Campbell & Kenny, 1999). The correlation of .30 in Fig. 1 suggests that P and R are additionally linked to the effect of P1 on R2.

Besides allowing for a clearer interpretation of cross-lagged effects and correlated change, another advantage of path analysis is that it reduces shared method variance. This is particularly important in studies of personality–relationship transaction where personality and relationship quality are often reported by the same informant. In this case, individual differences in socially desirable responding, extremity of responding, mood effects on responding, etc. inflate concurrent correlations between personality and relationship quality. Because cross-paths control statistically for the indirect paths that contain the full bias, the error is at least partly eliminated.

It should be acknowledged that the analysis of cross-paths is unable to provide conclusive evidence of causal effects because the quasi-experimental nature of correlational designs does not make it possible to rule out alternative explanations such as third variables, mediation, or selection effects. More strict causal interpretations require full experimental control of the independent variables, which is impossible to achieve in studies of normal personality and relationship variation. We therefore use terms such as personality effects or relationship influences in a statistical sense rather than a theoretical one that would imply causal arguments. Despite these problems, the study of cross-paths and correlated change appears to be the best possible approach to questions of causality in correlational studies.

Earlier Studies of Personality–Relationship Transaction

Numerous longitudinal studies have investigated predictive correlations between personality and social relationships, or vice versa. For example, attachment researchers have studied personality outcomes of early attachment style, and temperamental precursors of attachment style (see, e.g., Thompson, 1998). Relationship effects on personality have been reviewed by Hartup and Laursen (1999), and personality effects on relationships by Asendorpf (2002). But only a very few studies included simultaneous assessments of both personality and relationship quality at different ages in order to contrast personality effects on relationships and vice versa directly with one another and to avoid spurious results such as illustrated by Fig. 1.
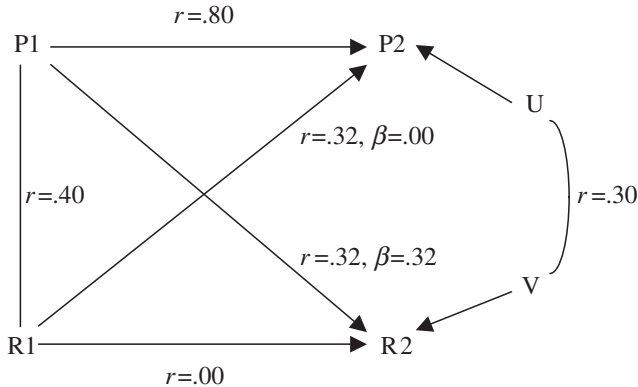
Figure 1
Correlations r and path coefficients β between personality (P1,P2), relationships (R1,R2), and correlated change of personality and relationships (U,V), controlling for all antecedent factors. In this fictitious example, the cross-correlations are equal but the cross-paths are different

To our knowledge, only two studies have exploited the full power of a longitudinal cross-lagged design for the study of personality–relationship transaction in unselected samples—and both concerned adults. Asendorpf and Wilpers (1998) assessed 132 German students' personalities (Big Five personality [sub]factors) and relationship quality (social network questionnaire) 7 times over a period of 18 months. Once path coefficients rather than cross-lagged correlations were considered, and measures were taken to prevent chance results due to the large number of statistical tests, a clear pattern of personality–relationship transaction emerged. Personality predicted relationship quality but not vice versa, and personality and relationship change were uncorrelated. In particular, extraversion or its subfactors predicted number of peers, falling in love, and perceived support from peers; agreeableness predicted low conflict with peers; and conscientiousness predicted contact frequency with parents.

Using the same methodology as Asendorpf and Wilpers (1998), Neyer and Asendorpf (2001) obtained similar findings with a general population sample of 489 German adults who were assessed at ages 18–30 years and 4 years later. Again, path analyses revealed a clear dominance of personality effects over relationship effects. For 6

personality traits, 5 substantial relationship effects were observed. In contrast, for 60 relationship variables, only 2 substantial relationship effects were found. Curiously, these effects referred to relationships of the participants with their own children.

Concerning correlated change, not a single one of the 60 changes of relationship quality was significantly correlated with personality change. Neyer and Asendorpf (2001) additionally studied associations between personality change and the emergence of new intimate relationships (rather than change in the quality of existing relationships). Whereas birth of a child was not associated with personality change in the parent, engaging for the first time in a serious partnership was associated with decreases in neuroticism and increases in extraversion and conscientiousness. However, this type of correlated change in the relationship and personality domains could not be investigated in the present study because new formation of similarly important relationships does not occur over adolescence in sufficiently large numbers (rare exceptions are cases when children from one-parent families form a close relationship with a stepparent or stepsiblings).

Neyer and Asendorpf (2001) attributed the clear dominance of personality over relationships in their and Asendorpf and Wilpers's (1998) study to the higher stability of personality. Indeed, the average 18-month stability was .76 for personality and .30 for relationship quality, and the 4-year stability was .64 for personality and .39 for relationship quality. (The higher stability of relationship quality in the Neyer and Asendorpf study seems to be due to the older average age of the participants.) Neyer and Asendorpf (2001) argued that personality has a greater a priori chance to influence relationship quality because the effects of the more stable traits are also more stable and accumulate over time, while the effects of the less stable relationship qualities are likely to fluctuate and may even cancel each other out. Only highly important relationship changes such as beginning a serious partnership for the first time in one's life have a chance to affect personality at this age.

Core Versus Surface Personality Characteristics

The present study goes beyond the Asendorpf and Wilpers (1998) and Neyer and Asendorpf (2001) studies by including not only fairly stable personality traits such as the Big Five but also presumably less

stable individual characteristics such as general and domain-specific self-esteem and loneliness. Recent theoretical approaches to personality such as the 3-layer classification by McAdams (1996) or the five-factor theory by McCrae and Costa (1996, 1999) assume that more stable, "hard core" traits such as the Big Five, including temperament, are strongly based on genetic differences and less susceptible to influences by culture and individual life experiences whereas more malleable individual characteristics such as self-concept and attitudes are more open to such contextual influences. McCrae and Costa (1996, 1999) used the labels "basic tendencies" and "characteristic adaptations" for these two classes of personality characteristics.

We agree with McCrae and Costa that a distinction between more versus less stable personality characteristics is potentially useful and that the higher stability of some traits can most likely be attributed to their lower susceptibility to environmental influences. There is good empirical evidence for adulthood that self-concept and life satisfaction are less stable than temperament (Conley, 1984) and that various social relationship qualities are less stable than the Big Five (Asendorpf & Wilpers, 1998; Neyer & Asendorpf, 2001). Also, to the extent that self-concept, life satisfaction, and more specific affective evaluations of one's life, such as loneliness, are an outcome of one's real accomplishments in life, rather than due to general affective biases, a distinction between core traits and surface characteristics is in order.

However, in contrast to McCrae, Costa, Ostendorf, Angleitner, Hrebícková, et al. (2000) we do allow the possibility that environmental influences affect traits such as the Big Five. Genetic influence is restricted to less than 50% of the variance for the Big Five up to early adulthood in methodologically advanced studies that combine twin and adoption data (e.g., Loehlin, 1992) and often lower in childhood than in adulthood, and some individual characteristics that McCrae and Costa (1996, 1999) call characteristic adaptations, such as particular attitudes and life satisfaction, appear to be as much genetically influenced as temperamental traits (e.g., Myers & Diener, 1995; Olson, Vernon, Harris, & Jang, 2001). Furthermore, equation of genetic influence and stability is not warranted because some differential genetic effects appear only later in life, causing then instability of interindividual differences (e.g., genetic effects on puberty; see Plomin, 1986, for a more general

discussion), and some environmental conditions foster stability in personality (see Caspi & Moffitt, 1993). Furthermore, the term "adaptation" in McCrae and Costa's "characteristic adaptations" has functional implications for interindividual differences that are not warranted at the descriptive level and difficult to prove.

Because of these problems with McCrae and Costa's terminology we prefer to distinguish *core* from *surface* personality characteristics. We use these terms exclusively for descriptive purposes, without implications for ontogenetic or even evolutionary adaptedness. Our distinction does not refer to two clearly separable classes of individual differences; instead, we assume that there is a continuous dimension extending from core to surface on which personality characteristics can be ordered for a specific age and culture. Thus, a temperamental trait or a self-concept characteristic may shift on that dimension with increasing age.

Our distinction is related to *stable* versus *unstable*, but not identical with this dimension, because the key property of *core* is its high (but not perfect) immunity to environmental influences, and the key property of *surface* is its high (but not total) susceptibility to environmental influences, including relationship influences. Thus, a core trait may become unstable because of developmental changes in genetic activity (but also because of an extreme relationship event such as the death of a parent), and a surface trait may be quite stable if the environment is highly stable and may be more stable than relationships because of self-stabilizing tendencies of personality.

The Present Study

The aim of the present study was to apply the methodology used by Asendorpf and Wilpers (1998) and Neyer and Asendorpf (2001) to the study of personality–relationship transaction over adolescence, to try to replicate key findings of these earlier studies, particularly the dominance of core traits over relationship quality, and to extend the analysis to transactions between relationship quality and surface characteristics.

For this purpose, we reanalyzed existing data from the Munich Longitudinal Study on the Genesis of Individual Competencies (LOGIC; Weinert & Schneider, 1999). Although this study followed children from the age of 4 years to the age of 17 years, data on their social relationships were only assessed at the last two measurement

points at ages 12 and 17. Following Furman and Buhrmester's (1985) approach to studying children's personal relationships, the LOGIC participants were asked at age 12 to nominate significant others in their recent life and to rate each relationship quality on various scales (van Aken & Asendorpf, 1997). At age 17, time restrictions prevented a replication of this social network procedure. Instead, children were asked to rate their relationship with mother, father, best friends in their school class, and best nonclass friends (distinguishing between same- and opposite-sex friends) on 4 social support scales that were also used for age 12. Because of the strong sex segregation in peer relationships at age 12, we refrained from studying opposite-sex peer relationships at this age and distinguished only between friends in class and nonclass friends. Because the 4 different support qualities that were rated at both ages were strongly correlated within relationships, we aggregated them to a single index of perceived support.

Core traits were studied in terms of self-rated Big Five personality scales to make the analyses as comparable as possible with the studies by Asendorpf and Wilpers (1998) and Neyer and Asendorpf (2001). Building on earlier studies that have shown that a considerable portion of adults' personality differences is captured by the Big Five dimensions of personality (John & Srivastava, 1999), researchers have also studied, in recent years, children's and adolescents' personality in terms of the Big Five (Asendorpf & van Aken, in press; Digman, 1989; John, Caspi, Robins, Moffitt & Stouthamer-Loeber, 1994; Kohnstamm, Halverson, Mervielde, & Havill, 1998; Mervielde & Asendorpf, 2000; Mervielde, Buyst, & De Fruyt, 1995; Mervielde & De Fruyt, 2000; Scholte, van Aken, & Van Lieshout, 1997; Van Lieshout & Haselager, 1994).

As surface characteristics, we chose assessments of general self-worth, self-perceived peer acceptance, and loneliness because these were expected to transact with relationship quality (other self-concept measures used in the LOGIC study, such as cognitive self-esteem, were not included because they were unrelated to relationship quality, both conceptually and empirically).

There are three conceptual problems linked to this approach. First, it may be argued that perceived support is a surface personality characteristic, not a quality of a dyadic relationship. Our view on this point is that perceived support from a concrete relationship reflects both actual support provided by the relationship

partner and a perceptual bias of the receiver of the support. If perceived support is assessed for concrete relationships, one by one, as we did, the perceptual bias is not avoided but minimized. This should be reflected in a relatively low consistency of perceived support across relationships. The more abstract the support questions become, for example, asking for support from people in general, the more the perceptual bias is increased, and the more consistent are the support measures across types of relationships and with measures of self-esteem and well-being (see, Davis, Morris, & Kraus, 1998; Pierce, Sarason, & Sarason, 1991).

A similar conceptual problem refers to the conceptual status of perceived peer acceptance and its relation with perceived support from peers. These variables seem to be highly similar in meaning, so why is the former considered a personality characteristic and the latter a relationship quality? Again, our answer refers to the assessment and the consistency of these variables. We assessed perceived peer acceptance with traditional self-concept scales (Harter, 1985; Marsh & O'Neill, 1984), whose items refer to peers or friends in general, not to specific concrete relationships. There-fore, we (as most self-concept researchers do) consider these scales as measuring aspects of personality.

Our conceptual approach to perceived support and perceived peer acceptance can be put to an empirical test. If our line of reasoning is correct, (a) perceived support should show only low correlations across different types of relationships, (b) the correlation between perceived support from peers and perceived peer acceptance should be clearly lower than the mean reliability of these two variables, and (c) perceived support from peers should correlate less with global self-worth than perceived peer acceptance.

A third conceptual problem concerns the relation between core and surface personality characteristics. These are not independent aspects of personality, of course; both McAdams (1996) and McCrae and Costa (1996, 1999) assumed that surface characteristics are results of the dynamic interaction between core traits and external influences. Consequently, they should be correlated with core traits, and they may show effects on relationships that are, in fact, side effects of the underlying core traits. We, therefore, tested incremental effects of surface characteristics over core traits, and vice versa, in our predictions of relationship quality through hierarchical multiple regression.

We expected that over adolescence, when self-esteem shows substantial differential change (McGuire et al., 1999), self-esteem effects on relationships can be traced back to effects of associated core traits, such as emotional stability and extraversion. Beyond these effects, we did not expect long-term self-esteem effects on relationships because of the low stability of self-esteem, which should lead to self-esteem effects that do not accumulate over time. Also, we did not expect effects of loneliness on relationships beyond the effects of underlying core traits, such as emotional stability and extraversion, because loneliness is by definition an immediate outcome of unsatisfactory relationships, and we did not expect a high stability of relationship quality over adolescence; consequently, the loneliness effects should not accumulate over time.

For the reverse causal direction, we expected effects of relationships on self-esteem and loneliness (but not on core traits) because global self-worth is a function of self-relevant experiences such as perceived support from close relationships, among other determining factors (see Marsh, 1993), and loneliness is an outcome of unsatisfactory close relationships (Peplau & Perlman, 1982). To the extent that the relationship qualities at age 12 are stable over time, their effects should accumulate over time and influence later self-worth and loneliness.

For correlated change, we expected some correlations between changes in self-esteem or loneliness and changes in subjective relationship quality due to unmeasured social variables that exerted similar effects on both perceived support and self-esteem or loneliness after age 12. A plausible unmeasured variable would be, for example, the amount of actual (not necessarily perceived) rejection by peers or parents after age 12. Actual rejection should decrease perceived support and self-esteem and increase loneliness, at least in a larger subgroup of adolescents (see Rubin, Bukowski, and Parker, 1998). We did not expect correlations between changes in perceived support and changes in core traits because of the relatively high stability of the core traits.

Hypotheses

To summarize, we propose a dual model of personality–relationship transaction. We assume that core traits are relatively stable and largely immune against experiences in relationships and continu-

ously influence their flux and flow. Surface characteristics are more open to relationship influences over adolescence, and therefore less stable. More specifically, we propose the following 4 hypotheses:

1. *Conceptualization Hypothesis.* For our choice of operationalizations, perceived support can be conceptualized as a relationship quality, and perceived peer acceptance as a personality characteristic. In particular,

   (1a) perceived support shows a low consistency across different types of relationships;

   (1b) the correlation between perceived support from peers and perceived peer acceptance should be clearly lower than the mean reliability of these two variables (the upper limit of the correlation); and

   (1c) perceived support from peers should correlate less with global self-worth than perceived peer acceptance.

2. *Stability Hypothesis.* Core traits (the Big Five) are more stable than surface characteristics (general self-worth, peer acceptance, and loneliness) and relationship qualities (perceived support).

3. *Transaction Hypothesis.* In path analyses of personality–relationship transaction,

   (3a) some core traits predict perceived support in some relationships, even when surface characteristics are statistically controlled, particularly extraversion→peer support and conscientiousness→family support (Asendorpf & Wilpers, 1998; Neyer & Asendorpf, 2001);

   (3b) surface characteristics do not predict perceived support in relationships when core traits are statistically controlled;

   (3c) perceived support in relationships does not predict core traits; and

   (3d) perceived support in some relationships does predict some surface characteristics, particularly parental support → global self-esteem and low loneliness (Peplau & Perlman, 1982; van Aken & Asendorpf, 1997), and peer support→perceived peer acceptance and low loneliness (Rubin et al., 1998).

4. *Correlated Change Hypothesis.* Changes in relationship quality are not correlated with changes in core traits, but with changes

in some surface characteristics, particularly changes in peer support and changes in perceived peer acceptance and loneliness (Rubin et al., 1998).

METHOD

Participants

The participants were part of the Munich Longitudinal Study on the Genesis of Individual Competencies (LOGIC). The LOGIC sample originally consisted of 230 children (119 boys, 111 girls) who were studied every year from their first or second year in preschool until age 12. The sample was rather unbiased because the schools were selected from a broad spectrum of neighborhoods, more than 90% of the parents who were asked for permission gave their consent for their child's participation, and attrition until age 12 was low (19% over 8 years) and unsystematic (see Weinert & Schneider, 1999, for this initial part of the study). After age 12, the LOGIC sample was reassessed once more at age 17. Attrition was again low (6% over 5 years), resulting in 174 participants at age 17. A comparison with the 56 drop-outs did not reveal significant differences in terms of socioeconomic status of the family, ego-control, or ego-resiliency that were assessed in the first year through a German version of the California Child Q-set (see Asendorpf & van Aken, 1999).

Assessments and Measures

The present study contrasts assessments of the Big Five factors of personality, self-esteem, and loneliness, and perceived support from parents and friends at ages 12 and 17 with one another. Whereas the personality scales were identical at both ages, the self-esteem, loneliness, and support measures were conceptually closely related but assessed by different procedures because the self-esteem and loneliness items used at age 12 did not seem age-appropriate for late adolescents, and time constraints urged us to reduce the extensive support assessment at age 12 to fewer items and relationships at age 17.

Core Traits: Big Five Questionnaire. At age 12 and at age 17, all 174 participants rated their personality on a Big Five questionnaire

consisting of 5 scales (*extraversion*, *emotional stability*, *conscientious-ness*, *agreeableness*, and *culture*). Emotional stability refers to inverse neuroticism, and culture to openness to experience in McCrae and Costa's (1996) five-factor model. Each scale consisted of 8 bipolar adjectives that were balanced with regard to the social desirability of the items. The items were answered on a 5-point scale (with labels *very*, *somewhat*, *neither/nor*, *somewhat*, *very*). This questionnaire was derived in a multistep procedure from a pool of 179 bipolar items used by Ostendorf (1990) for adults. The steps included deletion of items that were not clearly understood by 12-year old children in a pretest screening, selecting among the remaining items the 12 highest-loading items for each factor in a forced 5-factor solution of the original adult sample of Ostendorf (1990), assessing these 60 items in the LOGIC sample at age 12, and selecting 8 items per scale with regard to their factor loadings and cross-loadings in this assessment (see Asendorpf & van Aken, 1999, in press, for more details). The internal consistencies (Cronbach's α) of the resulting 8-item scales were sufficiently high with two exceptions (for age 12, mean $\alpha = .76$, range $.68 - .83$; for age 17, mean $\alpha = .82$, range $.75 - .88$). The two exceptions were relatively low alphas for culture and emotional stability at age 12 (.68 in both cases), which can be attributed to the early age of the respondents because both scales had satisfactory alphas at age 17 (culture, .75; emotional stability, .81).

Surface Characteristics. At age 12, *global self-worth* (e.g., "I am happy the way I am") and self-perceived *peer acceptance* (e.g., "I am popular with kids") were assessed by German adaptations of the corresponding scales from Harter's (1985) Self-Perception Profile for Children (see also Asendorpf & van Aken, 1993, 1999). In addition, *loneliness* was assessed with a short version of a loneliness scale for children by Asher, Hymel, and Renshaw (1984); the retained items were *I am lonely*, *I feel alone*, *I feel left out of many things*. These items were mixed with other items and were rated on a 5-point frequency scale (with labels ranging from *never* to *always*). All three scales showed satisfactory internal consistencies ($\alpha > .77$).

At age 17, *global self-worth* (e.g., "Overall, I have a lot of respect for myself") and self-perceived *peer acceptance* (e.g., "I am popular with members of the same sex," "I make friends easily with members of the opposite sex") were assessed with German short versions of

the global self-esteem scale and the two scales—self-esteem toward same-sex peers and self-esteem toward opposite-sex peers—of the SDQ III by Marsh and O'Neill (1984). The 6 items with the highest corrected item-scale correlations in the original questionnaire were translated into German. The two sex-specific peer acceptance scales were aggregated, resulting in one peer acceptance scale. *Loneliness* was assessed with a short version of the German adaptation of the UCLA loneliness scale (Döring & Bortz, 1993); retained were the 10 highest-loading items (e.g., "I feel lonely"). The resulting $6+12+10$ items were randomly mixed and answered on a 5-point scale (with labels ranging from *not at all true for me* to *fully true for me*). All three scales showed satisfactory internal consistencies ($\alpha > .79$).

Perceived Support. At age 12, participants were individually interviewed about their significant social relationships. They were asked to mention all the persons with whom they had regular interactions at least once a month or who aroused positive or negative emotions in them. They were guided through these relationships by questioning about various kinds of relationships, particularly with parents and those peers they considered as friends, separately asking for friends in their class and nonclass friends. Subsequently, they rated each relationship (15 on average) on seven 3-item scales for relationship quality, using 5-point scales with scores ranging from 1 to 5 and labels ranging from *never* to *always*.

For the present study, only the relationships with mother, father, friends in class (3.0 on average) and nonclass friends (2.8 on average) were considered, and only the ratings on the scales *instrumental help*, *intimacy*, *esteem enhancement*, and *reliability*, because only these scales were also assessed at age 17. The items of the first 3 scales were adapted from the NRI (Furman & Buhrmester, 1985; sample items are: "This person teaches you how to do things that you don't know," "You tell this person everything," "This person likes or approves of the things you do," respectively); the reliability scale consisted of new items that emphasized the unreliability of the relationship (the 3 items were "You feel left alone by this person" (reversed), "You feel abandoned by this person" (reversed), "You can rely on this person"). Thus, the 12 items assessed different aspects of *perceived support*. They were averaged separately for mother, father, class friends, and nonclass friends. The internal consistencies of these four support scales were sufficiently high

($\alpha > .70$ in each case). A few participants reported no friend in class or outside of class; in this case, friend support was replaced by the minimum score 1.

At age 17, the same scales were assessed only for mother, father, same- and opposite-sex best friend in class, and same- and opposite-sex nonclass best friend; again, the internal consistencies were sufficiently high ($\alpha > .70$ in each case). The ratings were averaged across the same- and opposite-sex friend ratings, resulting in one support score for friends in class and one score for nonclass friends. As in the analyses of the age 12 assessments, missing scores because of no friend in class or outside of class were replaced by the minimum score of 1.

The reason for treating support from friends separately for class friends and nonclass friends was the finding by van Aken and Asendorpf (1997) that these friends seem to serve different support functions. For a similar reason, support from same- and opposite-sex friends was separately assessed at age 17. Missing father support scores (12 at both ages) were not replaced by minimum scores because the reasons for missing fathers were less under participants' control than missing friend support scores.

RESULTS

Intercorrelations at Ages 12 and 17

The means and standard deviations of the main variables are presented in Table 1, and their intercorrelations in Table 2. The Big Five scales showed sufficiently low intercorrelations except for the correlation between extraversion and emotional stability, which was somewhat higher than in adult assessments (see, e.g., John & Srivastava, 1999; McCrae & Costa, 1990), particularly at age 12. More generally, the intercorrelations of the Big Five scales decreased from an average of .31 at age 12 to an average of .23 at age 17. This decrease indicates an increasing differentiation of the participants' personality self-concept.

Concerning our Conceptualization hypothesis 1a, perceived support showed a low consistency between the four types of relationships except for a relatively high consistency between support from mother and father, which can be attributed to the similar roles of the parents. In particular, support from class friends

Table 1

Means and Standard Deviations of the Main Variables at Ages 12 and 17

Variable	Age 12		Age 17	
	M	*SD*	*M*	*SD*
Extraversion	3.94	0.60	4.03	0.60
Emotional stability	3.70	0.49	3.75	0.56
Agreeableness	3.77	0.48	3.65	0.54
Conscientiousness	3.45	0.60	3.27	0.71
Culture	3.86	0.40	3.85	0.42
Global Self-Worth	3.05	0.50	4.12	0.59
Peer acceptance	3.00	0.51	4.02	0.53
Loneliness	2.15	1.03	1.50	0.51
Mother Support	4.21	0.51	3.78	0.62
Father Support	4.07	0.59	3.51	0.67
Classfriend Support	3.36	0.73	3.54	0.83
Nonclass Friend Support	3.19	0.93	3.81	0.71

Note. $N = 174$ (for father support, $n = 162$). The scores for surface characteristics and support cannot be directly compared across age because of different assessment methods.

was completely unrelated to support from the other relationships at both ages. This pattern clearly supported our conceptualization of perceived support as a relationship-specific variable.

Concerning Hypotheses 1b and 1c, the correlation between perceived peer acceptance and perceived support from peers was not higher than .40, which is much lower than the reliability of these variables, and perceived support from peers did not correlate with global self-worth at either age, whereas perceived peer acceptance showed correlations close to .50 with global self-worth at both assessments. This pattern clearly supported our conceptualization of perceived peer acceptance as a personality characteristic. Thus, our Conceptualization hypothesis was fully confirmed.

The concurrent correlations between the three sets of variables (core traits, surface characteristics, and relationship quality) were, by and large, similar at both ages, with the notable exception of

Table 2
Intercorrelations of the Main Variables at Ages 12 and 17, and Their 5-Year Stabilities

Variable	Core Traits				Surface Characteristics				Perceived Support			
	Ext	Emo	Agr	Con	Cul	Glob	Peer	Lone	Mo	Fa	Cf	Ncf
Extraversion	*.54*	**.43**	**.28**	.07	**.25**	**.28**	**.53**	**−.40**	.15	−.02	**.24**	**.43**
Emotional Stability	**.57**	*.17*	**.23**	**.15**	**.37**	**.46**	**.36**	**−.33**	.12	.13	.09	**.24**
Agreeableness	**.39**	**.35**	*.44*	**.18**	.07	.10	**.21**	**−.31**	**.28**	.10	**.16**	**.27**
Conscientiousness	**.20**	**.19**	**.30**	*.50*	**.25**	**.17**	.06	−.04	**.21**	**.30**	.00	.13
Culture	**.30**	**.34**	.09	**.34**	*.24*	**.38**	**.25**	**−.22**	.10	.15	.11	.05
Global Self-Worth	**.19**	**.27**	.08	−.05	.14	*.18*	**.48**	**−.62**	**.17**	**.29**	.02	.12
Peer Acceptance	**.45**	**.37**	**.18**	.04	.07	**.49**	*.28*	**−.60**	.13	.12	**.19**	**.40**
Loneliness	**−.37**	**−.33**	−.05	−.09	−.11	**−.29**	**−.41**	*.22*	**−.28**	**−.20**	**−.22**	**−.46**
Mother Support	.01	.03	.07	**.23**	.14	**.28**	**.19**	−.06	**.39**	**.48**	.07	**.29**
Father Support	.10	.07	.15	**.21**	.13	**.34**	.09	−.09	**.68**	*.39*	.00	.05
Classfriend Support	**.34**	**.29**	**.26**	.01	.01	.14	**.25**	−.13	.09	.12	*.18*	**.19**
Nonclass Friend Support	**.23**	.14	.05	.14	.12	.03	.14	−.03	**.17**	**.16**	.03	*.18*

Note. $N = 174$ (for father support, $n = 162$). Intercorrelations at age 12 are below, intercorrelations at age 17 are above the diagonal; on the diagonal are the stabilities between ages 12 and 17 (in bold italics). Significant correlations ($p < .05$) in boldface.

loneliness. Loneliness showed similar correlations with extraversion and emotional stability at both ages, but consistently nonsignificant correlations with perceived support at age 12, and consistently significant correlations with all four support variables at age 17.

Stability Between Ages 12 and 17

The stabilities of the 12 main variables between ages 12 and 17 are reported in the diagonal of Table 2. As expected by our Stability Hypothesis, the mean stability of the core traits was higher (.38) than the mean stability of the surface characteristics (.23) and perceived support (.29). However, this rough comparison obscures the fact that there were significant stability differences within 2 of these 3 sets of variables. Steiger's (1980) tests for differences between correlations in the same sample showed that extraversion, conscientiousness, and agreeableness were more stable than both emotional stability and culture (in each case, $z > 2.1$, $p < .05$).

Particularly interesting is the fact that emotional stability was much less stable than extraversion, $z = 4.55$, $p < .0001$. Together with the decreasing correlation between these two traits and the increasing internal consistency of emotional stability (from $\alpha = .68$ to $\alpha = .81$, see method section), this finding suggests that emotional stability differentiates from extraversion over adolescence.

In addition, support from parents was significantly more stable than support from both types of friends (in each case, $z > 2.1$, $p < .05$). One reason for this difference may be that parents continued to be the same persons, whereas, in many cases, the friends changed.

Prediction of Later Support From Earlier Personality

Hierarchical multiple regression was used to test effects of core traits and surface characteristics on later support, controlling for earlier support. This approach is a natural extension of the path analysis approach for just two transacting variables to the case of sets of multiple variables that transact with another variable. Thus, R^2 increments were tested for significance. In each regression equation, earlier support was entered first, and then either core traits or surface characteristics. Because there were 5(core traits)+3(surface characteristics) = 8 predictors each of which could be entered in two

different orders into the regression equation, and 4(support) dependent variables, there were 64 possible regressions which posed problems of chance findings due to the many tests.

Our solution was to (a) aggregate the two parental support variables and the two peer support variables, and (b) enter all core traits as one block and all surface characteristics as another block into the regression equation. Thereby, we also controlled for the intercorrelations of these predictors. This procedure reduced the number of significance tests from 64 to 8 (see Table 3). Only if one of these 8 tests was at least marginally significant ($p<.10$), did we explore through post hoc regressions which predictors, and subsequently, which of the two aggregated dependent variables, produced significant effects ($p<.05$). We chose $p=.10$ instead of $p=.05$ for the overall analysis because the latter can obscure significant effects of concrete traits.

Table 3 indicates that, after controlling for support at age 12, the core traits significantly predicted support from both parents and peers at age 17, even when the surface characteristics were entered before the core traits into the regression equation. In contrast, surface characteristics did not predict support if they were entered after the core traits. Thus, the only significant prediction by surface

Table 3
Prediction of Support by Personality Through Hierarchical Regression

		Support at Age 17 From	
Step	Predictors at Age 12	Parents	Peers
1	Support by Same Relationships	.17***	.07***
2	Core Traits	.05$^{(*)}$	.15***
3	Surface Characteristics	.02	.02
2	Surface Characteristics	.01	.08**
3	Core Traits	.06**	.09**

Note. $N = 174$. R^2 change and the significance of the increment are shown at each step.
$^{(*)}p < .10$ ** $p < .01$ *** $p < .001$.

characteristics (to peer support) was in fact due to the core traits. All in all, then, only the core traits predicted support, confirming our Transaction Hypotheses 3a and 3b.

Post hoc regressions showed that the core trait effect on parental support was due to conscientiousness, $R^2_{change} = .03$, $p < .05$. Conscientiousness predicted support from the father, $R^2_{change} = .04$, $p < .02$, but not from the mother, $R^2_{change} = .00$. Thus, as expected, conscientious children perceived increasing support from their fathers over adolescence relative to nonconscientious children, but unexpectedly this trait had no relation to maternal support. A similar analysis confirmed the (much stronger) expected extraversion effect on peer support, $R^2_{change} = .10$, $p < .001$. Extraversion predicted support from nonschool friends much more strongly, $R^2_{change} = .14$, $p < .001$, than support from friends in their classroom, $R^2_{change} = .02$, $p < .05$.

Prediction of Later Personality From Earlier Support

Hierarchical multiple regression was also applied to the prediction of personality from support. All four support variables were entered as one block into the regression equation after the early assessment of personality, resulting in eight significance tests for effects of support (see Table 4). If an effect was significant at $p < .10$, post hoc regression was used to explore which types of relationships accounted for the effect.

As Table 4 indicates, early support did not predict later core traits (for all effects, $p > .20$). In contrast, early support significantly predicted all three surface characteristics (in each case, $p < .02$). Thus, our Transaction hypotheses 3c and 3d were confirmed.

Post hoc regressions showed that these overall effects were due to different types of relationships. Global self-worth was predicted by support from the father, $R^2_{change} = .07$, $p < .001$. Perceived peer acceptance was predicted by support from class friends, $R^2_{change} = .05$, $p < .01$. Loneliness was predicted from lack of support from the father, $R^2_{change} = .06$, $p < .001$; the mother, $R^2_{change} = .03$, $p < .05$; and class friends, $R^2_{change} = .03$, $p < .05$.

Correlated Change

Correlations between personality change and support change were analyzed as explained in the introductory section by correlating age

Table 4

Prediction of Personality by Support Through Hierarchical Regression

| | | Personality at Age 17 | | | | | | | |
| | | Core Traits | | | | Surface Characteristics | | | |
Step	Predictors at Age 12	Ext	Emo	Agr	Con	Cul	Global	Peer	Lonely
1	Same Personality Variable	.26***	.03$^{(*)}$	.18***	.26***	.06*	.03*	.08***	.06**
2	Support	.02	.02	.02	.02	.01	.08**	.07*	.08**

Note. $N = 174$. R^2 change and the significance of the increment are shown at each step. See Table 2 for the abbreviations of the personality variables.
$^{(*)}p < .10$ * $p < .05$ ** $p < .01$ *** $p < .001$.

17 scores that were residualized on the two antecedent scores (correlations between U and V, see Fig. 1). For example, the extraversion scores at age 17 were residualized on the extraversion and the perceived peer competence scores at age 12, the perceived peer competence scores at age 17 were residualized on the extraversion and perceived peer competence scores at age 12, and these two residual scores were then correlated. To prevent chance results due to the large number of correlations, the alpha level was controlled by a stepwise Bonferroni procedure. These correlations are presented in Table 5.

Table 5 indicates that five correlations were significant. Four referred to changes in support from nonclass friends, which correlated with changes in extraversion, agreeableness, perceived peer acceptance, and (negatively) loneliness. An additional correlation was found between changes in agreeableness and changes in maternal support.

In order to control correlations between changes in support and changes in surface characteristics, we additionally computed partial correlations where the changes in all surface characteristics were partialled out from the changes in core traits, and vice versa. The resulting partial correlations are presented also in Table 5; their significance was also corrected by a stepwise Bonferroni procedure.

Table 5
Correlations Between Personality Change and Support Change

| | Change in Support By[a] | | | | Change in Support By[b] | | | |
| | | | Friends | | | | Friends | |
Personality Change	Mother	Father	Class	Nonclass	Mother	Father	Class	Nonclass
Extraversion	.11	.02	.12	**.27**	.10	−.05	.09	.19
Emotional Stability	.16	.13	.06	.21	.13	.06	.05	.16
Agreeableness	**.30**	.13	.11	**.24**	**.27**	.12	.06	.14
Conscientiousness	.18	.21	.02	.13	.19	.19	.04	.18
Culture	.10	.11	.13	.06	.08	.06	.14	.02
Global Self-Worth	.12	.18	.01	.12	.10	.17	−.05	.03
Peer Acceptance	.04	.08	.11	**.34**	.00	.08	.06	**.27**
Loneliness	−.20	−.11	−.16	**−.42**	−.12	−.08	−.12	**−.36**

Note. $N = 174$ (for father support, $n = 162$). Significant (partial) correlations after stepwise Bonferroni correction in boldface.
[a]Correlations between residualized change scores (see text).
[b]Partial correlations between residualized change scores. Changes in surface characteristics were partialed from changes in core traits, and vice versa.

For example, we partialled out from the correlation between changes in extraversion and changes in nonclass friend support ($r = .27$) the residualized change scores (the V-variables in terms of Fig. 1) for global self-worth, peer acceptance, and loneliness. The resulting partial correlation of .19 was somewhat lower than the original .27 because the residualized change scores for extraversion correlated with the residualized change scores for the three surface characteristics. Similarly, the correlation between changes in loneliness and changes in support from nonclass friends of $r = -.42$ became less negative ($-.36$) when changes in all five core traits were partialled out.

The resulting partial correlations (see Table 5) show specific linkages between support change and changes in core traits versus surface characteristics. As expected by our Correlated Change Hypothesis, changes in support from nonschool friends were specifically correlated with changes in perceived peer acceptance and loneliness. These correlations were, however, specific to nonclass friends; changes in support from classmates were unrelated to personality changes. More detailed analyses showed that these correlations were similar for same-sex and for opposite-sex friends. Contrary to our expectation, changes in the core trait agreeableness were correlated with changes in maternal support (but not with changes in paternal support).

DISCUSSION

This longitudinal study fully confirmed numerous hypotheses about differential influences of two classes of personality characteristic—core traits and surface characteristics—on social relationships and vice versa; only our Correlated Change Hypothesis was partly confirmed. The Conceptual Hypothesis and the Stability Hypothesis concerned the theoretical status of the operationalizations of core traits, surface characteristics, and relationship quality. It was hypothesized, and empirically confirmed, that core traits (Big Five personality traits) were more stable over the 5-year observation interval than both surface characteristics (global self-worth, perceived peer acceptance, and loneliness) and relationship quality (relationship-specific assessments of perceived support from parents and peers). Also confirmed was a low cross-relationship consistency of the relationship qualities and higher correlations between

perceived peer acceptance and global self-worth than between perceived support from concrete peer relationships and global self-worth.

Building on these findings, all parts of the key Transaction hypothesis were confirmed. First, core traits influenced perceived support from both parental and peer relationships, even when surface characteristics were statistically controlled, whereas surface characteristics did not influence perceived support from parental or peer relationships when core traits were statistically controlled. Second, perceived support influenced the surface characteristics global self-esteem, perceived peer acceptance, and loneliness, but not core traits.

Finally, the Correlated Change hypothesis was only partly confirmed. As expected, changes in perceived peer support were correlated with changes in perceived peer acceptance and loneliness, that is, with surface characteristics, but unexpectedly, changes in one core trait (agreeableness) correlated with changes in maternal support (but not with changes in support from other relationships). Before we discuss these major findings in more detail, we remind readers that we use terms such as "X influences Y," "X affects Y," or "X has an effect on Y" in a statistical rather than a causal sense.

Personality Effects on Relationships

Two personality effects on relationships were identified. The stronger effect was an extraversion effect on perceived support from peers. This result replicates, once more, similar findings in adulthood. Asendorpf and Wilpers (1998) found effects of extraversion, or its subfactors, sociability and non-shyness, on the frequency of newly established peer relationships, support from peers, and falling in love during the first 18 months at university. Neyer and Asendorpf (2001) found effects of extraversion on the perceived importance of, and closeness with, friends and colleagues in a somewhat older sample. In both studies, as in the present one, extraversion had no effect on relationships with one's family of origin. The reason is obvious; family relationships are a given, whereas peer relationships have to be actively constructed. Sociable people who prefer to be in the company of others rather than being alone, and nonshy people who easily approach others, are more

likely to engage in new peer relationships and have, therefore, a better chance to receive support from such relationships.

A similar argument explains the fact that in the present study extraversion affected support from nonclass friends much more strongly than support from friends in the school class. The classmates are a given and are easily available. Being sociable and nonshy is more an advantage for establishing supportive friendships with peers outside of the school class because it is more difficult to get acquainted with them and to maintain the friendship.

The second personality effect on relationships concerned a conscientiousness effect on support from the father (but not the mother). Asendorpf and Wilpers (1998) also found an effect of conscientiousness on family relationships, but it concerned interaction frequency rather than support and applied to both parents and to siblings. Neyer and Asendorpf (2001) found no conscientiousness effect on relationships. Because two-thirds of the student participants in the Asendorpf and Wilpers (1998) study no longer lived with their family of origin and were of an older age, the conscientiousness effect in this study may be quite different from the conscientiousness effect in the present study.

We can only speculate about mechanisms that would explain the conscientiousness effect on support from the father. Perhaps, conscientious children perceived increasing support from their fathers over adolescence relative to nonconscientious children because fathers increasingly valued conscientiousness in their children because of its importance for school achievement. That that conscientiousness over adolescence did not affect mothers' support cannot be attributed to a ceiling effect because the variance of perceived support from the mother was substantial and only slightly smaller than the variance of perceived support from the father.

All effects were also found when the three surface characteristics—global self-worth, perceived peer acceptance, and loneliness—were entered before the core traits into the regression equation. Thus, they can be attributed to the core traits themselves, not to effects of the associated surface characteristics. Because self-worth, perceived social acceptance, and loneliness contain a strong affective component, this result has the implication that the observed personality effects on relationships were not, or only to a small degree, due to general affective biases in personality self-

judgments. This is an important conclusion because a major problem with personality judgments provided by children and early adolescents is that these judgments appear to be more strongly susceptible to general affective biases than personality judgments by adults (see, Kohnstamm et al., 1998; Mervielde & Asendorpf, 2000).

The three surface characteristics affected perceived support from peers, but this effect broke down completely when the core traits were entered before the surface characteristics into the regression equation. Thus, these effects can be attributed completely to the core traits underlying the surface characteristics. Using a similar argument as above, this finding implies that general affective biases, as well as general and domain-specific self-evaluations, added nothing to the effects of core traits for predicting long-term relationship outcomes. (Of course, it cannot be ruled out that other surface characteristics that we did not study may contribute to the predictions independently of the core traits.)

This key finding can be attributed to the fact that these peripheral affective biases and self-evaluations are unstable over longer time intervals. When each surface characteristic was regressed on the concurrent assessments of the Big Five and the residuals were correlated across time, the stability was virtually zero in each case. Thus, one can say more than that the surface characteristics were less stable than the core traits: they only showed long-term stability to the extent that they were correlated with stable core traits.

Relationship Effects on Personality

As expected, relationship quality at age 12 did not predict core traits at age 17. However, relationship quality at age 12 showed specific effects on surface characteristics. First, global self-worth was influenced by perceived support from the father (but not from the mother); when children felt supported by their father, they later reported a higher self-esteem than when they felt less supported. This effect cannot be attributed to a decreasing self-esteem in children who lacked a father in their social network at age 12 because father support was coded by a missing score in these cases. But the effect could be at least partly due to those families where the father was less available for the children because he was not living in the household or rarely interacted with the children for other

reasons. In any case, this finding highlights the importance of the father-child relationship over adolescence for adolescents' self-worth.

Perceived support from class friends at age 12 did not influence later global self-worth, but it did influence later perceived peer acceptance. Thus, the effect was specific to the peer domain. At first glance, this finding seems surprising because perceived support from class friends showed only a low stability (e.g., relative to perceived support from the father). However, most participants in the present study continued to be in the same peer group in their school until age 16, and only during the last year of the 5-year observation interval, when the participants left school or the school class was dissolved because children followed different specialized educational tracks within their age group, did this peer group discontinue. Thus, support from friends in their class was probably more stable until age 16, and only then became destabilized; the effects of perceived support over the first 4 years may account for the effects of perceived class friend support on perceived peer acceptance.

It is not to be expected that this pattern of higher stability over the first 4 years applies also to peer relationships outside of the classroom. Instead, the low stability of support from nonclass friends seems to be due to a shift from same-sex friendships to same- and opposite-sex friendships. This was very likely a gradual shift that began for different participants at different times over adolescence. Therefore, accumulation of effects of support from nonclass friends was less likely than accumulation of effects of support from class friends.

Our interpretation of the different effects of class friend versus nonclass friend support is speculative; longitudinal studies with yearly assessments of perceived support and perceived peer acceptance are needed to support our interpretation empirically. That support from the parents did not affect perceived peer acceptance, of course, is not surprising.

Finally, loneliness at age 17 was affected by perceived support from father, mother, and class friends. The effect was stronger for the father than for the mother. Because loneliness is only related to social experiences, whereas general self-worth is additionally related to experiences in the academic domain, it is not surprising that the weaker effect of support from the mother did not show up in the broader self-esteem variable. That support from class friends, but

not from nonclass friends, influenced the later loneliness ratings is consistent with the findings for perceived peer acceptance.

Correlated Changes in Personality and Relationships

As expected, changes in perceived support from nonclass friends were correlated with changes in perceived peer acceptance and loneliness. Interestingly, changes in support from classmates were unrelated to personality change. This finding seems to underscore the importance of friendships outside the classroom for personality development over adolescence relative to friendships within the classroom. It should be noted, however, that in Germany ''class friends'' is a more fuzzy category at age 17 than at age 12. Whereas pupils form a clearly defined group of 20–30 peers that stays together for most of the time during school hours at age 12, there is nearly no core class left at age 17 because, after grade 10, pupils specialize in different courses according to their interests and capabilities. At this age, "class" refers to a special track within school that consists of an often smaller and more irregularly meeting peer group, with a lower likelihood that a very good friend is a member of this peer group. In line with this argument, support from the best class friend was rated somewhat lower on average than support from the best nonclass friend (see Table 1).

Contrary to our expectation, changes in the core trait agreeableness were correlated with changes in maternal (but not paternal) support, even when changes in surface characteristics were statistically controlled. It may be tempting to consider this as a violation of our general assumption that core traits are less susceptible to relationship influences than surface characteristics, particularly because changes in maternal support were not correlated with changes in surface characteristics. However, the interpretation that changes in maternal support caused changes in the self-concept of agreeableness is not the only possible one.

Alternatively, differential change in agreeableness over adolescence may have caused changes in support from the mother. The key causal factor for the differential change in agreeableness could be the onset of puberty. The onset of puberty varies considerably between adolescents, a variation that seems to be due not only to genetic but also to environmental causes early in life

(Ellis, McFadyen-Ketchum, Dodge, Pettit, & Bates, 1999). This differential timing of maturation is expected to induce a differential change in agreeableness because agreeableness decreases with the onset of puberty for a limited period (Moffitt, 1993; Stattin & Magnusson, 1990). Parents, particularly mothers, are particularly sensitive to differences in agreeableness in their adolescents as reflected in a particularly large variance in their agreeableness judgments (Branje, van Aken, & Van Lieshout, in press; Kohn-stamm et al., 1998), and are likely to adjust their support accordingly (Jensen-Campbell & Graziano, 2001). Thus, correlated change would be ultimately due to unmeasured variables, namely genetic or early environmental effects on maturation. This possibility illustrates the limits of correlated change data for understanding development. Correlated change only tells us that some linkage exists between personality and relationship changes; it is silent about the specific mechanisms.

Problems and Limitations

Small Effect Sizes. The sizes of the effects reported in the present study ranged from 2% to 7% of the variance, and thus are small according to Cohen (1992). Small effect sizes have been shown as impressive elsewhere (Ahadi & Diener, 1989; Caspi, 2000), but Asendorpf (2002) pointed out that effect sizes of personality–relationship transaction are necessarily limited in size, because each dyadic relationship is influenced by two personalities plus the related interaction history. If one assumes that most personality traits show only low correlations between the relationship partners (with the notable exception of genetic relatives), and that the interaction history is as important for the relationship as each partner's personality, the concurrent personality–relationship correlations rarely exceed .50, and path coefficients that control for these correlations necessarily are even smaller.

Limited Assessment of Relationship Quality. Support is only one of many dimensions of relationship quality. For example, frequency of interaction and amount of conflict are fairly independent dimensions that were studied, for instance, by Asendorpf and Wilpers (1998), but not in the present study. Therefore, the number of personality effects on relationships and the number of relationship effects on

personality seriously underestimate the actual number of quasicausal effects. However, this is not critical for the purpose of the present study, which is a comparison of effects concerning core traits and surface characteristics. The findings for effects of core traits on relationships were consistent with the findings by Asendorpf and Wilpers (1998) and Neyer and Asendorpf (2001) that were based on a much larger range of relationship qualities.

Assessment Schedule. Findings of dynamic interaction studies are strongly constrained by the assessment schedule, i.e., how many assessments were scheduled at what ages over how long a time period. One limitation of the present study is that personality–relationship transactions were studied with regard to two points in time. Studies with multiple assessments provide more opportunities to replicate findings across time and to assess changes more reliably. However, many (more costly) assessments are not necessarily more advantageous than few assessments. Asendorpf and Wilpers (1998), who analyzed seven assessments of one longitudinal sample, arrived at the same conclusions regarding transactions between core traits and relationships as the present study.

Heterotypic Measures Across Age. The three surface characteristics in our study were assessed with different scales at the two ages. This was done for good reasons. For example, our assessments at age 17, but not at age 12, included opposite-sex peer relationships because of the importance of romantic opposite-sex friendship in late adolescence. Any change in operationalizations across age faces a risk that the validity is different for the two ages. If the age 12 assessments were much less valid than the age 17 assessments, this would explain the low stability of the surface characteristics. However, the reliabilities and concurrent external correlates of the surface characteristics were similar at both ages, and therefore, the low stability of the surface characteristics does not seem to be due to their different assessment across age.

Is Emotional Stability a Core Trait? Emotional stability and culture showed a much lower stability than the other Big Five traits. The low stability of the culture factor can be attributed to participants' growing awareness of the many facets of this broad and somewhat

diffused personality factor (see John & Srivastava, 1999). Puzzling was the fact, however, that emotional stability was least stable, and extraversion was most stable, of all Big Five self-ratings, although the concurrent correlations between extraversion and emotional stability were highest for all pairs of the Big Five. Given its low stability, shouldn't emotional stability be regarded as a surface characteristic rather than a core trait?. We have two responses to this question. First, there are clear indications in the data that emotional stability differentiated from extraversion in the self-ratings over adolescence, namely that the internal consistency of emotional stability increased, its concurrent correlation with extraversion decreased, and its external correlates became more different (as can be seen by comparing the first two columns and the first two rows of Table 2). Second, the low stability over age and the increasing differentiation from extraversion was not observed in parental judgments of the same children (not reported in the present study). For example, the stability of the parental judgments of extraversion, $r = .57$, and emotional stability, $r = .60$, were similar, and their concurrent correlation did not decrease, $r = .39$ (age 12), $r = .47$ (age 17). Thus, both the low stability of the emotional stability ratings and their decreasing differentiation from extraversion can be attributed to differential change in the self-concept of personality, not necessarily to differential change in the core trait emotional stability itself.

This response provokes the question of why we relied on self-ratings of personality in the first place instead of using the parental judgments. We did not base our analyses on the parental judgments because their effects on relationships and vice versa would be confounded with judgmental differences, and the two best comparable studies (Asendorpf & Wilpers, 1998; Neyer & Asendorpf, 2001) used self-ratings of the Big Five. In addition, parental judgments are not necessarily more valid for emotional stability than self-ratings in adolescence. In fact, the concurrent correlation between self- and parental judgments of emotional stability tended to decrease from .30 at age 12 to .17 at age 17. Thus, the higher stability of the parental judgments may be due to the continuation of parents' view of their children that had some validity in childhood but was less valid in late adolescence. Over adolescence, many facets of emotional instability are internalized and become private (Rosenberg, 1979); in adulthood, emotional stability shows low self–other

judgmental agreement relative to other Big Five judgments, which is attributed to its low observability (Funder & Dobroth, 1987).

Our view is that both self- and parental judgments contain biases and that these biases are particularly strong for emotional stability. Ultimately, behavioral and physiological studies are needed to distinguish biases in the self- and parental judgments from "real" emotional stability. In the absence of these data, strong conclusions about the validity of either self- or other-judgments of emotional stability are not warranted. Thus, the data of the present study are not conclusive about the question whether emotional stability should be considered a core trait or a surface characteristic. Perhaps the more productive questions for future studies should be which aspects of self-ratings of emotional stability at a particular age reflect a core trait, and which aspects refer to a surface characteristic.

Future Directions

Our study has important implications for future research on personality and social relationships over the life span. First, it is one thing to distinguish core traits and surface characteristics conceptually, but it is quite another to formulate empirically testable hypotheses about differences between operationalizations of core traits and surface characteristics. The present study provides an example of how this can be achieved. Future studies on personality can take up this approach, formulate additional hypotheses, and test them. We expect that many more studies will be required before the distinction between core traits and surface characteristics is sufficiently backed up by empirical results.

Second, we used a general principle in our hypothesis building concerning, as well as explaining, the effects of earlier individual differences on later ones. We assumed that more stable individual differences have effects that are more stable themselves and thus accumulate over time. However, we did not show the assumed process of accumulation for core traits, and we did not show how effects of less stable surface characteristics and relationships do not accumulate, or even cancel each other out. Future studies are needed that track these (non)cumulative effects in detail by closely spaced assessments. Also, as one reviewer pointed out, there may be clear exceptions to our rule. Extremely emotionally important singular

events that disrupt relationships, such as the death of a parent, are expected to show long-lasting effects on personality development despite the fact that relationship quality is not stable in these cases.

Third, the dominance of core traits over relationships may considerably change according to age. It may well be that in early childhood relationship experiences dominate over core traits. Unfortunately, this is regularly assumed by developmental researchers, particularly attachment researchers, without providing strong evidence for the assumed relationship effects with cross-lagged panel designs. Unless such studies are conducted, the rarely questioned assumptions of the importance of early relationships for personality development will continue to be at odds with assumptions of highly stable core traits from birth onwards. Future cross-lagged panel design studies are urgently needed that play relationship qualities against temperamental traits in early child development.

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