Empathy Development in Adolescence Predicts Social Competencies in Adulthood

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Abstract
This 23-year study explored the predictive associations between empathy development in adolescence and self-reported social competencies and outcomes in adulthood. Participants were 1,527 adults aged 35 years (48.3% female). The predictor variable (adolescent empathy) was measured yearly at the ages of 12 to 16 years. The outcome variables (adult empathy, communication skills, social integration, relationship satisfaction, and conflicts in relationships) were measured at the age of 35 years. Five important results stand out. First, longitudinal measurement invariance was established for the measure of adolescent empathy. Second, empathy tended to increase during the adolescent years. Third, significant interindividual differences in level and change of adolescent empathy were found. Fourth, gender was related to level of adolescent empathy, favoring girls over boys. Fifth, not only level but also change in adolescent empathy predicted individual differences in social competencies in adulthood two decades later. These findings demonstrate that developmental processes that are relevant for adjustment reveal long-term social consequences beyond the adolescent years.

Empathy is the ability to share and understand others’ thoughts and feelings (Eisenberg & Fabes, 1990; Hoffman, 2000). This ability is important for promoting positive behaviors toward others and facilitating social interactions and congenial relationships (McDonald & Messinger, 2011). Previous research suggests positive associations between pro-social tendencies and both situationally induced and dispositional empathy-related responses. For example, adolescents who report higher empathy also report more pro-social goals, are socially more competent, are less aggressive, have more supportive peer relationships, are well liked by their peers, and are more likely to help others (Eisenberg, Morris, McDaniel, & Spinrad, 2009). Moreover, adult empathy has been linked to a wide array of pro-social correlates. For example, adults who report higher empathy are more willing to volunteer (Davis et al., 1999), donate more to charity (Wilhelm & Bekkers, 2010), and are more grateful to others (McCullough, Emmons, & Tsang, 2002). Empathy also appears to enhance forgiveness in individuals (McCullough, Worthington, & Rachal, 1997) and couples (Paleari, Regalia, & Fincham, 2005). It is unsurprising, then, that higher empathy enables individuals to relate to others in a way that promotes cooperative, pro-social, and satisfying relationships rather than conflicted, antisocial, and unpleasant interactions with others. However, it is unclear whether change in empathy may have long-term consequences on social outcome variables over and above the empathy level. Thus, this study examined the predictive associations between empathy development in adolescence and social competencies and outcomes in adulthood, well beyond the adolescent years.

Empathy Development in Adolescence
Evidence for empathy as a developmental construct comes from intervention and developmental studies. First, empathy can be experimentally manipulated or changed with teaching and practice over relatively short periods of time. For example, studies have shown that empathy trainings promote emotional...
competencies in school-aged children (Greenberg, Kusche, Cook, & Quamma, 1995) and helping skills and pro-social motivation in delinquent youth (Gibbs, Potter, Barriga, & Liau, 1996). Empathy trainings also increase pro-social behaviors in adults (Leiberg, Klimecki, & Singer, 2011). Second, there is emerging evidence for normative changes in empathy over longer periods of time. Research demonstrates that empathy-related abilities emerge in the early years of life and develop in more complex forms in childhood and adolescence (Eisenberg, Spinrad, & Morris, 2013; McDonald & Messinger, 2011). Empathy changes were also evidenced in emerging adulthood (Eisenberg et al., 2002; Konrath, O’Brien, & Hsing, 2011), and from early adulthood to old age (O’Brien, Konrath, Grühn, & Hagen, 2013). Moreover, research demonstrates individual differences in the degree and direction of empathy development (Grühn, Rebuca, Diehl, Lumley, & Labouvie-Vief, 2008).

Although the literature supports the claim that empathy is malleable across the entire life span, adolescence is an important developmental period that seems particularly essential for empathy development for several reasons. Adolescence has traditionally been conceived as a transitional period, characterized by a number of physical and physiological changes in such characteristics as height, weight, body proportions, and hormones, combined with individual, social, and contextual transitions (Blakemore & Mills, 2014; Steinberg & Morris, 2001; Zarrett & Eccles, 2006). Many of these changes and challenges have important implications for empathy development. For example, improvements in abstract thinking in tandem with socioemotional changes such as increased emotion regulation abilities promote pro-social tendencies and empathy (Eisenberg, Fabes, & Spinrad, 2006). Changes in moral reasoning are also important with respect to empathy development. Adolescents increasingly develop internalized abstract moral and social principles that promote pro-social and responsible behaviors, and they have more opportunities to help others by means of volunteering activities (Eisenberg et al., 2006; Hoffman, 2000). Finally, normative changes in social relationships with peers and adults in tandem with increases in autonomy with respect to social behaviors and values provide opportunities to show pro-social behaviors such as empathy-related responding (Zarrett & Eccles, 2006). Furthermore, teachers and parents often give adolescents more autonomy in order to let them gradually grow into adult societal roles (Steinberg, 2008). These tasks let adolescents take over responsibility for their own actions and, in turn, might promote responsible and pro-social behavior. Based on these theoretical assumptions, there is good reason to expect continued increase in empathy across the adolescent years.

The literature on empathy development from ages 12 to 16, however, is limited, and empirical findings are inconsistent. There is evidence for normative increases in pro-social tendencies and behaviors from childhood to adolescence (Eisenberg & Fabes, 1998), although not from early (ages 13 to 15) to later (ages 16 to 18) adolescence (Fabes, Carlo, Kumpanoff, & Laible, 1999). Moreover, the evidenced age trends were dependent on the study design (e.g., correlational or experimental studies), the method of assessment (e.g., self-report, other-report, observation), and the target of pro-social behavior (e.g., peers or adults; Eisenberg & Fabes, 1998). For example, pro-social behaviors such as sharing or donating were more pronounced in adolescents compared to children aged 7 to 12 years, but not with respect to instrumental helping or comforting. Some findings indicated that pro-social behavior directed toward adults did not change in adolescence (cf. Eisenberg & Fabes, 1998). Other studies reported decreases in pro-social tendencies from early to middle adolescence (Carlo, Crockett, Randall, & Roesch, 2007), and slight increases in late adolescence and early adulthood (Eisenberg, Cumberland, Guthrie, Murphy, & Shepard, 2005). A recent longitudinal study of adolescents aged 13 at the first assessment found that self-reported pro-social behaviors (i.e., sharing, helping, and caring) decreased until late adolescence and then slightly rebounded after age 21 (Kanacri, Pastorelli, Eisenberg, Zuffiano, & Caprara, 2013). In contrast, there is also some evidence for a modest positive age trend in empathy across the adolescent years, with older adolescents being more empathic than younger adolescents (cf. Eisenberg et al., 2009).

Even less is known about individual differences in the degree and direction of empathy development during the adolescent years, as adolescents may differ in their management of the manifold changes related to adolescence (Zarrett & Eccles, 2006). Whereas some adolescents successfully manage these challenges, other adolescents find the transition to adulthood more difficult. Such differences might lead to significant individual differences in empathy development. Accordingly, it becomes a question for research whether these individual differences in change are related to adult outcomes.

### Long-Term Consequences of Adolescent Empathy Development

Adolescence represents a unique window into developmental changes that might have long-term consequences for the individual well beyond the adolescent years. As such, it has often been described as a time of heightened vulnerability for the onset of later adaptation problems in social and emotional domains (Steinberg, 2005). Most adolescents have the personal, emotional, and social resources to successfully explore and interact with the manifold challenges of this period. However, some adolescents have not and engage in unhealthy and risky behaviors, such as drug abuse, unsafe sex, school underachievement, and delinquency. These behaviors might have long-term consequences for the individual, such as motherhood or fatherhood as a result of teenage pregnancy or lower educational attainment in adulthood due to underachievement at school and learning difficulties (cf. Lerner & Galambos, 1998).

The adolescent years also provide opportunities to develop and exercise social competencies and skills, attitudes, and
Adolescent Empathy and Adult Outcomes

social values that are necessary to make a successful transition into adulthood and that will help them to become caring and responsible adults (Erikson, 1968; Zarrett & Eccles, 2006). The adults who emerge from adolescence must be equipped with skills and competencies to navigate the social complexities of adult life. During this time period, adolescents typically experience shifts in their relationship to parents from dependency to autonomy and increasing responsibilities in the family and community. For example, the opinions of peers become more important than those of family members (Larson, Richards, Moneta, Holmbeck, & Duckett, 1996). Adolescents are also exposed to novel social situations, and they explore new social roles and experience their first intimate partnerships. As such, adolescence might represent a period of enhanced sensitivity for social experiences in the environment that might motivate certain behaviors, such as empathy-related responding (Blakemore & Mills, 2014). Indeed, the ability to share and understand others’ thoughts and feelings is particularly important in this respect, as it facilitates positive social interactions with others and effective understanding and communication (McDonald & Messinger, 2011).

Social relationships provide excellent opportunities to practice and display pro-social skills and competencies such as empathy and thus to receive constructive feedback from others. Such reciprocal processes may then promote social competencies and help to build long-lasting social resources. Therefore, the acquisition of skills, attitudes, and values needed to make a successful transition into adulthood—including partnership, parenting, work, and citizenship—are important challenges in adolescence. In particular, empathy might positively affect future social relationships, including romantic relationships. Imagining others’ thoughts and feelings promotes behaviors that are adaptive in social relationships, such as sharing, caring, helping, and active listening (e.g., Caprara, Alessandri, & Eisenberg, 2012; Eisenberg & Fabes, 1990; Graziano, Habashi, Sheese, & Tobin, 2007). Taken together, empathy development across the adolescent years is important because it might help in building (unsupervised) extrafamilial peer relationships, maintaining friendships, and developing strong communities.

Despite the social benefits of empathy, very high levels or very low levels of empathy can be costly (e.g., Hodges & Biswas-Diener, 2007; Hoffman, 2000). For example, high empathy might lead to empathic distress, as sharing and understanding others’ concerns and negativity is consuming on the emotional level. Empathic distress then may result in an egoistic motivation to reduce this distress (e.g., by avoiding the stressor) and thus decrease the capacity to be of assistance to others and to show pro-social behaviors (Decety & Lamm, 2009). Low empathy might have adverse effects as well, as it makes social interactions and relationships more difficult. Research has consistently demonstrated that those individuals who score low in empathy tend to show more aggressive and violent behaviors, bullying, and more conflicts with others (e.g., Gini, Albiero, Benelli, & Altoè, 2007; Jolliffe & Farrington, 2004). Individuals with low empathy cannot imagine the potential harm and consequences that they might cause. As such, low empathy is related to antisocial behaviors.

In addition, it has been suggested that the adolescent years are particularly formative years for moral personality development that continues across the life span (Hill & Roberts, 2010), and that empathy plays an important role in moral behavior and development (Hoffman, 2000; Tangney, Stuewig, & Mashek, 2007). As research demonstrates associations between empathy-related responses and morally relevant behaviors such as helping behaviors (e.g., Eisenberg et al., 2009), changes in empathy would have clear ramifications for moral behavior and possibly for what individuals view as moral or not. For example, it is during adolescence that individuals are beginning to engage in adultlike activities, such as community service. These activities reflect adult society. Engagement in such activities and behaviors provides meaningful opportunities for adolescents to explore their identity and potential social roles in society (Youniss, McLellan, Su, & Yates, 1999). The ability to understand others’ thoughts and feelings is particularly important in the engagement of social activities and roles, as it includes an explicit focus on others. This idea is related to the social investment theory, suggesting that greater investment in social roles should promote adaptive personality development (e.g., increases in agreeableness, conscientiousness, and emotional stability; Roberts & Wood, 2006). In turn, individuals with an adaptive personality profile are better suited for engagement in society (Lodi-Smith & Roberts, 2007).

In summary, theory suggests that empathy contributes to positive social interactions and socially skilled behavior. However, it is unclear whether adolescent empathy development has consequences for social adjustment beyond the adolescent years. So far, no study has investigated whether individual differences in empathy development in adolescence have long-term social consequences in adulthood.

Goals and Hypotheses of the Current Study

This 23-year study examined the predictive associations between adolescent empathy development and social outcome variables in adulthood. We had four specific goals, whereby the first goal reflected a prerequisite for the other goals. The first goal was to establish longitudinal measurement invariance of the empathy measure to ensure that the construct is comparable across measurement occasions (Meredith & Horn, 2001). Frequently, in developmental studies, it is implicitly assumed that the measurement process of constructs is similar over time. But changes can only be unambiguously interpreted as a reflection of a developmental process when items of a questionnaire do not change connotation or contribution to the construct over time. Therefore, establishing measurement
invariance is an essential prerequisite for the study of constructs over time (e.g., Allemand, Zimprich, & Hertzog, 2007; Meredith & Horn, 2001).

The second goal was to examine empathy development across the adolescent years by means of latent growth models (e.g., Bollen & Curran, 2006). Based on previous findings (Eisenberg & Fabes, 1998; Eisenberg et al., 2009), we expected an average positive age trend in empathy during adolescence. More importantly, we expected individual differences in the degree and direction of empathy development, as individuals may begin at different initial levels and show different developmental trajectories or rates of change.

The third goal was to examine whether gender explains individual differences in empathy development. Due to social expectations and gender stereotypes, it is possible that girls are more encouraged to develop empathic skills and display greater empathy than boys (e.g., Kite, Deaux, & Haines, 2008). Indeed, it appears that in adolescence, girls view themselves as being more pro-social and empathic, and they also engage in more pro-social and caring behaviors than do boys (e.g., Eisenberg & Fabes, 1998). Therefore, we expected gender differences in empathy development, favoring girls over boys.

The fourth goal of this study was to explore whether individual differences in empathy development in adolescence are related to self-reported social competencies (e.g., adult empathy, communication skills) and social outcomes in adulthood (e.g., perceived social integration, relationship satisfaction, conflicts in relationships). Social competencies reflect relatively enduring tendencies to react in socially competent ways to others. As such, we expected that adolescent empathy would be modestly related to adult empathy, as the ability to empathize with others during the adolescent years may be an important contributor of social competencies in adulthood. We also expected that adolescent empathy is relevant for basic communication skills in relationships, such as active listening or self-reflection, as good communication skills typically require the ability to share and understand others’ perspectives. Support for the assumption that adolescent empathy is related to adult social competencies comes from research demonstrating that personality traits observed in childhood and adolescence predict adult behaviors and outcomes (Nave, Sherman, Funder, Hampson, & Goldberg, 2010; Roberts, Kuncel, Shiner, Caspi, & Goldberg, 2007). Besides the empathy level in adolescence, we also considered change in empathy as an important predictor of social competencies, as adolescence is a time of “reorganization” and a time period to experiment with new social roles and experiences that allow and foster the development of empathy (e.g., Steinberg, 2005). Therefore, independent of initial empathy level, change in empathy should be related to these social competencies in adulthood.

We also explored whether adolescent empathy is related to *social outcomes* in adulthood, and for these outcomes, we expected modest long-term associations at most. The first social outcome refers to positive social perceptions in adulthood, such as being socially integrated in a group of friends. One reason for this assumption is that the capacity to share and understand others’ thoughts and feelings might help to achieve better social relationships and integration in social networks. In addition, we examined long-term associations between adolescent empathy development and adult relationship aspects such as relationship satisfaction and perception of conflicts in relationships. We investigated these associations, as the ability to empathize is important for relationship quality, in part, by facilitating the maintenance of meaningful social relationships (McDonald & Messinger, 2011). Indeed, research suggests that empathy is a key component of relationship satisfaction and success (Cramer & Jowett, 2010) and is related to high levels of conflict resolution skills in adolescents and adults (de Wied, Branje, & Meeus, 2007; Paleari et al., 2005).

In summary, the aim of this study was to examine individual differences in adolescent empathy development, and to demonstrate that not only empathy level predicts social outcomes but also change in empathy during the adolescent years has positive long-term social consequences in adulthood. The novel contributions of this study are the focus on the predictive associations between empathy level and, particularly, change in *adolescence* and self-reported social competencies and outcomes in adulthood; the use of a large and unique data set containing data covering the adolescent years from ages 12 to 16, with frequent (i.e., yearly) measurements; and the inclusion of important social variables at the age of 35, thus covering a long time span.

**METHOD**

**Participants and Procedure**

Data come from the German LifE-Study (Lebensverläufe von der späten Kindheit ins frühe Erwachsenenalter [Pathways From Late Childhood to Adulthood]; Fend, Georg, Berger, Grob, & Lauterbach, 2002). Adolescents (*N* = 2,054) were assessed five times during adolescence: at the age of 12 years (T1: 1979), 13 years (T2: 1980; *N* = 2,047), 14 years (T3: 1981; *N* = 2,003), 15 years (T4: 1982; *N* = 1,952), and 16 years (T5: 1983; *N* = 1,790). A follow-up assessment was conducted in adulthood when participants were 35 years old (T6: 2002). From the initial study participants, 74% (*N* = 1,527; 48.3% female) participated at T6 as adults. For this study, we focused on these 1,527 participants because we were interested in linking variables in adolescence with variables in adulthood.

With respect to educational attainment, 4.5% of participants reported having no further education after the compulsory school years (primary and secondary school: 9 years in total), 50.1% reported having completed an apprenticeship after school, 22.5% reported having completed a technical or professional school, and 22.1% reported having a college degree or university degree. Regarding marital status, 59.2% were married, 32.8% were single, and 7.9% were either divorced or widowed. Of the study participants, 85.2% reported being in an actual romantic relationship at the age of 35 years (T6).
The adolescent participants represented the full range of socioeconomic status in the general West Germany population, were mainly of German origin, and were close to representative of the Western German population (see Fend, Berger, & Grob, 2009, for details). In the follow-up measurement two decades later (T6), some differences between the remaining adult sample and the youth sample emerged. For instance, a smaller number of participants originated from lower socioeconomic status, from metropolitan regions, and from lower educational background compared to a representative German population survey conducted in the same year (Fend et al., 2009). Moreover, attrition analysis showed that individuals who participated in the follow-up study at age 35 did not significantly differ in their level of empathy at T1 from those individuals who dropped out of the study.

**Measures in Adolescence**

**Empathy.** Empathy was measured in adolescence (T1 to T5) with eight items (Briechle & Fend, 1986). Example items were “When my friend is nervous, I can immediately feel that,” “When my friend is afraid of a school test, I immediately note that before he or she even tells me,” and “I can easily feel if my parents worry about my school grades, even if they don’t say anything.” Participants rated each item on a dichotomous scale (1 = rather disagree, 2 = rather agree). The reliability estimates for the dichotomous measure ranged from .67 to .73 for the five measurement occasions.

**Measures in Adulthood**

**Empathy.** Three items were used to assess participants’ perception of their empathy ability at T6. These items originated from a scale on individual relationship competencies (Vierzigmann, 1995). The items were “When somebody is sad or upset, I find it easy to find the right words,” “I find it difficult to understand other people’s feelings,” and “In general, I have a good sense for how others feel.” Participants were asked to indicate on a 6-point scale (1 = does not apply at all to 6 = applies fully) how they perceived their empathic ability. The alpha reliability estimate for the three-item scale was .71.

**Communication Skills.** Five items were used to measure communication skills in relationships (i.e., active listening, I-messages, joint solution, meta-communication, and self-reflection) that are important in conflict situations (Fend et al., 2002). Example items were “It is important to me to precisely understand what my partner wants to say,” “I try to find a solution which is also acceptable to my partner,” and “We talk about how we interact with each other.” Participants indicated on a 6-point scale (1 = never to 6 = always) how they typically respond to conflict situations in their marriage or relationship. The alpha reliability estimate was .85.

**Social Integration.** Three items were used to measure adults’ perception of their social integration. Items originated from the family survey of the German Youth Institute (Bien, Bender, Mittag, & Brislinger, 2000). The items were “I often feel lonely,” “I think the circle of my friends is too small,” and “I miss companionship with people.” Participants were asked to indicate on a 6-point scale (1 = does not apply at all to 6 = applies fully) whether they perceived themselves as isolated or well integrated in a group of friends. The items were reverse coded so that higher scores reflect higher standing on the construct. The alpha reliability estimate was .79.

**Relationship Satisfaction.** This scale included six items on relationship satisfaction, indicating appreciation and intimacy in romantic relationships (Furman & Buhrmester, 1985). Example items were “In our relationship, I can tell my partner everything that worries me,” “I feel I’m really important to my partner,” and “My partner likes me the way I am.” Participants indicated on a 6-point scale (1 = never to 6 = always) how often these statements were true for them. The alpha reliability estimate was .86.

**Conflicts in Relationships.** Three items were used to measure conflict in adult romantic relationships based on Schneewind and Ruppert (1992). The items were “In our marriage/relationship there are tensions and fights,” “In our marriage/relationship small things end up in big fights,” and “In our marriage/relationship we have loud and heavy fights.” The participants could answer on a 6-point scale (1 = never to 6 = always) how they perceived conflict frequency in their marriage or relationship. The alpha reliability estimate was .83.

**Statistical Analyses**

We performed the analyses in four steps. First, we tested longitudinal measurement invariance (MI) of the empathy measure to examine whether the measure behaves equivalently across the five measurement occasions in adolescence (T1 to T5). In practice, longitudinal MI includes fitting confirmatory factor models with increasingly severe restrictions on three measurement parameters over time: factor loadings, intercepts/thresholds (continuous/categorical variables), and residual variances (e.g., Meredith & Horn, 2001; Widaman, Ferrer, & Conger, 2010). The measurement model consisted of five correlated latent empathy factors (T1 to T5) with eight manifest indicators (items) per measurement occasion. Because data in this study were categorical, we used models for categorical variables and estimated thresholds between categories (Millsap & Yun-Tein, 2004). The number of thresholds is equal to the number of categories minus 1, resulting in one threshold to be estimated.

The steps of invariance testing with categorical variables differ from the more familiar case of invariance testing with continuous variables (Muthén & Muthén, 2010). The
invariance testing comprises three steps (Schroeders & Wilhelm, 2011, p. 860). For the least restrictive model (configural invariance), manifest indicators (items) are constrained to load on the same factor across time. Next, factor loadings and thresholds are constrained to be equal across time in tandem (strong invariance). Assessing invariance with categorical variables requires constraining factor loadings and thresholds in tandem because item characteristic curves are based on both parameters (Muthén & Muthén, 2010, p. 433). Finally, for the most restrictive model (strict invariance), all parameters are constrained to be equal across time with residual variances being fixed at 1 across time (Schroeders & Wilhelm, 2011). To scale the latent variables, the factor loading for the first item of the empathy measure was fixed at 1. Moreover, we specified correlated residual variances over time.

Second, after establishing longitudinal MI, we estimated second-order latent growth models with eight manifest indicators (items) per measurement occasion (e.g., Duncan, Duncan, & Strycker, 2006; Geiser, Keller, & Lockhart, 2013) to examine empathy across the five measurement occasions. These models were used instead of standard first-order latent growth models based on a single manifest indicator variable per measurement occasion because unreliability of the manifest variables can lead to an underestimation of change. For all five lower-order factors (latent empathy at T1 to T5), the means (intercepts) were fixed at 0 across all measurement occasions. For the higher-order models, we specified one intercept factor and one slope (change) factor. We tested three different models: First, we tested an intercept-only model (baseline model). Next, we estimated a linear growth model and a nonlinear growth model to test the shape of empathy development by specifying an intercept factor and one slope/shape factor. Because time intervals were 1 year, slope factor loadings were fixed to 0, 1, 2, 3, and 4, corresponding to linear growth. The nonlinear growth model was specified as suggested by Meredith and Tisak (1990). The first shape factor loading was fixed to 0 to estimate the intercept, the second loading was fixed to 1 to identify the metric of the slope factor, but the third through fifth loadings were freely estimated. This nonlinear model is able to capture a variety of nonlinear growth change patterns because it does not have a specific functional form, such as a quadratic growth model. In addition to average estimates of intercept and slope/shape, we were particularly interested in individual differences in empathy intercept and slope/shape. Significant variance in intercept would indicate that individuals differ in their initial level of empathy, whereas significant variance in empathy slope/shape would suggest that adolescents differ in their empathy development.

Third, we included gender as a time-invariant covariate to examine whether empathy intercept and slope in adolescence vary as a function of gender.

Fourth, we investigated the predictive associations between empathy development in adolescence and self-reported social outcome variables in adulthood using adolescent empathy intercept and slope as predictors of adult outcome variables. Each outcome variable was predicted separately by empathy intercept and slope. We controlled for possible gender effects in these analyses. We modeled the outcome variables as latent constructs using items of the outcome variables as manifest indicators.

All analyses were performed with Mplus 6 (Muthén & Muthén, 2010), accounting for the presence of missing data by the full information maximum likelihood (FIML) algorithm. We used the theta parameterization and the robust weighted least squares mean-adjusted (WLSM) estimator for our analyses and report the mean-adjusted chi-square (adj. \( \chi^2 \)). As criteria for model fit, we report the comparative fit index (CFI) and the root mean square error of approximation (RMSEA). Values of the CFI above .95 and values of the RMSEA below .06 reflect a well-fitting model (Hu & Bentler, 1999). In comparing the relative fit of nested models, we used the Satorra-Bentler adjusted chi-square difference test (S-B \( \chi^2 \); Satorra & Bentler, 2001). Due to its dependency on sample size, we complemented the chi-square difference test by calculating 90% RMSEA confidence intervals (CIs) for the models estimated (MacCallum, Browne, & Sugawara, 1996). Since the RMSEA is virtually independent of sample size, the comparison of RMSEA CIs provides an effective, alternative method of assessing relative model fit of nested models. Moreover, a change in the CFI of less than .01 amounts to a trivial difference in model fit (Cheung & Rensvold, 1999).

RESULTS

Longitudinal Measurement Invariance

Table 1 presents descriptive statistics and zero-order correlations among the study variables. To establish longitudinal measurement invariance, we first started with the least restrictive model (Model 1: configural invariance) that constrains manifest indicators (items) to load on the same factor across time. As can be seen from Table 2, this model did achieve a good model fit as judged by the CFI and RMSEA. Second, factor loadings and thresholds were constrained to be equal over time (Model 2: strong invariance; see Muthén & Muthén, 2010, p. 433). This more restrictive model also achieved an acceptable model fit (see Table 2). In comparison to Model 1, the Satorra-Bentler adjusted chi-square difference was statistically significant. However, as indexed by a substantial overlap of the RMSEA 90% CIs, there was no difference in fit. Likewise, the change in the CFI of .003 reflects a trivial difference in model fit. From these results, one might conclude that strong invariance holds over time with respect to empathy. Finally, in the most restrictive model, all measurement parameters are constrained to be equal across time, with residual variances fixed at 1 across time (Model 3: strict invariance). This model represented the data adequately (see Table 2). In comparison to Model 2, Model 3 did not represent a statistically significant reduction in model fit. This suggests that strict invariance did
hold in this sample and adequately captured the data. In summary, the current results indicated that the measure of empathy behaved equivalently across the five measurement occasions in adolescence.

### Empathy Development in Adolescence

The latent year-to-year stability correlations based on Model 3 were .63 (age 12 to 13), .78 (age 13 to 14), .70 (age 14 to 15), and .71 (age 15 to 16), with all correlations being significant ($p < .01$). Figure 1 presents the mean-level estimates of empathy from Model 3 with the first measurement occasion (T1) as reference, that is, T2 to T5 are relatively scaled to T1. The results suggest that latent empathy increased from age 12 to 16.

To examine empathy development across the adolescent years more precisely, we estimated three second-order latent growth models based on the model of strict measurement invariance (Model 3). Table 2 presents the model fits of the intercept-only model or baseline model (Model 4), the linear growth model (Model 5), and the nonlinear growth model (Model 6). All three models achieved acceptable fits. However, the linear model and the nonlinear model represent the data better than the intercept-only model (see Table 2). The comparison between the linear and nonlinear models suggests that both models are equal in terms of model fit (see Table 2). Also, as

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### Table 1 Descriptive Statistics and Correlations Among the Study Variables

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<td>.28**</td>
<td>.29**</td>
</tr>
<tr>
<td>9. Relationship satisfaction age 35 (T6)</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td>.54**</td>
</tr>
<tr>
<td>10. Conflicts in relationship age 35 (T6)</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
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<td></td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

**Potential range 1–2**

**M**

1.66 1.70 1.71 1.73 1.78 4.33 4.65 4.73 4.77 2.44

**SD**

0.27 0.26 0.25 0.26 0.23 0.73 0.84 1.03 0.77 0.72

*Note. *p < .05. **p < .01.

---

### Table 2 Longitudinal Measurement Invariance Models and Latent Growth Models

<table>
<thead>
<tr>
<th>Model</th>
<th>adj. $\chi^2$</th>
<th>df</th>
<th>SC</th>
<th>CFI</th>
<th>RMSEA (90% CI)</th>
<th>S-B $\Delta \chi^2$</th>
<th>$\Delta$df</th>
<th>$\Delta$Models</th>
</tr>
</thead>
<tbody>
<tr>
<td>M1: Configural invariance</td>
<td>658.18</td>
<td>650</td>
<td>0.773</td>
<td>1.000</td>
<td>.003 [.000, .009]</td>
<td>—</td>
<td>—</td>
<td>—</td>
</tr>
<tr>
<td>M2: Strong invariance</td>
<td>736.23</td>
<td>674</td>
<td>0.789</td>
<td>.997</td>
<td>.008 [.001, .011]</td>
<td>59.00*</td>
<td>24</td>
<td>2-1</td>
</tr>
<tr>
<td>M3: Strict invariance</td>
<td>733.72</td>
<td>706</td>
<td>0.861</td>
<td>.999</td>
<td>.005 [.000, .010]</td>
<td>21.39</td>
<td>32</td>
<td>3-2</td>
</tr>
<tr>
<td>M4: Intercept only</td>
<td>1328.48**</td>
<td>719</td>
<td>0.910</td>
<td>.974</td>
<td>.024 [.022, .026]</td>
<td>—</td>
<td>—</td>
<td>—</td>
</tr>
<tr>
<td>M5: Linear growth</td>
<td>803.20*</td>
<td>716</td>
<td>0.893</td>
<td>.996</td>
<td>.009 [.005, .012]</td>
<td>98.98*</td>
<td>3</td>
<td>4-5</td>
</tr>
<tr>
<td>M6: Nonlinear growth*</td>
<td>788.96*</td>
<td>713</td>
<td>0.885</td>
<td>.997</td>
<td>.008 [.003, .012]</td>
<td>6.81</td>
<td>3</td>
<td>5-6</td>
</tr>
<tr>
<td>M7: Linear growth plus gender</td>
<td>1018.27**</td>
<td>754</td>
<td>0.894</td>
<td>.988</td>
<td>.015 [.013, .018]</td>
<td>—</td>
<td>—</td>
<td>—</td>
</tr>
</tbody>
</table>

*Note. M1 to M3 = longitudinal measurement invariance models; M4 to M6 = latent growth models; M7 = latent growth model including gender as time-invariant covariate; adjusted $\chi^2$ = mean-adjusted chi-square test statistics (WLSM estimator); SC = scaling correction factor; CFI = comparative fit index; RMSEA = root mean square error of approximation; 90% CI = 90% confidence intervals for RMSEA; S-B $\Delta \chi^2$ = Satorra-Bentler scaled chi-square difference; $\Delta$Models = comparison of models.

*p < .05. **p < .01.

---

**Figure 1** Empathy development from age 12 to 16. Mean estimates are from the model of strict measurement invariance (Model 3). The initial measurement occasion at age 12 was used as a reference having a factor mean of zero, that is, factor means from age 13 to 16 reflect deviations from the reference.
indexed by a substantial overlap of the RMSEA 90% CIs, there
was no difference in fit. Likewise, the change in the CFI of .001 reflects a trivial difference in model fit. Although both models are equal in terms of model fit, we decided to report the findings from the linear growth model, because it is statistically more parsimonious and simpler in interpretation. Moreover, the estimates from the linear and nonlinear models are virtually identical.

The unstandardized mean estimates for the linear growth model were as follows: intercept (M = 0.28, p < .01, SE = 0.03) and slope (M = 0.09, p < .01, SE = 0.01). The intercept did not significantly covary with the slope (Cov = −0.01, SE = 0.01). Moreover, we found significant variances in intercept (Var = 0.20, p < .01, SE = 0.03) and slope (Var = 0.01, p < .01, SE = 0.003), suggesting individual differences in level and change of adolescent empathy. In summary, the average trend suggests an increase in empathy across the adolescent years. Moreover, individuals differed in their initial level and change in empathy.

**Gender Differences in Empathy Development and Adult Social Competencies**

Next, we included gender (0 = female, 1 = male) as time-invariant covariate in the linear model to examine whether empathy level and change vary as a function of gender (Model 7 in Table 2). The results indicate that gender was significantly related to the intercept of adolescent empathy (unstandardized estimate: B = −0.23, p < .01, SE = 0.04) but not to the slope (unstandardized estimate: B = −0.02, p > .10, SE = 0.01). In summary, girls had a higher initial level of empathy as compared to boys, but they did not develop differently across the adolescent years with respect to empathy.

Significant gender differences were evidenced for the social competencies but not for the social outcomes. Women (M = 4.49, SD = 0.69) were more empathic than men (M = 4.17, SD = 0.73, d = 0.45), and they tended to have higher levels in communication skills (M = 4.72, SD = 0.82) compared to men (M = 4.58, SD = 0.86, d = 0.17).

**Predictive Associations With Adult Social Competencies**

To examine the predictive associations between empathy development and social variables in adulthood, we estimated models that include empathy intercept and slope as predictors of one of the five adult variables. Gender was controlled in all analyses. The models showed acceptable fits (adj. χ²s = 1149.19 to 1475.44, df/s = 874 to 1006, ps < .01; CFIIs = .989 to .983, RMSEAs = .014 to .017).

Table 3 presents the findings of these models. The results demonstrate that empathy level in adolescence is related to different differences in social competencies (i.e., empathy and communication skills) at the age of 35 years. Being more empathic in adolescence predicted higher empathy in adulthood as well as better self-reported communication skills in relationships. In addition, not only empathy intercept was related to social variables in adulthood but also change in empathy. More specifically, empathy slope predicted a higher standing on empathy, communication skills (marginally significant), and perceived social integration at the age of 35 years (see Table 3). In other words, those participants who increased in empathy across the adolescent years perceived themselves as being more empathic and socially integrated in adulthood compared to those who decreased in empathy during adolescence. They also tended to report higher levels of communication skills that are important in conflict situations. In summary, not only level but also changes in adolescent empathy predicted individual differences in social competencies in adulthood two decades later.

**DISCUSSION**

Adolescence is a key period in the life span for individuals to develop and exercise social skills and competencies that will help them to become caring and responsible adults. What may be most fascinating about the present results is that the ability to share and understand others’ thoughts and feelings and its development during adolescence matter for individual differences in self-reported social competencies decades later in adulthood.

### Table 3 Level and Linear Change of Empathy as Predictors of Adult Social Outcomes

<table>
<thead>
<tr>
<th>Outcomes in Adulthood</th>
<th>Intercept as Predictor</th>
<th>Slope as Predictor</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>Standardized Coefficient</td>
<td>Unstandardized Coefficient</td>
</tr>
<tr>
<td>Empathy</td>
<td>0.23**</td>
<td>0.31</td>
</tr>
<tr>
<td>Communication skills</td>
<td>0.18**</td>
<td>0.29</td>
</tr>
<tr>
<td>Social integration</td>
<td>0.01</td>
<td>0.02</td>
</tr>
<tr>
<td>Relationship satisfaction</td>
<td>0.05</td>
<td>0.08</td>
</tr>
<tr>
<td>Conflicts in relationship</td>
<td>0.05</td>
<td>0.06</td>
</tr>
</tbody>
</table>

Note. Controlled for gender effects. SE = standard error.

* p < .09. ** p < .05. *** p < .01.
For this study, we pursued four goals. As a first goal, we examined longitudinal measurement invariance of the measure of adolescent empathy that has a dichotomous response format. This issue has received less attention in previous empathy development research but is more prominent in personality development research (e.g., Allemand et al., 2007; Zimprich, Allemand, & Lachman, 2012). In this study, we demonstrated strict invariance of the empathy measure over time, which warranted unbiasedness of the empathy measure across measurement occasions. Put differently, the measure behaved equivalently across the five measurement occasions in adolescence.

As a second goal, we examined empathy development across the adolescent years. On the one hand, we found relatively high levels of stability in empathy with respect to the year-to-year stability correlations. This implies high persistence of individual differences over time. Although most adolescents tended to maintain their relative standing on empathy relative to others over time, this does not imply that there are no reliable individual differences in empathy change. Note that stability was modeled on the latent level, that is, estimates were uncontaminated by measurement error. In this case, stability coefficients less than 1 necessarily entail individual differences in change. On the other hand, we found a modest increase in empathy at the mean level, implying that adolescents tended to increase in empathy as they moved through the adolescent years. This result confirms our expectation and some previous findings (e.g., Eisenberg et al., 2009). Note, however, that in the present study we modeled empathy on the latent level and based on strict measurement equivalence. The positive age trend in empathy might reflect maturation processes consistent with the notion that adolescents increasingly develop and internalize abstract moral and social principles that, in turn, promote pro-social and responsible behaviors (e.g., Eisenberg et al., 2006).

This result is similar to findings from the personality development literature suggesting that changes toward maturation in biological and psychosocial domains are reflected by changes in personality traits. More specifically, maturation in personality in adolescence typically involves personality changes toward an adultlike personality profile, with increases in agreeableness, conscientiousness, extraversion, and openness, and a decrease in neuroticism (e.g., Caspi, Roberts, & Shiner, 2005; Klimstra, Hale, Raaijmakers, Branje, & Meeus, 2009). Agreeableness has been seen as a major determinant of pro-sociality (Caspi et al., 2005), as individuals with high scores on agreeableness are generally more concerned with others’ well-being and report having more empathy (e.g., Caprara et al., 2012; Graziano et al., 2007). In addition, individual differences in the capacities for behavioral and cognitive control (Caspi et al., 2005) are also relevant for empathy-related responding, perhaps because high conscientiousness helps to inhibit antisocial behaviors and to promote well-controlled and responsible behavior. Along this line of reasoning, the developmental pattern of empathy found in our study might reflect a change toward maturation.

In addition to an average increase of empathy, we found clear evidence for individual differences in adolescent empathy development. As such, our findings contribute to the literature by showing that adolescents differed in their initial level of empathy, and despite the average increase in empathy, they differed in the degree and direction of their development. These results are consistent with the literature on personality development demonstrating significant individual differences in personality change during childhood and adolescence (e.g., De Fruyt et al., 2006; Pullmann, Raudsepp, & Allik, 2006).

As a third goal, we examined whether gender explains individual differences in empathy development. The results demonstrated that gender was significantly related to the level of adolescent empathy favoring girls over boys, but it was not related to empathy change. This suggests that although boys and girls developed in a similar way across the adolescent years, girls tended to be generally higher on empathy. Likewise, female participants were also more empathic than male participants at the age of 35. These findings are consistent with commonly held stereotypes and popular culture suggesting that women have a greater capacity for understanding others’ thoughts and feelings than do men (Kite et al., 2008). They also confirm findings of prior studies that consistently found that girls and women report higher empathy than boys and men (e.g., Batson et al., 1996; Eisenberg & Fabes, 1998).

As a fourth goal, we examined whether individual differences in empathy development in adolescence are related to self-reported social competencies and outcomes in adulthood. The results demonstrate that not only level but also change in adolescent empathy predicted individual differences in social competencies in adulthood. More specifically, the findings with respect to level of empathy as a predictor indicate that those adolescents high in empathy tended to be high in empathy as adults and use more constructive communication skills in conflict situations in their marriage or relationship. These findings are consistent with research findings demonstrating that individual differences in personality assessed in earlier periods of the life span have long-term effects on behaviors and outcomes later in life (e.g., Nave et al., 2010). For example, a recent study demonstrated the significance of childhood personality for competence and resilience in early adulthood (Shiner & Masten, 2012). Big Five personality traits assessed at the age of 10 years were related to several measures of social competencies 10 and 20 years later. Another study demonstrated that early childhood temperament predicts variation in political ideology at the age of 18 years (Fraley, Griffin, Belsky, & Roisman, 2012). Personality appears to be prospectively related to important life outcomes, such as health and longevity, marital success, and educational and occupational attainment (Roberts et al., 2007).

Moreover, the results with respect to change of empathy as a predictor indicate that individuals who increased in empathy during the adolescent years exhibited higher levels of empathy.
and perceived themselves as being well integrated in social networks two decades later in adulthood. An increase in empathy also appeared to be marginally related to better communication skills. Although the current predictive associations were generally small in size, it is important to remember that empathy development was related to social variables two decades later, well beyond the adolescent years. These findings clearly underscore the notion that adolescence is an important developmental period in the life span, with potential positive and negative implications for later age periods.

One of the unique aspects of this study was the focus on individual differences in change in empathy as a predictor of adult outcomes. Recent studies indicated that change in personality itself is an important predictor of life outcomes, such as substance abuse (Hampson, Tildesley, Andrews, Luckyx, & Mroczek, 2010), self-rated health (Turiano et al., 2012), mortality (Mroczek & Spiro, 2007), and depression (Steiger, Allemand, Robins, & Fend, 2014). Our study significantly contributes to this literature by showing that individual differences in empathy change across the adolescent years still matter two decades later, at least for some self-reported social variables in adulthood.

Interestingly, empathy level in adolescence was not related to perceived social integration in adulthood, whereas the developmental process seemed to be important for these social perceptions. During adolescence, individuals explore new social roles, build up less supervised peer friendships, and initiate first romantic relationships (Steinberg & Morris, 2001; Zarrett & Eccles, 2006). Hence, an increase in empathy may play an important role in these new social contexts and influence the perception of social interactions and social networks in the long term. Indeed, our results demonstrated that those adolescents who increased in empathy tended to perceive themselves as being more socially integrated and having many good friends as adults. It is possible that increases in empathy might lead to better integration and interpersonal security in a variety of relationship experiences. By contrast, adolescents who decreased in empathy reported more loneliness and a smaller circle of friends as adults. Becoming less empathic during the adolescent years thus seems a risk factor for later social experiences such as loneliness. It is possible that a decrease in empathy thus leads to negative relationship experiences, which might be related to negative outcomes later in life. Indeed, a recent study demonstrated that an accumulation of adverse relationship experiences in youth is a risk factor for health outcomes in young adulthood, such as poor general health and depressive symptoms (Adam et al., 2011).

The current results demonstrated that adolescent empathy level and change were not related to relationship functioning in adulthood. There are at least two possible explanations for these results. First, it is possible that distal factors such as adolescent empathy play a negligible role for adult relationship satisfaction, as proximal factors such as current intimacy, stressful life circumstances, or poor coping processes might be more influential for relationship satisfaction and conflicts. Second, the results of this study indicate that adult participants who view themselves as empathic also tended to be more satisfied with their relationship and reported lower levels of conflicts in relationships. As shown above, adolescent empathy predicted adult empathy. Therefore, the relationship between higher adult empathy and higher relationship satisfaction (and lower conflict levels) might be driven, at least in part, by positive empathy development or initial higher empathy level in adolescence. This interpretation would follow the idea that empathy is important for current relationship satisfaction (e.g., Cramer & Jowett, 2010), as it may promote adaptive processes following conflicts (McCullough et al., 1997; Paleari et al., 2005).

**LIMITATIONS AND FUTURE RESEARCH DIRECTIONS**

To the best of our knowledge, the current study is the first to examine long-term consequences of adolescent empathy development covering a time span of 23 years. Despite this unique longitudinal design, our work is not without limitations. First, it would be valuable to supplement the current work with other assessment methods. For instance, personality researchers have noted the importance of supplementing self-reports with observer-reports, such as reports by parents or teachers (Vazire, 2006). This would be especially helpful for competencies that are related to others and not only to the self, which is the case for empathy. It is possible, for example, that high discrepancies between self- and other-perceptions in empathy (e.g., self-rated high, other-rated low) would lead to maladaptive outcomes, and only a congruence between different assessments of empathy might have positive social outcomes. Second, the constructs were assessed with short measures due to time and resources, limitations typically associated with large-scale longitudinal studies (e.g., Lucas & Donnellan, 2011). It would be valuable to include longer measures in future studies. Third, the study design included frequent measurements in adolescence and only one measurement occasion in adulthood, and as such, it would be valuable to have more assessments in adulthood in order to chart the normative developmental patterns of empathy beyond the adolescent years (e.g., Eisenberg et al., 2002; Grühn et al., 2008). That said, it would be valuable to include more measurement occasions in adulthood to examine the processes by which empathy influences diverse social competencies and outcomes.

Finally, it is possible that some “third variables” underlie both empathy development in adolescence and the individual differences in social competencies in adulthood. One potential candidate is agreeableness. Agreeableness includes a variety of traits that promote positive behaviors toward others and facilitate congenial relationships with others (Graziano & Eisenberg, 1997). Agreeable individuals are more cooperative, considerate, empathic, generous, polite, and kind. As such, it is possible that adolescents high in agreeableness are the ones
most likely to develop more strongly in empathy and to be more socially competent in adulthood. Future studies may examine whether and to what degree empathy and agreeableness develop in tandem. It would also be valuable to examine the joint power of both constructs in future studies. Unfortunately, we were unable to test these ideas, as the Big Five personality traits were not measured in this study.

**CONCLUSION**

This study provides some of the first findings of predictive associations between empathy development during adolescence and social outcome variables in adulthood. It is clear from our results that, on average, adolescents increase in their ability to share and understand others’ thoughts and feelings across the adolescent years. It is also clear from our findings that irrespective of the average developmental trend in empathy, adolescents significantly differ in their initial level as well as in their change over time. What may be most fascinating about the results is that these individual differences in developmental processes are influential at least for some aspects of self-reported social functioning two decades later. As such, the current results are important because they show that it matters whether an adolescent increases or decreases in empathy across the transition period of adolescence. In other words, irrespective of the initial empathy level, even small decreases in empathy during adolescence can be regarded as a risk factor for later social outcomes, whereas increases tend to reflect individual resources for social functioning as an adult. The current results represent a challenge to future theorizing and research to provide a better understanding of how developmental processes in adolescence are related to positive adult functioning.

**References**


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