Empathy Across the Adult Lifespan: Longitudinal and Experience-Sampling Findings

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Abstract

This study examined change in self-reported empathy in a four-wave longitudinal study spanning 12 years (1992–2004) and the association between empathy and other measures, including daily reports of relationship experiences. Participants initially ranged in age from 10 years to 87 years. Cross-sectional and longitudinal associations of age with empathy revealed divergent patterns. Whereas cross-sectional analyses suggested that older adults scored lower in empathy than younger adults, longitudinal analyses showed no age-related decline in empathy. This combined pattern suggests that the cross-sectional age-differences reflect a cohort rather than an age effect, with older cohorts reporting lower levels of empathy than younger ones. Independent of age, empathy was associated with a positive well-being (e.g., life satisfaction) and interaction profile (e.g., positive relations with others). In addition, a subsample of participants (*n*= 114) conducted experience-sampling about social interactions for a week. People with high self-reported empathy perceived their interactions as more meaningful, felt more positive in these interactions, and thought that their interaction partner felt also more positive. Thus, self-reported empathy was meaningfully associated with adults' actual social interactions.

Keywords

empathy; age differences; cohort effect; experience sampling

Empathy, the ability to understand another person's thoughts and feelings, involves emotional and cognitive processes and is a fundamental aspect of social interactions and relationships (Davis, 1994; Ickes, 1997; Singer, 2006). Moreover, empathic understanding is also an integral part of moral development and an important motivational component of prosocial and altruistic behavior (Eisenberg, 2000; Hoffman, 1977, 2000). Although empathy is relevant for social interactions across the entire lifespan, the development of empathy has been studied mainly in

childhood and adolescence rather than adulthood and old age (e.g., Eisenberg & Fabes, 1990; Hoffman, 2000; Zahn-Waxler, Radke-Yarrow, Wagner, & Chapman, 1992). Overall, this research has shown that precursors of empathy-related abilities appear quite early in life in the form of simple emotional contagion (e.g., Hoffman, 1977, 2000; Singer, 2006) and develop in more complex forms in childhood and adolescence in tandem with major progressions in cognitive and emotional development (e.g., Eisenberg, 2000). Some lifespan researchers (Erikson, 1968; Vaillant, 1977) have also emphasized the central role of empathy in continued development and adaptation in adulthood. In contrast to the early lifespan, however, systematic knowledge about the development of empathy across the adult years is very limited and comes mainly from cross-sectional studies rather than longitudinal research. Thus, an open question is whether empathy shows general long-term changes in adulthood and whether it may change in specific ways with age. A few recent studies have started to address these questions and a body of work is emerging that can inform current and future research on the development of empathy across the adult lifespan.

Empathy

Empathy is a complex emotional system that includes both emotion-related processes of automatic responding to and resonance with the experience of others and cognition-related processes of deliberate, conscious control (Davis, 1983; Decety & Jackson, 2004; Eisenberg & Fabes, 1990; Hoffman, 2000; Preston & de Waal, 2002; Singer, 2006). The action-perception model of Preston and de Waal (2002), for example, argues that perceiving others' emotional states automatically activates representations of these states in the self. The activation of these shared representations, in turn, provokes emotional contagion and emotional resonance with associated autonomic and somatic responses as well as action tendencies. The automaticity and emotionality of these responses may vary, however, with age, experience, ability to differentiate between self and others, display rules, and more generally people's regulation styles. The involvement of these more cognitively based competencies allows people to inhibit and transform automatic tendencies into responses that are informed by the states of others as well as suited to relieve their distress. Hence empathic responses are formed by a combination of thoughts (i.e., cognitive aspects) and feelings (i.e., emotional aspects).

Thus, an individual's ability to regulate his or her emotions may make the difference between reacting with sympathy to the negative emotions of others, reacting with personal distress, or even anger. Persons with a good regulation style show sympathy to others' needs, transform the response in an appropriate way to the others' condition (e.g., by consoling, comforting, understanding), and are more likely to help others (Eisenberg & Fabes, 1990; Toi & Batson, 1982). In contrast, people with a poor regulation style are overwhelmed by others' negative emotions and react with avoidance (Zahn-Waxler, Cole, Welsh, & Fox, 1995), antisocial behavior (Kochanska, 1993; Miller & Eisenberg, 1988), or even aggression and heightened personal distress (Miller & Eisenberg, 1988; Radke-Yarrow, Zahn-Waxler, Richardson, & Susman, 1994). To the extent that regulation styles change across the adult lifespan, it seems reasonable to expect that empathic reactions may change with age as well.

Empathy Across the Adult lifespan

How does empathy change across the adult lifespan? The general emotion literature on adulthood and aging provides a mixed pattern of findings. On the one hand, older adults often report better emotion regulation abilities than young adults in self-report data (Birditt & Fingerman, 2005; Gross et al., 1997; Lawton, Kleban, Rajagopal, & Dean, 1992) and in experience-sampling studies (Carstensen, Pasupathi, Mayr, & Nesselroade, 2000). These findings suggest that older adults may have better empathic understanding than young adults. On the other hand, some evidence suggests that older adults' ability to process complex

affective information is frequently diminished (Labouvie-Vief, Grühn, & Mouras, in press; Labouvie-Vief & Marquez, 2004). For example, older adults revealed a less differentiated view of self and others (Labouvie-Vief, Chiodo, Goguen, Diehl, & Orwoll, 1995; Labouvie-Vief, DeVoe, & Bulka, 1989) and tend to rely more on stereotypical information (e.g., Blanchard-Fields, Baldi, & Stein, 1999; von Hippel, Silver, & Lynch, 2000) than younger adults do. These findings suggest potential deficits in older adults' empathic understanding.

To date, empirical studies specifically conducted on adult age differences or age-related changes in empathy are fairly scarce and differ greatly in their approach. In an autobiographical study of wisdom (Glück, Bluck, Baron, & McAdams, 2005), people's narratives about their lives were content-coded for the type of life situation in which individuals had acted wisely. One form of wisdom derived from these narratives was called "empathy and support." This form consisted of statements considering others' perspectives and feelings. In a first study, adolescents mentioned this category more frequently than early midlife adults or older adults. A second study with a continuous age range from 30 to 72 years, however, revealed no age-related differences in mentioning empathy and support statements in personal narratives. Thus, findings from these qualitative studies suggest either a pattern of negative age differences or no age differences in the use of empathy-related statements in personal wisdom narratives.

Similar to the qualitative approach, findings from cross-sectional questionnaire studies indicate either stability or a pattern of negative age differences in dispositional empathy. Two studies reported no significant age differences in empathy. Eysenck, Pearson, Easting, and Allsopp (1985) found no age differences in self-reported empathy in a large sample of people ranging from 16 to 87 years. In a sample ranging from 15 to 87 years, Diehl, Coyle, and Labouvie-Vief (1996) found no significant age differences in empathy. In contrast, three studies found a pattern of negative age differences. Comparing young and older adults' emotional functioning, Phillips, MacLean, and Allen (2002) found that young adults reported more empathy than older adults; however, after education was controlled, the age effect was no longer significant, suggesting that age-related differences in empathy were partly associated with age differences in education. In a large sample of 1581 adults aged 22 to 92 years, Schieman and Van Gundy (2000) found a substantial negative association between age and self-reported empathy ($\beta =$ −.24). This negative association was partly related to education; however, after controlling for several sociodemographic, health-related, and psychological variables, the negative association between age and empathy was still significant. Helson, Jones, and Kwan (2002) reported correlations between age and empathy from five cross-sectional samples. Average cross-sectional correlations of empathy with age were $r = −.22$ for men and $r = −.27$ for women, suggesting that empathy shows a moderate, yet significant negative association with age.

The only study that has examined longitudinal change in empathy has been reported by Helson et al. (2002), who examined the developmental trajectory of empathy in three longitudinal studies using the California Personality Inventory (CPI; Gough & Bradley, 1996). Men and women in these studies had been followed over periods of approximately 40 years. In particular, the sample of the Oakland Growth Study (N_{T1} = 124) was followed from age 33 to age 75; participants in the Berkeley Guidance Study (N_{T1} = 104) were followed from age 35 to age 68; and women in the Mills Longitudinal Study (N_{T1} = 140) were first assessed at about age 21 and last assessed at about age 61. In order to analyze longitudinal change, Helson and colleagues used multilevel modeling, which showed a linear decline over the 40-year observation period. This decline was fairly small yet statistically significant (i.e., 0.014 raw score unit per year; $M_{empathy}$ = 20.588, $SE_{empathy}$ = 0.246), resulting in the conclusion that empathy showed an age-related decline over the 40-year observation period in these longitudinal samples. However, the overall long-term decline was mainly due to the women in the Mills Longitudinal Study, who showed a medium change in empathy from the initial to the final wave (Cohen's d = −.48). In contrast, samples from the Oakland Growth and the

Berkeley Guidance Studies reported practically no change between the first and final wave (Cohen's d = .02).

Taken together, the empirical findings regarding age differences and age-related changes in self-reported empathy are mixed. Some studies suggest a negative pattern of age differences, whereas others suggest no significant age differences. No study, however, suggests an age-related increase in empathy. The only longitudinal study available suggests that self-reported empathy may decline with age, but quite modestly. Given this state of the literature, it is not well known whether empathy shows long-term change and, if so, whether long-term change in empathy depends on people's age or other person characteristics. In particular, the trend of an age-related decline in empathy in previous research may be due to an age-related decline in fluid intellectual functioning.

Goals of the Present Study

The findings from previous empirical investigations suggest that older individuals tend to report lower levels of empathy than younger ones. Yet, with the exception of the report by Helson and colleagues (2002), little is known about long-term change in empathy. The present study aimed to contribute to this literature by reporting findings of a longitudinal-sequential study on emotion-cognition relations throughout the lifespan ranging from 10 years to 87 years. Although this research project was not designed with a major focus on empathy, the assessment included a measure of empathy based on the CPI. Thus, we can address both cross-sectional differences and longitudinal change in self-reported empathy. This allowed us to examine the relationship between age and empathy more systematically than previous research. In particular, our knowledge about interindividual variability in the developmental pathways is limited because the investigation of long-term change in empathy involves not only an average group trajectory for the study sample, but also interindividual differences in the shape and direction of individual trajectories. As is known from longitudinal research in cognitive and personality psychology (e.g., Smith & Baltes, 1993; Wilson et al., 2002), individuals begin at different initial levels and show different developmental trajectories and/or rates of change. Growth curve models permit one to analyze simultaneously these two aspects of long-term change, namely interindividual differences in intraindividual change. In the present study, we used latent growth curve modeling to examine overall change and age-related change in empathy over 12 years. Specifically, we were interested in whether age predicted interindividual differences as well as intraindividual change in self-reported empathy. In order to extend past research, we also examined other person characteristics (rather than age per se) as predictors of interindividual differences in intraindividual change in empathy—including measures of affect, psychological well-being, and intellectual functioning. In addition, we used a wide age range from adolescents to old age.

A limitation of previous studies is that they provided little evidence regarding the convergent validity of their empathy measures and failed to link individuals' self-reported empathy to their behavior or perceptions in actual social interactions. Because empathy is an important part of social interactions, we also examined the convergent validity of the self-report measure and its associations with variables derived from actual social interactions. First, we looked at covariates of empathy that were expected to be associated with positive development, including subjective and psychological well-being. We expected positive correlations between empathy and these measures. Second, a subsample of the longitudinal sample participated in an experience-sampling study in which people reported on their social interactions multiple times daily for a week. Thus, we were able to examine correlates of self-reported empathy in social interactions. These analyses of the relationships of empathy with subjective and psychological well-being and persons' reports of social interactions offered a broader picture of empathy and its influences.

Method

Participants

Longitudinal study—Data stem from a four-wave 12-year longitudinal study covering a wide age range from adolescence over adulthood into old age. In 1992, participants were recruited from three suburban communities in a major Midwestern metropolitan area. The three communities were selected to represent low, medium, and high income levels on the basis of the median housing value from 1990 census information. An age- and gender-stratified sample of 400 individuals (aged 10 to 87 years, $M = 44.7$ years, $SD = 20.3$ years, 51.3% women) was randomly selected. The majority (95%) of the participants were White.

In 1994, 330 participants (aged 12 to 87 years, $M = 46.6$ years, $SD = 20.1$ year; 154 men, 176 women) of the original sample were followed up. This is a return rate of 83%. In 1998, 260 participants (aged 16 to 92 years, $M = 50.4$ years, $SD = 19.6$ years, 115 men, 145 women) of the original sample were reexamined. This is a return rate of 65% of the original sample and 78.8% of the Time 2 sample. In addition to the longitudinal sample, a new sample of 166 African American participants (aged 14 to 82 years, $M = 46.4$, $SD = 17.5$; 82 men, 84 women) was recruited in 1998. Finally, six years later, in 2004, 171 participants of the original longitudinal sample (aged 18 to 93 years, $M = 54.6$ years, $SD = 18.2$ years; 72 men, 99 women) and 65 participants of the original African American sample (aged 16 to 87 years, $M = 54.1$ year, $SD = 15.8$ years; 27 men, 38 women) were reexamined (236 participants in total), a return rate of 42.8% and 39.1%, respectively. Table 1 provides person characteristics for the total sample at the four occasions of measurement.

For the 229 participants who dropped out at any time during the 12-year period from the original longitudinal sample, reasons for nonparticipation were as follows: 120 (52.9%) were not interested, did not answer, were too busy, or dropped out without mentioning a specific reason; 59 (25.7%) had moved out of the area and/or could not be contacted; 39 (17.0%) were deceased; and 11 (4.8%) were unable to participate due to health problems. For the 101 participants who dropped out from the African American sample over the 6-year period, reasons for nonparticipation were as follows: 56 (55.9%) were not interested, did not answer, were too busy, or dropped out without mentioning a specific reason; 40 (40.1%) had moved out of the area and/or could not be contacted; and 4 (4.0%) were deceased.

Attrition across the 12-year period did not alter age and gender composition for the different waves. One exception was chronological age in 2004: Participants who returned for testing were slightly younger ($M_{T1} = 42.2$, $SD_{T1} = 18.2$) than nonreturnees ($M_{T1} = 46.6$, $SD_{T1} = 21.5$), $F(1, 398) = 4.56$, $p = .03$, $\eta^2 = .01$. Nonreturnees had significantly lower levels of education and scored lower on fluid intelligence (i.e., letter sets) than returnees. No significant differences between returnees and nonreturnees were found for self-reported empathy, depression, and a measure of crystallized intelligence (i.e., vocabulary). Overall, this pattern of attrition is very similar in magnitude and nature to the patterns reported from other longitudinal studies of adult development (e.g., Schaie, 2005).

Experience-sampling study—At each wave, a smaller satellite sample was selected for more intensive study. After the fourth wave in 2004, a subsample of 190 individuals (of the 236 combined samples of participants who were living locally) was invited to participate in an experience-sampling study. Of the 190 invited individuals, 119 individuals (63%) took part in this substudy. Five participants were excluded from the final data set due to noncompliance ($n = 3$), cognitive difficulties ($n = 1$), and a stolen device ($n = 1$), so the final sample consisted of 114 participants (44 men and 70 women), ranging in age from 21 to 89 years ($M = 53.7$ years, $SD = 16.0$ years).

Measures From the Longitudinal Study

Empathy—Empathy was assessed with a modified version of the empathy subscale of the California Personality Inventory (CPI; Gough & Bradley, 1996). The CPI was designed to measure relevant personality characteristics in daily life in normal nonclinical populations. According to the test authors, the empathy subscale assesses a person's interest and resourcefulness in understanding others. The original scale consisted of 38 yes/no-questions and had internal consistencies in the low range of acceptability ($\alpha_{1992} = .66$, $\alpha_{1994} = .65$, $\alpha_{1998} = .64$, $\alpha_{2004} = .64$). In our modified version, we mainly eliminated items that lacked obvious face validity. The resulting 32-item scale had high internal consistency (all αs = .83) and correlated highly with the original empathy scale at the four waves ($r_{1992} = .83$, $r_{1994} = .80$, $r_{1998} = .81$, $r_{2004} = .84$). The empathy scale was conceptualized as a one-dimensional scale tapping emotional and cognitive aspects of empathy conjointly (Hogan, 1969). Scree plots from exploratory factor analyses were also supportive of a one-factor solution at all four waves. Overall scores were transformed to a 0 to 100-point scale indicating the percent of responses into the direction of more empathy. The CPI was administered to participants aged 15 and older at all four waves. Thus, empathy was not assessed in children younger than 15. As these children grew older, the CPI was administered in later waves. In total, 553 participants responded at least once to the empathy scale. Of these, 171, 130, 120, and 132 people completed the empathy scale on one, two, three, and all four time points, respectively.

Subjective well-being—Participants' subjective well-being was assessed using measures of life satisfaction, positive and negative affect, and depressive symptoms. Specifically, life satisfaction was assessed with a single item ("In general, my life has been …") to which participants responded on a 7-point scale ranging from *extremely unhappy* (1) to *extremely happy* (7). Positive and negative affect was assessed with the Positive Affect Negative Affect Schedule (PANAS; Watson, Clark, & Tellegen, 1988). The PANAS has a total of 20 affect items, 10 for positive and 10 for negative affect. Participants indicated to what extent they felt each affect during the past few weeks on a 5-point scale ranging from *very slightly or not all* (1) to *extremely* (5). Internal consistencies were high (positive affect: $\alpha_{1998} = .88$, $\alpha_{2004} = .90$; negative affect: $\alpha_{1998} = .86$, $\alpha_{2004} = .87$).

Depressive symptoms were measured with the Center for Epidemiological Studies – Depression scale (CES-D; Radloff, 1977). Unlike more clinically oriented depression scales, the CES-D assesses milder depressive symptoms with an emphasis on depressed mood during the last week. The CES-D consists of 20 items, which people evaluate on a 4-point scale ranging from *rarely or none of the time* (0) to *most or all of the time* (3). Respondents' answers are summed into a total score, with higher scores indicating a higher frequency of depressive symptoms. The CES-D had good internal consistencies ($\alpha_{1992} = .87$, $\alpha_{1994} = .88$, $\alpha_{1998} = .88$, $\alpha_{2004} = .90$).

Psychological well-being—In contrast to measures of subjective well-being that focus on positive and hedonic aspects of people's lives, Ryff's Psychological Well-Being Scale (PWBS; Ryff, 1989, 1995) measures the extent to which individuals perceive their lives as meaningful, worthwhile, in their own control, and as having good relationships with others. Thus, the PWBS operationalizes psychological well-being in terms of six dimensions, namely autonomy, environmental mastery, personal growth, positive relations with others, purpose in life, and self-acceptance. Each dimension is assessed with 14 statements to which participants respond on a 6-point scale ranging from *strongly disagree* (1) to *strongly agree* (6). The six scales had good internal consistencies (autonomy: $\alpha_{1998} = .82$, $\alpha_{2004} = .86$; environmental mastery: $\alpha_{1998} = .85$, $\alpha_{2004} = .92$; personal growth: $\alpha_{1998} = .87$, $\alpha_{2004} = .87$; positive relations: $\alpha_{1998} = .88$, $\alpha_{2004} = .89$; purpose in life: $\alpha_{1998} = .89$, $\alpha_{2004} = .90$; self-acceptance: $\alpha_{1998} = .90$, $\alpha_{2004} = .92$).

Intellectual functioning—To assess participants' fluid and crystallized intelligence, two timed tests from the Kit of Factor- Referenced Cognitive Tests (Ekstrom, French, Harman, & Derman, 1976) were used: letter sets (fluid intelligence) and vocabulary (crystallized intelligence). The letter sets test measures inductive reasoning by finding a letter set among five letter sets that does not belong to the others. Vocabulary is a multiple-choice test requiring participants to find a correct synonym for a key word from five alternatives. For both tests, sum scores from correctly answered items were calculated.

Procedure

Longitudinal study—On each of the four occasions, participants completed two 2-hr sessions. Testing was conducted by trained graduate students and held in small groups at locations in the participants' communities. In 1992 and 1994, participants received a remuneration of $50 for the completion of both testing sessions. In 1998 and 2004, participants received $75 for the completion of the testing sessions.

Experience-sampling study—Participants were trained individually in the proper operation of the handheld computers (Palm Pilot Tungsten E-2). The device emitted a beep-like signal five times per day at random times between 9:00 a.m. and 9:00 p.m.–with interbeep intervals ranging from 15 minutes and 3 hours. Participants were instructed to carry the handheld computer device for seven consecutive days (5 beeps per day for a total of 7 days, resulting in a total of 35 possible signals) and to respond to questions when prompted. For data recording, we utilized the iESP software, created by the Intel Research Seattle and University of Washington Computer Science and Engineering Department. The iESP is free and open source software (http://seattleweb.intel-research.net/projects/esm/iESP.html) and is a modified version of the ESP Software created by Lisa Feldman Barrett and Dan Barrett (2001) of Boston College.

Each time participants received a beep, they were instructed to report on their social interactions since the last beep. Positive and negative interactions were assessed by asking participants two questions: "Did you have a positive interaction with another person since the last beep?" and "Did you have a negative interaction with another person since the last beep?" Participants either endorsed "Yes" or "No" to each question. Each question was followed by a set of questions regarding the features of the interaction (e.g., the perceived quality of the contact). Specifically, participants were asked (a) how they felt during the interaction (1 = *very negative*, 5 = *very positive*), (b) how they thought the interaction partner felt during the interaction (1 = *very negative*, 5 = *very positive*), (c) how much positive emotions their partner expressed during the interaction (1 = *none at all*, 5 = *extremely*), (d) how much negative emotions their partner expressed during the interaction (1 = *none at all*, 5 = *extremely*), and (e) how meaningful this interactions was for them (1 = *none at all*, 5 = *extremely*).

A "social interaction" was explained to participants as a social exchange that involves the participant and at least one other person. If more than one other person was involved, participants were instructed to select one social partner and to report on the experience with that chosen partner. They were also instructed that the social exchange could be brief or long, and formal or casual, and the interaction could occur face-to-face, on the telephone, via electronic mail, or electronic messaging. After seven days, in a posttest session, participants were compensated $125 for completing the experience-sampling study.

Results

Results are presented in four major sections. First, we present descriptive statistics for self-reported empathy over the 12-year observation period and its correlates with participants' age. This includes a latent growth curve model examining the shape of the developmental change

trajectory. Second, we examined cross-sectional correlates of self-reported empathy. Third, we used correlates as predictors for interindividual differences in the developmental change trajectory. These analyses provide information why some individuals' empathy declined or increased over the 12-year period. Finally, we present findings from the experience-sampling study. In particular, we examined associations between self-reported empathy and people's reports about the nature and meaningfulness of their daily social interactions. Regarding general information about the empathy scale, Table 2 provides correlations among waves and descriptive statistics for each wave. Specifically, self-reported empathy showed high retest stability ($.77 \leq r \leq .85$) across waves.

Age and Self-Reported Empathy

Cross-sectional analyses—We first examined the relation between empathy and participants' age cross-sectionally. Separately for each of the four time points, we examined (a) the correlations between age and empathy, and (b) mean differences in empathy among age groups defined in decade intervals. Correlations between age and empathy are shown in Table 1. As can be seen in Table 1, correlations were small but consistently negative and significantly different from zero ($-.16 \leq r \leq -.10$). In general, older adults tended to have lower empathy scores than younger adults at all four testing occasions.

This cross-sectional pattern of negative age differences in empathy was also supported by analyses of variance conducted at each time point with age group as between-subjects variable. The analyses revealed significant main effects of age group for the first two waves, all Fs > 2.00, ps < .05, $.04 \leq \eta^2 \leq .05$. The main effect of age group was not significant at the third, $F(6, 402) = 1.28$, $p = .26$, $\eta^2 = .02$, and fourth wave, $F(6, 219) = 1.87$, $p = .09$, $\eta^2 = .05$. A linear contrast for age group, however, was significant for all four waves ($p < .05$). Descriptive statistics by age groups are provided in Table 3.

In sum, the cross-sectional analyses suggested a pattern of age differences similar to that found in previous studies. Specifically, data from the present study supported a negative pattern of age differences from adolescence to old age.

Latent growth curve model—To investigate long-term change in empathy, we made use of the full longitudinal information across the 12-year period and estimated a latent growth curve model over the four occasions of measurement. In this model, two latent variables, an intercept (1, 1, 1, 1) and a linear slope (0, 2, 6, 12), were created with loadings on the manifest empathy variables. In addition, participants' age in 1992 was used as the predictor for the intercept and the slope. The model is depicted in Figure 1. This model permits the examination of age-related change across the 12-year observation period rather than age-related differences in empathy. Mplus (Muthén & Muthén, 2007) was used for these analyses.

The latent growth curve model with participants' age as a predictor revealed a reasonable fit to the data, $\chi^2 = 5.54$, $df = 7$, $p = .59$, CFI = 1.00, NFI = 1.00, RMSEA = .00 (CI: .000, .045). The parameters estimated by this model are shown in Table 4.[1] As can be seen in Table 4, age showed a significant and negative path to the latent intercept. This paralleled the findings from the cross-sectional correlations between age and empathy. In particular, self-reported empathy was lower in older age cohorts than in more recent age cohorts.

To examine long-term intraindividual change in empathy, two aspects of the model have to be considered, namely (a) the overall mean trend for the entire sample and (b) interindividudal

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[1]The estimates of the latent growth curve model were practically unaffected when the data were analyzed without the African American sample. Moreover, estimates were practically identical when using participants who responded to the empathy questionnaire at all four occasions of measurement. These additional findings suggest that the model's estimates were highly robust.

differences in intraindividual change. First, the mean of the slope ($M = -0.003$) was not significantly different from zero, indicating that there was no overall positive (i.e., age-related increase) or negative trend (i.e., age-related decrease) in empathy. On average, people's empathy remained stable and flat over the 12-year period. Despite this flat overall trend in empathy, there was evidence for significant interindividual differences in intraindividual change; that is, the variance of the slope was significant. This suggested that not every person showed the same developmental trajectory. Some persons showed declines and others increases in empathy. However, age was not significantly related to the latent slope documenting that interindividual differences in intraindividual change in empathy were not related to age. Thus, whether people's empathy increased or decreased was not related to their age. Figure 2 presents individual developmental trajectories.

In sum, there was no evidence for an overall positive or negative trend in long-term change of empathy as well as no evidence that age moderated long-term change in empathy. These two findings suggest that long-term change in empathy did not follow the same trend as the pattern of age differences observed in the cross-sectional analyses.

Cross-Sectional Covariates of Empathy From the Longitudinal Study

Associations with sociodemographic variables—In addition to age, we considered gender, education, and ethnicity as possible covariates of empathy. There was no evidence for gender-related differences (all ps > .10; $\eta^2 < .01$) in self-reported empathy at any of the four occasions of measurement.

In previous studies on self-reported empathy (Phillips et al., 2002; Schieman & Van Gundy, 2000), education mediated the relation between age and empathy. To examine whether education had the same effect in our data, we investigated (a) whether empathy differed by educational level (categorized into three levels: up to high school graduate only, college up to bachelor's, or education beyond bachelor's), and (b) whether the cross-sectional relations between age and empathy were altered when level of education was controlled. First, analyses of variance with education as a between-subjects variable revealed a significant main effect of education only for the third, $F(2, 405) = 8.71$, $p < .01$, $\eta^2 = .04$, and fourth wave, $F(2, 223) = 6.09$, $p < .01$, $\eta^2 = .05$. The main effects of education for the first, $F(2, 365) = 2.52$, $p = .08$, $\eta^2 = .01$, and second waves, $F(2, 312) = 0.33$, $p = .72$, $\eta^2 < .01$, were not significant, although the mean level differences were similar for all four occasions of measurement. As shown in Table 5 for all four waves, people with education beyond a bachelor's degree had the highest empathy scores, those with high school or less had the lowest scores, whereas those with college up to a bachelor's had intermediate levels of empathy.

We found no evidence, however, for education confounding the cross-sectional relation between age and empathy. After controlling for the effect of education, the associations between age and empathy were practically unchanged. In summary, education was positively associated with self-reported empathy but did not account for the negative relation between age and empathy in cross-sectional analyses.

We had no specific hypothesis with regards to ethnicity differences in empathy. However, because the study design included an African American sample at the last two occasions of measurement, we were able to examine potential ethnic differences in self-reported empathy. Findings from these analyses did not reveal any significant difference in empathy between the European American and African American samples at either the third or fourth waves (all ps > .10; $\eta^2 < .01$).

Associations with measures of subjective and psychological well-being—
Indicators of subjective well-being showed positive associations with participants' empathy

scores at all four occasions of measurement (see Table 1). People with higher empathy scores reported greater life satisfaction, more positive affect, less negative affect, and less depressive symptoms than people who had lower empathy scores. Participants' empathy scores also showed positive associations with all six dimensions of psychological well-being at both occasions of measurement. As can be seen in Table 1, the correlations were lowest between empathy and Environmental Mastery (r_{1998} = .21 and r_{2004} = .25, respectively) and highest for Relations with Others (r_{1998} = .44 and r_{2004} = .50, respectively) and Personal Growth (r_{1998} = .42 and r_{2004} = .51, respectively).

Associations with measures of intellectual functioning—The indicator of fluid intelligence (i.e., letter sets) showed positive correlations with empathy at the first two occasions of measurement—but not at the later waves. Vocabulary was not significantly correlated with empathy at any occasion of measurement.

Predictors of Intraindividual Change in Empathy Over the 12-Year Period

The latent growth curve model provided evidence for significant interindividual differences in intraindividual change; that is, not every person showed the same developmental trajectory in empathy. To examine explanatory variables, we included covariates as predictors in the latent growth curve model in addition to age. For person characteristics that were assessed at all four occasions (e.g., depression), we conducted bivariate latent growth curve models. For person characteristics that were only assessed at two or three occasions, we modeled a latent factor with occasions as manifest variables. In both cases, we were interested in the effect of the covariate on the slope of empathy; that is, whether the covariate predicted a decline or increase in empathy over the 12-year period.

We found significant effects on the slope of empathy for four measures of subjective and psychological well-being: positive affect, depressive symptoms, autonomy, and self-acceptance. No cognitive or sociodemographic variable predicted change in self-reported empathy. All four models showed reasonable fit to the data (all CFI > .96, NFI > .96, RMSEA < .05). In order to facilitate communication of these analyses, we report the effects in terms of the expected difference on empathy over the 12-year period when the predictor differed by one standard deviation. These expected differences were based on estimates from the latent parameters.

Positive affect showed a significant positive effect on the slope of empathy; people who reported positive affect above the mean showed increases in empathy over the 12-year period, whereas people reporting positive affect below the mean showed decreases in empathy. A difference of one *SD* in positive affect was equivalent to a difference of 2.2 points (or 0.1 *SD*) on empathy over the 12-year period. The intercept of depressive symptoms was significantly related to change in empathy. People high in depression showed significant declines over the 12-year period. One *SD* in depressive symptoms translated to a difference of 2.1 points (or 0.1 *SD*) on empathy. Self-acceptance predicted positive change in empathy. People above the mean of self-acceptance increased in empathy, whereas people below the mean of self-acceptance declined in empathy. A difference of one *SD* in self-acceptance was equivalent to a difference of 2.0 points (or 0.1 *SD*) on empathy over the 12-year period. Autonomy was negatively associated with change in empathy: People high in autonomy declined in their reported empathy. One *SD* in autonomy was equivalent to a difference of 1.9 points (or 0.1 *SD*) in empathy over the 12-year period. On the first glance, this negative pattern of autonomy seems contradictory to expectations; however, autonomy was also positively related to the intercept of empathy. One *SD* on autonomy was related to a difference of 8.7 points (or 0.6 *SD*) on empathy. Thus, despite the negative effect of autonomy on the slope of

empathy, the general positive association between autonomy and the intercept of empathy was stronger and compensated for this decline.

In sum, we found four significant predictors for interindividual differences in intraindividual change in empathy: positive affect, depression, self-acceptance, and autonomy. People high in positive affect, high in self-acceptance, low in depressive symptoms, and low in autonomy showed significant increases in empathy over the 12-year period. However, all of these effects were small and, in fact, smaller than the positive associations between covariates and the intercept of empathy (see also Table 1).

Associations Between Empathy and Social Interactions: An Experience-Sampling Approach

The above correlations between empathy and other personality and well-being dimensions may be artificially inflated by shared method variance. To reduce this potential confound while further studying empathy and social interactions, we examined the relationship between empathy and people's reports about their ongoing social interactions. In the experience-sampling study, participants were asked at each random beep whether they had a positive or negative interaction since the prior beep. We summed the number of positive and negative interactions across the 35 occasions to obtain the total number of positive and negative interactions during the observation period. In addition, we aggregated participants' ratings to each interaction over all their positive and negative social interactions separately. Using this procedure, we obtained, for example, an overall score of how positive a person felt in his or her positive interactions. Table 6 provides descriptive statistics for these variables as well as their correlations with empathy.

As can be seen in Table 6, empathy was not significantly related to the overall number of positive or negative interactions. Thus, people with higher empathy experienced no more or less frequent positive or negative interactions than people with lower empathy scores. Empathy was related, however, to several characteristics of persons' positive interactions. In their positive interactions, compared to people with lower empathy scores, people who had higher empathy scores (a) felt more positive about themselves, (b) thought that their interaction partners felt more positive, and (c) reported that their interaction partners expressed more positive emotions. In contrast, empathy was not significantly associated with any of these variables in negative interactions. Finally, persons with higher empathy scores tended to perceive both positive and negative interactions as more meaningful than persons with lower empathy scores. These associations between empathy and social interaction variables were not altered when participants' age was controlled.[2]

Discussion

A primary goal of this study was to examine age-related differences and age-related change in self-reported empathy across the adult lifespan. To do this, we examined data from a four-wave 12-year longitudinal study. Analyses showed different patterns of findings for cross-sectional and longitudinal analyses. Whereas self-reported empathy showed a pattern of negative age differences in the cross-sectional analyses, latent growth curve analyses failed to support an age-related decline longitudinally. Taken together, these findings are suggestive of a cohort rather than an age effect with regard to empathy. Moreover, self-reported empathy was associated with a positive personality and interaction profile. Specifically, empathy was

[2]We also conducted analyses in which individual slopes from the LGM were used to predict reports of social interactions. This is the question of whether people who declined, increased, or remained fairly stable in empathy over time showed a differential pattern in the social interactions. With the exception of one variable, however, the individual slopes were not significantly related to the perception of social interactions in the daily experience-sampling study. The one exception was related to meaningfulness in negative interactions: People who reported increased levels of empathy over time reported to find more meaning in negative interactions.

positively related to the quality of people's social interactions. These findings are discussed in turn.

Cohort Effect in Empathy

Consistent with previous studies (Phillips et al., 2002; Schieman & Van Gundy, 2000), we found in cross-sectional analyses a pattern of negative age differences in empathy: Older adults, on average, reported lower empathy scores than younger adults. However, examination of the longitudinal data failed to provide evidence for a systematic age-related decline in empathy over a 12-year period. Overall, this contrast in findings from cross-sectional and longitudinal analyses suggests that the pattern of negative age differences should be attributed to differences among cohorts rather than differences due to age.

Our findings appear to contrast with the findings of Helson and colleagues (2002). In their analyses of three longitudinal samples, they found a small but significant decline over a 40-year period. Closer inspection of this finding, however, showed that this age-related decline in empathy was mostly due to the change in the women in the Mills Longitudinal Study. In comparison, the longitudinal changes in empathy in the participants of the Oakland Growth Study and the Berkeley Guidance Study were quite small and not very different from the findings obtained from our sample. One reason for the different pattern might be the different time span covered by the different studies. Although 12 years are a reasonable time span to observe developmental changes, it is relatively short compared to the 40-year period. Thus, our time span may be too short to observe a significant decline. On the other hand, if one needs such a long time period to observe long-term change, one may question the developmental significance of this change. Second, their studies were pure longitudinal studies of specific birth cohorts from the 1920s and 1930s. Our study, however, followed individuals from different birth cohorts. This allowed us to disentangle more carefully the effects of age and cohort.

Although we can only speculate about the possible causes for these cohort differences, research on cohort differences in personality characteristics (e.g., Twenge, 2001) suggest that recent cohorts' behavior has been influenced by the dissemination of findings from psychological research. In particular, the infusion of psychology into everyday life may, at least in part, account for the higher empathy scores in more recent age cohorts. For individuals in these cohorts, it may be more acceptable to talk and think about their own and others' feelings than for individuals who grew up during an earlier era.

Empathy and Positive Development

Empathy showed a pattern of significant associations with measures of positive development. In particular, empathy was related to measures of subjective well-being. Empathic individuals were more satisfied with their lives and reported more positive affect, less negative affect, and less depressive symptoms than less empathic individuals. In concert with these hedonic aspects, empathy was positively associated with people's psychological well-being. People with high empathy were especially more interested in positive relations with others and their own personal growth. This may indicate that although empathic people approach others and are interested in others, they also value the meaning and importance of social interactions for their own development. These findings support Erikson's (1968) postulate that empathy is a cornerstone of responsive relationships that form a crucial part of positive development. The small but significant effects of indicators of positive development on the change in empathy suggests that positive development also encourages further growth in empathy, because people high in positive affect, high in self-acceptance, and low in depression showed increases in empathy over time. Thus, people who emit warmth and positive self-esteem may attract social interactions that further their empathic abilities.

Indeed, the pattern of findings from the experience-sampling study showed that empathy was related to characteristics of persons' positive interactions. As suggested by several researchers (e.g., Eisenberg, 2000; Erikson, 1968; Hoffman, 2000; Singer, 2006), empathy is a vital part of fostering and widening social interactions. Specifically, people with higher empathy (a) felt more positive about themselves, (b) thought that their interaction partners felt more positive, and (c) reported that their interaction partners expressed more positive emotions than people with lower empathy. This was, however, only the case for positive interactions. In contrast, empathy was not significantly associated with any of these variables in negative interactions. This suggests that empathy may enhance the emotional nature of positive interactions but does not necessarily change the emotional quality of negative interactions.

Overall, these findings suggest that individuals with high empathy may display behaviors that make it easier for others to relate to them. For example, others may perceive empathic individuals as more understanding, more caring, and more concerned about how they feel and what they may think. Thus, people with high empathy may send out "positive invitations" to others that others then, in turn, find easy to respond to in equally positive and enjoyable ways. These positive invitations may not reduce the negativity from others' negative emotions. However, the finding that empathy was related to the meaningfulness of positive *and* negative interactions suggests that empathic individuals may be better able to accept negativity in their social interactions than nonempathic individuals. They seem to develop meaning and personal significance even out of negative encounters. Overall, people with high empathy may emanate an appearance that facilitates the cultivation of social interactions. Social interactions may as well foster and demand empathic competencies leading to reciprocal reinforcements or empathy and social interactions.

Covariates of Empathy

In the present study, we found little empirical evidence for influences of sociodemographic variables (other than age) on empathy. In particular, gender and ethnicity were not related to empathy. With regard to gender, empirical findings are mixed. In a meta-analysis of self-report measures of empathy, Eisenberg and Lennon (1983) found that women scored higher than men. In an analysis of studies on empathic accuracy, the ability to accurately determine the emotional state of another person, Graham and Ickes (1997) concluded that gender differences were primarily due to motivational differences rather than due to differences in empathic abilities. This is consistent with studies suggesting that women tended to be more motivated and oriented to others' emotional states than men (Levenson & Ruef, 1992; Pennebaker & Roberts, 1992; Roberts & Pennebaker, 1995).

Some previous studies on age differences in empathy (Phillips et al., 2002; Schieman & Van Gundy, 2000) suggested that education was positively related to empathy. Consistent with these studies, we found that a higher level of education, on average, was also related to greater empathy. Education and experience may facilitate the positive cultivation of social interactions. In particular, individuals with higher levels of education may live in more complex social environments (e.g., more often assume leadership positions) that require and stimulate the development of more refined empathic abilities because of more complex relationships and interactions. In contrast to previous studies, however, education did not alter the cross-sectional relation between age and empathy in the present study. Thus, the finding that older age cohorts report lower empathy than more recent cohorts cannot be attributed to cohort differences in education.

We found some limited empirical evidence for an association between intellectual functioning and empathy. A measure of fluid intelligence showed significant positive but small correlations with empathy at the first two occasions of measurement—but not at later waves. However, controlling for fluid and crystallized intelligence did not modify intercept and slope of empathy

and its relation to participants' age. Thus, we found no evidence that age differences in self-reported empathy were partly due to an age-related decline in intellectual functioning. This may also suggest that our measure of empathy taps rather emotional components of empathy than cognitive components of empathy.

Strengths and Limitations

A strength of the present study was the combination of cross-sectional and longitudinal data. We assessed empathy in participants ranging from 15 to 87 years and followed them over a time span of 12 years. This allowed us to provide a more definitive answer with regard to age versus cohort effects in empathy. Another strength of this study was that we were able to examine associations between empathy and characteristics of actual social interactions as assessed in the experience-sampling study. The analyses showed clear relations between empathy and participants' perception in real interactions.

One limitation of the present study was that the CPI empathy scale was conceptualized as a unidimensional construct. Other empathy scales (Davis, 1983; Hogan, 1969) assess empathy as a multidimensional concept. Similarly, recent neuropsychological research on empathy stresses a multilevel approach and provides evidence that different components of empathy, such as the affective and cognitive components, are associated with neural activation in different areas of the human cortex (e.g., Singer, 2006) Future research on age-related change in empathy would benefit from measuring empathy in a multidimensional way, which would permit the examination whether different components of empathy show different developmental trajectories over the adult lifespan. The unidimensional measure of empathy used in the present study may conceal such trends.

Future research could also greatly benefit from a multimethodological assessment of empathy. In our study, we used self-report data. Self-report data, however, may be prone to response biases and/or effect of social desirability. In addition to self-report data, future research on the developmental trajectory of empathy may also focus on assessing empathic abilities in the laboratory or in real life settings, or reports of participants' empathy from third party informants, so that the results from these different methods can be examined in terms of their convergence or divergence.

Implications and Conclusion

The fact that empathy remained fairly stable across the adult lifespan has two major implications for developmental psychology. First, the foundation of empathy seems to be built early in life (i.e., infancy through adolescence) rather than develop continuously over the adult lifespan. This is consistent with suggestions that shared self-other representations develop already in infancy and are the building blocks for social transactions in later years (e.g., Meltzoff, 2007). Second, empathy—or at least its perception and outer presentation—seems to be well-preserved into old age. Despite this stability into old age, the nature of empathy may be different at different ages. One may speculate that empathy may become more simplistic and schematic due to lower levels of self-other differentiation in old age (Labouvie-Vief et al., in press; Labouvie-Vief & Marquez, 2004), but may still be functional in social relations. However, this positive view of empathy may have its limits in very old age (i.e., 85 + years), in which health-related declines increase significantly and start to take their toll on individuals' socioemotional functioning (e.g., Kunzmann, Little, & Smith, 2000).

Acknowledgements

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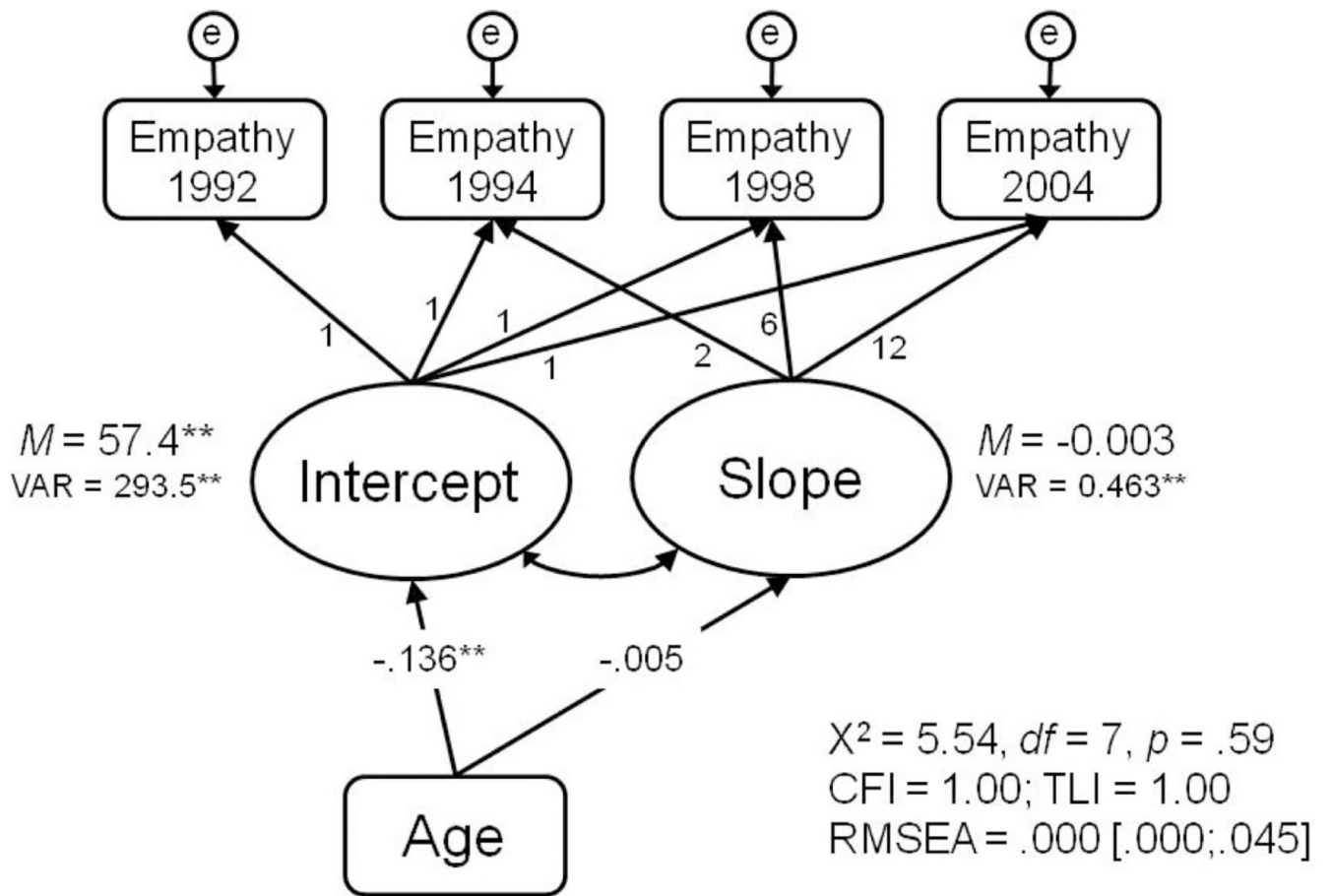
Figure 1.
Latent growth curve model with participants' age as predictor for intercept and slope over the 12-year period.
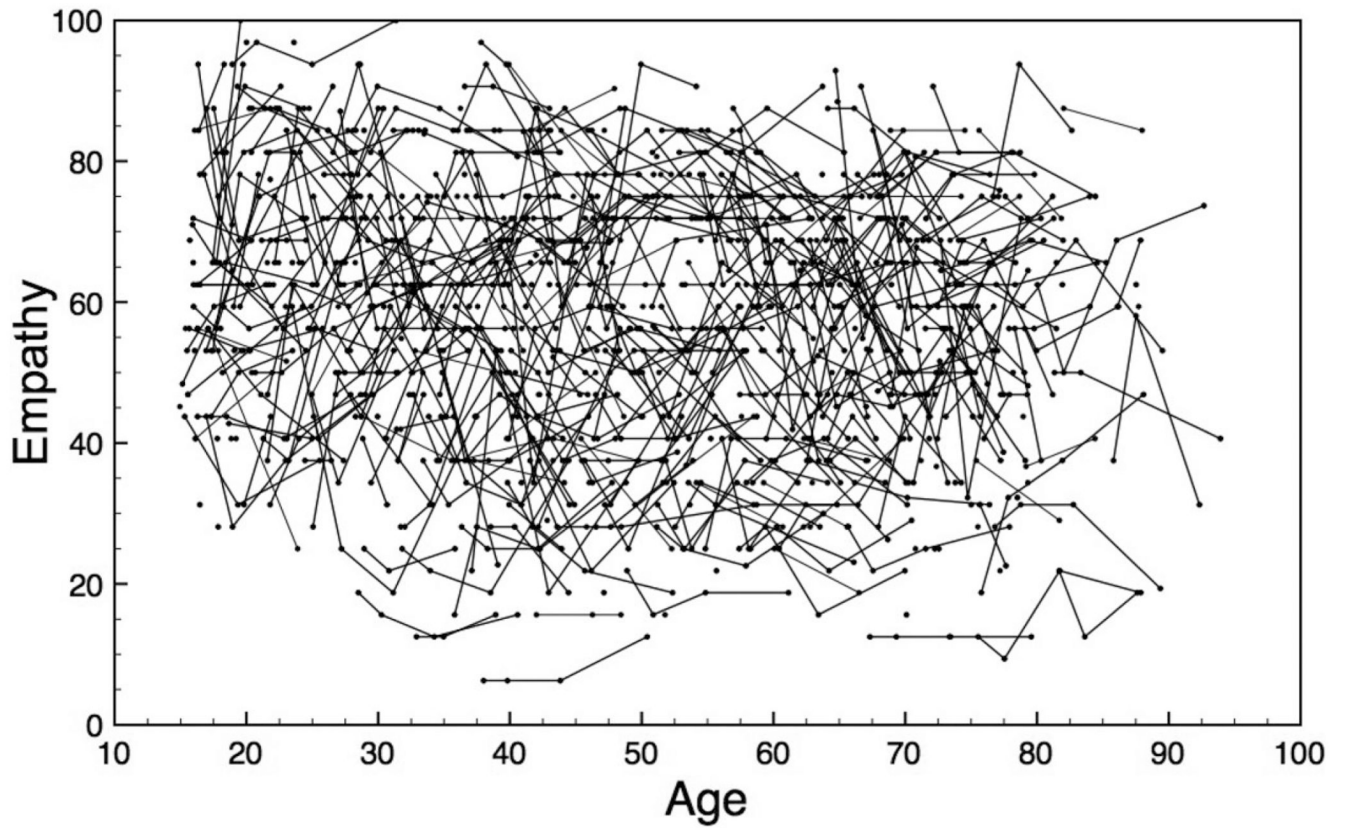
Figure 2.
Individual developmental trajectories of empathy over the 12-year period.

Table 1

Person Characteristics of the Total Sample and Their Correlations With Empathy at the Four Occasions of Measurement

Variables	Zero-order correlations with empathy				Means				Standard deviations			
	1992	1994	1998	2004	1992	1994	1998	2004	1992	1994	1998	2004
Age (in years)	−.16**	−.14*	−10*	−.15*	44.7	46.6	48.9	54.5	20.3	20.1	18.9	17.8
Subjective well-being												
Life satisfaction	—	.26**	.18**	.16*	—	5.4	5.1	5.4	—	1.0	1.2	1.1
Positive affect	—	—	.30**	.42**	—	—	3.5	3.4	—	—	0.7	0.7
Negative affect	—	—	−.16**	−.12	—	—	1.6	1.5	—	—	0.6	0.6
Depression	−.21**	−.20**	−.20**	−.22**	11.2	11.0	11.1	10.3	8.6	9.0	8.8	9.5
Psychological well-being												
Autonomy	—	—	.30**	.44**	—	—	60.7	61.3	—	—	9.5	9.8
Environmental mastery	—	—	.21**	.25**	—	—	62.8	62.5	—	—	10.8	13.9
Purpose in life	—	—	.27**	.42**	—	—	66.2	65.9	—	—	11.5	11.5
Self-acceptance	—	—	.31**	.36**	—	—	63.5	65.3	—	—	12.2	12.2
Personal growth	—	—	.42**	.51**	—	—	71.1	70.6	—	—	9.6	9.4
Relations with others	—	—	.44**	.50**	—	—	64.7	65.7	—	—	11.9	11.9
Intellectual functioning												
Letter sets	.25**	.20**	.05	.16	8.9	9.7	9.5	10.0	3.4	3.5	3.6	3.0
Vocabulary	.08	.07	.07	−.05	12.4	13.1	13.3	13.8	3.6	3.2	3.0	2.6

Note. − = Measure was not assessed in this wave.

*
$P < .05$.

**
$p < .01$.

Table 2

Intercorrelations and Descriptive Statistics for Self-Reported Empathy

	Intercorrelations				Descriptive statistics		
Occasion	1992	1994	1998	2004	N	M	SD
T1: 1992		303	231	155	368	57.8	19.0
T2: 1994	.83 **		238	155	315	57.3	18.8
T3: 1998	.84 **	.83 **		200	410	57.3	18.6
T4: 2004	.79 **	.77 **	.85 **		226	57.8	19.2

Note. Values below the diagonal are correlations; values above the diagonal are the corresponding sample sizes.

**
p < .01.

Table 3

Self-Reported Empathy by Age Group for the Four Occasions of Measurement

	Age group							
	15–24	25–34	35–44	45–54	55–64	65–74	75+	
M								
T1: 1992	64.2_a	57.1_{ab}	60.2_{ab}	55.2_{ab}	58.3_{ab}	56.4_{ab}	47.3_b	
T2: 1994	65.7_a	55.1_{ab}	57.6_{ab}	54.8_{ab}	57.2_{ab}	57.4_{ab}	49.9_b	
T3: 1998	60.2_{ab}	62.0_{ab}	55.1_{ab}	58.0_{ab}	55.4_{ab}	56.2_{ab}	54.5_{ab}	
T4: 2004	62.0_{ab}	68.0_a	57.1_{ab}	56.3_{ab}	56.3_{ab}	53.7_b	56.9_{ab}	
SD								
T1: 1992	17.6	19.8	20.0	19.3	18.0	18.1	17.1	
T2: 1994	17.7	20.0	21.3	19.9	15.7	16.0	18.2	
T3: 1998	15.9	15.1	21.5	19.4	18.1	18.4	19.9	
T4: 2004	23.2	16.8	17.9	20.1	17.7	19.4	19.9	
N								
T1: 1992	54.0	61.0	58.0	53.0	58.0	58.0	26.0	
T2: 1994	47.0	46.0	53.0	43.0	46.0	53.0	27.0	
T3: 1998	55.0	54.0	75.0	71.0	60.0	55.0	39.0	
T4: 2004	10.0	29.0	34.0	43.0	40.0	36.0	34.0	

Note. Means with different letters were significantly different in post-hoc comparisons with Tukey's HSD.

Table 4

Means and Variances of the Latent Growth Curve Model With Age as Predictor for Interindividual Differences (Intercept) and Intraindividual Change (Slope) in Empathy

Effects	Estimate	Confidence interval	SE	Estimate/SE
Intercept				
Mean	57.398	[55.802, 58.993]	0.814	70.515[**]
Variance	293.547	[251.062, 336.031]	21.676	13.543[**]
Slope				
Mean	−0.003	[−0.131, 0.125]	0.065	−0.040
Variance	0.463	[0.134, 0.793]	0.168	2.754[**]
Intercept-slope				
Covariance	−3.699	[−6.212, −1.186]	1.324	−3.012[**]
Age regressed on				
Intercept	−0.136	[−0.219, −0.054]	0.042	−3.234[**]
Slope	−0.005	[−0.013, 0.002]	0.004	−1.500

[**] $p < .01$.

Table 5

Self-Reported Empathy by Education for the Four Occasions of Measurement

Occasion	Some high school			Some college			Beyond bachelor		
	M	*SD*	*N*	*M*	*SD*	*N*	*M*	*SD*	*N*
T1: 1992	55.0	18.4	81	57.0	19.6	172	60.8	18.3	115
T2: 1994	55.5	16.6	50	57.4	19.9	178	58.2	17.7	87
T3: 1998	50.6	17.3	78	57.1	18.5	194	61.5	18.5	136
T4: 2004	48.5	19.4	32	57.3	19.2	105	61.9	17.9	89

Table 6

Descriptive Statistics for Positive and Negative Social Interactions and Their Correlations With Empathy

| | Correlations between empathy in 2004 and …. | | Descriptive statistics | | | |
| | Positive interactions | Negative interactions | Positive interactions | | Negative interactions | |
			M	SD	M	SD
Number of interactions	.02 (.00)	−.08 (−.12)	13.8	8.0	1.7	2.7
Self-feeling	.25** (.28**)	.03 (.05)	4.2	0.4	2.8	1.0
Other-feeling	.23* (.25**)	−.07 (−.04)	4.1	0.5	2.4	0.9
Expressed negativity	−.01 (−.05)	.15 (.13)	1.4	0.4	2.9	1.0
Expressed positivity	.25** (.27**)	−.03 (−.01)	3.6	0.6	2.0	0.9
Meaningful	.22* (.26**)	.29* (.30*)	3.5	0.8	2.9	0.9

Note. Values in parentheses are partial correlations controlled for participants' age.

*
$p < .05$.

**
$p < .01$