

Are Differences in Empathy Age-Related?

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Abstract

In this study we wanted to show how different the mean values of the four empathy components Empathic Concern, Perspective Taking, Fantasy, and Personal Distress are in a total of 7 age groups between 15 and over 60 years old. Using questionnaire data from the German version of the Interpersonal Reactivity Index of a total of 9 156 subjects, we were able to show that, with the exception of the variable Fantasy, the youngest group in particular consistently exhibited the weakest expressions, and although the respective mean values differed significantly in some cases, the deviations were very small. Thus, we refute the assumption that empathy decreases with increasing age and were able to show that especially the affective components show a high stability. Finally, we advise against the formation of a total score on empathy because of the unclear diagnostic interpretability.

Keywords: Age, Empathy development, Empathic Concern, Perspective Taking, Personal Distress

1. Introduction

Empathy defined as “the ability to understand and share in the internal states of others” (Saxena et al., 2017, p. 765) is generally considered a multidimensional construct consisting of affective and cognitive components (Cliffordson, 2002; Cuff et al., 2016; Davis, 1980; Dziobek et al., 2008; Ze et al., 2014). In some definitions, altruistic behavior is added as a third component (Clark et al., 2019; Powell & Roberts, 2017), although altruism should rather be seen as a consequence of especially affective empathy (Batson, 2011; Batson et al., 2009; Batson et al., 1981; Deschamps et al., 2014). Emotional concern (EC) and feeling personal distress (PD) are considered affective components (Fabi et al., 2019; Israelashvili et al., 2020), while the cognitive ability of perspective taking (PT), sometimes with fictional persons (fantasy scale, FS) forms the counterpart of affective empathy (Batson et al., 1997; Davis, 1983a; Reusser, 2018). There is a rather moderate correlation between both poles of empathy (De Corte et al., 2007; $-.09 < r < .37$; Gilet et al., 2013; $.48 < r < -.42$; Ingoglia et al., 2016; $.29 < r < .51$).

Regardless of the form in which empathy is recorded (self-report via questionnaires, emotion recognition via pictures, or even physiological measures), women are generally considered to be more empathic than men (Simon Baron-Cohen & Sally Wheelwright, 2004; Baron-Cohen et al., 2001; Christov-Moore et al., 2014; Gurthrie et al., 1997; Koirikivi, 2014; Löffler & Greitemeyer, 2021; Mehrabian et al., 1988; Preti et al., 2011; Saxena et al., 2017). This is also true across cultures (Schneider et al., 2013; Tavassoli et al., 2018).

The age effect on empathy is somewhat more controversial. While affective factors show a very high (72%) heritability coefficient (Melchers et al., 2016) and consequently a high stability (Davis & Franzoi, 1991; Farrell & Vaillancourt, 2020), perspective-taking ability is subject to the natural stages of cognitive development (Eisenberg et al., 2005). Jean Piaget (1932) and also George H. Mead (1934) already referred to the ability to take perspectives (“ability to decenter”) as part of social and cognitive development. Selman (1980) showed several levels of socio-moral development in the ability to socially take perspective: Between the ages of three and eight, children have only undifferentiated assumptions about the thoughts and motives of others; they do not distinguish between external behavior and internal drives. At this early age, they can already recognize the basic emotions of fear, sadness, and joy from facial expressions (Silbereisen, 1995), but they do not yet distinguish between their own and others' reactions in certain situations. Only at the age of about seven to twelve years does the ability to see oneself from the perspective of another develop, accompanied by the insight that emotions can also be feigned or that competing experiences (e.g., curiosity and insecurity) can also occur in parallel. The highest level according to Selman (ibid.) is the social-symbolic PT and describes the realization that “not all motives and emotions can be self-reflexively accessed and relationships between people can exist on multiple levels (superficial to deeper)” (Jerusalem & Klein-Heßling, 2002, p. 166).

Even if EC in particular shows a (not uncontroversial) high stability, this does not mean that no developments take place. Especially the period of adolescence has a strong influence on emotional empathy because of the experienced changes in emotional interaction within

peer-groups or the family or somewhat later in first love relationships (Choudhury et al., 2006). Davis and Franzoi (1991) described an almost linear increase in both EC and PT within a 4-year period of adolescence, whereas Eisenberg et al. (2005) spoke of EC remaining constant while PT increased sharply. Similar results were found by Van der Graaff et al. (2018) specifically in girls, whose EC remained relatively stable but weakened in boys during the 13- to 16-year age phase but increased thereafter. Gruhn et al. (2008), in turn, showed that there were no significant changes in the increase in empathy, but significant differences in the variance of the increase. This finding in particular suggests that there may be individual differences in development within the empathy factors, such that some subjects may experience an increase in empathic abilities during development, while others may experience a decrease.

In their 6-year longitudinal study of adolescents aged 13 to 19, Van Lissa et al. (2015) looked at affective and cognitive factors in their interplay. The combination of empathic involvement and perspective taking led to the identification of three groups of developmental trajectories: “The majority of adolescents showed an average empathy trajectory characterized by lower, stable empathic involvement and a slight increase in perspective taking (60.6% overall; 42% girls). The second largest group exhibited a high empathy trajectory characterized by the highest scores in both empathic sympathy and perspective taking, with the greatest increase in perspective taking from early to mid-adolescence (i.e., ages 13 to 16 years; 22.5% overall; 29% girls). The smallest group exhibited a low empathy trajectory, characterized by the lowest scores for both forms of empathy and a decrease in both forms from early to middle adolescence, followed by an increase from middle to late adolescence (i.e., ages 16 to 18; 16.9% overall, 63% girls)” (Farrell & Vaillancourt, 2020, p. 3). The aforementioned authors replicated the study by Van Lissa et al. (2015) and extended it to include latent-class analysis procedures, but were able to confirm the aforementioned findings. Also in their study, EC scores remained stable in most subjects, whereas PT ability increased moderately.

While the development of empathic abilities during childhood and adolescence has been fairly well studied, there have been few studies describing changes in empathic abilities into old adulthood. On the one hand, older adults were shown to have better emotion regulation than younger adults, so they may have had better emotional understanding of others (Carstensen et al., 2000); on the other hand, there is evidence that information processing of complex emotional processes decreases in older people (Labouvie-Vief & Marquez, 2004). Using data from three longitudinal studies over a combined 40 years, Helson et al. (2002) were able to show that there was a slight but significant decline in the expression of both cognitive and affective empathy factors, which was mainly due to the female subjects: “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 $d = .48$)” (Gruhn et al., 2008, p. 2). However, this trend could not be confirmed in the Oakland Growth and Berkeley Guidance Studies, where there were virtually no changes between measurement time points (Cohen's $d = .02$) (Helson et al., 2002).

From these findings, we can infer that there should be age-related differences, especially in the cognitive empathy components.

2. Method

2.1 Sample

The sample consisted of a total of 9 157 subjects, 2 878 males and 6 279 females. The sample was divided into developmentally relevant age sections with the following sizes:

Table 1. Age groups and sample sizes

Age	< 15 Y.	16-21 Y.	22-26 Y.	27-33 Y.	34-40 Y.	41-60 Y.	> 60 Y.
N	414	3 546	2 135	1 275	679	1 026	82

2.2 Measures

To measure empathy, we used the German version of Davis' (1983b) Interpersonal Reactivity Index, the Saarbrücken Personality Questionnaire SPF (Paulus, 2009, 2012, 2023; Paulus & Meinken, 2022a). It captures in an optimized version the four factors of empathy described in Davis (1980): Emotional Concern (EC) and Personal Distress (PD) as affective, Perspective Taking (PT) and the Fantasy Scale (FS) as cognitive factors. The latter scale is not controversial because its items contain both cognitive (“I can very well imagine the feelings of a person in a novel”) and affective (“I really get involved with the feelings of the characters in a novel”) formulations. In addition to the four variables, we also determined a general empathy score according to Cliffordson (2002), which was calculated as Empathy (EM) = EC + PT + FS.

There were 4 items per factor with a 5-level response option from “1: never true” to “5: always true”. The German version has good internal reliability criteria (all Cronbach's alpha > .75) and high validity (Koller & Lamm, 2015; Paulus, 2009, 2012, 2016).

The data collection took place anonymously partly in paper-pencil form, partly online.

3. Results

3.1 Statistical Methods

To test for differences in means between age groups, we used the analysis of variance (ANOVA) procedure with Bonferroni correction. “Bonferroni correction” is a procedure in mathematical statistics for adjusting the significance levels of individual tests in multiple testing to counteract alpha error accumulation and to maintain a predetermined significance level for the average hypothesis.

3.2 Empathic Concern (EC)

Table 2. Descriptive statistics EC

	N	Mean	Std. Deviation	Std. Error
(1) < 15 Y.	414	13.79	3.41	.16
(2) 16-21 Y.	3 546	14.88	3.06	.05
(3) 22-26 Y.	2 135	14.82	3.01	.06
(4) 27-33 Y.	1 275	14.60	2.94	.08
(5) 34-40 Y.	679	14.53	3.05	.11
(6) 41-60 Y.	1 026	14.75	3.03	.09
(7) > 60 Y.	82	14.55	3.12	.34
Total	9 157	14.73	3.05	.03
Model	Fixed Effects		3.04	.03
	Random Effects			.13

ANOVA revealed an overall significant effect between groups ($F_{6; 9\ 150} = 9.17, p < .001$). The “under 15 years” age group was significantly different from all others except the “over 60 years” age group. EC scores between the remaining age groups did not differ. This is consistent with the expectation of relative stability of the affective empathy component.

3.3 Perspective Taking (PT)

Table 3. Descriptive statistics PT

	N	Mean	Std. Deviation	Std. Error
(1) < 15 Y.	414	12.77	3.57	.17
(2) 16-21 Y.	3 546	14.37	3.18	.05
(3) 22-26 Y.	2 135	14.76	3.08	.06
(4) 27-33 Y.	1 275	14.74	3.12	.08
(5) 34-40 Y.	679	14.32	3.31	.12
(6) 41-60 Y.	1 026	14.57	3.19	.10
(7) > 60 Y.	82	14.33	3.35	.37
Total	9 157	14.46	3.21	.03
Model	Fixed Effects		3.18	.03
	Random Effects			.23

ANOVA revealed an overall significant effect between groups ($F_{6; 9150} = 25.08, p < .001$). Post hoc tests confirmed the difference between the “under 15” to all other groups. In addition, there were small significant differences between (2), (3), (4), and (5) (see Table 4).

Table 4. Significant mean differences - **PT**

(I) age groups	(J) age groups	Mean Difference (I-J)	Std. Error	Sig.
(1) < 15 Y.	(2) 16-21 Y.	-1.60	.16	<.001
	(3) 22-26 Y.	-1.98	.17	<.001
	(4) 27-33 Y.	-1.97	.18	<.001
	(5) 34-40 Y.	-1.55	.19	<.001
	(6) 41-60 Y.	-1.79	.18	<.001
	(7) > 60 Y.	-1.56	.38	.001
	(2) 16-21 Y.	(3) 22-26 Y.	-.38	.08
(4) 27-33 Y.		-.37	.10	.007
(3) 22-26 Y.	(5) 34-40 Y.	.43	.14	.041

3.4 Personal Distress

Table 5. Descriptive statistics **PD**

	N	Mean	Std. Deviation	Std. Error
(1) < 15 Y.	414	11.73	3.38	.16
(2) 16-21 Y.	3 546	11.38	3.41	.05
(3) 22-26 Y.	2 135	11.25	3.43	.07
(4) 27-33 Y.	1 275	11.28	3.38	.09
(5) 34-40 Y.	679	11.74	3.58	.13
(6) 41-60 Y.	1 026	11.45	3.58	.11
(7) > 60 Y.	82	10.52	3.39	.37
Total	9 157	11.38	3.44	.03
Model	Fixed Effects		3.44	.03
	Random Effects			.08

ANOVA revealed an overall significant effect between groups ($F_{6, 9150} = 3.59, p < .001$). For this variable, only groups (3) and (5) differed from each other. It is interesting to note that the youngest subjects already had values similar to those of all other age groups.

3.5 Fantasy Scale (FS)

Table 6. Descriptive statistics FS

	N	Mean	Std. Deviation	Std. Error
(1) < 15 Y.	414	15.14	3.615	.178
(2) 16-21 Y.	3 546	14.45	3.675	.062
(3) 22-26 Y.	2 135	14.10	3.429	.074
(4) 27-33 Y.	1 275	13.64	3.534	.099
(5) 34-40 Y.	679	13.18	3.800	.146
(6) 41-60 Y.	1 026	13.29	3.635	.113
(7) > 60 Y.	82	12.50	3.785	.418
Total	9 157	14.05	3.641	.038
Model	Fixed Effects		3.603	.038
	Random Effects			.300

ANOVA revealed an overall significant effect between groups ($F_{6, 9150} = 33.31, p < .001$). There were the largest differences observed in FS (see table 7), where it is noticeable that the mean values of the age groups are steadily decreasing. This is the only variable where the youngest subjects show the highest value.

Table 7. Significant mean differences - FS

(I) age groups	(J) age groups	Mean Difference (I-J)	Std. Error	Sig.
(1) < 15 Y.	(2) 16-21 Y.	.69	.18	.004
	(3) 22-26 Y.	1.04	.19	<.001
	(4) 27-33 Y.	1.50	.20	<.001
	(5) 34-40 Y.	1.96	.22	<.001
	(6) 41-60 Y.	1.85	.21	<.001
	(7) > 60 Y.	2.64	.43	<.001

(2) 16-21 Y.	(3) 22-26 Y.	.35	.09	.008
	(4) 27-33 Y.	.80	.11	<.001
	(5) 34-40 Y.	1.27	.15	<.001
	(6) 41-60 Y.	1.16	.12	<.001
	(7) > 60 Y.	1.95	.40	<.001
(3) 22-26 Y.	(4) 27-33 Y.	.45	.12	.007
	(5) 34-40 Y.	.92	.15	<.001
	(6) 41-60 Y.	.81	.13	<.001
	(7) > 60 Y.	1.60	.40	.002

3.6 Empathy (EM)

Table 8. Descriptive statistics - EM

	N	Mean	Std. Deviation	Std. Error
(1) < 15 Y.	414	41.70	8.373	.412
(2) 16-21 Y.	3546	43.70	7.694	.129
(3) 22-26 Y.	2135	43.67	7.524	.163
(4) 27-33 Y.	1275	42.98	7.694	.215
(5) 34-40 Y.	679	42.03	8.256	.317
(6) 41-60 Y.	1026	42.60	8.032	.251
(7) > 60 Y.	82	41.38	8.569	.946
Total	9157	43.23	7.801	.082
Model	Fixed Effects		7.776	.081
	Random Effects			.362

ANOVA revealed an overall significant effect between groups ($F_{6; 9150} = 10.74, p < .001$). We observe significant jumps in mean scores between age groups here (see table 9). It should be noted, however, that the formation of an overall empathy score is quite controversial (Cliffordson, 2002; Paulus, 2012), as the direct influences of the respective components on the overall score cannot be determined directly.

Table 9. Significant mean differences - EM

(I) age groups	(J) age groups	Mean Difference (I-J)	Std. Error	Sig.
(1) < 15 Y.	(2) 16-21 Y.	-1.99	.404	<.001
	(3) 22-26 Y.	-1.97	.418	<.001
(2) 16-21 Y.	(5) 34-40 Y.	1.66	.326	<.001
	(6) 41-60 Y.	1.09	.276	.001
(3) 22-26 Y.	(5) 34-40 Y.	1.64	.343	<.001
	(6) 41-60 Y.	1.07	.295	.006

4. Discussion

In this study, we wanted to show how different the mean scores of the four empathy components EC, PT, FS, and PD are in age groups younger than 15 and older than 60. We were able to show that the youngest group in particular consistently has the weakest expressions, with the exception of the FS variable. However, it is also difficult for adolescents under 15 years of age to answer the items of the questionnaire, since these items are rather trait- or experience-oriented, therefore possibly still unknown (example: “In delicate situations, I tend to lose control over myself” or “When I see someone being taken advantage of, I believe I have to protect them.”).

These findings are in line with Eysenck et al. (1985) or also Ze et al. (2014) and are somewhat in contrast to other studies that speak of declining empathy in older age (Helson et al., 2002; von Hippel et al., 2000; Ziaei et al., 2021). However, it is important to note which methods and procedures have been used to measure empathy. This ranges from retrospective autobiographical interviews (Gluck et al., 2005) to longitudinal or cross-sectional data from questionnaires (Diehl et al., 1996; Gruhn et al., 2008). “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.” (Gruhn et al., 2008, p. 753).

In particular, the affective factors EC and PD proved to differ little between age groups, which in turn seems to confirm the relative stability of the affective empathy factors. Here, even the younger group did not differ from the respective older group, confirming the assumption of early genetic disposition of affective empathy (Davidov et al., 2013; Knafo et al., 2008; Melchers et al., 2016; Zahn-Waxler et al., 1992). In contrast, the low score of group

(1) on perspective taking indicates that PT as a cognitive skill is subject to developmental change during adolescence (Eisenberg et al., 2005; Farrell & Vaillancourt, 2020; Zahn-Waxler et al., 1992), which is the basis of many empathy trainings, among others (Bas-Sarmiento et al., 2017; Mehta et al., 2021; Paulus & Meinken, 2022b). In contrast, empathizing or engaging in fictional stories appears to be a strength of younger people, as indicated by steadily decreasing FS scores. This decrease was also described by Melchers et al. (2016, p. 724), among others, who found a negative correlation between FS and age ($r = -.37, p < .001$) on a sample with subjects between 17 and 58 years old. Slightly lower, but with also negative direction proved the correlation between PD and age ($r = -.22, p < .001$).

Finally, we take a look at the empathy score EM. The large fluctuations in the mean values can be seen as an indication that such a score cannot be interpreted in a very meaningful way. It is composed of the sum of the affective factor EC, the cognitive factor PT, and the factor FS, which is found in the literature to be not clearly assignable (S. Baron-Cohen & S. Wheelwright, 2004; De Corte et al., 2007; Lawrence et al., 2004). Thus, while linking affective and cognitive traits that are moderately strongly correlated (De Corte et al., 2007; Paulus, 2012), one blurs this mix by means of FS, which remains ambiguous even in Davis's (1983b) theory. High or low expressions of the overall empathy scale cannot therefore be unambiguously explained because these scores may have ambiguous causes and are therefore not very reliable from a diagnostic point of view. Thus, in agreement with Cliffordson (2002), we advise against the formation of an overall score and recommend considering the four empathy factors separately.

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