Reading Thoughts and Feelings in Other People – Empathic Accuracy Across Adulthood

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Abstract

Empathy is a multifaceted trait. One facet is cognitive empathy, the ability to accurately infer others' thoughts and feelings (also referred to as empathic accuracy). It is associated with markers of positive adjustment, such as satisfaction with social relationships, in earlier phases of the lifespan. In previous research, empathic accuracy was less pronounced in older than in younger adults. We review evidence for such age differences and argue for the importance of ecological validity in age-comparative research. Furthermore, we discuss factors that may contribute to empathic accuracy, such as cognitive abilities or (assumed) similarity with a social partner, and discuss their potentially differential role in different age groups. We especially highlight the role of motivation (e.g., the age-relevance of a task). Assuming that older adults sometimes are less empathically accurate, there is little evidence that this particularly compromises older adults' social lives and overall adjustment. Moreover, a lack of longitudinal research raises the question whether age differences point to an age-related trajectory or to cohort differences. Thus, promising avenues for future research include the use of cohort-sequential, ecologically valid, and motivating paradigms to understand in which situations empathic failures impair older adults in their daily lives.

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"Empathy is a quality of character that can change the world."

Barack Obama in his commencement address at the University of Massachusetts, 2006

As the quote illustrates, empathy is a highly valued character trait. However, there is no consensus on what empathy really *means*, and there is a plethora of scientific definitions for it. Many scientists agree that it is a multifaceted psychological construct that has at least two components: *cognitive* and *emotional or affective* empathy (e.g., Decety & Jackson, 2004). Cognitive empathy pertains to an understanding of the mental states, thoughts, and feelings of other individuals. Emotional empathy pertains to the sharing of others' feelings (also termed experience sharing, Zaki & Ochsner, 2012, or emotional congruence, Wieck & Kunzmann, 2015). Some researchers refer to the sharing of emotional experiences simply as *empathy* without taking other components into account (e.g., Bloom, 2017; Singer & Klimecki, 2014).

Two other components, which are sometimes also subsumed under the term of emotional empathy, are *empathic concern* and *personal distress.* Empathic concern describes a compassionate emotional response of caring about the other person's well-being (Davis, 1983; also referred to as sympathy/prosocial concern, e.g., Zaki & Ochsner, 2012). Personal (empathic) distress is a negative reaction towards the feelings of another person, characterized by anxiety and discomfort (Davis, 1983). However, many researchers argue that empathic concern (or compassion) and distress are distinct from emotional empathy: Whereas the latter pertains to the sharing of emotional experience (which could be positive or negative), empathic concern refers to positive other-related feelings and distress refers to negative self-related feelings (e.g., Singer & Klimecki, 2014).

Accumulated evidence suggests that empathy develops and evolves not only during the early years of life, but also throughout the adult lifespan (see e.g., O'Brien et al., 2013). However, such development may be facet-specific and multidirectional. Components of emotional empathy have been found to be comparable (or even elevated) in advanced adult age as compared to younger adult age groups (e.g., Sze et al., 2012). In contrast, findings on age differences in cognitive empathy are more diverse and complex, suggesting that, overall, older adults demonstrate lower cognitive empathy as measured with the prevailing psychological methods. This is alarming, given that cognitive empathy has been associated with various indicators of positive adjustment in younger individuals, most notably, socio-emotional adjustment, such as prosocial behavior in children (e.g., Caputi et al., 2012) or relationship well-being in adolescents and adults (e.g., Carton et al., 1999; Cohen et al., 2012; see Sened et al., 2017, for a meta-analytic review). Deficits in cognitive empathy, on the other hand, have been observed in populations with adjustment problems, for example, abusive men (Schweinle et al., 2002), individuals with schizotypal personality disorder (Ripoll et al., 2013), or with autism (e.g., Dziobek et al., 2008). It is, however, important to acknowledge that cognitive empathy is strongly influenced by motivation (e.g., Ickes, 2011). In fact, there can be occasions at which it may be more adaptive to be empathically *inaccurate* rather than accurate. For example, in situations that were construed as relationship threatening, motivated inaccuracy was associated with greater relationship satisfaction in couples (Simpson et al., 1995).

In this chapter, we review evidence on age differences in cognitive empathy and embed these findings into a theoretical scaffold of potential contributing factors to such age differences. We take an integrative approach by considering related and overlapping psychological constructs stemming from different research traditions using diverse methodological approaches. We show that age differences are more pronounced when using certain approaches than others. We discuss these different approaches with a special focus on

empathic accuracy (Ickes et al., 1990), which pertains to the level of accuracy that people achieve in understanding other's thoughts and feelings. We then dissect how and when individuals can be empathically accurate and how factors contributing to empathic accuracy can differ between adults from various age groups. We also highlight potential consequences of an age-related decline in cognitive empathy for older adults. We close with a word on potential cohort effects and with an outlook on future routes for this line of research.

Adult age difference in cognitive empathy

The scientific inquiry of cognitive empathy comprises different research traditions that have used various research methods to investigate this trait. The constructs investigated differ in the spectrum of phenomena that they cover, their theoretical underpinnings, and their assessment methods. The overarching construct of *cognitive empathy,* which describes the ability to understand another person's perspective (thoughts, feelings, intentions, and so forth), was originally assessed via trait self-report measures (e.g., the facet *perspective taking* in the Interpersonal Reactivity Index; Davis, 1983). Based on such self-report measures, there is some evidence that older adults tend to describe themselves as less empathic than younger adults in general (e.g., Grühn et al., 2008), and specifically with regard to their self-reported cognitive empathy (e.g., Bailey et al., 2008).

However, measuring empathy with self-report measures has a number of limitations. First, such measures reflect individuals' beliefs about themselves (their self-concepts), which may not necessarily correspond with their actual empathic abilities in specific situations. Many people think of empathy as a highly desirable trait, which could make them answer self-report measures in a socially desirable way, overestimating their empathy. Particularly gender norms may play a role in this regard, as women often rate their empathy higher than men (e.g., Ickes et al., 2000b) — a trend that seems to intensify in early adolescence, when gender role expectations become more salient (Van der Graaff et al., 2014). Indeed, when comparing self-reported cognitive empathy measures with performance-based measures, there is often little

overlap, which could indicate that individuals' insight into their own empathy is limited (Ickes et al., 2000a). One could speculate that the value of empathy as a desirable character trait may be more pronounced in younger than in older generations, as parenting styles have become less disciplinary and expression of, and communication about, emotional states more common (see also section *A word on cross-sectional age-comparative designs*). Second, the Interpersonal Reactivity Index as the most frequently used measure of empathy assesses cognitive empathy in a way that could also be interpreted as empathic motivation rather than an actual empathic ability (e.g., item 8: *I try to look at everybody's side of a disagreement before I make a decision.*). Other trait empathy measures do not differentiate between different empathy facets, such as emotional and cognitive empathy (e.g., the Empathy Quotient; Baron-Cohen & Wheelwright, 2004). However, as different empathy facets may evolve differentially with advancing age, distinguishing them is key to studying developmental changes.

When measured with performance-based methods, evidence for age-related differences in cognitive empathy is based mainly on emotion recognition and Theory of Mind tasks. *Emotion recognition* (ER) refers to how accurately individuals can identify others' nonverbally expressed emotions. It is most typically assessed using static pictures of individuals posing in prototypic expressions of highly intense basic emotions (e.g., happiness, anger, or sadness) as stimuli (e.g., Ekman & Friesen, 1976). In these tasks, participants are usually instructed to indicate which basic emotion is depicted in each picture using multiple-choice answering formats. Numerous studies using this, or similar, paradigms have yielded a relatively homogenous picture of adult age differences in ER. A meta-analysis by Ruffman et al. (2008) showed that younger adults (mean age between 19 and 29 years) outperform older adults (mean age between 65 and 76 years) in recognizing not only posed facial, but also bodily and vocal, expressions. Age differences were most evident for the emotions anger and

sadness; somewhat less pronounced regarding fear, surprise, and happiness; and non-existent for disgust.

Theory of Mind (ToM), in comparison, refers to the inference of other people's mental states (Premack & Woodruff, 1978). ToM is often measured by having participants read vignettes or stories of false beliefs, faux-pas (social blunder) situations, or complex social interactions. An exemplary story features a burglar who robbed a shop and is stopped by a policeman (Happé et al., 1998). The burglar immediately admits to the crime, although the policeman just wanted to tell him that he dropped his glove. After reading the story, participants are asked to describe the intentions and mental states of the protagonist (in this case, the burglar). Another approach to measuring ToM is similar to ER tasks. Instead of pictures of emotional facial expressions, participants are presented with pictures of individuals' eye regions, and are asked to infer their mental states (including affect) using a multiple-choice answering format (e.g., "Reading the Mind in the Eyes", RMET; Baron-Cohen et al., 2001). Among others, Walter (2012) differentiated between cognitive and affective ToM, the former pertaining to the inference of thoughts, the latter to the inference of affect (the RMET being an example of affective ToM). A meta-analytic review on age differences in ToM revealed that younger adults also outperformed older adults in various ToM tasks, including both affective and cognitive ToM (Henry et al., 2013).

As compared to self-report measures, both ER and ToM tasks have the methodological advantage of using performance-based indicators. However, these tasks have also been criticized for various reasons, most notably, their limited ecological validity. Ecological validity pertains to the generalizability of behavior from the context of an empirical study to the real world. Kunzmann and Isaacowitz (2017) differentiate between two types of ecological validity in psychological research: validity of the stimuli and validity of the setting. Most criticism of age-differential research on cognitive empathy pertains to the validity of the stimuli. ER tasks were traditionally based on still pictures taken of mostly younger individuals

posing with stereotypical expressions of basic emotions. In real life, however, emotional expressions are usually dynamic and not stereotypical (e.g., a full blown anger expression can rarely be observed in actual interactions, as anger is typically expressed more subtly in accordance with social display rules). Similarly, ToM tasks are often based on contrived stories that are of little relevance to the participants. Likewise, such tasks have been criticized for their lack of ecological validity (Dziobek, 2012). With regard to age-differential research, it has been argued that older adults may invest their cognitive resources, some of which are known to decline with increasing age (e.g., Salthouse, 2004), selectively in tasks that they find personally relevant (e.g., Hess, 2006). This may not be the case with regard to most ER or ToM tasks. Others have argued that limited ecological validity may disadvantage older adults more than younger adults (Rauers et al, 2013; Riediger et al., 2014). This argument builds on evidence that age differences in various types of cognitive performance are more pronounced for artificial problems than for ecologically valid problems that older adults encounter in their daily lives (e.g., Kliegel et al., 2007; Phillips et al., 2006). This effect might generalize to differences between artificial and ecologically-valid ER and ToM tasks as well. Furthermore, it has been argued that older adults may be better in judging the thoughts and feelings of individuals their own age (own-age bias; e.g., Riediger et al., 2011).

More recent studies have attempted to address these various methodological concerns. Various studies using stimuli with same-age protagonists and dynamic emotional expressions have replicated the finding of younger adults outperforming older participants (e.g., Riediger et al., 2011; Riediger et al., 2014), but still were limited in their ecological validity. Thus, the research on age differences in cognitive empathy gradually turned towards studying the more ecologically-relevant concept of *empathic accuracy*, which was introduced by William Ickes and colleagues (Ickes et al., 1990). It has addressed some of the problems of ER and ToM, and differs from these constructs in some ways. Defined as the correct inference of others' thoughts and feelings, it covers a complex phenomenon (unlike, for example, the more

circumscribed construct of ER). Importantly, it is based on paradigms that have a relatively high ecological validity. Two major measurement approaches to empathic accuracy have been used (for an overview, see, e.g., Rollings et al., 2011): the standard-stimulus video paradigm (e.g., Marangoni et al., 1995) and the (unstructured) dyadic interaction paradigm (e.g., Ickes et al., 1990).

The standard-stimulus video paradigm uses pre-recorded clips of target persons talking about personal experiences. Afterwards, the targets review the video tape and indicate moments at which they remember having had a thought or feeling (using an open answer format). These videos are then shown to participants (the perceivers), and the video is stopped at occasions when the targets indicated a thought/feeling. Participants try to infer the target's thoughts/feelings at these tape stops. The agreement between the self-report of the target person and the perceiver is established by external raters and serves as the indicator of empathic accuracy. Originally, tapes showing simulated therapy sessions, in which four target individuals talked about ongoing personal problems with a licensed therapist and expressed genuine emotions, were used as stimulus material (Marangoni et al., 1995). The paradigm is thus quite similar to traditional ER or ToM designs (and sometimes the terminology is used interchangeably). However, since real emotional experiences are expressed in a dynamic way, it can be considered to be more ecologically valid than most ER or ToM stimuli. Nevertheless, the standard-stimulus paradigm lacks a central dimension of real-life emotion communication—namely, the communication dynamic that evolves between specific interaction partners discussing emotional experiences, and that adds to empathic accuracy in a given interaction above and beyond the perceiver's typical empathic ability and the sender's typical empathic readability (Back & Kenny, 2010). That is, although the standard-stimulus paradigm is more ecologically valid than previous approaches to measuring empathy with respect to the validity of the stimuli, the paradigm still lacks validity of the setting.

A more ecologically valid method in terms of the setting which enables researchers to study empathy within a conversation is the dyadic interaction paradigm. Here, a conversation between two individuals is videotaped and then reviewed by both conversation partners. When first reviewing the video tape, both partners independently indicate moments at which they remember having had a thought or feeling. Both partners then separately review the tapes a second time. This time, the tape is stopped at occasions when the participants' partners indicated a thought/feeling and participants try to infer it. Both partners are thus perceivers and targets in this paradigm. The agreement between the self-report of one person and their partner's judgment is, again, established by external raters and serves as the indicator of empathic accuracy. This paradigm is arguably more ecologically valid in terms of the setting, as empathic accuracy is measured based on a conversation in which the participants played an active role (as in real life). Importantly, in both paradigms, the criterion for accuracy is the self-report of the target. However, one potential disadvantage of the dyadic interaction paradigm is its unknown reliability. In the standard-stimulus paradigm, all perceivers judge a range of targets, usually with acceptable reliability across targets (e.g., Kunzmann et al., 2018, obtained a Cronbach's alpha of .73 across nine stimuli). The dyadic interaction paradigm, in contrast, is usually based on one interaction with a specific target person. It is not clear in how far the empathic accuracy of the perceiver, which is also shaped by the readability of the sender and the specific relationship between perceiver and sender, can be generalized beyond this specific interaction. It may thus rather represent a state measure of empathy than a trait measure. Ideally, the dyadic interaction paradigm should therefore be repeated with several different partners. To our knowledge, this has only been done in one prior study with young adult participants so far (Buysse & Ickes, 1999). This study, however, was likely underpowered given the complex multifactorial study design (Lashley & Kenny, 1998).

These two empathic accuracy paradigms have been modified in various ways. Notably, many aging researchers have developed new stimulus material for the standard-stimulus

paradigm, focusing on empathic accuracy for feelings only. Instead of open-open answer formats, continuous rating dials (e.g., Levenson & Ruef, 1992) or emotion rating scales (e.g., Richter & Kunzmann, 2011) were used. Furthermore, new methods of assessing empathic accuracy are being developed. For example, the experience-sampling method was used to repeatedly ask both members of a couple about their own feelings in daily life, and about the inferred feelings of their partners, making it possible to compare the self-rating of one partner with the inferred partner rating of the other partner to calculate accuracy (e.g., Hülür et al., 2016; Rauers et al., 2013; Wilhelm & Perrez, 2004). Although experience-sampling is arguably the most ecologically valid method with respect to the setting, it is not without limitations. For example, it can only be used to study empathic accuracy in individuals who know / interact with each other (currently only couples).

Using empathic accuracy paradigms has led to new insights into adult age differences in cognitive empathy. Although empathic accuracy (like ER and ToM) also seems to be lower in older adults, various factors may attenuate these age differences. As Stanely and Isaacowitz (2015) summarized it, *knowing more* and *caring more* are essential ingredients. In other words, when older adults are presented with ecologically-valid, age-relevant tasks that give them the opportunity to use all their sources of accuracy, and that motivate them to do their best, age differences in empathic accuracy may occur only under select conditions (e.g., Blanke et al., 2015; Rauers et al., 2013) or even become non-existent (e.g., Wieck & Kunzmann, 2017). In a few cases, the age-differential pattern is even reversed with older adults outperforming younger adults (e.g., Katzorreck & Kunzmann, 2018)

These results suggest that older adults may need to concentrate their resources on such tasks, more so than younger adults, to achieve high accuracy. We next highlight sources of empathic accuracy, and their possible associations with aging. We acknowledge that age is only a proxy, which stands for differences in the sources of empathic accuracy that individuals *could* and *actually do* make use of. We use these potential contributing factors to

empathic accuracy to structure our more fine-grained review of seminal findings on age differences in empathic accuracy, and thereby outline potential new pathways for future investigations.

Sources of empathic accuracy and how aging may be associated with these sources

Perceiver's empathic accuracy is shaped by many interindividual differences. However, the search for "good and poor perceivers" has so far not been very successful (Ickes et al., 2000a). For example, while women are more often more empathically accurate than men, gender differences in empathic accuracy were shown to vanish when male participants were motivated to be more accurate (e.g., Ickes et al., 2000b). In the following, we concentrate on sources of accuracy that have either been related to age differences in empathic accuracy, or other important sources that could potentially be differentially related to accuracy in different age groups. We then highlight factors that we think may have potential explanatory value for the pattern of results produced by previous research. Focusing on the more ecologically-valid empathic accuracy paradigms, we only briefly touch upon less ecologically-valid ER and ToM paradigms. Much of our discussion is centered around the perceiver (the person who makes the accuracy judgment) more than on the target (the person to be judged) since this has been the focus of most previous research (and is in line with viewing empathy as a trait). We progress from more fundamental sources of accuracy (such as hearing, vision, cognition) towards more specific sources (such as contextual factors).

Basic sensory abilities (hearing, vision). In most paradigms, necessary bases for accuracy are the abilities to sufficiently see and hear. However, age differences in ER have also occurred in individual without visual impairments (e.g., Sullivan et al., 2007). Similarly, hearing difficulty did not explain age-differences in auditory ER (Orbelo et al., 2005). Furthermore, many age-comparative studies control for age-related differences in vision and hearing. Thus, reported age differences cannot be attributed solely to age-related declines in sensory acuity.

Cognitive abilities. Baltes (1987) differentiates between two types of cognitive abilities: cognitive mechanics and cognitive pragmatics. *Cognitive mechanics* or fluid abilities pertain to basic information processing, which is strongly intertwined with neurobiological processes (e.g., processing speed). Such abilities are known to decline with older age. The other facet in Baltes' theory, *cognitive pragmatics,* pertains to crystalized abilities like knowledge (e.g., vocabulary or specialized knowledge about a certain topic), and are known to increase throughout large proportions of the adult lifespan and then stay stable with increasing age. Only when the cognitive mechanics fall below a critical functional threshold, cognitive pragmatics also start to decline. Both facets play an important role for empathic accuracy.

Cognitive mechanics. To achieve empathic accuracy, individuals need to have the cognitive capacity to pay attention to the relevant information, process it, and hold it in memory (e.g., Ickes, 1997). These abilities map onto cognitive mechanics, and it seems plausible to assume that, in part, age differences in cognitive empathy could be attributable to an aging-related decline in such cognitive abilities. Indeed, research on related constructs, such as ER, has shown that cognitive decline affects performance; however, it did not fully account for age-group differences in emotion recognition (Ruffman et al., 2008). There is also first evidence that an age-related cognitive decline in emotion recognition may be associated with changes in the brain. A study by Williams et al. (2006) showed that a lower performance in the recognition of fear was associated with a reduction in grey matter in older adults. In line with these findings from the ER literature, research on associations between cognitive mechanics and empathic accuracy is emerging. In in a sample of 86 older couples (mean age 75 years), a lower performance in a task that measures cognitive mechanics (the Digit Symbol test) was related to lower empathic accuracy for happiness in older men, but not women, in daily life as measured with experience sampling (Hülür et al., 2016). Evidence for the impact of an age-related cognitive decline in men also comes from a recent study by Kunzmann et al.

(2018). In this study, a sample of 151 participants, comprised of adolescents (mean age 16 years), younger (mean age 29 years) and middle-aged (mean age 50 years) men[1], completed a video-based standard-stimulus empathic accuracy task. Younger men outperformed both adolescents and middle-aged men, and these differences in task performance were related to differences in cognitive mechanics (measured with a composite score of two tasks pertaining to speed and logical reasoning). Overall, lower scores in cognitive mechanics seem to be associated with worse performances in empathic accuracy tasks, at least in men. However, as we point out below, diverse factors can contribute to differences in empathic accuracy, which can potentially buffer the effects of declining cognitive mechanics in older adults.

Cognitive pragmatics. As mentioned above, empathic accuracy also depends on cognitive pragmatics (or crystallized abilities, such as knowledge about the world) that stay stable into old age (Baltes, 1987). In the following, we differentiate between three types of knowledge: general verbal abilities, stereotypical knowledge about social interactions or social interaction partners, and knowledge about specific interaction partners.

In their study, Kunzmann et al. (2018) also showed that *verbal ability* (as a global indicator of cognitive pragmatics) was related to empathic accuracy. These results are in line with earlier work by Ickes et al. (2000a) suggesting that verbal intelligence predicts empathic accuracy in men. This may be due to the fact that most information in empathic accuracy paradigms lies in the auditory, and specifically the verbal, information (e.g., Gesn & Ickes, 1999; Zaki et al., 2009). Having a good understanding of verbal information may therefore be helpful. However, general verbal abilities (vocabulary) may be a rather remote and indirect indicator of the relevant facets of knowledge. To achieve accuracy about a particular person in a specific situation, the perceiver may need more specific knowledge about this person and/or the situation the person is in. As a study by Lewis et al. (2012) showed, empathic accuracy about certain topics (in this case, how new mothers feel) can be driven by *stereotypical knowledge* as some of the targets may have thoughts that align with common stereotypes.

Having had similar experiences (in this case, being a mother themselves) increased accuracy at predicting such stereotypical attitudes, but not other individual thoughts (Hodges et al., 2010). It has yet to be shown whether such stereotypical knowledge differentially affects accuracy in different age groups. However, with increasing age, individuals accumulate social expertise (e.g., Hess, 2006). It may thus be the case that older adults can rely on such knowledge to a similar degree as younger adults.

To be empathically accurate, individuals also benefit from *specific knowledge* about the individual(s) in question. The better people know each other, the higher their empathic accuracy; for example, friends perform better than strangers (Stinson & Ickes, 1992). Also, within a conversation, empathic accuracy is usually higher at the end than at the beginning (Gesn & Ickes, 1999). As knowledge (cognitive pragmatics) is typically maintained throughout much of adulthood, and only declines in very advanced age, age differences in empathic accuracy can be reduced when older adults judge familiar individuals as compared to when they judge strangers (Stanley & Isaacowitz, 2015). This is also in line with results from an experience-sampling study by Rauers et al. (2013). In this study, couples rated their own feelings as well as their partners' feelings six times a day for several days in daily life using smart-phones. Partners rated each other's feelings when the other partner was present, but also when the partner was absent. When the partner was absent, the couples could only use their knowledge about each other to make their judgments. In these instances, couples were more accurate than chance, and there were no age differences in empathic accuracy, suggesting that older adults' knowledge about their partners was comparable to younger adults. Interestingly, while younger adults' levels of empathic accuracy were significantly higher when their partner was present, this was not the case for older adults. Possibly, older adults overly rely on their knowledge about each other.

In sum, there is some evidence that cognitive pragmatics in a very general sense (verbal abilities) as well as with regard to more specific components of knowledge about

persons or situations plays a role in empathic accuracy. Older adults seem to profit from this source of accuracy at least as much as younger adults do, so cognitive pragmatics does not explain age differential patterns in empathic accuracy. As we point out below, there are also other reasons apart from knowledge that may contribute to higher scores in empathic accuracy for familiar partners, and such reasons may also be different in younger and older adults.

(Assumed) Similarity. Another reason why individuals who are more familiar with each other are more empathically accurate is assumed or real similarity. When individuals make judgments about the thoughts and feelings of another person, they can use their own state of mind as a reference point. Depending on the real similarity between both individuals, this can prove to be a valuable source of information (see Zaki & Ochsner, 2011, for a discussion of the topic). In contrast, deliberately trying to take another person's perspective may not be as effective (Eyal et al., 2018). Similar experiences have also been shown to increase accuracy at guessing stereotypical attitudes (e.g., how new mothers feel, Hodges et al., 2009). With regard to age differences, there is some indication that older adults may rely more heavily on their own feelings when judging others, and thus show an egocentricity bias (Riva et al., 2016). In cases where perceiver and target are truly similar, this may help older adults' judgments. Rauers et al. (2013) and Blanke et al. (2015) used the truth and bias model (West & Kenny, 2011) to predict the perceiver's judgments of an interaction partner's affect by both the partner's own affect ("truth") and the perceiver's affect ("bias" or assumed similarity). Age differences persisted when controlling for possible assumed similarity. However, the authors did not investigate age differences in the use and the predictive value of assumed similarity. It is thus possible that older adults rely more on assumed similarity, but this does not seem to be the only source for age differences in empathic accuracy.

Self-monitoring and emotion differentiation. In a study by Ickes et al. (1990), a correlate of empathic accuracy was the tendency to monitor the self. A specific type of self-monitoring may be the ability to experience and label emotions in a differentiated way. A

study by Erbas et al. (2016) showed that the better individuals were able to differentiate between their own emotions, the more accurately they judged their romantic partner's emotions. Evidence for emotion differentiation in older adults has been mixed, which is partly due to the conceptualizations and statistical tools used to study the subject (Grühn et al., 2013). In a study by Brose et al. (2015), older adults' affect was less variable than younger adults' affect; taking these different levels in variability into account, older adults' differentiation may be comparable to younger adults'. However, whether age differences in emotion differentiation or self-monitoring more generally, are related to age differences in empathic accuracy has, to our knowledge, not yet been studied.

Emotional empathy/empathic concern. While it may seem likely that sharing other's feelings and experiencing empathic concern increases accuracy, evidence corroborating this assumption is sparse. Emotional empathy and cognitive empathy are two distinct constructs that have mostly non-overlapping neurological bases (Zaki & Ochsner, 2011). However, it has been shown that when making empathically accurate judgments, not only the network associated with mental state attributions (related to cognitive empathy) but also networks associated with sharing representations (related to emotional empathy) seem to be active (Zaki et al., 2009). Relatedly, empathizer's self-reported emotional concern may contribute to empathic accuracy (Zaki et al., 2008; however, see Grant et al., 2018, for a failed replication). A study by Winczewski et al. (2016) showed that empathic concern was also important when it came to responsive behaviors in couples: Only when empathic concern was high, did empathic accuracy facilitate responsive behaviors in a dyadic interaction. If emotional empathy/empathic concern can indeed increase empathic accuracy or moderate the effect of empathic accuracy on adaptive social behavior, older adults' high levels of emotional empathy, and of empathic concern and sympathy (e.g., Richter & Kunzmann, 2011; Sze et al., 2012), may be of advantage.

The role of empathic concern for older adults' empathic accuracy has, to our knowledge, not been investigated yet. However, empathic concern may also be viewed as a specific type of motivation (see Winczewski et al., 2016), which is of major importance for empathic accuracy as we review below. If empathic concern motivates older adults to be more empathically accurate, this would explain why, in certain paradigms, there are no apparent age differences in empathic accuracy.

Obtaining and using the right cues. Social exchanges hold much information that could be used to make an accurate judgment. However, accuracy will depend on the choice of cues to which one pays attention, and which one ultimately uses to make a judgment, since some cues may hold more valuable information than others. In facial ER tasks, it was sometimes shown that older adults (as compared to younger) fixate on the less informative mouth region longer than the more informative eye region (e.g., Isaacowitz & Stanley, 2011; Ruffman, 2011; Ruffman et al., 2008). However, it is not clear whether this actually hinders older adults' emotion recognition (Sullivan et al., 2007; Wong et al., 2005). A study that looked at age differences in judgments about rapport based on videotaped conversations found that, although younger and older adults did not differ in accuracy, they made use of different cues (Vicaria et al, 2015). These 18 cues (e.g., expressivity or synchrony) were rated by independent raters. These were related to the targets' reports of rapport (the criterion for accuracy, as in empathic accuracy tasks) to determine the validity of the cues for predicting rapport. Older adults made less use of invalid cues (e.g., expressivity) than younger adults.

In empathic accuracy tasks, most information can be found in the verbal information (e.g., Gesn & Ickes, 1999; Zaki et al., 2009). However, it is not clear whether younger and older adults use this verbal information differentially. A study by Wieck & Kunzmann (2017) showed that younger adults outperformed older adults in tasks that were solely based on prosodic or lexical information. However, these age differences vanished when the

information was presented in a multisensory fashion and when the task was relevant to the older adults (which we discuss below with regard to motivation).

When making judgments about others, perceivers also need to achieve the right level of detail. Whereas individuals tend to think of themselves in more detail, they tend to construe others in less detail. However, to be empathically accurate, individuals need to construe targets at the same level of detail as the targets construe themselves (Eyal & Epley, 2010). However, we know of no research that has examined age-differences in the level of construal. Assuming the other person's willingness to give this information, it has been more recently suggested that the most effective strategy in obtaining an accurate judgment is to simply *ask* the other person (Eyal et al., 2018). Since almost no age-comparative research used the dyadic interaction task (for an exception, see Blanke et al., 2015), it is not yet clear whether there are age differences in how far individuals make use of this simple, yet effective strategy. In sum, more research about which kinds of information older adults obtain and use to make their judgements is necessary to understand whether this could explain age differences in overall empathic accuracy performance.

Motivation. As mentioned with regard to studies investigating motivated inaccuracy (for an overview, see Rollings et al., 2011), motivation is crucial for empathic accuracy. Although older adults have anecdotally been described as motivated participants (Ruffman, 2011), there is evidence that a number of factors may specifically influence older adults' motivation to be accurate. As already mentioned, one major source of motivation for older adults to engage in empathic accuracy tasks may be the tasks' ecological validity (Isaacowitz & Stanley, 2011). However, empirical evidence is accumulating that context rich and realistic stimuli per se, may not entirely eliminate age differences in empathic accuracy (e.g., Richter et al., 2011; Wieck & Kunzmann, 2015). More importantly, the task needs to be of interest to older adults, who have been shown to display higher levels of empathic accuracy when the topic of the to-be-judged material was relevant to their lives (e.g., spending time with

grandchildren, Wieck & Kunzmann, 2015; experiencing losses, Katzorreck & Kunzmann, 2018). This effect of relevance was not observed for younger adults, suggesting that it is not simply due to similarity effects between observer and target, but due to motivational differences in younger and older adults. Similarly, as indicated above, it has been assumed that there may be an own-age bias when it comes to emotion recognition, that is, individuals from an in-group are easier to read than individuals from an out-group (possibly due to exposure and/or motivation). ER tasks have usually not been age fair in that they featured emotions displayed by younger, but not by older, adults. However, there is mixed evidence for the importance of including targets from different age groups (e.g., Ebner et al., 2011; Riediger et al., 2011). As also discussed above, stimuli of familiar targets are easier to read than stimuli of unfamiliar targets. However, this may also be a motivational effect as older adults may find such tasks more relevant (Stanley & Isaacowitz, 2015). This is in line with findings from two studies by Zhang et al. (2013) on performance in ToM and ER tasks. In Study 1, older adults' ToM performance was enhanced simply by having familiar individuals as experimenters. In Study 2, familiarity with the target in an ER task was manipulated by telling participants that they shared interests, which again, boosted older adults' performance.

Stanley and Isaacowitz (2015) also found that age differences in a traditional ER task were eliminated when the participants were told that they would have to explain their judgments (accountability instructions). Interestingly, this was mostly due to younger adults' performance being decreased by these accountability instructions (rather than older adults' performing better in this condition). The authors speculated that younger adults usually process emotional expressions more automatically, whereas older adults process the same information more deliberately. While accountability instructions only marginally benefited older adults' processing style, they may have caused younger adults to use a more deliberate processing style, which they may have had less experience with.

Another motivational aspect may be the valence of the to-be-judged material. In traditional ER paradigms, older adults have sometimes shown less age differences with regard to positive than negative emotions. This, however, may have been a ceiling effect since these tasks usually only included one positive emotion (happiness) that was relatively easy to differentiate from the other negative emotions (Ruffman et al., 2008). Theoretically, however, a preference for the recognition of positive versus negative emotions would be in line with socioemotional selectivity theory and research regarding the "positivity effect" (e.g., Scheibe & Carstensen, 2010). In two studies using realistic stimuli (Richter et al., 2011) or a dyadic interaction (Blanke et al., 2015), age differences were only apparent in the inference of negative, but not positive, information (in the former study, this was only the case in a context rich condition in which all informational channels could be used). In the latter study, two previously unacquainted women shared stories about positive and negative experiences. In this context, it may be reasonable for older adults, who are particularly motivated to maintain positive affect, not to tune in too much to the sorrows of the other person. However, in other studies using video stimuli, this effect was not shown (e.g., Wieck & Kunzmann, 2015). A recent study by Fung et al. (2018) suggests that perceived emotional closeness with a target may be more important than valence, at least when it comes to visual attention. That is, for emotionally closer targets, positive and negative expressions may be of a similar importance, whereas for other targets, older adults may prefer positive over negative information.

In sum, differences in motivation seem to be one of the most promising candidates in explaining age differences in empathic accuracy. However, in most cases, motivation was assumed to be the underlying factor, although it was not measured directly (e.g., by asking about it), but was inferred by the performance itself.

Differences in the target and in the perceiver-target relationship. Characteristics of the target are often neglected despite the fact that a considerable amount of variance in empathic accuracy resides in differences in the target's thoughts, rather than in the perceiver's

(Lewis et al., 2012). While we already touched upon some of the target's characteristics (such as familiarity and age of the target), one of the most important features may be the target's expressivity. In a study by Zaki et al. (2009) more expressive individuals produced more cues that were also especially effective in communicating their affective experiences. For example, since facial expressions are not very diagnostic of positive affect in social interactions (people smile a lot, e.g., to be polite), expressive individuals used more affective language when discussing positive events which led to higher empathic accuracy in perceivers. With regard to age differences, there is some indication that social partners may treat older adults more forgivingly and avoid conflict with them (Fingerman & Charles, 2010). It may thus be possible that in dyadic interaction paradigms, targets express less negative affect in the presence of older adults which makes them harder to read.

More generally, it is most likely not only qualities of the perceiver or the target that constitute empathic accuracy, but also the relationship between the two. A meta-analysis by Davis and Kraus (1997) on associations between measures of accuracy (mostly based on accuracy with regard to nonverbal emotional expressions) indicated that individuals higher in empathic accuracy are generally well-adjusted. Adjustment was measured with combined indices tapping into self-esteem, socialization, maturity, and personal adequacy. As noted, empathic accuracy is also associated with relationship satisfaction (Sened et al., 2017). Although most research on the association between empathic accuracy and such measures of socio-emotional adjustment is correlational, socio-emotional adjustment is usually seen as an outcome rather than a predictor of empathic accuracy, as we discuss next.

Potential consequences of age differences in empathic accuracy

Assuming that age differences in empathic accuracy can at least occur in situations in which older adults are not as motivated as younger adults to achieve accuracy, the question arises whether these age differences have any consequences for older adults. Overall, most studies only point to the benefits of empathy in younger adults, assuming that it should be

beneficial in older adults as well. Only few studies investigated the relationship between cognitive empathy and socio-emotional adjustment specifically in older adults. In the study by Grühn et al. (2008), self-reported empathy of individuals of all age groups was associated with higher well-being (e.g., higher life satisfaction, and higher positive affect). Moreover, individuals higher in self-reported empathy perceived their social interactions in daily life as more meaningful and positive. However, in this study, the authors did not differentiate between cognitive and affective empathy, but used a composite measure. In another study, a composite measure of empathy was associated with loneliness in a lifespan sample (Beadle et al., 2012a); however, in this study, there were no age differences in empathy.

There is some indication that older adults' poorer emotion recognition is associated with problems in detecting deceit (Ruffman et al., 2012; Stanley & Blanchard-Fields, 2008). However, in the study by Stanley & Blanchard-Fields (2008), these difficulties only existed under certain conditions (when confronted with crime stories that were presented visually without sound, but not when the same material was presented audio-visually, and also not when confronted with other material, in this case, opinions about legislation). In another study, no age differences in deceit detection could be observed (Slessor et al., 2014). Whether or not older adults are more susceptible to fraud in daily life is therefore still an open question.

One study found that ER deficits in older men were associated with verbosity (i.e., extended speech that is lacking in focus or coherence; Ruffman et al., 2010). In this study, verbosity may be seen as a proxy of social adjustment, since verbosity was previously linked to lower conversation satisfaction with a conversation in the non-verbose partner (Pushkar et al., 2000). The authors assumed that the older men were not able to infer from the emotional expression of the conversation partner that they were talking too much. In the Ruffman et al. (2010) study, however, the interaction partner was a confederate, and conversation satisfaction could not be assessed. In the study by Blanke et al. (2016) empathic accuracy for

positive thoughts and feelings in a dyadic interaction task was associated with conversation satisfaction in both younger and older women, and empathic accuracy for positive thoughts was further related to satisfaction with social relationships. In this study, older women, however, did not display lower levels of empathic accuracy for positive content, only for negative content (which was not related to social adjustment outcomes). Another recent study by Murry and Isaacowitz (2018) assessed ER using a picture-based task and conversation ability, which was rated by coders based on interactions between same-aged participants who solved tasks together. Conversation ability was rated on four subscales (attention, composure, expressiveness, and coordination). Older adults performed worse in the ER task – however, ER task performance was not related to conversation ability, where there were no age differences.

Thus, it remains rather unclear whether age differences in cognitive empathy impact well-being in the older adults. Importantly, older adults usually report very high levels of affective well-being and high quality social relationships (e.g., Luong et al., 2011). Since cognitive empathy is not the only predictor of well-being and socio-emotional adjustment, it may be the case that older adults (or their social partner, see Fingerman & Charles, 2010) can compensate for their potential disadvantages. In some domains, cognitive empathy may also have *differential consequences* in younger and older adults. In a study about economic decision making, older adults with higher levels of self-reported cognitive empathy were more likely to reject unfair offers in an Ultimatum Game, obtaining higher financial payoff, whereas younger adults with higher cognitive empathy behaved more prosocially, obtaining lower financial payoffs (Beadle et al., 2012b). In some domains, cognitive empathy or empathic accuracy could also be of *differential importance* in younger and older adults. A meta-analytic review by Sened et al. (2017) showed that empathic accuracy for negative feelings was associated with relationship satisfaction in couples. This effect was especially strong for relationships of moderate length, and the authors suggested that empathic accuracy

is important in a particular phase of a relationship, in which the relationship consolidates. In this phase, partners may have to learn about each other to make the relationship last beyond the first phase of infatuation; later on, the partners' behaviors may be more strongly guided by habit. This was also in line with the results from one of the very few longitudinal studies on empathic accuracy in couples (Kilpatrick et al., 2002). Since older adults have usually been married for extensive periods of time, it may be the case that empathic accuracy is no longer that important in older couples. In sum, we still know very little about specific situation in everyday life in which older adults may display lower levels of empathic accuracy as compared to younger adults, and about the potential negative consequences that older adults may face in such situations.

A word on cross-sectional age-comparative designs

So far, almost all studies investigating age differences in cognitive empathy were based on cross-sectional designs, comparing individuals of different age groups. Most of such designs were comparisons between extreme groups (younger vs. older adults) rather than investigating age as a continuum (for exceptions, see, e.g., Grühn et al., 2008, or O'Brien et al., 2013). However, cross-sectional approaches do not tell us whether these observed differences are due to developmental changes as people grow older. There are very few studies that investigated changes in empathy across adulthood longitudinally, and those studies relied on self-report measures. In one study that investigated self-reported empathy longitudinally over the course of 12 years, older adults described themselves as less empathic, but there was no decrease in self-reported empathy across time (Grühn et al., 2008). It is thus possible that at least in part, age differences in empathic accuracy could be due to stable differences between birth cohorts (i.e., cohort differences). For example, the way emotions are being expressed changes as individuals from younger cohorts are more likely to smile in pictures taken at official occasions (DeSantis & Sierra, 2000). Just as expressing emotions may not have been as common in earlier cohorts, thinking and talking about one's own

emotions may have increased over time. Thus, one might speculate that today's older adults may not be as experienced in thinking about their own and other peoples' thoughts and feelings with as much detail as younger adults, and perhaps also value empathy less as a desirable character trait. More recently, there is a trend in the opposite direction, with younger generations of college students, particularly from 2000 to 2009 (end of the studied period), rating themselves lower on emotional and cognitive empathy than previous cohorts (Konrath et al., 2011). As the authors pointed out, this generation is often described as more self-centered and individualistic than previous cohorts, which may explain this drop in empathy.

To disentangle age from cohort differences, cohort-sequential designs are necessary, which combine a cross-sectional with a longitudinal approach (e.g., Baltes et al., 2006). Milojev and Sibley (2017) used such a design to study changes in personality, including a self-reported measure of agreeableness which was related to empathic concern (e.g., one item being "feel others' emotions"). In this study, there was a drop in self-reported agreeableness from age 19 to 29 with relative stability thereafter, which was not attributable to cohort-differences. Future studies that measure empathy facets directly, preferably with performance-based measures, are needed to further investigate such trends.

Conclusion and future directions

Taken together, age-comparative research on cognitive empathy, and more specifically empathic accuracy, suggests that older adults sometimes display lower levels of empathic accuracy than younger adults. Because some sources of accuracy (e.g., cognitive mechanics) can be limited in older adults, they may need to invest more resources to achieve the same levels of accuracy as younger adults. Current research suggests that this is possible under certain conditions. Older adults seem to profit from tasks that are ecologically valid and that are of relevance to their own lives, potentially because such tasks provide them with the opportunity to use resources that stay stable with age (e.g., knowledge) and because such tasks are highly motivating. Moving forward, it would be important to better understand

which resources younger and older adults rely on to make their judgments. Empathic accuracy tasks that place a high importance on ecological validity not only of the stimuli, but also of the setting, may be the most promising route in this direction. The dyadic interaction task could have great potential in this regard; however, one of its downsides is the task's unknown reliability. To estimate the extent to which a perceiver's empathic accuracy in a given interaction (which could be considered a state measure of empathic accuracy) can be generalized to other situations (in a trait-like fashion), it would be ideal if individuals would interact with multiple partners in a round-robin design (in which a group of individuals take turns in interacting with each other; e.g., Back & Kenny, 2010). This way, perceiver effects of empathic accuracy (i.e., trait empathic accuracy) can be separated from influences of target readability, and from influences of the relationship between perceiver and target.

So far, there is little evidence that lower empathic accuracy impairs older adults' lives. In close relationships, older adults may potentially compensate lower empathic accuracy by displaying caring behavior. It is therefore an open question whether social partners even notice older adults' lower empathic accuracy. Even if so, however, older adults' empathic failures may be treated more forgivingly to maintain social harmony. We thus need to understand contexts in which empathic accuracy is important for older adults' lives, and contexts in which empathic failures may be problematic. For example, it could be the case that lower empathic accuracy displayed towards strangers makes older adults more susceptible to fraud in daily life (Ruffman et al., 2012). For such cases, specific interventions may help older adults to overcome their difficulties. Furthermore, we need longitudinal and cohort-sequential studies to learn whether age-related differences are a product of cohort differences or whether aging really impacts empathic accuracy (via the differential opportunity or motivation to use sources of accuracy) to get a more complete picture of the development of this highly valued ability across the lifespan.

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Footnotes

[1] Several studies on empathic accuracy have focused on one gender only to reduce the complexity of the study designs (see also Blanke et al., 2015, Wieck & Kunzmann, 2015). As pointed out in this chapter, there is little evidence for gender differences in empathic accuracy (e.g., Ickes et al., 2000b) and age differences in empathic accuracy may also be similar in women and men (e.g., Rauers et al., 2013).