Empathy and Close Social Ties in Late Life

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Abstract

Objectives: Older adults with stronger social ties often lead longer, happier and healthier lives, but these ties may differ based on older adults' ability to share and understand others' emotions (i.e., empathy). This study asked how empathy was associated with the way that older adults construct and engage in their social worlds.

Method: We drew on the *Daily Experiences and Well-being Study* to examine how older adults' empathy was associated with the structure (e.g., network size, contact), function (e.g., support), and quality (e.g., affection, conflict) of their close social ties. Participants ($N = 333$) self-rated empathy and listed their social partners using three concentric convoy circles.

Results: Empathy was not associated with older adults' social network structure, but more empathic older adults exchanged support with more social partners and reported greater affection for their social partners. We did not observe a significant link between older adults' empathy and conflict with social partners.

Discussion: Examining empathy advances our understanding of individual differences in older adults' close social ties. This study suggests that empathy may play a promising role with regard to promoting older adults' social experiences and strengthening their close ties.

Keywords: empathy, social ties, contact, support, quality

Introduction

Older adults with stronger social ties often lead longer, healthier and happier lives (Charles & Carstensen, 2010; Holt-Lunstad, Smith, & Layton, 2010). Thus, it is crucial to understand what factors may underlie these strong ties. Human bonding typically relies on individuals' awareness and responses to others in social context. Empathy, the ability to share and understand others' emotions, may be a central feature of older adults' social lives and a cornerstone of successful aging (Decety & Svetlova, 2012). Indeed, individual differences in empathy may explain the different ways that older adults behave in their social worlds. More empathic older adults may be more attuned to others' emotions and sustain better quality ties with more people. Less empathic older adults, on the contrary, may ignore key social cues and incur ostracism (Batson, 2011; Grühn, Rebucal, Diehl, Lumley, & Labouvie-Vief, 2008; Kang, Ham, & Wallraven, 2016). To date, however, little research has tested these associations between empathy and older adults' close social ties in real-life settings.

Addressing this research question may advance our understanding of older adults' social lives. Older adults prioritize their close ties with family and friends, which may serve as these older adults' primary source of social connections and support (Charles & Carstensen, 2010). We were interested in whether and in what ways empathy was associated with these important social ties. For example, we asked whether more empathic older adults had a greater number of close social ties and/or were more involved (e.g., contact, support) in these ties than their less empathic counterparts. We also assessed links between older adults' empathy and the qualities of their close ties. Findings offer promising insights into interventions targeting older adults who lack close social ties or incur isolation.

Empathy and Close Social Ties in Late Life

Human beings are innately social and empathy may be a requisite for them to lead a successful social life (Decety & Svetlova, 2012). We were interested in whether individual differences in empathy explained variation in older adults' close social ties. Thus, we measured empathy as a personality-like trait that varies across individuals rather than a performance-based experience that varies momentarily (Beadle, Sheehan, Dahlben, & Gutchess, 2015; Grühn et al., 2008; Sze, Gyurak, Goodkind, & Levenson, 2012). Several theoretical perspectives guided our hypotheses. For example, the Perception-Action Model (PAM; Preston & de Waal, 2002) suggests that more empathic individuals *share* others' emotions more automatically than their less empathic counterparts. While sharing emotions, more empathic individuals may feel greater concern and understand others' perspectives more accurately, which allows them to behave more appropriately in social context (de Waal, 2008; Ickes & Hodges, 2013).

To gain a more complete understanding of empathy and close social ties in late life, we also drew on the well-established convoy model to assess these ties (Antonucci, Ajrouch, & Birditt, 2013). The convoy is a dynamic social network of close social partners that surrounds the individual. Individuals typically exhibit great variation in the structure (e.g., network size, contact frequency), function (e.g., support exchanges) and quality (e.g., affection and conflict) of their social ties (Antonucci et al., 2013; Fiori et al., 2007). Here, we examined how older adults' empathy was associated with each aspect of social convoys.

Social network structure. We first examined how empathy may shape the structure of older adults' close social ties. Older adults typically show great variation in their network size, with gains and losses of social ties over the life course (Cornwell & Laumann, 2015; Fiori et al., 2007; Rook & Charles, 2017). Individual differences in empathy likely explain such variation.

Indeed, empathy is a central ability underlying a variety of prosocial behaviors that facilitate relationship formation and maintenance. For example, more empathic individuals are more likely to show gratitude towards others' kindness and forgive others' inappropriate behaviors (Algoe, Haidt, & Gable, 2008; Breen et al., 2010; Giammarco & Vernon, 2014). Thus, more empathic older adults may have accumulated a greater number of social ties and also tend to establish new ties if they lose someone close in late life. Here, we expected more empathic older adults to report a greater number of social partners than less empathic older adults.

We also examined variability in the number of social partners in older adults' innermost convoy circle (i.e., the partners that individuals cannot imagine life without; Antonucci et al., 2013). Research has revealed that retaining ties to these social partners is especially critical to older adults' well-being (e.g., these ties may provide a sense of self-worth and serve as the primary source of emotional connections; English & Carstensen, 2014; Fung, Carstensen, & Lang, 2001). Here, we asked whether empathy was associated with the size of this innermost network and considered competing hypotheses. On the one hand, more empathic older adults may have bigger social networks in general, which also include more social partners in the innermost circles. On the other hand, more empathic older adults may limit their innermost networks. More empathic individuals are often more devoted to their social partners (Batson, 2011). Following resource depletion theory (Davey, Janke, & Savla, 2005; Fingerman et al., 2015), more empathic older adults may focus on fewer social partners to guarantee that they have sufficient time, energy, and resources to devote to these partners.

Further, we asked whether empathy was associated with the frequency of contact with social partners. One study revealed a link between older adults' empathy and more active engagement with social partners (e.g., visiting relatives, eating out; Bailey et al., 2008). Another

study found that compared to less empathic participants, more empathic adults (aged 21 to 89) perceived their contact as more pleasant and meaningful throughout the day (Grühn et al., 2008), which may facilitate more future contact. Taken together, it may be that more empathic older adults feel more comfortable interacting with friends and family, or that the way these older adults behave attracts more social partners to initiate contact. We expected more empathic older adults to have more frequent contact with social partners than less empathic older adults.

Relationship functions. Close social ties often function as a primary source of support, thus we asked whether empathy was associated with older adults' support exchanges. In this study, we considered three types of support that are frequently exchanged in close ties: emotional support, practical support, and advice (Huo, Graham, Birditt, & Fingerman, 2018; Swartz, 2009). Emotional support refers to being available when someone is upset. Practical support refers to running errands or offering transportation. Advice refers to giving suggestions in the face of problematic situations.

The literature has linked empathy to support provision. The empathy-altruism hypothesis argues that empathy may elicit altruistic behaviors in the hope of improving others' welfare (Batson, 2011). Previous studies have also shown that more empathic older adults offer more frequent support to other people, including strangers in the laboratory and also their close social partners (Beadle, Sheehan, Dahlben, & Gutchess, 2015; Huo, Graham, Birditt, & Fingerman, 2018; Sze et al., 2012). Yet, it remains unclear how empathy facilitates older adults' support provision within their social networks. We assessed each type of support separately and expected more empathic older adults to provide emotional support, practical support, and advice to more social partners than less empathic older adults.

In addition, more empathic older adults may receive support from more social partners.

Following equity/reciprocity theory (Gleason & Iida, 2015), these empathic older adults, who typically offer more help than less empathic older adults, may receive more support from their social partners in return. Moreover, more empathic older adults may be more aware of others' helping behaviors, which increases these older adults' gratitude and encourages more helping behaviors from their social partners (Algoe et al., 2008; Breen et al., 2010). Thus, we expected more empathic older adults to receive support from more of their social partners than less empathic older adults. Further, we speculated this link may be especially evident with regard to emotional support, given our recent work showing that more empathic older adults were more likely to receive emotional support on a daily basis (Huo et al., 2018).

Relationship qualities. We then turned to the qualities of older adults' close ties and asked whether empathy was associated with older adults' affection and conflict with their social partners. More empathic older adults may enjoy better quality social ties. Indeed, a 4-wave longitudinal study included participants aged 10 to 87 in Wave 1 and revealed a consistent link between empathy and more positive relations with others across 12 years (Grühn et al., 2008). This link also holds true in a plethora of research examining romantic couples (e.g., Cohen, Schulz, Weiss, & Waldinger, 2012; Paleari, Regalia, & Fincham, 2005). For example, a study conducted in the UK examined empathy in heterosexual couples aged 16 to 56 and found that empathy was positively associated with relationship satisfaction (Cramer & Jowett, 2010). As such, we expected more empathic older adults to experience greater affection for their social partners than less empathic older adults.

It is unclear, however, whether empathy is associated with less conflict. Some studies have found that empathy reduces conflict in adolescents' and young adults' relationships (Cramer & Jowett, 2010; van Lissa, Hawk, Branje, Koot, & Meeus, 2016). More empathic

individuals may show better conflict resolution strategies, such that they anticipate and avoid

conflict before it becomes too severe (Simpson, Ickes, & Oriña, 2001). Also, in the face of

tensions, more empathic individuals often focus on solving problems rather than arguing or

fighting with the other party (Carlo et al., 2012; Rizkalla, Wertheim, & Hodgson, 2008).

Yet, empathy can also increase conflict. Indeed, accurately detecting others' thoughts and

emotions is not always beneficial, especially when the thoughts or emotions are threatening or

harmful for social ties (Ickes & Hodges, 2013). For example, accurate awareness of social

partners' unpleasant feelings may undermine relationships (Ickes & Hodges, 2013). Instead, an

inaccurate but more cooperative view of the other party's feelings may help resolve conflicts at

times (Rusbult, Finkel, Kumashiro, 2009). Here, we considered these competing hypotheses.

Other Factors Associated with Empathy and Social Ties in Late Life

The current study also considered other participant characteristics that may be associated

with empathy and social ties. We included older adults' age, gender, and self-rated health.

Findings on age and empathy are mixed. Cross-sectional studies have found either a decline or

an inverse U-shaped curve of empathy with age (Denckla, Fiori, & Vingerhoets, 2014; O'Brien,

Konrath, Grühn, & Hagen, 2013). Yet, longitudinal research has documented no age differences

in empathy across the life span (Grühn et al., 2008). In addition, women typically report higher

levels of empathy and greater involvement in social ties (O'Brien et al., 2013). Prior work has

also established that social ties are associated with better health (Holt-Lunstad et al., 2010).

We also controlled for older adults' education, minority and marital status. People with

higher education attainment tend to show greater empathy (Phillips, MacLean, & Allen, 2002).

Studies have also shown that these upper socioeconomic status adults enjoy more satisfying

marriages (Conger, Conger, & Martin, 2010; Fingerman et al., 2015). With regard to minority

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status, studies suggest that individuals report greater empathy towards ingroup members (e.g.,

Cikara, Bruneau, & Saxe, 2011), but few studies have examined racial differences in empathy.

There are racial differences, however, in terms of social networks. Compared to White adults,

Black adults typically have smaller social networks that include more family than non-family

members (Ajrouch, Antonucci, & Janevic, 2001; Fiori et al., 2017). Marital status may also

influence older adults' social experiences, such that married older adults provide more support to

their adult children whereas widowed older adults require more support (Fingerman et al., 2015;

Isherwood, Luszcz, & King, 2016).

Last, we also considered two personality traits that are associated with empathy –

agreeableness and neuroticism (Graziano, Habashi, Sheese, & Tobin, 2007; Haas, Ishak,

Denison, Anderson, & Filkowski, 2015; Mooradian, Davis, & Matzler, 2011). Highly agreeable

people typically report greater empathy and engage in more cooperative behaviors (Graziano et

al., 2007; Haas et al., 2015). Highly neurotic people, by contrast, tend to process emotions in a

negative manner and behave aggressively in social situations. Thus, it may be harder for highly

neurotic people to sustain social ties (Robinson, Ode, Moeller, & Goetz, 2007).

The Current Study

We tested the following hypotheses:

Ho1: Empathy and social network structure

Ho1a: More empathic older adults may have a greater number of social partners

than less empathic older adults.

Ho1b: We considered competing hypotheses and asked whether more empathic

older adults have a greater or smaller number of partners in the innermost convoy circle.

Ho1c: More empathic older adults may have more frequent contact with their social

partners than less empathic older adults.

Ho2: Empathy and relationship functions

Ho2a: More empathic older adults may provide support to a greater number of their social partners than less empathic older adults.

Ho2b: More empathic older adults may receive support from a greater number of their social partners than less empathic older adults.

Ho3: Empathy and relationship qualities

Ho3a: More empathic older adults may experience greater affection for their social partners than less empathic older adults.

Ho3b. We did not specify a hypothesis regarding conflict with social partners and empathy, but examined this issue.

Methods

Sample and Procedures

We used data from the *Daily Experiences and Well-being Study* (DEWS), whose procedures were approved by the University of Texas at Austin Institutional Review Board. Data collection occurred in 2016–2017 and included 333 older adults aged 65 and over (65–92, $M_{age} =$ 74.15). Both a priori and post hoc power analyses assured that a sample of 333 had adequate power (*power* = .88) to test an effect as small as 0.03. Participants resided in the greater metropolitan Austin, Texas area, including urban, suburban and rural areas. Criteria for study inclusion were residing in the community and not being employed full time for pay. We oversampled older adults in areas with high-density minority population, so that 33% of the participants self-identified as ethnic or racial minorities (e.g., African Americans, Hispanic or Latinos). We also recruited participants with the full range of socioeconomic status; although the

sample was slightly better educated than the general older population in the greater Austin area

(U.S. Census Bureau, 2017). Table 1 describes background information regarding the sample.

Participants completed a 2-hour face-to-face interview and received $50 in compensation.

During this interview, participants provided their background characteristics (e.g., age, gender,

education, health), rated their empathy levels and reported on their close social ties. Participants

were then invited for a 5- to 6-day intensive data collection, during which they reported their

experiences with social partners throughout each day. This study did not include data from the

intensive data collection.

Measures

Empathy. We measured empathy using a 5-item scale adapted from the widely-used

Interpersonal Reactivity Index (IRI, empathic concern and perspective taking subscales; Davis,

1983). Example items were: "I often have tender and concerned feelings for people less fortunate

than me" and "Before criticizing somebody, I try to imagine how I would feel if I were in their

place." Participants rated the extent to which these five statements described them on a scale

from 1 (*not at all*) to 5 (*a great deal*). The scale initially included eight statements but

interviewer notes and recordings revealed participants' difficulties in understanding three

reverse-scored statements (e.g., "Sometimes I do not feel sorry for other people when they are

having problems"). Including these reverse-scored items lowered the scale reliability (to $\alpha = .60$).

Thus, we excluded these reverse-scored items and generated an empathy score for each

participant by averaging their ratings across five items ($\alpha = .73$).

Social Convoy. Participants also indicated their close social ties using three concentric

convoy circles (Antonucci et al., 2013). In each circle, participants offered names of people they:

(a) felt so close to that it was hard to imagine life without them, (b) to whom they might not feel

quite that close to, but who were still very important to them, or (c) social partners they hadn't already mentioned but who were close enough and important enough in their lives that these social partners should also be included in the diagram. On average, each participant listed 15.02 social partners (SD = 6.95, ranged from 0 to 30; total n = 5,002), a higher number than reported by samples in other studies (e.g., n = 11.30 in Ajrouch, Fuller, Akiyama, & Antonucci, 2017; n = 10.82 in Fiori et al., 2007). To avoid fatigue, participants specified details (e.g., contact, support, relationship qualities) with up to 10 social partners (Fiori et al., 2007). In total, 30% of participants (n = 99) had 10 or fewer social partners. For the other 70% of participants (n = 234) who listed over 10 social partners, they elaborated on the 10 closest partners.

Social network structure. Structural indicators included the total number of social partners that participants listed in the convoy, the number of social partners listed in the inner circle of the convoy, and the average frequency of participants' contact with their social partners. The total number of social partners was the sum of partners that participants listed across all three circles. Participants also reported the frequency of their contact with up to their 10 closest social partners, indicating how often they see or have contact with each social partner via phone or by text from 1 (*less than once a year or never*) to 8 (*daily*). We generated a mean score of contact frequency averaging across up to 10 social partners.

Relationship functions. Functional indicators involved participants' support exchanges with social partners (up to 10 social partners). Participants indicated whether they provided or received (a) emotional support, (b) practical support, and (c) advice with each social partner at least once a month with 1 (*yes*) and 0 (*no*). We calculated the total number of social partners who provided and received each type of support at least once a month. We examined each type of

support in separate analyses. Across different types of support, 2% ($n = 6$) to 8% of participants

($n = 26$) reported exchanging support at least once a month with all 10 closest social partners.

Relationship qualities. We measured the quality of participants' social ties via affection

and conflicts (up to 10 social partners). Participants indicated affection by rating how much they:

(a) can share their very private feelings and concerns with each social partner, (b) can rely on

each social partner for help if participants have a serious problem, and (c) feel loved and cared

for by each social partner (Fingerman et al., 2011). Participants reported their conflicts by rating

(a) how much each social partner is critical of the participant and what the participant does, and

(b) how much each social partner gets on the participant's nerves (Birditt, Manalel, Sommers,

Luong, & Fingerman, 2018). Responses were coded on a scale from 1 (*not at all*) to 5 (*a great*

deal). We averaged participants' ratings of affection and conflicts across social partners ($\alpha_{affection}$

$= .76$, $\rho_{conflicts} = .54$). Here we calculated the Spearman-Brown formula, which is a more

appropriate reliability indicator for two-item scales (Eisinga, Grotenhuis, & Pelzer, 2013).

Control variables. During the 2-hour interview, participants provided their demographic

characteristics. Age was reported in years. Gender was coded as 1 (*male*) and 0 (*female*).

Participants indicated their education on a scale of 1 (*no formal education*), 2 (*elementary*

school), 3 (*some high school*), 4 (*high school*), 5 (*some college/vocation or trade school*), 6

(*college graduate*), 7 (*post college but no additional degree*), and 8 (*advanced degree*).

Participants self-rated their physical health from 1 (*poor*), 2 (*fair*), 3 (*good*), 4 (*very good*), and 5

(*excellent*; Idler & Kasl, 1991). Participants also reported whether they were married, remarried,

cohabitated, divorced, or single. We recoded marital status as 1 (*married/remarried*) and 0 (*not*

married). Participants indicated whether they were Hispanic/Latino and their racial group (e.g.,

Native American, African American, Asian, White). We generated a variable to measure

minority status by assigning a 1 to participants who were Hispanic/Latino or non-White (e.g.,

Black or Asian) and a 0 to participants who were non-Hispanic Whites.

With regard to personality traits, participants completed measures of personality

developed for the full adult age range. Participants rated how well each of the five agreeableness

items (e.g., helpful, softhearted, sympathetic; Mroczek & Almeida, 2004) described them from 1

(*not at all*) to 5 (*a great deal*). They also rated four neuroticism items (e.g., moody, nervous;

Lachman & Weaver, 1997) on a scale from 1 (*not at all*) to 4 (*a lot*). We calculated the

agreeableness score (α = .77) and neuroticism score (α = .70) by averaging the ratings.

Analytic Strategy

This study examined how older adults' empathy was associated with the structure,

function, and quality of their social ties. We estimated multiple regressions controlling for

participant age, gender, education, self-rated health, marital status, minority, agreeableness, and

neuroticism. The predictor was participant empathy. For older adults' network structure, we

included three outcomes in separate models: (a) the total number of social partners, (b) the

number of social partners in the innermost convoy circle, and (c) the average frequency of

participants' contact with up to 10 closest social partners. For the function of older adults' close

ties, we predicted the number of social partners who provided and received emotional support,

practical support and advice from participants at least once a month (six outcomes in separate

models). For relationship qualities, we treated participants' average affection and conflict across

the 10 social partners as two separate outcomes.

Results

On average, older adults sustained contact with their social partners a few times per

month; approximately a third of social partners were listed in the inner circle of the convoy.

Older adults provided and received support from about 4 to 5 social partners. Older adults

reported relatively high affection and low conflict with their close social partners. Supplementary

Table 1 presents bivariate correlations of demographic characteristics and relationship indicators.

Social network structure. We tested links between older adults' empathy and social

network structure, considering network size and contact frequency. Empathy was not associated

with the total network size ($B = 0.94$, $p = .11$), the number of social partners in the innermost

network ($B = 0.14$, $p = .60$), or the average frequency of contact that older adults had with their

social partners ($B = -0.01$, $p = .90$, see Supplementary Table 2).

Relationship function. We then examined whether older adults' empathy was associated

with their support exchanges. As shown in Table 2, more empathic older adults provided

emotional support ($B = 0.55$, $p = .02$) and advice ($B = 0.47$, $p = .04$) at least once a month to

more social partners than less empathic older adults. Empathy was not associated with providing

practical support ($B = 0.23$, $p = .29$; see Supplementary Table 2). Interestingly, more empathic

older adults also received emotional support ($B = 0.71$, $p = .003$), practical support ($B = 0.42$, p

$= .04$), and advice ($B = 0.68$, $p = .003$) at least once a month from more social partners.

Relationship quality. We also estimated multiple regressions to examine the qualities of

older adults' close social ties. Older adults' empathy was associated with greater affection for

their social partners ($B = 0.26$, $p < .001$) but not linked to conflict with social partners ($B = -0.01$,

$p = .91$; see Supplementary Table 2).

Post hoc tests. We examined the circumstances under which older adults reciprocated

support (i.e., they provided and received support at least once a month from the same social

partner). The support that was reciprocated did not have to be of the same type. We counted the

number of social partners who reciprocated support with older adults and treated this number as

the outcome. A multiple regression model revealed that more empathic older adults reciprocated

support with more social partners than less empathic older adults ($B = 0.52$, $p = .02$).

We also re-estimated models predicting older adults' affection controlling for their conflict with social partners, and vice versa. Findings remained the same, such that empathy was only associated with affection ($B = 0.27$, $p < .001$, see Supplementary Table 3).

Discussion

Scholars have long proposed the central role that empathy plays in successful social lives, but links between older adults' empathy and close social ties remain understudied. Some recent studies examined older adults' empathy and prosocial behaviors either in laboratory settings or on a daily basis (Beadle et al., 2015; Grühn et al., 2008; Huo et al., 2018; Sze et al., 2012). Yet, this study utilized an overarching approach and examined social networks of older adults. We asked whether and how empathy was associated with the structure, function and quality of this network. Findings suggest that being more empathic is not associated with larger social network or more contact. Yet, more empathic older adults appear to be involved in more support exchanges and experience greater affection for their social partners.

Interestingly, empathy was not associated with older adults' network structure. That is, more empathic older adults hold a similar number of social ties (including ties in the innermost networks) and engage in contact as often as less empathic older adults. Resource depletion theory (Davey et al., 2005) may still explain these nonsignificant findings, such that empathy perhaps influences how older adults allocate their resources among different social experiences. More empathic older adults may prefer to retain a manageable size of social ties but stay involved in more of these ties. For example, more empathic older adults may devote more time and energy to their social partners and respond to these partners' needs more readily than less empathic older adults.

Indeed, more empathic older adults may make a better use of their close social ties as a

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venue of support exchanges. We found that more empathic older adults provided and received

support from more social partners than less empathic older adults. Findings offer additional

evidence to the empathy-altruism hypothesis (Batson, 2011), revealing that more empathic older

adults offer emotional support and advice to more social partners. We did not observe this link

for practical support, which requires physical resources and proximity (Swartz, 2009). That said,

being empathic may not necessarily facilitate offering practical help to more social partners.

We also found that more empathic older adults received each type of support from more

social partners. As we have discussed earlier, social partners of more empathic older adults often

receive plenty of support from these older adults and they may feel obligated to reciprocate such

support (Gleason & Iida, 2015). Post hoc tests offer preliminary evidence for this idea in that

more empathic older adults reciprocate support with more social partners. Yet, this possibility

should be interpreted with caution given that this study only relied on older adults' reports.

Future research may consider both parties' perspectives and examine the reasons why social

partners of more empathic older adults offer more support to these older adults. Moreover, given

the homophily principle (i.e., similar people tend to stay together; McPherson, Smith-Lovin, &

Cook, 2001), more empathic older adults may have a greater number of social partners who are

also more empathic and more likely to help.

Further, this study extends our understanding of how empathy is associated with the

qualities of older adults' social ties. In line with prior research (Grühn et al., 2008), more

empathic older adults reported greater affection for their social partners. Findings cannot imply

causality due to the cross-sectional nature of data. Being more empathic may improve older

adults' relationship quality but there may also be a selection bias that older adults in closer ties

are more empathic. Future research is needed to understand the mechanism underlying this link.

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We did not observe a link between empathy and conflict in late life, which was inconsistent with the literature using younger populations (Cramer & Jowett, 2010; van Lissa et al., 2016). Scholars have argued that older adults generally tend to avoid conflicts (Birditt, Nevitt, & Almeida, 2014; Charles & Carstensen, 2010), and this tendency may not vary based on their empathy. It is also possible that empathy exacerbates conflict in certain group of older adults. Charles' strength and vulnerability integration model (SAVI; Charles, 2010) posits that older adults incur greater emotional suffering when conflicts or distress becomes hard to avoid. Thus, the link between empathy and conflict may be more evident and salient among older adults who are exposed to chronic stress.

This study is subject to several limitations. We followed prior research (e.g., Grühn et al., 2008) and examined individual differences in empathy using older adults' self-reports. Yet, we acknowledge that self-reports of empathy may be biased and constrain our hypothesis testing. Due to social desirability, older adults may self-report themselves as more empathic and considerate than they truly are. These older adults may also view themselves as being more helpful and having closer social ties. This tendency to have positive self-views may also account for the reported links in certain participants. In addition, older adults' reports of contact, support exchanges, and relationship qualities were all limited to only up to 10 closest social partners. This has been widely used in prior research regarding social network (Ajrouch et al., 2017; Fiori et al., 2007) but it may also lead to biased estimates in this study. Further, as mentioned above, this study revealed correlational findings. Longitudinal data are needed to further explore the role of empathy in older adults' social ties and to incorporate empathy into interventions that benefit older adults' social lives and well-being.

In conclusion, this study innovatively introduces the concept of empathy into the

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literature regarding older adults' social lives. More empathic older adults may not necessarily

have more social ties; yet, they engage in more support exchanges and have more positive

feelings about social partners than less empathic older adults. That is, despite the correlational

nature of this study, being more empathic may still have the potential to improve the function

and quality of older adults' close social ties. Findings may inspire more work on individual

differences in socioemotional aging and carry practical implications for relationship therapies in

the long run.

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Table 1

Descriptive Information of Participants (N = 333)

Characteristics	*M*	*SD*	*Range*
Age	74.15	6.57	65–92
Education[a]	5.88	1.59	1–8
Health[b]	3.54	1.02	1–5
Empathy[c]	3.78	0.66	1–5
Agreeableness[d]	3.45	0.49	1–4
Neuroticism[e]	2.42	0.68	1–5
Social network structure			
Total network size[f]	15.02	6.95	0–30
Inner circle size[g]	4.67	2.97	0–10
Contact frequency[h]	5.08	0.99	1–8
Relationship function			
Provided emotional support[i]	5.40	2.78	0–10
Provided practical support[i]	3.48	2.47	0–10
Provided advice[i]	4.59	2.78	0–10
Received emotional support[i]	4.63	2.86	0–10
Received practical support[i]	3.28	2.42	0–10
Received advice[i]	3.56	2.59	0–10
Relationship quality			
Affection[j]	3.63	0.63	1–5
Conflict[j]	1.68	0.56	1–5
		Proportion	
Females		.55	
Minority[k]		.33	
Marital status[l]		.59	

[a]On a scale from 1 (*no formal education*), 2 (*elementary school*), 3 (*some high school*), 4 (*high school*), 5 (*some college/vocation or trade school*), 6 (*college graduate*), 7 (*post college but no additional degree*), to 8 (*advanced degree*). [b]On a scale from (*poor*), 2 (*fair*), 3 (*good*), 4 (*very good*), to 5 (*excellent*). [c]Averaged ratings of five empathy items from 1 (*not at all*) to 5 (*a great deal*). [d]Averaged ratings of five agreeableness items from 1 (*not at all*) to 4 (*a lot*). [e]Averaged ratings of four neuroticism items from 1 (*not at all*) to 5 (*a great deal*). [f]Total number of social partners that participants reported using the three concentric convoy circles. [g]Number of social partners (up to 10 social partners) listed in the inner circle. [h]Frequency of contact that older adults had in person or via telephone with up to 10 social partners, coded from 1(*less than once a year or never*) to 8 (*daily*). [i]Number of social partners (up to 10 social partners) with whom participants provided or received each type of support at least once a month. [j]Averaged ratings of three affection items and two conflict items from 1 (*not at all*) to 5 (*a great deal*). [k]Coded as 1 (a *racial minority*), 0 (*not a minority*). [l]Coded as 1 (*married/remarried*), 0 (*not married*).

Table 2

Multiple Regressions Predicting the Function and Quality of Older Adults' Close Social Ties by Empathy

| | Provided support | | | | Received support | | | | | | Affection | |
| | Emotional | | Advice | | Emotional | | Practical | | Advice | | | |
Parameter	B	SE	B	SE	B	SE	B	SE	B	SE	B	SE
Intercept	3.81	2.48	2.00	2.53	1.72	2.63	0.02	2.26	2.85	2.45	3.04***	0.58
Participant empathy[a]	0.55*	0.23	0.47*	0.23	0.71**	0.24	0.42*	0.21	0.68**	0.22	0.26***	0.05
Participant covariates												
Age	-0.06**	0.02	-0.06*	0.02	-0.04	0.02	0.02	0.02	-0.03	0.02	-0.01*	0.01
Gender[b]	-1.73***	0.32	-1.23***	0.33	-1.55***	0.34	-0.85*	0.29	-1.06**	0.32	0.03	0.07
Education[c]	0.09	0.10	0.08	0.10	0.18	0.11	-0.06	0.09	0.03	0.10	0.00	0.02
Health[d]	0.21	0.15	0.19	0.16	-0.09	0.16	-0.23	0.14	-0.19	0.15	0.06	0.04
Marital status[e]	0.88**	0.32	0.74*	0.33	0.26	0.34	0.77*	0.29	0.32	0.32	-0.12	0.08
Minority status[f]	0.86*	0.34	0.85*	0.34	0.81*	0.36	0.56	0.31	0.44	0.33	-0.01	0.08
Agreeableness[g]	0.77*	0.31	0.95**	0.32	0.53	0.33	0.22	0.29	0.01	0.31	0.16*	0.07
Neuroticism[h]	0.02	0.22	0.21	0.22	0.24	0.23	0.05	0.20	0.36	0.22	-0.09	0.05
F	9.20***		7.00***		6.76***		3.61***		4.31***		6.87***	
Adjusted R²	.19		.14		.14		.07		.09		.14	

Note. Older adults $N = 333$. Outcome variables were (a) the number of social partners receiving support from participants at least once a month, (b) the number of social partners providing support to participants at least once a month, and (c) participants' affection for up to 10 closest social partners.

[a]Averaged ratings of five empathy items from 1 (*not at all*) to 5 (*a great deal*). [b]Coded as 1 (*male*), 0(*female*). [c]On a scale from 1 (*no formal education*), 2 (*elementary school*), 3 (*some high school*), 4 (*high school*), 5 (*some college/vocation or trade school*), 6 (*college graduate*), 7 (*post college but no additional degree*), to 8 (*advanced degree*). [d]On a scale from (*poor*), 2 (*fair*), 3 (*good*), 4 (*very good*), to 5 (*excellent*). [e]Coded as 1 (a *racial minority*), 0 (*not a minority*). [f]Coded as 1 (*married/remarried*), 0 (*not married*). [g]Averaged ratings of five agreeableness items from 1 (*not at all*) to 4 (*a lot*). [h]Averaged ratings of four neuroticism items from 1 (*not at all*) to 5 (*a great deal*).

*p < .05. **p < .01. ***p < .001.

Supplementary Table 1

Correlations between Measures (Participants N = 333)

Characteristics	1.	2.	3.	4.	5.	6.	7.	8.	9.	10.
1. Age	–									
2. Education[a]	-0.07	–								
3. Health[b]	-0.04	0.30***	–							
4. Empathy[c]	-0.07	0.12*	0.01	–						
5. Agreeableness[d]	-0.03	-0.03	0.01	0.33***	–					
6. Neuroticism[e]	-0.13*	-0.09	-0.25***	-0.05	-0.13*	–				
7. Total network size[f]	-0.18**	0.17**	0.17**	0.18**	0.25***	-0.10	–			
8. Inner circle size[g]	-0.09	-0.03	-0.00	0.11	0.19**	-0.06	0.65***	–		
9. Contact frequency[h]	-0.02	-0.18**	-0.07	0.05	0.17**	0.03	0.03	0.21***	–	
Provided support										
10. Emotional[i]	-0.21***	0.02	0.05	0.21***	0.24***	0.00	0.43***	0.30***	0.38***	–
11. Practical[i]	-0.20***	0.00	0.09	0.11*	0.13*	-0.03	0.23***	0.15**	0.52***	0.59***
12. Advice[i]	-0.18**	-0.02	0.00	0.19**	0.24***	0.03	0.33***	0.23***	0.36***	0.78***
Received support										
13. Emotional[i]	-0.10	0.00	-0.07	0.22***	0.20***	0.03	0.29***	0.25***	0.35***	0.67***
14. Practical[i]	0.04	-0.13*	-0.16**	0.12*	0.11	0.03	0.13*	0.14**	0.42***	0.50***
15. Advice[i]	-0.10	-0.04	-0.12*	0.18**	0.09	0.11*	0.18**	0.14*	0.33***	0.60***
16. Affection[j]	-0.10	0.08	0.12*	0.33***	0.23***	-0.16**	0.15**	0.14**	0.16**	0.22***
17. Conflict[j]	-0.14*	-0.24***	-0.24***	-0.03	-0.07	0.24***	-0.16**	-0.05	0.14*	0.09
18. Females	0.03	0.17**	0.04	-0.13*	-0.26***	0.03	-0.24***	-0.23***	-0.13*	-0.28***
19. Minority[k]	-0.11*	-0.37***	-0.35***	0.01	0.02	0.13*	-0.12*	0.09	0.25***	0.10
20. Marital status[l]	-0.22***	0.17**	0.05	-0.02	-0.12*	0.14*	0.05	-0.01	0.06	0.06

[a]On a scale from 1 (*no formal education*), 2 (*elementary school*), 3 (*some high school*), 4 (*high school*), 5 (*some college/vocation or trade school*), 6 (*college graduate*), 7 (*post college but no additional degree*), to 8 (*advanced degree*). [b]On a scale from (*poor*), 2 (*fair*), 3 (*good*), 4 (*very good*), to 5 (*excellent*). [c]Averaged ratings of five empathy items from 1 (*not at all*) to 5 (*a great deal*). [d]Averaged ratings of five agreeableness items from 1 (*not at all*) to 4 (*a lot*). [e]Averaged ratings of four neuroticism items from 1 (*not at all*) to 5 (*a great deal*). [f]Total number of social partners that participants reported using the three concentric convoy circles. [g]Number of social partners (up to 10 social partners) listed in the inner circle. [h]Frequency of contact that older adults had in person or

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via telephone with up to 10 social partners, coded from 1(*less than once a year or never*) to 8 (*daily*). [i]Number of social partners (up to 10 social partners) with whom participants provided or received each type of support at least once a month. [j]Averaged ratings of three affection items and two conflict items from 1 (*not at all*) to 5 (*a great deal*). [k]Coded as 1 (a *racial minority*), 0 (*not a minority*). [l]Coded as 1 (*married/remarried*), 0 (*not married*).

Supplementary Table 1 – Continued

Correlations between Measures (Participants N = 333)

Characteristics	11.	12.	13.	14.	15.	16.	17.	18.	19.	20.
1. Age										
2. Education[a]										
3. Health[b]										
4. Empathy[c]										
5. Agreeableness[d]										
6. Neuroticism[e]										
7. Total network size[f]										
8. Inner circle size[g]										
9. Contact frequency[h]										
Provided support										
10. Emotional[i]										
11. Practical[i]	–									
12. Advice[i]	0.58***	–								
Received support										
13. Emotional[i]	0.40**	0.59***	–							
14. Practical[i]	0.48***	0.57***	0.59***	–						
15. Advice[i]	0.46***	0.66***	0.73***	0.71***	–					
16. Affection[j]	0.05	0.19**	0.19***	0.15**	0.26***	–				
17. Conflict[j]	0.13*	0.09	0.01	0.11*	0.11	-0.11*	–			
18. Females	-0.06	-0.20***	-0.26***	-0.15**	-0.20***	-0.06	0.11	–		
19. Minority[k]	0.11*	0.14*	0.13*	0.16**	0.11	-0.04	0.33***	0.01	–	
20. Marital status[l]	0.16**	0.05	-0.05	0.03	-0.00	-0.07	0.13*	0.39***	-0.05	–

[a]On a scale from 1 (*no formal education*), 2 (*elementary school*), 3 (*some high school*), 4 (*high school*), 5 (*some college/vocation or trade school*), 6 (*college graduate*), 7 (*post college but no additional degree*), to 8 (*advanced degree*). [b]On a scale from (*poor*), 2 (*fair*), 3 (*good*), 4 (*very good*), to 5 (*excellent*). [c]Averaged ratings of five empathy items from 1 (*not at all*) to 5 (*a great deal*). [d]Averaged ratings of five agreeableness items from 1 (*not at all*) to 4 (*a lot*). [e]Averaged ratings of four neuroticism items from 1 (*not at all*) to 5 (*a great deal*). [f]Total number of social partners that participants reported using the three concentric convoy circles. [g]Number of social partners (up to 10 social partners) listed in the inner circle. [h]Frequency of contact that older adults had in person or

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via telephone with up to 10 social partners, coded from 1(*less than once a year or never*) to 8 (*daily*). [i]Number of social partners (up to 10 social partners) with whom participants provided or received each type of support at least once a month. [j]Averaged ratings of three affection items and two conflict items from 1 (*not at all*) to 5 (*a great deal*). [k]Coded as 1 (a *racial minority*), 0 (*not a minority*). [l]Coded as 1 (*married/remarried*), 0 (*not married*).

Supplementary Table 2

Nonsignificant Multiple Regressions Predicting the Structure, Function and Quality of Older Adults' Close Social Ties by Empathy

Parameter	Network size B	SE	Inner circle B	SE	Contact B	SE	Provided practical support B	SE	Conflict B	SE
Intercept	7.88	6.30	3.59	2.84	3.59***	0.93	2.90	2.33	2.53***	0.51
Participant empathy[a]	0.94	0.58	0.14	0.26	-0.01	0.08	0.23	0.21	-0.01	0.05
Participant covariates										
Age	-0.12*	0.06	-0.03	0.03	0.01	0.01	-0.04*	0.02	-0.01	0.00
Gender[b]	-3.62***	0.81	-1.46***	0.37	-0.30*	0.12	-0.48	0.30	0.11	0.07
Education[c]	0.62*	0.25	0.07	0.12	-0.06	0.04	-0.03	0.09	-0.06**	0.02
Health[d]	0.77	0.39	0.07	0.18	0.03	0.06	0.28	0.14	-0.06	0.03
Marital status[e]	1.84*	0.82	0.63	0.37	0.34**	0.12	0.99**	0.30	0.10	0.07
Minority status[f]	-0.45	0.86	0.74	0.39	0.50***	0.13	0.87**	0.32	0.28***	0.07
Agreeableness[g]	2.32**	0.80	0.75*	0.36	0.30*	0.12	0.52	0.29	-0.03	0.06
Neuroticism[h]	-0.51	0.55	-0.22	0.25	0.04	0.08	-0.10	0.21	0.11*	0.04
F	8.53***		3.96***		5.23***		4.34***		9.12***	
Adjusted R²	.17		.08		.11		.09		.19	

Note. Older adults $N = 333$. Outcome variables were (a) participants' total network size, (b) the proportion of social partners listed in the inner circle, (c) frequency of contact that participants had with up to 10 closest social partners, (d) the number of social partners receiving practical support from participants at least once a month, and (e) participants' conflict with up to 10 closest social partners. [a]Averaged ratings of five empathy items from 1 (*not at all*) to 5 (*a great deal*). [b]Coded as 1 (*male*), 0(*female*). [c]On a scale from 1 (*no formal education*), 2 (*elementary school*), 3 (*some high school*), 4 (*high school*), 5 (*some college/vocation or trade school*), 6 (*college graduate*), 7 (*post college but no additional degree*), to 8 (*advanced degree*). [d]On a scale from (*poor*), 2 (*fair*), 3 (*good*), 4 (*very good*), to 5 (*excellent*). [e]Coded as 1 (*a racial minority*), 0 (*not a minority*). [f]Coded as 1 (*married/remarried*), 0 (*not married*). [g]Averaged ratings of five agreeableness items from 1 (*not at all*) to 4 (*a lot*). [h]Averaged ratings of four neuroticism items from 1 (*not at all*) to 5 (*a great deal*).
*$p < .05$. **$p < .01$. ***$p < .001$.

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Supplementary Table 3

Multiple Regressions Predicting Affection and Conflict Controlling for Each Other

Parameter	Affection		Conflict	
	B	*SE*	*B*	*SE*
Intercept	3.09***	0.60	2.68***	0.53
Participant empathy[a]	0.27***	0.05	0.01	0.05
Participant covariates				
Age	-0.01*	0.01	-0.01	0.01
Gender[b]	0.03	0.08	0.11	0.07
Education[c]	-0.00	0.02	-0.06	0.02
Health[d]	0.05	0.04	-0.05	0.03
Marital status[e]	-0.12	0.08	0.09	0.07
Minority status[f]	-0.01*	0.08	0.28	0.07
Agreeableness[g]	0.17	0.07	-0.02	0.07
Neuroticism[h]	-0.07	0.05	0.10	0.05
Affection[i]	–	–	-0.05	0.05
Conflict[i]	-0.07	0.06	–	–
F	6.57***		8.31***	
Adjusted R²	.15		.19	

Note. Older adults $N = 333$. Outcome variables were participants' affection and conflict with up to 10 closest social partners.
[a]Averaged ratings of five empathy items from 1 (*not at all*) to 5 (*a great deal*). [b]Coded as 1 (*male*), 0(*female*). [c]On a scale from 1 (*no formal education*), 2 (*elementary school*), 3 (*some high school*), 4 (*high school*), 5 (*some college/vocation or trade school*), 6 (*college graduate*), 7 (*post college but no additional degree*), to 8 (*advanced degree*). [d]On a scale from (*poor*), 2 (*fair*), 3 (*good*), 4 (*very good*), to 5 (*excellent*). [e]Coded as 1 (a *racial minority*), 0 (*not a minority*). [f]Coded as 1 (*married/remarried*), 0 (*not married*). [g]Averaged ratings of five agreeableness items from 1 (*not at all*) to 4 (*a lot*). [h]Averaged ratings of four neuroticism items from 1 (*not at all*) to 5 (*a great deal*). [i]Averaged ratings of three affection items and two conflict items from 1 (*not at all*) to 5 (*a great deal*).
*p < .05. **p < .01. ***p < .001.