

Age Differences in Negotiations: Older Adults Achieve Poorer Joint Outcomes in Integrative Negotiations

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In integrative as opposed to distributive negotiations, the interests of the negotiation partners can be simultaneously realized to some degree, which results in higher individual as well as joint outcomes. Perspective taking is important to detect and tap into this integrative potential. In negotiations, priority-related information exchange can be seen as a behavioral consequence of perspective taking. Based on findings on the development of perspective taking across the life span, we tested the hypothesis that there are age differences in integrative negotiations. In 2 quasi-experimental studies (Study 1 and 2), participants worked in face-to-face interacting dyads on an apartment rental negotiation. In Study 3, participants read a negotiation transcript that contained all priority-related information. Our results consistently revealed that younger dyads (17–35 years) achieved significantly higher joint outcomes than older dyads (65–85 years; in Study 1 and 2) or age-heterogeneous dyads (in Study 1) and that younger participants proposed more integrative agreements (in Study 3). Differences between younger and older dyads were mediated via information exchange about the negotiation partners' different priorities (Study 2) and via the extraction of relevant information about underlying different priorities (Study 3).

Keywords: age differences, integrative negotiation, interest-related questions, perspective taking


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Negotiations, defined as “an interpersonal decision-making process necessary whenever we cannot achieve our objectives single-handedly” (Thompson, Wang, & Gunia, 2010, p. 493), are a ubiquitous part of our daily life. They play a major role in politics and business, but also in everyday social activities. Negotiations are necessary when interests conflict or resources need to be distributed. For instance, imagine a situation where only four eggs are left in the fridge and two people want to bake or cook, respectively. A simple distributive solution (i.e., compromise; Walton & McKersie, 1965) would result in each one having two

eggs at their disposal. However, that would be a suboptimal solution given that one person wants to prepare meringue (needing only egg white) and the other hollandaise sauce (needing only the yolk). Recognizing these different interests would yield an integrative solution to the problem, that is, an agreement, which expands the amount of resources to be divided (Walton & McKersie, 1965). Despite the finding that integrative agreements are associated with positive immediate and long-term effects (e.g., De Dreu, Weingart, & Kwon, 2000; Rubin, Pruitt, & Kim, 1994), research has found a strong bias toward proposing and implementing distributive solutions (e.g., Bazerman & Neale, 1983; Kemp & Smith, 1994; Thompson & Hastie, 1990).

Negotiations, as a highly prevalent and powerful means to resolve social conflicts, are common across the entire life span, and therefore, potential age differences should be considered. Surprisingly, to date, research on negotiations has overwhelmingly focused on young adults. For instance, an analysis of participants' age in the studies included in a recent and widely cited review on negotiations (Thompson et al., 2010) revealed that participants were on average 27 years old.¹ Only about nine percent of these studies recruited nonstudent samples, and even these samples had

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Data of all three studies were presented at the 51st Congress of the German Psychological Association, September 15–20th, Frankfurt, Germany, and at the 22nd Conference of the Section Developmental Psychology of the German Psychological Association, August 31st to September 2nd, 2015, Frankfurt, Germany.

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¹ We identified 182 independent samples in 95 articles. Average age was reported for 45 of these samples.

a relatively low average age (about 37 years). Thus, negotiation research on older adults is clearly underrepresented.

The present article reports the first empirical tests of age differences in integrative negotiations and potential mechanisms underlying such age-related differences in negotiation performance. Our research contributes to research on negotiation and life span psychology in at least two ways. First, we extend research on negotiations to a wider age range. As we will argue below, there are good theoretical reasons to assume that negotiation performance changes across the life span. The present studies provide the first empirical test of this idea. In this vein, the studies also allow an assessment of the generalizability of a bias toward distributive negotiation solutions that has been reported in studies using samples of young individuals (e.g., Bazerman & Neale, 1983; Kemp & Smith, 1994; Thompson & Hastie, 1990). Second, we aimed to scrutinize the psychological mechanisms underlying age differences in integrative negotiations. Specifically, we tested whether differences between younger and older dyads in negotiation performance are mediated by perspective taking and subsequent information exchange about the negotiation partners' priorities as well as by extracting relevant information about underlying priorities. By doing so, we also contribute to research on social cognition and aging (cf. Kalokerinos, von Hippel, & Henry, 2017).

Perspective Taking and Priority-Related Information Exchange in Negotiations

Perspective taking has been found to foster the likelihood of integrative agreements resulting in better individual as well as joint economic outcomes (e.g., Galinsky, Maddux, Gilin, & White, 2008; Trötschel, Hüffmeier, Loschelder, Schwartz, & Gollwitzer, 2011). Perspective taking refers to the cognitive ability to adopt another individual's point of view and thereby to better anticipate and evaluate the behavior and reactions of that individual (Davis, 1983; Trötschel et al., 2011). It has been postulated that perspective taking facilitates information exchange between negotiation parties (Bazerman & Neale, 1983; Kemp & Smith, 1994). In fact, people who are willing to actively take another party's perspective may realize that initiating information exchange, as well as extracting information about the other's interests from this exchange, are particularly useful ways to learn about this party's perspective on the negotiation. This interest-related information exchange between negotiation partners often concerns each other's priorities, that is, the different values the partners attach to negotiation issues. Hence, priority-related information exchange could be seen as a behavioral consequence of perspective taking.

Priority-related information exchange is particularly effective because this type of information—if correctly recognized—can be used for logrolling (i.e., the exchange of concessions on low- vs. high-value offers; Froman & Cohen, 1970). Priority-related information exchange has accordingly been found to increase the negotiation parties' joint outcomes (e.g., Hüffmeier et al., 2019; Pruitt & Lewis, 1975; Thompson, 1991; Zerres, Hüffmeier, Freund, Backhaus, & Hertel, 2013).

Perspective Taking and Age

Given the theoretical argumentation that priority-related information exchange is a behavioral consequence of perspective taking

(e.g., Bazerman & Neale, 1983; Kemp & Smith, 1994), two lines of life span research on perspective taking inform about possible age differences in perspective taking, priority-related information exchange, and integrative negotiation outcomes: research on the development of Theory of Mind (ToM) and research on wisdom. Research on ToM as “an important social-cognitive skill that refers broadly to our capacity to understand others' mental states” (Henry, Phillips, Ruffman, & Bailey, 2013, p. 826) shows medium to large ($r = -.41$) age-related performance losses, indicating *decreased* perspective taking abilities (see Henry et al., 2013). The age-related decline in ToM was found to generalize across diverse task types, domains, and modalities. Building on this line of research, we expect decreased perspective taking and—as a consequence—less priority-related information exchange and less integrative agreements in negotiations among older as compared with younger negotiators.

Although this rationale, as derived from ToM research, is straightforward and based on solid empirical evidence, research on wisdom might predict the opposite finding or at least no age differences. Research by Grossmann and colleagues on the development of wisdom (which also includes aspects of perspective taking) over the life span provides tentative evidence for an increase of perspective taking abilities with age (Grossmann et al., 2010; Grossmann, Na, Varnum, Kitayama, & Nisbett, 2013) or shows no age differences (Grossmann & Kross, 2014; Rakoczy, Wandt, Thomas, Nowak, & Kunzmann, 2018). This line of research implies that older adults should fare better than or at least equally well as younger adults in finding integrative agreements. However, findings regarding the development of wisdom seem to be somewhat inconsistent, and there is an ongoing debate on the measurement of wisdom (see Glück et al., 2013). Our studies will provide valuable empirical evidence to clarify these competing viewpoints of ToM and wisdom research.

In the present research, we examined age differences in negotiations in three quasi-experimental studies. In addition, we studied perspective taking and priority-related information exchange (in Studies 1 and 2) or recognition of priorities (in Study 3), respectively, as possible underlying mechanisms. Our three studies pursued the following goals: In Study 1, we set the stage and tested whether age differences in integrative negotiations and in priority-related information exchange occur at all. Study 2 replicated Study 1 while using a larger sample. In addition, in Study 2, we examined perspective taking *sensu* ToM and priority-related information exchange as potential mediators of age differences in negotiations. Finally, in Study 3, we tested whether age differences even occur if priority-related information is fully available, that is, when this information only has to be extracted and correctly applied to identify an integrative agreement.

Study 1

Research Question and Hypotheses

Given the contradicting age-related trajectories regarding perspective taking, we formulated competitive alternative hypotheses for Study 1. Building on the ToM approach, we hypothesized that younger as compared with older negotiation dyads achieve higher joint outcomes (Hypothesis 1a). In contrast, building on the wis-

dom approach, older as compared with younger adults should arrive at higher joint outcomes (alternative Hypothesis 1b).

Based on the assumption that priority-related information exchange is facilitated by perspective taking (cf. Bazerman & Neale, 1983; Kemp & Smith, 1994), we further hypothesized that younger as compared with older dyads would exchange more information according to the ToM approach (Hypothesis 2a). By contrast, building on the wisdom approach, older dyads should exchange more information (Hypothesis 2b).

In a more exploratory manner, we also examined how age-heterogeneous dyads perform in comparison with age-homogeneous dyads. Research suggests that only one negotiator with good perspective taking abilities (Galinsky et al., 2008; see also Kemp & Smith, 1994) or one negotiator who initiates priority-related information exchange (Hüffmeier et al., 2019; Zervas et al., 2013) might be sufficient for the dyad to arrive at an integrative agreement. Therefore, we tested whether age-heterogeneous dyads achieve joint outcomes that are comparable with those of the better age-homogeneous dyads.

Method

For all three studies, materials, data sets, and codebooks can be retrieved from <https://osf.io/hr9pb/>.

Participants and design. Forty-five young ($M = 23.51$ years, $SD = 3.21$, 19–35 years; 56% female) and 45 old adults ($M = 71.98$ years, $SD = 5.77$, 65–84 years; 60% female) took part in the study (see Table 1). We employed a one-factorial quasi-experimental design with three types of negotiation dyads (age-homogeneous: young/young vs. old/old; age-heterogeneous). Old participants were mainly recruited from a guest auditor program at a university. Young participants were undergraduate students.

All young participants had a general qualification for university entrance or a higher educational degree, whereas 84% of the older adults had at least a secondary school leaving certificate (comparable with a high school diploma, awarded after 10 years of schooling). Note that secondary and tertiary schooling was generally less common for older adults when they were young (see Barro & Lee, 2015), and therefore educational attainment levels are not directly comparable. The study was conducted in accordance with the Declaration of Helsinki. Participants provided written informed consent and received €10 for participation.

Sample characteristics. Previous research on cognitive abilities of different age groups has frequently observed a dissociation between an age-related decline in fluid intelligence and executive functions and maintenance (or even increase) of crystallized intelligence (e.g., Baltes, 1997; Li et al., 2004). To assess executive functioning, participants received the Trail-Making Test (TMT, Reitan & Wolfson, 1995). This test consists of two parts. The first part (TMT-A) is a measure of processing speed, in which participants are asked to connect 25 numbers in their ordinal sequence on a piece of paper. In the second part (TMT-B), participants have to switch between letters and numbers to connect them in alternating order (i.e., 1-A-2-B-3-C, etc.). The difference between $time_{TMT-B}$ and $time_{TMT-A}$ represents the measure of executive functioning. For crystallized intelligence, participants' verbal ability was assessed with the German Mehrfachwahl-Wortschatz-Intelligenztest (MWT-B, multiple-choice vocabulary intelligence test; Lehrl, 2005). This test consists of 37 items that increase in difficulty. For each item, participants had to identify a correct (i.e., existing) word of five words with four nonexistent pseudowords as distractors.

The younger age group achieved significantly better results in the trail-making task than older adults ($M_{young} = 25.36$ s, $SD_{young} = 15.62$ s vs. $M_{old} = 88.03$ s, $SD_{old} = 85.13$ s; Welch's $t[46] = -4.81$, $p < .001$), whereas older participants outperformed younger participants in the verbal intelligence task ($M_{young} = 26.02$, $SD_{young} = 2.78$ vs. $M_{old} = 32.69$, $SD_{old} = 1.95$; Welch's $t[79] = -13.18$, $p < .001$). Hence, our sample can be seen as representative for both age groups regarding fluid and crystalline intelligence.

Measures

Negotiation task. For the negotiation, we adapted a car sale negotiation task from Thompson and Hastie (1990). We changed this task to an apartment rental context (see Table 2). Participants were assigned to either the role of an estate agent or a tenant. To rule out age differences attributable to differences in experience with the negotiation context or ability to take the assigned role, we conducted a pilot study (young adults: $N = 27$, $M = 25.4$ years, 21–37 years, all female, $M = 12.5$ school years; old adults: $N = 23$, $M = 70.7$ years, 65–82 years, 74% female, $M = 11.0$ school years). In this pilot study, we tested age differences in the apartment rental context regarding the (a) ability to put oneself in the role's position, (b) general compre-

Table 1
Sample Descriptions

Study	Dyad type	Age (years)			% female	TMT		MWT-B	
		Range	<i>M</i>	<i>SD</i>		<i>M</i>	<i>SD</i>	<i>M</i>	<i>SD</i>
Study 1	Young/young ($n = 30$)	19–35	23.4	3.3	53	22.6	16.3	25.9	2.8
	Old/old ($n = 30$)	65–84	72.5	5.7	60	85.5	75.3	32.5	2.0
	Young/old	Young adults ($n = 15$)	20–32	23.7	3.1	30.9	13.0	26.2	2.8
		Old adults ($n = 15$)	65–81	70.9	6.0	93.5	106.1	33.0	1.8
	Overall	Young adults	19–35	23.5	3.2	25.4	15.6	26.0	2.8
		Old adults	65–84	72.0	5.8	88.0	85.1	32.7	2.0
Study 2	Young/young ($n = 60$)	17–30	21.2	2.8	53	29.5	47.5	20.8	2.2
	Old/old ($n = 60$)	65–85	71.4	5.3	50	53.9	40.7	24.2	1.4
Study 3	Young ($n = 52$)	18–35	24.0	5.4	69	24.2	18.8	24.2	3.6
	Old ($n = 50$)	65–85	72.5	5.3	59	51.4	40.5	29.8	3.5

Note. TMT = Trail-Making Test (response time in part A subtracted from response time in part B). MWT-B = Mehrfachwahl Wortschatztest.

Table 2
Payoff Schedules for Apartment Sale Negotiation Task

Issue 1: Interest rate fitted kitchen (incl. electrical devices)		Issue 2: Duration of guarantee for kitchen (incl. elect. devices)		Issue 3: Bathroom amenities		Issue 4: Time until date of moving in	
Option	Payoff	Option	Payoff	Option	Payoff	Option	Payoff
Payoff schedule for estate agent							
10%	4000	6 months	2,400	Set E	1,600	1 week	2,400
8%	3000	12 months	1,800	Set D	1,200	2 weeks	1,800
6%	2000	18 months	1,200	Set C	800	1 month	1,200
4%	1000	24 months	600	Set B	400	2 months	600
2%	0	30 months	0	Set A	0	3 months	0
Payoff schedule for tenant							
2%	1600	30 months	2,400	Set A	4,000	3 months	2,400
4%	1200	24 months	1,800	Set B	3,000	2 months	1,800
6%	800	18 months	1,200	Set C	2,000	1 month	1,200
8%	400	12 months	600	Set D	1,000	2 weeks	600
10%	0	6 months	0	Set E	0	1 week	0

Note. The task contained two distributive issues (Issues 2 and 4) and two integrative issues that could be logrolled to maximize joint outcomes (Issues 1 and 3).

hensibility of the task, (c) joyfulness of the task, and (d) experience with this specific kind of negotiation. Conducting independent *t* tests, we did not find any significant age differences for the apartment rental negotiation task (all *ts*[48] < 11.04, all *ps* > .30).

In the negotiation task, a dyad of participants (i.e., an estate agent and a tenant) had to find an agreement over an apartment rental. To close the deal, they had to agree concerning four remaining issues regarding the contract, with each issue having five options to choose from (see Table 2): (a) interest rate for a fitted kitchen (i.e., rate to pay for amortizing a new kitchen in the apartment, ranging from 2% to 10%), (b) duration of guarantee for the kitchen (guarantee ranging from 6 to 30 months), (c) bathroom amenities (selection of sets ranging from Set A to Set E), and (d) date of moving in (ranging from in one week to in three months).

Participants received a payoff schedule specific to their role informing them about the value of each option within each negotiation issue for their role based on the assigned points (see Table 2). The negotiation task contained two integrative issues (Issue 1: interest rate for a fitted kitchen; Issue 3: bathroom amenities) and two distributive issues (Issue 2: duration of guarantee for kitchen; Issue 4: date of moving in). Concerning the distributive issues, the joint outcome across both issues is fixed to 4,800 points (i.e., no between-dyad variance), because one negotiation party's win results in an equivalent loss for the other negotiation party (i.e., zero-sum issues). Accordingly, each party earning 2,400 points for these two issues would suggest a fully balanced compromise solution. In contrast, the joint outcome for the integrative negotiation issues could vary between 3,200 points (least optimal solution for both issues) and 8,000 points (full exploitation of the integrative potential), with 5,600 points resulting from a solution selecting the middle option of both integrative negotiation issues (i.e., a fully balanced compromise solution).

Priority-related information exchange. Negotiations were videotaped and priority-related information exchange was coded afterward. Three hypotheses-blind research assistants coded the videotapes independently. Coders received a detailed coding scheme (based on Zerres et al., 2013) and were trained in accordance with this scheme. One of the research assistants coded all of the 45 videos, the other two

coded 15 videos each (i.e., two thirds of the videos were coded twice) to calculate interrater reliability.

The three raters event-coded the behavior of each negotiator with respect to the occurrence of (a) provision of information about his or her priorities among negotiation issues (i.e., between-issue valuation; e.g., "The interest rate for the kitchen is especially important for me.") as well as (b) asking for information about the priorities of his or her counterpart (e.g., "How important is the date of moving in for you"?). It was also coded whether the provided information was correct or incorrect. The information exchange score was computed as the sum of inquired and correctly provided priority-related information. The interrater reliability using Krippendorff's alpha (Hayes & Krippendorff, 2007; calculated with ReCal, Freelon, 2013) was .893. Disagreements about coding were resolved through discussion.

Procedure. Participants had 20 min to negotiate an agreement. To do so, they had to find an agreement for each of the four issues. Participants sat across from each other at a table with a paper screen between them shielding their payoff schedules from the other's view but allowing face-to-face communication. For the subsequent collection of intelligence measures and questionnaire data, participants sat at separate tables facing away from each other. On average, negotiations took about 15 min (*SD* = 5.83 min). Older age-homogeneous dyads negotiated significantly longer (*M* = 17.6 min) than young age-homogeneous dyads (*M* = 11.9 min, *p* = .020), but their negotiation duration did not differ from age-heterogeneous dyads (*M* = 14.9 min, *p* = .579).

Results and Discussion

Please see the online supplemental materials, pages 3–5 for additional control analyses and Tables S1, S3, and S5 for Pearson correlations for all relevant variables for all three studies.

Joint outcomes. Given that joint outcomes for the two distributive negotiation issues cannot vary between dyads (i.e., zero-sum issues), we focus on joint outcomes for the two integrative negotiation issues in the following analyses. A one-way analysis of

variance (ANOVA) indicated a significant effect of dyad type on joint outcomes, $F(2, 42) = 3.98, p = .026, \eta_p^2 = .16$ (see Figure 1).² Bonferroni post hoc analyses revealed a significant difference between the young/young ($M = 6,320$ points, $SD = 759$) and the old/old dyads ($M = 5,440$ points, $SD = 920$), $p = .038, d = -1.04$. Moreover, the joint outcomes of the age-heterogeneous dyads ($M = 5,560$ points, $SD = 1,08$) tended to be lower than that of the young/young dyads, $p = .089, d = -0.82$, but they were not significantly different from the old/old dyads ($p = 1.0, d = 0.12$). Finally, only the young/young dyads' average joint outcomes were significantly higher as compared with the mere compromise agreement of 5,600 points, ($t(14) = 3.67, p = .003$). Thus, only the young/young dyads realized the integrative potential to some degree. In sum, our findings support the hypothesis informed by the ToM approach (Hypothesis 1a) and reject the alternative hypothesis informed by the wisdom approach (Hypothesis 1b).

Priority-related information exchange. On average, participants exchanged only a low amount of correct priority-related information ($M_{total} = 0.54, SD = 0.84$), which corresponds with prior research (e.g., Kemp & Smith, 1994; Thompson, 1991). An ANOVA showed a significant effect of dyad type, $F(2, 42) = 3.62, p = .035, \eta_p^2 = .15$. Post hoc analyses using Bonferroni correction indicated that the young/young dyads ($M = 0.73, SD = 0.80$) exchanged significantly more information than the old/old dyads, $M = 0, p = .046, d = 1.29$, but they did not differ significantly from the age heterogeneous dyads ($M_{Young/old} = 0.60, SD = 1.12$), $p = 1.0, d = 0.13$. Moreover, the old/old and the young/old dyads did not differ significantly, $p = .135, d = 0.76$.³

In conclusion, the results of Study 1 clearly favor Hypothesis 1a, which predicts that younger as compared with older negotiators achieve higher joint outcomes in an integrative negotiation. By contrast, the competing Hypothesis 1b, which predicts a superiority of older negotiators, can be rejected. Similarly, findings regarding priority-related information exchange are in line with Hypothesis 2a (rejecting Hypothesis 2b), that is, young/young dyads exchanged more priority-related information than old/old age dyads. Finally, we found no evidence that age-heterogeneous dyads performed comparably well as the superior age-homogenous group (although they did not differ in priority-related information exchange).

Study 2

Study 2 had two goals: First, we aimed to probe the robustness of the findings of Study 1 while realizing a higher test power. To this end, we increased the sample size and restricted the design to the two age-homogenous conditions (young/young vs. old/old). Because the results of Study 1 clearly supported Hypotheses 1a and 2a, we dropped Hypotheses 1b and 2b in Study 2. Accordingly, we hypothesized that younger as compared with older age dyads achieve higher joint outcomes (Hypothesis 1) and exchange more priority-related information (Hypothesis 2).

The second goal of Study 2 was to examine the underlying mechanisms of age differences in negotiations. Therefore, we investigated age differences in perspective taking and priority-related information exchange and their potential role as mediators of age differences in negotiation outcomes. Building on earlier research (e.g., Henry et al., 2013), we expected younger adults to

achieve higher ToM scores as compared with older adults (Hypothesis 3). We also assumed an indirect effect of age on joint outcomes via priority-related information exchange (Hypothesis 4), via ToM (Hypothesis 5) and a two-step mediation with an indirect effect of age on joint outcomes via ToM (as a first mediator), and via priority-related information exchange (as a second mediator; Hypothesis 6).

Method

Participants. Sixty younger ($M = 21.2$ years, $SD = 2.8$ years; 53% female) and 60 older adults ($M = 71.4$ years, $SD = 5.3$ years; 50% female) took part in Study 2 (see Table 1). Nine dyads (all from the older condition) did not reach an agreement in the negotiation task. Therefore, these participants were excluded from the analyses. Excluded participants did not differ significantly from included older adults regarding age, crystalline intelligence and executive functions, experience with rental and general negotiations, and ToM, $t(25-58) = 10.09-1.89, ps > .065$, as well as gender and education, Cramer's $V < .39, ps > .187$.

Older participants were recruited from a guest auditor program at a university, from adult education centers, and from leisure-time facilities such as sports clubs, choirs, and community centers. Younger participants were undergraduate students. Almost all younger participants had a general qualification for university entrance (97%), whereas 80% of the older adults had at least a secondary school leaving certificate. The study was conducted in accordance with the Declaration of Helsinki. Participants provided written informed consent and received €10 for participation.

² We also conducted a repeated-measurement ANOVA with role (estate agent vs. tenant; within-subjects) and dyad type (young/young vs. old/old vs. young/old; between-subjects) and individual points for integrative negotiation issues as the dependent variable. Besides the significant main effect of dyad type, a significant effect of role was obtained, $F(1, 42) = 11.40, p = .002, \eta_p^2 = .21$. Participants in the role of the tenant gained more points ($M = 3,369$ points) than estate agents ($M = 2,404$). The overall effect may well reflect the conditions in the apartment market in the city in which the research was conducted. It is a city with a shrinking population and, thus, more bargaining power owing to alternatives for the tenants.

³ Because the sample size of Study 1 undermines the power to detect significant effects in a mediation analysis, we refrained from including a mediation analysis in the main text. For the sake of completeness, however, we conducted a mediation analysis with prevalence of correctly exchanged priority-related information as a mediator of the relationship between dyad type and joint outcomes, using bias-corrected bootstrapping methods with 5,000 resamples to test the indirect effects. We used the PROCESS macro version 3.3 in SPSS (Hayes, 2017). Dyad types were dummy-coded with the young/young dyad as a reference category. Including priority-related exchange as a mediator variable reduced the difference between the age-homogeneous dyads on joint outcomes; the difference was not significant anymore (total effect: $B = -880.0, 95\% \text{ BCI: LL } -1,563.15; \text{ UL } -196.85, p = .013$; direct effect: $B = -591.46, 95\% \text{ BCI: LL } -1,290.59; \text{ UL } 107.67, p = .095$). In contrast, the effect of the difference between the young/young dyad and the age-heterogeneous dyad remained significant (total effect: $B = -760.00, 95\% \text{ BCI: LL } -1,443.15; \text{ UL } -76.85, p = .030$; direct effect: $B = -707.54, 95\% \text{ BCI: LL } -1,360.55; \text{ UL } -54.53, p = .034$). Moreover, exchange of priority-related information was positively associated with joint outcomes ($B = 393.47, 95\% \text{ BCI: LL } 47.16; \text{ UL } 739.78, p = .027$), that is, dyads who exchanged more priority-related information achieved higher joint outcomes. The confidence interval of the indirect effect of the age-homogeneous dyads on joint outcomes via priority-related exchange did not include zero ($B = -288.54, 95\% \text{ BCI: LL } -660.42; \text{ UL } -39.75$). Thus, we found evidence that priority-related information exchange is a mechanism linking age differences to joint outcomes. In contrast, the confidence interval of the indirect effect of the age-heterogeneous dyad did include zero ($B = -52.46, 95\% \text{ BCI: LL } -451.11; \text{ UL } 213.50$).

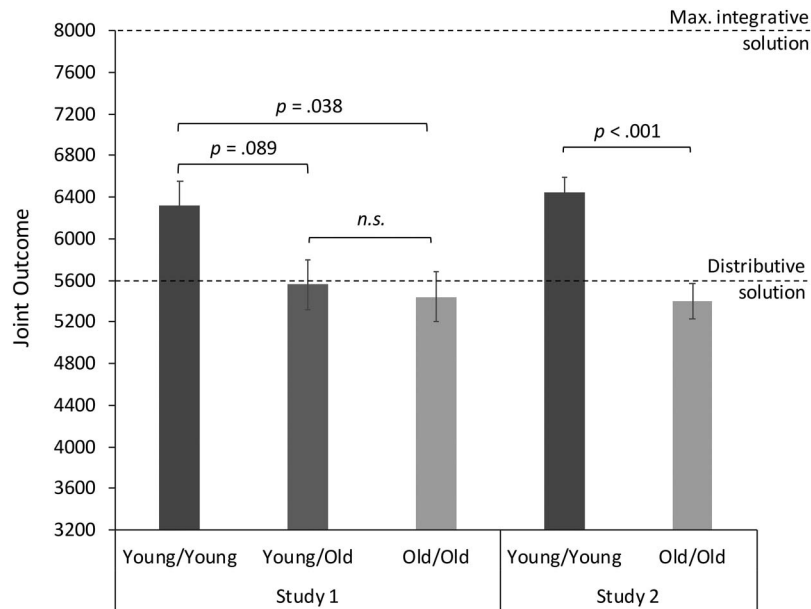


Figure 1. Joint outcomes (number of points) for the two integrative issues as a function of dyad type in Study 1 and Study 2. Bars denote standard errors. n.s. = not significant.

Sample characteristics. As in Study 1, measures of executive functions (TMT, Reitan & Wolfson, 1995) and crystalline intelligence (MWT, Lehl, 2005) were obtained and showed the expected age differences: The younger participants achieved significantly better results in the trail-making task than older adults ($M_{\text{young}} = 29.53$ s, $SD_{\text{young}} = 41.47$ s vs. $M_{\text{old}} = 53.93$ s, $SD_{\text{old}} = 40.71$ s; Welch's $t[116] = -3.22$, $p = .002$) and the older participants outperformed younger participants in the verbal intelligence task ($M_{\text{young}} = 20.78$, $SD_{\text{young}} = 2.19$ vs. $M_{\text{old}} = 24.20$, $SD_{\text{old}} = 1.36$; Welch's $t[99] = -10.27$, $p < .001$).

Measures and procedure. The negotiation task and the procedure were identical to the description in Study 1. Young negotiation dyads did not differ in negotiation duration from older negotiation dyads ($M_{\text{young}} = 13.4$ min vs. $M_{\text{old}} = 15.0$ min, Welch's $t[49] = -1.21$, $p = .231$). Also, as in Study 1, all negotiations were videotaped and analyzed for priority-related information exchange. Three research assistants coded the videotapes independently. Coders received a detailed coding scheme (based on Zerres et al., 2013) and were trained to use this scheme. Each of three raters coded two thirds of the videos, resulting in an overlap of half of the videos with each rater. The interrater reliability using Krippendorff's alpha (Hayes & Krippendorff, 2007; calculated with ReCal, Freelon, 2013) was .765. Disagreements were again resolved through discussions.

Perspective taking. As a measure of perspective taking, we used a ToM task using complex social stories where participants are asked to make inferences about the intentional states (beliefs, etc.) of the stories' protagonists (Happé, Winner, & Brownell, 1998). Although the original study by Happé et al. (1998) found a positive relation between age and ToM, all subsequent studies using Happé et al.'s stories demonstrated a negative relation between age and ToM (see Henry et al., 2013, for a meta-analytic review of age differences in ToM; however, see also Rakoczy et al., 2018, for a recent alternative interpretation of these findings).

Participants worked on a German translation of the ToM tasks (Rakoczy, Harder-Kasten, & Sturm, 2012). Four tasks involved social interactions that required inferences about the mental states of the protagonists in these interactions. Participants had to provide written answers to questions about the intention of the protagonists. Moreover, four control stories were used. These stories also involved complex social interactions, but did not require understanding of mental states. Instead, participants were asked, for instance, about causal relationships. Each answer was coded with 0 points (incorrect), 1 point (partly correct), or 2 points (fully correct). Answers were coded by a hypotheses-blind research assistant. To determine interrater reliability, the first 24 dyads, including younger as well as older dyads, were also coded by a second rater. Using Krippendorff's alpha (Hayes & Krippendorff, 2007; calculated with ReCal, Freelon, 2013), reliability was 1 (only three miss-matches in 192 comparisons). Mean scores were calculated for the four ToM stories and the four control stories.

Alternative mediating variables. Following the suggestion of one of our reviewers, we additionally coded several variables from the videos and used them in additional exploratory analyses. Particularly, we tested them as alternative mediators that we did not a priori consider in our hypotheses. In their classical article, Pruitt and Lewis (1975) differentiated between information exchange and trial and error as central approaches to integrative negotiations. Therefore, we coded the number of exchanged offers and claims, which operationalize the trial-and-error strategy. Offers (e.g., "I can offer you a guarantee of six months") and claims (e.g., "I want to move in in three months") are statements or proposals referring to at least one concrete negotiation option, where the negotiation partner could respond with acceptance or rejection.

Moreover, it is possible that old and young dyad types differ in their off-target verbosity. Off-target verbosity refers to a lack of focus and coherence concerning the target of the communication (here: the negotiation issues). It has been repeatedly found that

off-target verbosity increases in prevalence with age (e.g., Ar-buckle, Pushkar, Bourgeois, & Bonneville, 2004; Yin & Peng, 2016). Hence, off-target verbosity could also be a variable that mediates the effect of age on joint negotiation outcomes (given that it is very likely that off-target verbosity is negatively linked to negotiation outcomes). We calculated the number of exchanged offers/claims relative to the negotiation duration as a proxy of off-target verbosity (i.e., more offers/claims relative to the negotiation duration would reflect a lower level of off-target verbosity).

Finally, we coded the number of articulated threats as an indicator of communication quality. These are statements that threaten the negotiation partner to assert one's own interests, for instance, by using deadlines or threats with bad consequences in *if-then* clauses (e.g., "If you do not accept this offer, I will not give you the lower interest rate.").

Three hypotheses-blind research assistants coded the videotapes independently. The coders were trained with a detailed coding scheme. To assess interrater reliability using Krippendorff's alpha (Hayes & Krippendorff, 2007; calculated with ReCal, Freelon, 2013), 29 of 51 videos were double-coded. The interrater reliability for offers/claims was $\alpha = .87$ and for threats was $\alpha = .64$. The score for each dyad member was computed as an average across raters if more than one rater coded a video and then summed across both dyad members. The scores of both dyad members were summed to gain a score on the dyad level.

Results and Discussion

Joint outcomes. A one-way ANOVA for the joint outcomes resulting from the two integrative issues indicated that the young/young dyads realized significantly higher joint outcomes ($M = 6,440$ points, $SD = 797$) as compared with the old/old dyads ($M = 5,400$ points, $SD = 790$), $F(1, 49) = 21.18$, $p < .001$, $d = 1.31$ (supporting Hypothesis 1, see Figure 1).⁴ As in Study 1, only the average joint outcomes in the young/young dyads were significantly higher as compared with the mere compromise agreement of 5,600 points, $t(29) = 5.77$, $p < .001$. This indicates that only the young/young dyads realized the integrative potential to some degree. In conclusion, these findings of Study 2 closely replicate the findings of Study 1 and support Hypothesis 1.

Priority-related information exchange. As in Study 1, the younger as compared with the older dyads exchanged significantly more correct priority-related information ($M_{\text{Young/Young}} = 1.43$, $SD_{\text{Young/Young}} = 1.46$; $M_{\text{Old/Old}} = 0.43$, $SD_{\text{Old/Old}} = 0.68$), Welch's $t[44] = 3.31$, $p = .002$, Hedges' $g = -0.83$, thereby supporting Hypothesis 2.⁵

Perspective taking. We conducted a two-way mixed ANOVA with age of dyad (young vs. old) as a between subject-factor and story type (ToM vs. control) as a within-subject factor. The analysis showed a main effect of age of dyad, $F(1, 96) = 5.54$, $p = .021$, that, as expected, was qualified by an interaction with story type, $F(1, 96) = 5.35$, $p = .023$, $\eta_p^2 = .05$. A follow-up t test for independent samples revealed a significant age difference in ToM scores, supporting Hypothesis 3 ($M_{\text{Young/Young}} = 1.70$, $SD_{\text{Young/Young}} = 0.30$; $M_{\text{Old/Old}} = 1.43$, $SD_{\text{Old/Old}} = 0.45$), $t(99) = 3.34$, $p < .001$, Hedges' $g = -0.73$. In contrast, there were no significant age differences regarding the control stories

($M_{\text{Young/Young}} = 1.55$, $SD_{\text{Young/Young}} = 0.37$; $M_{\text{Old/Old}} = 1.49$, $SD_{\text{Old/Old}} = 0.39$), $t(97) = 0.77$, $p = .449$).

Relationship between age, ToM, priority-related information exchange, and joint outcomes. To test whether age group differences in joint outcomes are mediated via ToM and priority-related information exchange (Hypotheses 4, 5, and 6), we tested direct and indirect paths in a mediation analysis implemented in a Dyadic Score Model (DSM; Iida, Seidman, & Shrout, 2018). We employed the DSM because participants are nested within dyads in the current study, which results in a potential nonindependence of data. The DSM is suitable to test our hypotheses because it emphasizes dyadic-level variables (i.e., focusing on between-dyad variance; here: dyad level of age, ToM, priority-related information exchange, and joint outcome) while allowing for the inclusion of potential differences between negotiation parties (i.e., within-dyad variance) by modeling both the level of a variable in the dyad as well as differences in this variable between the dyad partners as latent variables. Moreover, this model offers the possibility of including an outcome variable that is negatively correlated among the dyad partners (Iida et al., 2018). In the present study, points of estate agent and tenant for integrative issues were negatively correlated, $r(49) = -.66$, $p < .001$. We used Mplus Version 7.1 (Muthén & Muthén, 1998–2012) to test the models. For the latent level variables, the paths to the individual variables were fixed to 1. The latent difference variables resulted from fixing the path from one partner to -0.5 and the other to 0.5 , whereas the correlation between the manifest variables was fixed to be zero. We included joint outcomes, ToM, priority-related information exchange, and age of dyad partners as variables in the models. The level of joint outcomes reflects the average points at the dyad level (i.e., the sum of both negotiators' points divided by two). First, we tested for each variable whether latent level and difference variables covaried. Level and difference only significantly covaried negatively for priority-related information exchange and, thus, covariation was constrained to be zero for the other variables in the models.

Model 1: Mediation of the age effect on joint outcomes via priority-related information exchange. Given that we did not have any hypotheses for differences in individual negotiation outcomes between parties within a dyad (because dyads were age-homogeneous), we focused on predicting the joint outcomes (i.e., level of joint outcomes) for the two integrative issues of the negotiation task, while still modeling the difference in points between partners. We examined the effect of level of age and level of priority-related exchange on joint outcomes and the indirect effect of age via exchange of priority-related information (Hypothesis

⁴ Similarly to Study 1 we found a role effect showing that tenants ($M = 3,313$ points) gained more points than estate agents ($M = 2,606$), $F(1, 49) = 5.93$, $p = .019$, $\eta_p^2 = .11$, but there was no interaction with dyad type.

⁵ We also conducted a repeated-measurement ANOVA with role (estate agent vs. tenant; within-subjects) and dyad type (young/young vs. old/old; between-subjects) and priority-related information exchange as the dependent variable. Besides the significant main effect of dyad type, $F(1, 49) = 8.67$, $p = .005$, $\eta_p^2 = .15$, a significant effect of role was obtained, $F(1, 49) = 9.05$, $p = .004$, $\eta_p^2 = .16$. Participants in the role of the tenant exchanged more priority-related information ($M = 0.75$, $SD = 1.00$) than estate agents ($M = 0.27$, $SD = 0.60$). There was no significant interaction effect.

esis 4). To control for the potential effect of differences between dyad partners, we also included the latent difference variables of age and priority-related information exchange as direct predictors of joint outcomes. Covariation between the latent difference variables and between latent level variables of age and priority-related information exchange with difference variables was constrained to be zero.

This model showed a very good fit, $\chi^2(9) = 7.47$, $p = .588$; RMSEA $< .001$. In Figure 2, all path coefficients are displayed. The direct effect of level of age on joint outcomes was significant, $B = -7.64$, $\beta = -0.41$, $p < .001$. Older compared with younger dyads achieved lower joint outcomes. Moreover, older adults exchanged less priority-related information, $B = -0.01$, $\beta = -0.31$, $p = .011$. Furthermore, the level of priority-related information exchange was a significant predictor of joint outcomes, $B = 286.95$, $\beta = 0.39$, $p = 0.002$, demonstrating that exchanging more priority-related information was associated with higher joint outcomes. Finally, the indirect effect of age via priority-related information exchange was significant, $B = -2.23$, $p = .049$ (95% CI $[-4.45, -0.01]$), supporting Hypothesis 4, which predicts that age differences in joint outcomes are mediated via priority-related information exchange. Neither of the latent difference variables was significantly related to joint outcomes, $ps > .205$. This model explained $R^2 = .42$ of the variance in joint outcomes.

Model 2: Mediation of the age effect on joint outcomes via ToM and priority-related information exchange. To additionally test the effect of ToM in a (serial) mediation model (Hypothesis 5 and 6), we included the latent level and latent difference of ToM between the negotiation parties within dyads in the model (but excluded the latent differences of age and priority-related information exchange as predictors because they were not significant in the previous model). We examined the effects of level of age, ToM, and priority-related information exchange on joint outcomes and the indirect effects of age via ToM, via priority-related information exchange, and the serial indirect effect via ToM (first mediator) and priority-related exchange (second mediator). The latent difference in ToM within negotiation dyads was included as a direct effect on joint outcomes.

The model showed a very good fit, $\chi^2(20) = 20.41$, $p = .433$; RMSEA $= .020$. All path coefficients are displayed in Figure 3. Age group significantly predicted level of ToM ($B = -0.01$, $\beta = -0.43$, $p = 0.001$). The direct effect of age group on level of priority-related information exchange was not significant ($B = -0.01$, $\beta = -0.22$, $p = 0.094$). Level of ToM did not significantly predict level of priority-related information exchange ($B = 0.39$, $\beta = 0.19$, $p = 0.155$). However, level of priority-related information exchange ($B = 257.28$, $\beta = 0.36$, $p = 0.001$) and level of age ($B = -5.02$, $\beta = -0.28$, $p = 0.021$) remained significant predictors of joint outcomes. Level of ToM showed no significant direct effect on joint outcomes, $B = 299.21$, $\beta = 0.20$, $p = 0.075$. None of the specific indirect effects (i.e., level of age via ToM, via priority-related information exchange, and the serial effect on joint outcomes) were significant. However, the total indirect effect consisting of all the specific indirect effects was significant, $B = -3.54$, $\beta = -0.20$, $p = 0.012$. Given the significant total indirect effect, there is, thus, tentative evidence of the importance of ToM and priority-related information exchange as mediators of the age effect on joint outcomes even though none

of the specific indirect paths were significant on their own. Moreover, the latent difference in ToM showed a significant effect on joint outcomes, $B = 289.97$, $\beta = 0.31$, $p = .002$. Higher values in the estate agents' ToM relative to the tenants' ToM were related to higher joint outcomes, while lower values were associated with lower joint outcomes. Overall, this model explained $R^2 = .49$ of the variance of the level of joint outcomes.⁶

Exploratory analyses. We examined whether the number of exchanged offers/claims differed between age groups. This analysis revealed that older dyads as compared with young dyads descriptively exchanged fewer offers/claims ($M_{\text{young dyads}} = 17.70$, $SD_{\text{young dyads}} = 7.04$; $M_{\text{old dyads}} = 14.29$, $SD_{\text{old dyads}} = 5.97$, $t(49) = 1.81$, $p = .076$). Moreover, older dyads showed a higher level of off-target verbosity compared with young dyads as reflected in the lower number of exchanged offers/claims relative to negotiation duration ($M_{\text{young dyads}} = 0.03$, $SD_{\text{young dyads}} = 0.01$; $M_{\text{old dyads}} = 0.02$, $SD_{\text{old dyads}} = 0.01$, $t(49) = 3.11$, $p = .003$). Finally, the age groups did not differ in the number of articulated threats, $t(49) = -0.23$, $p = .816$, with relatively few threats overall ($M_{\text{young dyads}} = 1.16$, $SD_{\text{young dyads}} = 1.35$; $M_{\text{old dyads}} = 1.25$, $SD_{\text{old dyads}} = 1.64$). Neither the number of offers/claims, $r(49) = .20$, $p = .162$, nor the number of offers/claims relative to negotiation duration, $r(49) = .24$, $p = .098$, nor the number of threats, $r(49) = -.07$, $p = .612$, was significantly correlated with joint outcomes. We conducted parallel analyses for Study 1. Please see pages 6–7 in the online supplemental materials for details.

In conclusion, Study 2 provides further evidence for the robustness of the superiority of younger over older negotiation dyads. In addition, we found support for an indirect effect of age differences in joint outcomes via priority-related information exchange. However, although we found the expected age differences in ToM, there was no support for a direct dyad-level effect of ToM or for the assumption of a two-step mediation of age differences in joint outcomes via ToM and priority-related information exchange. We will come back to this finding in the General Discussion.

However, we obtained a direct effect of within-dyad differences in ToM on joint outcomes, suggesting that a higher level of ToM of the estate agent relative to the tenant was associated with more integrative joint outcomes. This finding is likely to be attributable to the effect that in purchasing negotiations the seller's (in our case, the estate agent's) actions are often more conducive or—in the absence of effective actions—hindering for the achievement of higher joint outcomes than those of the buyer (in our case, the tenant; e.g., Cai, Wilson, & Drake, 2000; Schei, Rognes, & Myk-

⁶ Following a prompt of one reviewer during the review process, we additionally calculated separate DSMs to test the effects of fluid intelligence (as measured with the TMT), verbal intelligence (as measured with the MWT-B), and general as well as rental negotiation experience on joint outcomes, taking into account the effect of the aggregated dyad level of each variable and also the differences between dyad members. We included level of age and level and difference of the respective variable to directly predict level of achieved joint outcomes and test indirect effects of age via the level of the respective variable. None of the variables (fluid and verbal intelligence, global and specific experience) was significantly related to level of joint outcomes (TMT_{Level}: $B = -1.50$, $p = .503$, TMT_{Difference}: $B = 0.55$, $p = .630$; MWT_{Level}: $B = 3.14$, $p = .834$, MWT_{Difference}: $B = -0.57$, $p = .941$; General Exp._{Difference}: $B = 36.52$, $p = .595$; General Exp._{Level}: $B = -35.10$, $p = .335$; Rental Exp._{Level}: $B = 20.77$, $p = .785$, Rental Exp._{Difference}: $B = 19.41$, $p = .690$). None of the indirect effects was significant, although age remained a significant predictor in all models.

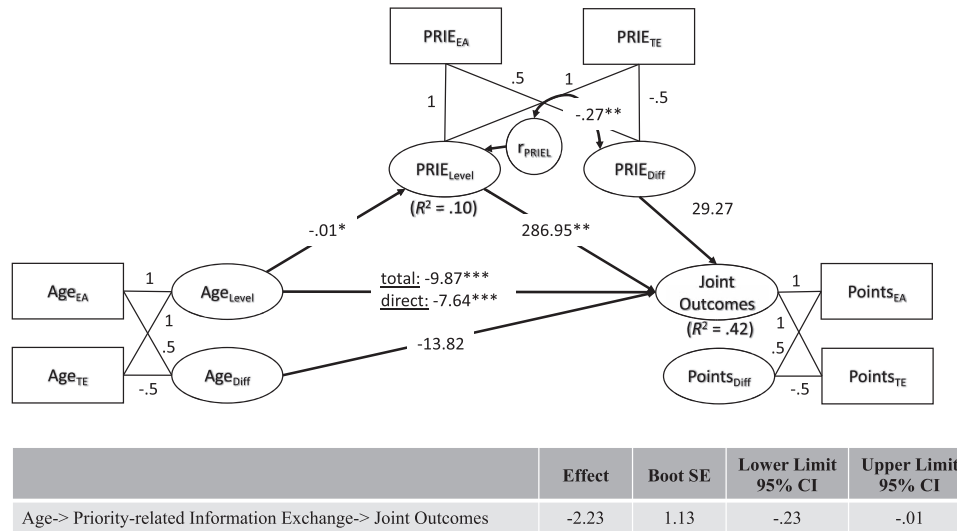


Figure 2. Mediation Model 1 and table of indirect effects (Study 2). All covariations among latent variables that are not displayed were fixed to be zero. Parameters of model fit: $\chi^2(20) = .433$, RMSEA = .020. PRIE = priority-related information exchange; EA = estate agent; TE = tenant; Diff = difference; PRIEL = residual of level of priority-related information exchange. Unstandardized coefficients, * $p < .05$. ** $p < .01$. *** $p < .001$.

land, 2006; Weingart, Thompson, Bazerman, & Carroll, 1990). Importantly, this finding lends support to the role of perspective taking in the negotiation process (e.g., Galinsky et al., 2008; Trötschel et al., 2011).

Regarding alternative underlying mechanisms, the exploratory analyses demonstrate that the mere exchange of offers and claims did not suffice to achieve integrative negotiation outcomes in our research (cf. Pruitt & Lewis, 1975). Moreover, age

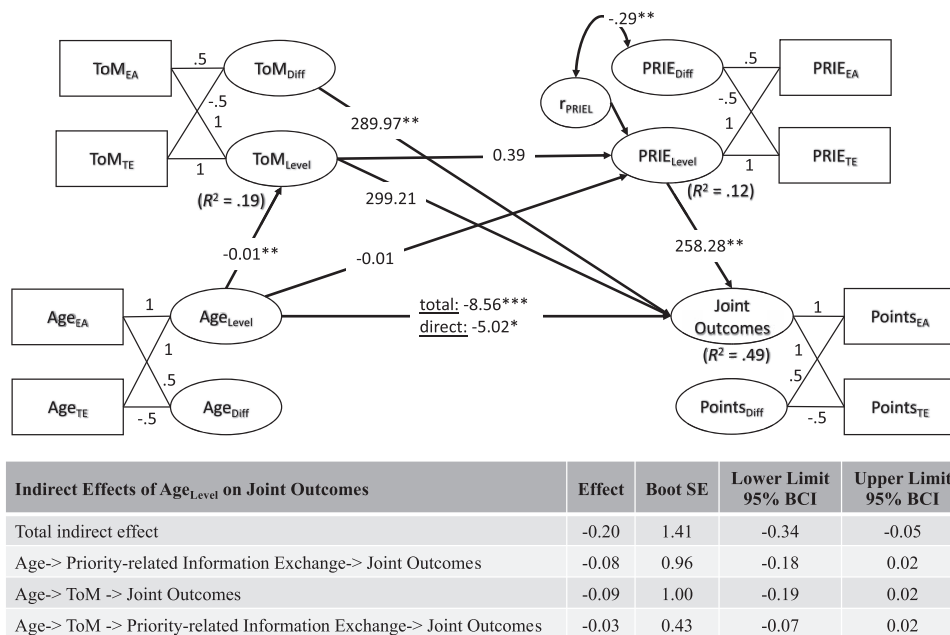


Figure 3. Mediation Model 2 (serial mediation) and table of indirect effects (Study 2). All covariations among latent variables that are not displayed were fixed to be zero. Parameters of model fit: $\chi^2(9) = .588$, RMSEA < .001. ToM = theory of mind; PRIE = priority-related information exchange; EA = estate agent; TE = tenant; Diff = difference; PRIEL = residual of level of priority-related information exchange. Unstandardized coefficients, * $p < .05$. ** $p < .01$. *** $p < .001$.

group differences in integrative negotiations cannot be explained by differences in off-target verbosity (Arbuckle et al., 2004; Yin & Peng, 2016) or communication quality. Note further, that there is evidence that agreeableness increases with age (Donnellan & Lucas, 2008; McAdams & Olson, 2010) and that older compared with young adults prioritize positive emotions (Carstensen, 2006), which in turn might have an impact on negotiation strategies. If threats were interpreted as a behavioral indicator of a lack of agreeableness, our findings indicate that older adults did not differ from younger adults in this respect in the present study.

Study 3

In Study 1 and Study 2, priority-related information exchange on the one hand and the recognition and correct implementation of the negotiation partners' different priorities on the other hand were entangled. That is, to realize the integrative potential of the negotiation, participants had to instigate priority-related information exchange and to successfully extract the relevant information from this exchange and correctly apply it to come to an integrative negotiation agreement. As a consequence, although the results of Study 1 and 2 provide some evidence that priority-related information exchange mediates the age effect on joint outcomes, we cannot rule out that the effects are also attributable to older adults being less able to adequately process the exchanged information. In Study 3, we hence tested whether age differences were still present if priority-related information was fully available and had only to be recognized and correctly applied. The purpose of Study 3 was therefore slightly different from the purpose of Studies 1 and 2. Whereas Studies 1 and 2 examined whether there are age effects regarding how individuals exchange and use priority-related information in face-to-face negotiations, Study 3 investigated whether there are age differences in how individuals are able to extract and use such information from a negotiation transcript that contained all the relevant information.

To standardize the presented information in Study 3, we used a transcript of a successful integrative negotiation with a complete exchange of priority-related information from Study 1. In the main task in Study 3, participants worked individually and were asked to propose an optimal agreement for both of the involved negotiators. Besides keeping the presented information constant, this approach also reduces the cognitive load of a negotiation, which helps to rule out high cognitive demands as being (solely) responsible for the demonstrated age differences in Study 1 and 2. Hence, this approach further contributes to testing the specificity of age differences in negotiations.

Based on the assumption that perspective taking increases the recognition of different viewpoints, we assumed that higher perspective taking would be associated with a better recognition of information about the negotiators' different priorities and also result in better propositions regarding integrative agreements (i.e., high joint outcomes). Moreover, in Study 1, we found that age-heterogeneous dyads failed to exhaust the integrative potential, although they exchanged as much priority-related information as the young/young dyads. This could have been attributable to an impaired understanding of the relevance of the exchanged priority-related information among older negotiators.

In conclusion, we hypothesized that younger as compared with older adults would propose more optimal agreements (Hypothesis 1) and that younger as compared with older adults would be better at recognizing differences in priorities between the negotiation parties (Hypothesis 2). Building on earlier research (Henry et al., 2013), we again expected younger adults to achieve higher ToM scores as compared with older adults (Hypothesis 3). Moreover, and paralleling our predictions for Study 2, we postulated that the age difference in the quality of the proposed agreement is mediated via the recognition of priorities (Hypothesis 4) and via ToM (Hypothesis 5), and a two-step mediation of the age differences in agreement quality via ToM (first mediator) and recognition of priorities (second mediator, Hypothesis 6).

Method

Participants. Participants were 52 younger adults (18–35 years, $M = 24.0$ years, $SD = 5.4$ years, 69% female) and 50 older adults (65–85 years, $M = 72.5$ years, $SD = 5.3$ years, 59% female). Nine older adults ($M = 76.0$ years, 8 females) and one younger male adult were excluded from the analyses because they did not provide complete data for the proposed agreement and recognition of the priorities. Compared with included older adults, there were no significant differences regarding their executive functions, verbal intelligence, and perspective taking ($ps > .163$), but the excluded participants indicated having significantly less experience with negotiations, having less fun with the task, perceiving the task as less meaningful, and being less motivated ($ps < .022$). Participants were recruited at a university campus (older adults: guest auditor program), adult education centers, and leisure-time facilities such as sports clubs, choirs, and community centers. The study was again carried out in accordance with the recommendations of the Declaration of Helsinki. All participants gave informed written consent and were not paid for their participation.

Sample characteristics. We employed the TMT (Reitan & Wolfson, 1995) to measure executive functions and the MWT-B (Lehrl, 2005) to assess verbal intelligence. As in Study 1 and 2, the younger age group achieved a significantly better result in the TMT ($TMT-B - TMT-A$) than older adults ($M_{\text{young}} = 24.17$ s, $SD_{\text{young}} = 18.79$ s vs. $M_{\text{old}} = 51.37$ s, $SD_{\text{old}} = 40.46$ s; Welch's $t[48] = -3.79$, $p < .001$; Hedge's $g = -0.91$) and older participants performed significantly better than young participants in the verbal intelligence task ($M_{\text{young}} = 24.20$, $SD_{\text{young}} = 3.57$ vs. $M_{\text{old}} = 29.75$, $SD_{\text{old}} = 3.54$; $t[89] = -7.40$, $p < .001$; Hedge's $g = 1.56$).

Materials and procedure.

Negotiation transcript. Participants received the excerpt (585 words) of a transcript of an apartment rental negotiation obtained from Study 1 (see the [online supplemental materials](#), p. 14, for the original wording). In a pilot study ($N = 38$, $M = 22.3$ years, $SD = 2.8$ years, 40% female), we pretested the anonymized transcript, in which a young dyad had fully exchanged information about their priorities concerning negotiation issues and completely exploited the integrative potential in the agreement. The original negotiation took about five minutes. The excerpt of the transcript ended before the dyad had started to talk about their final agreement. Participants in the pilot study were asked to evaluate the perceived priorities toward the issues separately for the tenant and the estate

agent based on the transcript on a scale ranging from 0 = *completely unimportant* to 4 = *very important* and to indicate on which sentences from the transcript they based their evaluation. Overall, the participants in the pilot study were able to correctly identify the highest and lowest priorities for both roles (mean ranks in Friedman test: agent: interest rate = 3.5, moving date = 2.7, guarantee = 2.4, bathroom = 1.4, $\chi^2[3] = 57.34$, $p < .001$; tenant: bathroom = 3.0, moving date = 2.7, guarantee = 2.4, interest rate = 1.9, $\chi^2[3] = 20.25$, $p < .001$).

The participants of Study 3 received the excerpt of the transcript and were informed that it was obtained from a previous study on an apartment rental negotiation involving four negotiation issues each containing five options. They were asked to read the transcript thoroughly from a neutral perspective and to propose the best possible agreement for both negotiation partners. Participants were handed a table displaying the four negotiation issues and the related negotiation options and were asked to choose the optimal option for each issue, that is, the option yielding the highest joint outcome.

Recognition of priorities. After proposing the contract solution, participants were asked to estimate the perceived priorities concerning each negotiation issue separately for the estate agent and the tenant on a 5-point scale from 0 = *completely unimportant* to 4 = *very important*.

Perspective taking. We used the same ToM measure as in Study 2. Answers were coded by two hypotheses-blind research assistants. The interrater reliability using Krippendorff's alpha (Hayes & Krippendorff, 2007; calculated with ReCal, Freelon, 2013) ranged between 0.57 and 0.95. One ToM story had very low interrater reliability (-0.12) and was therefore excluded. Mean scores were calculated for the three remaining ToM stories and the four control stories.

Data analysis. In a first step, we calculated (absolute) difference scores between the options as proposed in the agreement by the participant and the optimal option for each issue. The optimal option for integrative issues yields the highest joint outcomes because the negotiation party's most favorable option of the most prioritized issue was proposed. The possible range per integrative issue was 0–4 because each integrative issue had five options (lower values indicate a better agreement). For distributive issues, an optimal agreement would yield a fair distribution, that is, the fully balanced compromise. Deviations from this compromise would benefit one of the two negotiation parties with equivalent losses for the other. The possible range was 0–2 because no larger

deviations than two are possible from the middle/compromise option if an issue has five options (lower values indicate a better agreement). We then summed the differences between the proposed and optimal options across both the integrative and the distributive issues. Lower values indicate a more optimal proposed agreement (possible range: 0–12). This sum score was our dependent variable.

In a second step, we derived values for the recognition of negotiation parties' (differing) priorities by calculating difference scores in perceived priorities between the tenant and the estate agent for each issue. The possible range was 0–4 for each issue (0 = *no perceived difference in priorities between the parties*; 4 = *a perceived maximum difference in priorities between the parties*), because priority assessments ranged from 0 (*completely unimportant*) to 4 (*very important*). For integrative issues, higher values indicate correctly recognized differing priorities. For instance, for bathroom amenities, participants should perceive the highest priority for the tenant and the lowest priority for the estate agent. In contrast, higher values for distributive issues would be reflective of falsely assuming differing priorities. Therefore, we reverse-coded the difference scores for distributive issues. We then summed the difference scores across both the integrative and the distributive issues with higher values indicating a better recognition of the two negotiators' underlying priorities (possible range: 0–16). This sum score was one of the two mediator measures.

Results and Discussion

Integrative potential of proposed agreement. Regarding age differences in finding the optimal agreement for both negotiators (i.e., proposing an integrative agreement), we conducted an independent group t test. Younger adults ($M = 2.02$, $SD = 1.26$) were significantly closer to the optimal agreement than older adults ($M = 3.02$, $SD = 1.84$), Welch's $t(68) = -2.99$, $p = .004$, Hedges' $g = -0.65$ (see Table 3), thus supporting Hypothesis 1. A one-sample t test showed that both age groups were significantly different from the value of four (representing a mere compromise agreement), meaning that the integrative potential was realized to some degree (young: $t[50] = -11.25$, $p < .001$; old: $t[40] = -3.40$, $p = .002$).

Recognition of priorities. For the recognition of priorities, we conducted a simple t test, which showed that younger adults ($M = 10.02$, $SD = 1.72$) were significantly better able to identify the different priorities of the estate agent and tenant than older

Table 3
Means and SDs for Quality of Proposed Agreement, Recognition of Priorities, ToM, and Control Stories (Study 3)

Variable	Young adults ($n = 52$) M (SD)	Older adults ($n = 41$) M (SD)	Mean difference [95% CI]	Hedges' g
Quality of agreement (0–12) ^a	2.02 (1.26)	3.02 (1.84)	-1.00^* [$-1.68, -0.33$]	-0.65
Recognition of priorities (0–16)	10.02 (1.72)	9.00 (1.69)	1.02^{**} [$0.31, 1.73$]	0.60
ToM	1.81 (0.29)	1.63 (0.35)	0.17^{***} [$0.04, 0.30$]	0.57
Control stories	1.62 (0.33)	1.57 (0.34)	0.05 [$-0.09, 0.19$]	0.15

Note. ToM = theory of mind.

^a Lower values indicate a more integrative agreement.

* $p = .004$. ** $p = .006$. *** $p = .011$.

adults ($M = 9.00$, $SD = 1.69$), $t(90) = 2.84$, $p = .006$, Hedges' $g = 0.60$, thereby supporting Hypothesis 2.

Perspective taking. The t tests for ToM and the control stories supported Hypothesis 3 and replicated the findings of Study 2 and Rakoczy et al. (2012). Younger adults ($M = 1.81$, $SD = 0.29$) scored significantly higher than older adults ($M = 1.63$, $SD = 0.35$) in ToM, $t(91) = 2.58$, $p = .011$, Hedges' $g = 0.57$ (see Table 3). In contrast, there was no significant difference between age groups concerning the control stories, $M_{\text{Young}} = 1.62$, $SD_{\text{Young}} = 0.33$ versus $M_{\text{Old}} = 1.57$, $SD_{\text{Old}} = 0.34$, $t(91) = 0.72$, $p = .470$.

Relationship between age, ToM, recognition of priorities, and agreement quality. Prior to testing indirect effects of age via ToM and recognition of priorities on agreement quality, we calculated Pearson correlations. The quality of proposed agreements was significantly correlated with recognizing the distribution of priorities, $r(89) = -.30$, $p = .004$, and with ToM, $r(89) = -.26$, $p = .015$. However, recognizing priorities was not significantly linked to ToM scores, $r(89) = .12$, $p = .258$.

Model 1: Mediation of the age effect on agreement quality via recognition of priorities. In a first model, to test the indirect effect of age on agreement quality via recognition of priorities (Hypothesis 4), a mediation analysis (Model 4) was conducted using bias-corrected bootstrapping methods with 5,000 resamples to test the indirect effects (Hayes, 2017) employing PROCESS macro Version 3.3 in SPSS (Hayes, 2017). Age ($B = 0.74$, $\beta = .23$, $p = .029$) and recognition of priorities were directly linked to agreement quality ($B = -0.21$, $\beta = -0.23$, $p = .026$, see Figure 4). Moreover, age significantly predicted recognition of priorities ($B = -1.04$, $\beta = -0.58$, $p = .005$). The bias-corrected 95% confidence interval (BCI) for the specific indirect effect of age via recognition of priorities did not include zero ($[0.03, 0.50]$; indirect effect estimate = 0.22, $SE = .07$), indicating that there was a significant mediation effect between the age groups and the quality of proposed agreements via recognition of priorities, thereby supporting Hypothesis 4.

Model 2: Mediation of the age effect on agreement quality via ToM, and recognition of priorities. A test of serial mediation (Model 6) was conducted using bias-corrected bootstrapping methods with 5,000 resamples to test the indirect effects (Hayes, 2017) using PROCESS macro Version 3.3 in SPSS (Hayes, 2017). There were significant age differences in ToM ($B = -0.17$, $\beta = -0.52$, $p = .014$) and recognition of priorities ($B = -1.00$, $\beta = -0.56$, $p = .010$). However, ToM did not significantly predict recognition of priorities ($B = 0.26$, $\beta = 0.05$, $p = .650$). We tested the indirect effect of age on agreement quality via ToM, via recognition of priorities, and the serial mediation of age differences via ToM and recognizing priorities in a path analysis. The BCI for the specific indirect effect of recognition of priorities did not include zero ($[0.02, 0.49]$; indirect effect estimate = 0.20, $SE = .12$; see Figure 5), indicating that—as in Model 1—there was a significant mediation effect between the age groups and the quality of proposed agreements via recognition of priorities, thereby providing evidence for Hypothesis 4.

However, the specific indirect effects of age via ToM (specific indirect effect = 0.15, $SE = .14$, 95% BCI $[-0.05, 0.50]$) and via ToM and recognition of priorities did not contribute significantly to the explanation of the age difference in agreement quality (specific indirect effect = 0.01, $SE = .02$, 95% BCI $[-0.02, 0.06]$). Hence, similar to Study 2, we found support for Hypothesis

4, but not for Hypotheses 5 and 6. The effect of age on agreement quality decreased from $B = 0.96$, $\beta = .30$; $p = .004$ to $B = 0.60$, $\beta = .19$, $p = .080$ when including the mediator variables.⁷

In sum, Study 3 examined age differences in recognizing and correctly applying priority-related information in integrative negotiations. Moreover, we again investigated ToM and recognition of priority-related information as potential mediators of the age effect on the quality of proposed agreements. Mirroring findings of Study 1 and Study 2, younger as compared with older adults proposed more integrative agreements. This age difference was mediated by age differences in recognizing priority-related information. Finally, although—once more—we replicated the finding of age differences in ToM (Henry et al., 2013), there was no indirect effect of age on the quality of proposed agreements via ToM alone or in a serial mediation via ToM (as the first mediator) and recognition of priority-related information (as the second mediator). In conclusion, the results of Study 3 extend the results of Studies 1 and 2 by showing that older adults fare worse in integrative negotiations even when complete priority-related information is exchanged. The results of Study 3 hence suggest that age differences in negotiations are not only attributable to older adults exchanging less priority-related information than younger adults but also attributable to older adults being less able to process the exchanged information adequately.

General Discussion

The present research provides the first empirical investigation of age differences in integrative negotiations. We based our hypotheses on (a) the finding that perspective taking is associated with higher joint outcomes (e.g., Galinsky et al., 2008; Trötschel et al., 2011), (b) the finding that a key to achieving high joint outcomes in negotiations is the exchange of priority-related information (Hüffmeier et al., 2019; Pruitt & Lewis, 1975; Thompson, 1991), and (c) the assumption that perspective taking facilitates priority-related information exchange (cf. Bazerman & Neale, 1983; Kemp & Smith, 1994). Based on two lines of research regarding perspective taking, we tested two competing hypotheses: In line with ToM research demonstrating that older as compared with younger adults are worse in perspective taking (for a meta-analysis, see Henry et al., 2013), we argued that younger as compared with older adults engage more in priority-related information exchange (Study 1 and Study 2) and show better recognition of priority-related information (Study 3) and, in consequence, should achieve better joint outcomes in integrative negotiations (Study 1 and Study 2) and propose more integrative agreements (Study 3). In contrast, Grossmann and colleagues (2010, 2013) conducted research on perspective taking within a wisdom framework and found positive relationships with age. Building on this research, older compared with younger adults should achieve higher joint outcomes in integrative

⁷ Because gender was unequally distributed in the age groups and has been demonstrated to be associated with negotiation outcomes (Mazei et al., 2015), we also conducted the mediation analyses including gender as a covariate (dummy-coded: 0 = male, 1 = female). Female participants proposed more integrative agreements ($B = -.70$, $p = .033$), although recognition of priorities was unrelated to gender ($B = 0.07$, $p = .857$). Importantly, the indirect effect of age on agreement quality via recognition of priorities in the mediation analysis remained significant when controlling for gender.

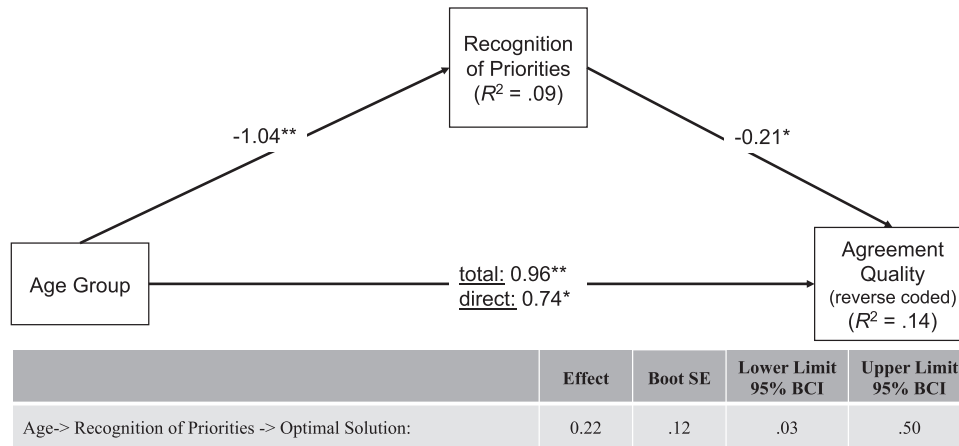


Figure 4. Mediation Model 1 and table of indirect effects (Study 3). $N = 91$, listwise deletion. Unstandardized coefficients, * $p < .05$. ** $p < .001$.

negotiation tasks based on more priority-related information exchange (Hypotheses 1b and 2b in Study 1; later dropped based on the observed findings of Study 1).

The results of three studies clearly and consistently show that younger age-homogeneous dyads achieved significantly more integrative joint outcomes than older age-homogeneous dyads. In fact, only younger dyads were able to exploit at least parts of the integrative potential of the negotiation task in Study 1 and Study 2. The findings of Studies 1 and 2 suggest that older adults might be even more at risk of a bias toward distributive agreements, that was frequently found in studies using samples of younger individuals (e.g., Bazerman & Neale, 1983; Kemp & Smith, 1994; Thompson & Hastie, 1990). In Study 3, younger and older adults proposed, on

average, agreements that would result in higher joint outcomes than a mere compromise. Albeit speculatively, this difference between studies might be attributable to the third-person perspective in Study 3, which allows for a neutral perspective on the negotiation and contributes to a more balanced conflict resolution (Carnevale & Pruitt, 1992; Grossmann & Kross, 2014). Moreover, the use of a transcript instead of a face-to-face negotiation might have reduced cognitive demands. However, in Study 3 there was still a significant age difference in the quality of proposed agreements that was in line with the findings of Studies 1 and 2.

As a potential mechanism underlying age differences in integrative negotiations, we examined the role of age differences in

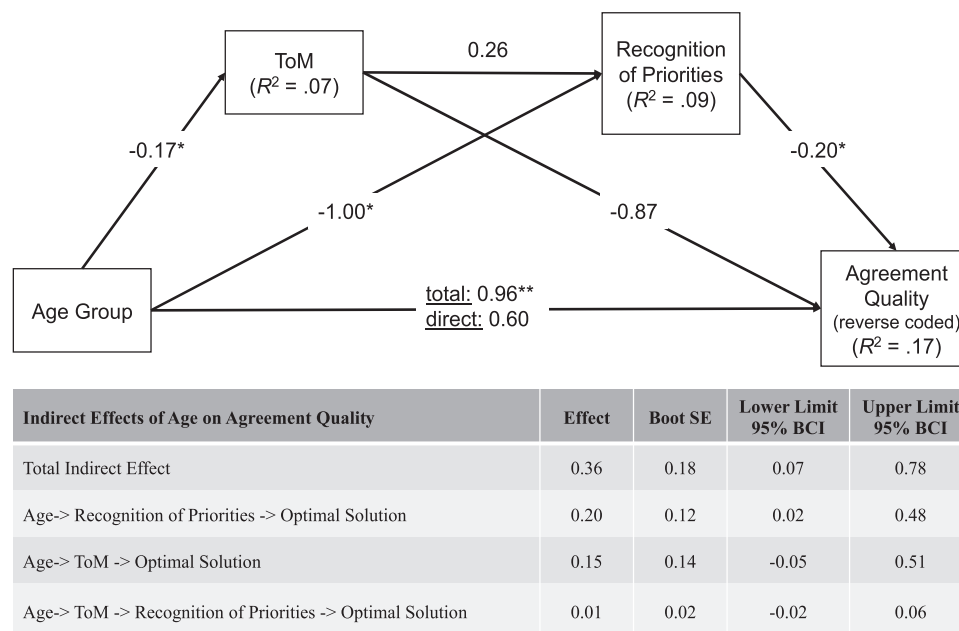


Figure 5. Mediation Model 2 (serial mediation) and table of indirect effects (Study 3). ToM = theory of mind. * $p < .05$. ** $p < .01$.

perspective taking. Perspective taking is related to higher individual and joint gains in integrative negotiations (Galinsky et al., 2008; Trötschel et al., 2011). Based on the theoretical argument that perspective taking increases the likelihood of priority-related information exchange (Bazerman & Neale, 1983; Kemp & Smith, 1994), we examined this information exchange as a behavioral consequence of perspective taking. Previous studies have demonstrated the importance of communicating one's own interests and processing information about the other's priorities among different negotiation issues, that is, priority-related information exchange has been found to be a key to achieving high joint outcomes in integrative negotiations (Hüffmeier et al., 2019; Pruitt & Lewis, 1975; Thompson, 1991). The present studies replicated this finding and showed that age differences in negotiation outcomes were attributable to age differences in the exchange of priority-related information (Study 2) and recognition and successful usage of available priority-related information (Study 3). These findings lend support to the importance of information exchange and processing for integrative negotiation outcomes.

However, our findings for the age-heterogeneous dyads in Study 1 suggest a qualification to this interpretation and point to potential moderators. Age-heterogeneous dyads did not differ from young dyads in the prevalence of exchanged priority-related information. Yet, younger dyads tended to achieve better negotiation outcomes than the age-heterogeneous dyads. Hence, age-heterogeneous dyads did not profit from exchanging information in terms of their joint outcomes. The findings of Study 3, in which priority-related information was fully available, suggest that correct recognition and successful use of this information is an important factor in this respect.

The findings of Study 1 and Study 3 correspond with previous studies, which have demonstrated that the availability of knowledge about a negotiation partner's priorities does not unequivocally lead to better joint outcomes, which may be attributable to a lack of motivation (De Dreu, Koole, & Steinel, 2000) or a lacking ability to process the information correctly (Pinkley, Griffith, & Northcraft, 1995). Because the older age group did not report less motivation or joy in the present studies (see page 4 and Table S5 in the online supplemental materials), differences in effective information processing are a more likely explanation. For example, an age-related decrease in the ability to inhibit distractors (e.g., Giesen, Eberhard, & Rothermund, 2015) might diminish a focus on the relevant information and reduce the correct interpretation of priorities of the other negotiation party.

Besides investigating priority-related information exchange as a behavioral consequence of perspective taking, we examined the role of perspective taking more directly with a ToM measure. Interestingly, although we consistently found age differences in ToM as reported in earlier research (Henry et al., 2013), and although the ToM measure was correlated with higher joint outcomes (Study 2) and more integrative proposed agreements (Study 3), it was not significantly associated with recognizing priorities. Hence, age differences in ToM cannot explain differences in priority-related information exchange or recognizing priorities, respectively, in our studies (i.e., we consistently found no support for a serial mediation). At first glance, these results are puzzling. However, perspective taking *sensu* ToM taps into a very general ability, while only parts of it might overlap with the specific perspective taking facets needed for anticipating deviating priori-

ties among different parties in social conflict situations. By contrast, Galinsky et al. (2008) and Trötschel et al. (2011) explicitly asked participants to take the other negotiator's perspective and to understand their interests and purposes, that is, they employed a very task-specific manipulation of perspective taking. Still, ToM was linked to negotiation outcomes in our studies (albeit not after controlling priority-related information exchange or recognition). This suggests that even a more general measure of perspective taking entails negotiation-specific variance to some degree. This aspect is also underlined by the finding of Study 2, which demonstrated that the estate agent's higher level of ToM relative to the tenant was associated with more integrative joint outcomes. This finding probably reflects that the behavior of a seller (or estate agent in our case) is often more decisive than the behavior of the buyer for reaching integrative agreements in negotiations among sellers and buyers (see Zerres et al., 2013, for an overview of this differentiation).

In addition to the theory-informed test of priority-related information exchange as an underlying mechanism, we also tested, in an exploratory manner, whether more global differences in communication quality might account for age differences. To this end, we coded the number of exchanged claims and offers in the negotiations. Although we found significant differences in exchanged claims and offers, with older participants having a lower number, this difference did not explain the age effect in joint outcomes. Moreover, to obtain a proxy of off-target verbosity (Arbuckle et al., 2004; Yin & Peng, 2016), we calculated the number of exchanged claims and offers relative to the negotiation duration and although, again, we found an age difference, this difference was not associated with age differences in joint outcomes.

Hence, it does not appear to be impaired information exchange *per se* or increased off-target verbosity that can account for age differences observed in our studies but rather the fact that older participants did not exchange any (Study 1) or only very little (Study 2) priority-related information and that older participants were less able to adequately process the priority-related information exchanged (Study 3). This interpretation is also in line with the results of Study 3, where participants did not interact with each other and, thus, general negotiation communication processes, such as off-target verbosity, cannot account for age differences. Taken together, in three studies we found consistent evidence for age differences in integrative negotiations that could be explained by two conceptually closely related explanations, priority-related information exchange (Study 1 and 2) and processing of priority-related information exchanged (Study 3), respectively, while ruling out a number of alternative explanations.

To avoid misunderstandings, we do not mean to imply that age-related impairments in perspective taking and priority-related information exchange are the only mechanisms that might account for age differences in negotiations. Negotiations can be regarded as a rather complex social-cognitive process drawing on a number of individual differences, such as intellectual abilities, but also personality differences, motivations, expectations, and beliefs (cf. De Dreu et al., 2000; Elfenbein, 2015), which might change across the life span and might, thus, be linked to age differences in negotiation outcomes.

Limitations and Future Directions

All our studies were sufficiently powered to reliably detect age differences in negotiation outcomes (Study 1: $1 - \beta = .76$; Study 2: $1 - \beta = .99$; Study 3: $1 - \beta = 0.87$)—which was the main objective of our research. Similarly, the power was sufficient to reliably detect age effects on priority-related information exchange (Study 1: $1 - \beta = .93$ and Study 2: $1 - \beta = .82$) and recognition of priorities (Study 3: $1 - \beta = 0.81$). Thus, our samples consistently reached the conventional power threshold of .80 and were able to reliably detect these effects. The investigation of age effects on ToM was slightly underpowered (Study 2: $1 - \beta = .71$ and Study 3: $1 - \beta = 0.77$).

Moreover, our sample sizes might have been slightly underpowered to detect significant indirect effects, particularly in serial mediation models. Fritz and MacKinnon (2007) provided an overview of the sample size needed, given different effect sizes, to achieve 80% power to detect a significant bias-corrected bootstrapped coefficient for an indirect effect. Given that we obtained large effects for the age difference in priority-related information exchange on joint outcomes in Study 2 and medium effects for Study 3 for the recognition of priorities, the requirements of Fritz and MacKinnon (2007) were fulfilled ($N = 34$ for large/large effects and $N = 71$ for medium/medium effects). However, given the somewhat smaller effects related to ToM, the sample size was potentially not large enough to reliably detect a significant effect for ToM in a simple mediation and much less in a serial mediation. The mediation results for ToM, therefore, should be interpreted with due caution.

In terms of alternative accounts for the observed age differences, previous studies have shown that age-related differences in ToM can be (partially) explained by age-related cognitive deficits (Rakoczy et al., 2012; Sullivan & Ruffman, 2004). This suggests that a decline in cognitive abilities might also (at least partially) account for age differences in joint outcomes in integrative negotiation tasks, implying a rather unspecific age effect. However, in the present studies, age differences in executive functions and verbal abilities did not contribute significantly to explained variance in the negotiation outcome measures (see Footnote 6), whereas age differences in priority-related information measures did. Moreover, although we reduced the cognitive demands in Study 3, the observed age difference prevailed. Still, to investigate the role of cognitive functions, future studies could experimentally vary participants' cognitive load, for instance, by varying the number of negotiation issues and options within issues, or by using dual-task paradigms.

Other studies suggest that age differences in cognitive tasks such as ToM tasks are primarily attributable to motivational factors (e.g., Blanke, Raters, & Riediger, 2015; Wieck & Kunzmann, 2015; Zhang, Fung, Stanley, Isaacowitz, & Ho, 2013). When tasks were adapted to suit older adults' goals (e.g., interaction with familiar/close people or focusing on positive information; see socioemotional selectivity theory, Carstensen, 2006) or concern older age-relevant topics, they performed similarly to younger adults. For instance, Zhang et al. (2013) obtained a similar performance for younger and older adults in *faux pas* and emotion recognition tasks when perceived closeness between participant and experimenter or target was experimentally increased. Moreover, older adults achieved results comparable with younger adults

if the tasks concerned age-relevant topics (Wieck & Kunzmann, 2015). In a similar vein, recent comparative and integrative work regarding wisdom and perspective taking research points to the role of the experiential context (i.e., age-relevance of the decisional situation or presentation of material) that might account for age differences in wisdom tasks to some degree (Grossmann, 2017; Rakoczy et al., 2018). More salient age-related experiences benefit the performance in these tasks; thus, depending on the age relevance, sometimes younger and sometimes older adults show better performances. To minimize the influence of these alternative interpretations, we used a task that was carefully pretested to be equivalent for younger and older adults regarding its relevance in everyday life, experience with the negotiation context, and joyfulness of the task (see pages 3–5 in the [online supplemental materials](#) for details). Still, future research is needed to examine whether our findings generalize to other types of negotiations.

Finally, we note that the involvement of older individuals in negotiations, for example, as mediators in third-party negotiations, might still benefit negotiation results because of other relevant factors such as confidence building among negotiation partners (Goldberg & Shaw, 2007) or recognizing and acknowledging emotions of negotiation partners (Bollen & Euwema, 2015). A number of studies on interpersonal problem solving appear to support this perspective because they found that older adults outperform younger adults in this domain (e.g., Blanchard-Fields, 2007, for a review). These studies suggest that older adults are better able to effectively tailor instrumental and emotion-regulation strategies to the specific context. Therefore, future research on age differences in negotiations should focus on factors such as third parties' emotion recognition and emotion regulation.

Conclusion

Previous studies on integrative negotiations have almost exclusively focused on younger adults despite the frequent involvement of older adults in negotiations in everyday life, politics, and economics. Our studies are the first to show that older adults fare worse in integrative negotiations as compared with younger adults, thereby pointing to a potential vulnerability in everyday life situations where older adults might achieve suboptimal negotiation outcomes. We also identified priority-related information exchange and, closely linked, recognition and usage of priority-related information, as important mediators of age differences in joint negotiation outcomes. These mediators might be a promising avenue for interventions to improve negotiation outcomes.

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