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# Perception of risk for older adults: Differences in evaluations for self vs. others and across risk domains

Rolison, J

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1 Running Head: PERCEPTIONS OF RISK FOR OLDER ADULTS

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4 domains

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6 Jonathan J. Rolison

7 Department of Psychology, University of Essex

8 Yaniv Hanoch

9 Department of Psychology, University of Plymouth

10 Alexandra M. Freund

11 Department of Psychology and University Research Priority Program Dynamics of Healthy

12 Aging, University of Zurich

13

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17 Author Note

18 Jonathan J. Rolison, Department of Psychology, University of Essex; Yaniv Hanoch, Department

19 of Psychology, University of Plymouth; Alexandra M. Freund, Department of Psychology and

20 University Research Priority Program Dynamics of Healthy Aging, University of Zurich.

21 Correspondence concerning the article should be addressed to Jonathan J. Rolison, Department

22 of Psychology, University of Essex. Email: [jrolison@essex.ac.uk](mailto:jrolison@essex.ac.uk). Data access: The data are

23 available via the OSF: <https://osf.io/t56hj/>.

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### Abstract

*Background and objectives:* Proxy decision-making may be flawed by inaccurate perceptions of risk. This may be particularly true when older adults are the targets of the decisions, given the pervasive negative stereotypes about older adults. *Methods:* Study 1: 18- to 87-year-olds (as target persons) as well as one of their close social partners (as informants) reported on the risks they perceived for the target person in various life domains. Study 2 additionally explored potential differences in how people make risky decisions on behalf of younger and older adult targets. Younger (18–35 years) and older (60–81 years) adults (as target persons of the risk evaluations) as well as informants reported on risk perceptions and likelihood of risk-taking for health, financial, and social scenarios concerning the target persons. Congruence between self-rated and informant-rated risk perceptions and risk-taking were computed on a dyadic as well as group level. *Results:* Informants' risk perceptions were positively associated with the risks their partners perceived for themselves. Informants and their partners agreed that social risks vary little across adulthood, but disagreed for recreational, financial, and health risks, disagreeing also in the decisions they would make. *Conclusion:* Family members, partners, and close friends are sensitive to vulnerabilities of their social partners, but in some domains and according to their partners' age perceive greater (or less) risk than their partners perceive for themselves. In situations requiring surrogate decision-making, people may decide differently to how their social partners would decide for themselves.

## 45 Perception of risk for older adults: The role of perspective and life domain

46 As people age, they face risky decisions in a range of domains, such as health,  
47 recreation, finance, and social environment. However, risk in these domains may not change  
48 uniformly across adulthood. For example, the social risk of speaking in public may be similar  
49 across adulthood, whereas swimming in rapid waters may pose greater risk for older adults who  
50 typically have lower muscle strength. There also exist individual differences in the factors  
51 associated with risk at any given age. For instance, while the average 75-year-old may have  
52 lower muscle strength than the average 45-year-old, a specific 75-year-old's muscle strength  
53 may be higher than that of her 45-year-old daughter. People likely possess unique insight into the  
54 personal risks they face (e.g., informed by perceptions of their own frailty).

55 Yet, in many instances, such as when decision-making capacity is impaired in older age,  
56 family members, partners, or close friends are called to act as surrogate decision-makers and to  
57 decide partially or entirely on behalf of others. In fact, nearly half of hospitalized patients aged  
58 65 years and older receive at least some surrogate involvement in decisions about their health  
59 care and treatment [1]. Close to one quarter of the medical decisions that involve a surrogate are  
60 made with no involvement from the patient [1]. Especially in old age, important financial  
61 decisions, including changes to wills and inheritance, as well as social decisions, such as whether  
62 to live independently or in a residential community, often involve surrogates in the decision-  
63 making process [2,3]. To address this important issue, the current research investigates the risks  
64 perceived and decisions made by younger and older adults for themselves and compares these  
65 with the risks perceived and decisions made for them by familiar others, including family  
66 members, partners, and close friends.

67 Older adults have typically been shown to be more cautious than younger adults when  
68 judging risks for themselves [4,5]. However, a wealth of research now suggests that risk-taking  
69 is to some extent domain-specific: Risk-taking in some domains (e.g., health) is less strongly  
70 associated with risk-taking in other domains (e.g., financial) than with risk-taking for other  
71 activities in the same domain [6, 7]. To capture the domain-specific nature of risk-taking, Weber  
72 and colleagues developed the Domain-Specific Risk-Taking scale (DOSPERT; [6, 8]. In their  
73 analysis of the revised DOSPERT, Highhouse and colleagues ([9]; see also [10]) discovered that  
74 risk-taking as assessed by the DOSPERT scale comprises both a general risk factor and domain-  
75 specific tendencies. Rolison, Hanoch, Wood, and Pi-Ju [11] employed the revised DOSPERT to  
76 measure risk-taking across adulthood. Their study uncovered age trends specific to each of the  
77 DOSPERT domains. Health risk-taking reduced smoothly with age, whereas recreational risk-  
78 taking reduced more steeply in early adulthood. Financial risk-taking declined more sharply in  
79 later life and risk-taking in the social domain actually increased slightly from younger to middle  
80 adulthood, before decreasing sharply in older adulthood.

81 Are there differences in how people perceive their own risk in various domains in  
82 younger and older age from how others perceive the risks for them? Some research suggests that  
83 people may be reasonably accurate at perceiving risks specific to a person whom they know well.  
84 Clinical tools for the assessment of vulnerabilities in older age have often recruited family  
85 members, partners, and close friends as knowledgeable informants. For example, the Social  
86 Vulnerability Scale (SVS) was developed as an informant scale to identify social vulnerabilities  
87 in older age, such as credulity and gullibility [12,13]. The SVS is designed as a clinical tool for  
88 identifying vulnerabilities among individuals aged 50 years or older and is completed by a  
89 knowledgeable informant (e.g., a family member) to circumvent issues associated with poorer

90 insight into one's own behavior in older age [13]. High scores on the SVS have been shown to  
91 predict neurological disease in older adults, suggesting that people may be reasonably good at  
92 judging the risks that are specific to a person they know well. Moreover, the use of surrogates to  
93 aid decision-making about people's medical care and treatment and their financial future and  
94 social environment rests on the assumption that people are sensitive to the risks faced by others.

95         Our current studies investigated if, and in what way, risk perceptions for social partners  
96 in different age groups (i.e., younger and older adults) differ from the risk that those social  
97 partners perceive for themselves and whether this depends on the domain of risk. In Study 1, we  
98 asked younger, middle-aged, and older participants about the risks they perceived for themselves  
99 and their likelihood of risk-taking for several activities and behaviors in multiple domains. Each  
100 participant also nominated a person who knew them well to report on the risks they perceived for  
101 their nominating partner. In Study 2, we asked younger and older participants about their risk  
102 perceptions and likelihood of risk-taking for a smaller number of more detailed scenarios and  
103 asked their nominated partners to report how likely they would be to take the same risk on behalf  
104 of their nominating partner in addition to reporting the risks they perceived for their partner.

105         We anticipated differences between how people perceive risks for themselves to how  
106 those risks are perceived for them by others. Namely, people may have specific insight into their  
107 own risks, which may lead them to perceive different risks to those judged for them by others.  
108 Fragility, dependency, physical handicaps, and need of care are prominent in stereotypes about  
109 older people [14,15]. The influence of aging stereotypes can even resist contradictory  
110 experience. For example, caregivers in nursing homes use baby talk regardless of the physical  
111 and cognitive abilities of older residents [16]. Thus, based on aging stereotypes, people may infer  
112 greater risks for older adults even despite contradictory knowledge about their strengths. We

113 hypothesize that if informants base their perceptions solely on age-related stereotypes, they will  
114 perceive greater risk for their older social partners in all domains than their partners perceive for  
115 themselves, making more cautious decisions on their behalf. However, aging stereotypes,  
116 internalized during childhood, can become self-stereotypes in older age. In fact, older adults have  
117 been shown to display negative aging self-stereotypes as implicit attitudes that are as negative as  
118 those possessed by people of younger ages [17]. Negative aging self-stereotypes can negatively  
119 impact on cognitive abilities, such as memory performance [18]. Thus, older adults may perceive  
120 themselves as more vulnerable than they truly are, leading to a higher estimate of their risks  
121 compared to estimates by their close social partners and consequently to more cautious decision-  
122 making.

## 123 **Study 1**

### 124 **Methods**

#### 125 *Participants*

126 One hundred thirty adults aged 18-87 years ( $M = 47.80$ ;  $SD = 21.07$ ; 63% female), were  
127 recruited from the local community. All participants aged 60 years or older passed the mini  
128 mental state examination as a screen for cognitive impairment [19] and none were excluded.  
129 Regarding education, 21% indicated high school as their highest level of education, 34% had  
130 completed college or third level education (e.g., A-levels, diploma), 33% had completed an  
131 undergraduate degree, and nine 7% indicated that they had completed post-graduate education  
132 (e.g., Master's degree, PhD degree). Each participant nominated a family member, partner, or  
133 close friend aged 35-60 years ( $M = 46.19$ ;  $SD = 8.27$ ; 62% female) to report on the risks they  
134 perceived for their nominating partner. We targeted the 35-60 year age range in order to restrict  
135 the age-related variance in risk perceptions in the informant sample, and because it seems the

136 most likely age of potential proxy decision-makers for both young and older adults who may not  
137 be able to make decisions for themselves. The informants had known their nominating partner at  
138 least one year ( $M = 26.91$ ;  $SD = 14.02$ ). The majority were parents (30%), sons or daughters  
139 (24%), spouses or partners (15%) siblings (6%), nieces or nephews (4%), or other family  
140 members (4%), and the remaining were close friends or work colleagues (18%). Regarding  
141 education, 20% indicated high school as their highest education level, 37% indicated that they  
142 had completed college or third level education, 33% had completed an undergraduate degree,  
143 and 8% indicated a post-graduate degree as their highest level of education. Ethical approval for  
144 the research protocol was granted by the institution ethics review board.

#### 145 *Materials and Procedure*

146 *Self-ratings:* All participants received the same 16 items divided equally into four  
147 domains, including the recreational (e.g., ‘*Going camping in the wilderness*’), social (e.g.,  
148 ‘*Admitting your tastes are different from those of a friend*’), financial (e.g., ‘*Betting on the*  
149 *outcome of a sporting event*’), and health (e.g., ‘*Taking a ride on a motorcycle without wearing a*  
150 *helmet*’) domains (see Appendix A for the full list of items). We did not include the ethical  
151 domain in our survey as the items were not suitable for use with informants (e.g., ‘*Having an*  
152 *affair with a married man/woman*’). Some of the survey items were similar or identical to those  
153 in the revised DOSPERT [20]. Other items were generated for our present purposes to ensure  
154 that they were suitable for a diverse age range. For example, rather than ask participants about  
155 ‘*Piloting a small plane*’ or ‘*Bungee jumping off a tall bridge,*’ which did not seem suitable for  
156 older adults, we asked them about ‘*Starting a new intense exercise routine*’ and ‘*Going winter*  
157 *swimming in an icy lake.*’ Items such as ‘*Starting a new career in your mid-thirties*’ in the social  
158 domain of the revised DOSPERT were replaced with less age-specific items, such as ‘*Speaking*

159 *at a debate club in your local community.*’ Some DOSPERT items in the financial domain  
 160 referred to income (e.g., *‘Betting a day’s income on the outcome of a sporting event’*) and were  
 161 made more generic (*‘Betting on the outcome of a sporting event’*), and items in the health  
 162 domain that required specific abilities (e.g., *‘Riding a motorcycle without a helmet’*) were made  
 163 more general (*‘Taking a ride on a motorcycle without wearing a helmet’*).<sup>1,2</sup>

164 Participants received a printed booklet containing the 16 items. They rated their risk-  
 165 taking likelihood and perceived risk in separate sections of the booklet. The items were presented  
 166 in a randomly generated order within each section, but in the same order for each participant.  
 167 The order of sections was randomly generated for each participant. In the risk-taking likelihood  
 168 section, participants were asked to *‘indicate the likelihood that you would engage in the*  
 169 *described activity or behavior if you were to find yourself in that situation.’* Participants provided  
 170 their ratings on a 7-point scale, ranging -3 (*‘Extremely unlikely’*), 0 (*‘Not sure’*), to 3  
 171 (*‘Extremely likely’*). Responses were summed across items to calculate likelihood ratings for  
 172 each risk domain, where higher ratings indicate a higher likelihood of risk taking. In the risk  
 173 perception section, they were told:

174 *‘People often see some risk in situations that contain uncertainty about what the outcome*  
 175 *or consequences will be and for which there is the possibility of negative consequences.*  
 176 *However, riskiness is a very personal and intuitive notion, and we are interested in your*  
 177 *gut level assessment of how risky each situation or behavior is for you.’*

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<sup>1</sup> Some items underwent further modification following initial pilot testing.

<sup>2</sup> As some of the scale items were modified for our purposes, we conducted an exploratory factor analysis (FA) on self-rated risk perceptions using Varimax rotation to test its factor structure. The FA extracted four factors based on a criterion of eigenvalues > 1 and explained 59% of the variance. All 4 recreational items loaded most heavily on Factor 1; 3 of the 4 social items loaded most heavily on Factor 2 (item 3 [see Appendix A for item description] loaded on Factor 1); 3 of the 4 financial items loaded most heavily on Factor 3 (item 3 loaded on Factor 1); and 2 of the 4 health items loaded most heavily on Factor 4 (items 2 and 4 loaded on Factor 1). Thus, our FA broadly confirmed the four-domain structure for our modified version of the DOSPERT (see Appendix B for more details).

178 Participants were then asked to ‘*indicate how risky you perceive each situation for you*  
179 *personally if you were to find yourself in that situation*’ on a 7-point scale, ranging 0 (‘*Not at all*  
180 *risky*’) to 6 (‘*Extremely risky*’). Risk perception ratings for each risk domain were calculated by  
181 averaging responses across items, where higher ratings indicate higher perceived risk. The  
182 participant instructions were similar to those used in the revised DOSPERT scale [20].

183 *Informant ratings:* The informants completed an online version of the risk perception  
184 section of the survey and were asked to rate the 16 items as they perceived them for their partner.  
185 This required slight amendments to the instructions, which instead read ‘*...we are interested in*  
186 *your gut level assessment of how risky each situation or behavior is for [partner name].*’ and  
187 ‘*indicate how risky you perceive each situation would be for [partner name] if he/she were to find*  
188 *himself/herself in that situation*’. The online nature of the informant version enabled us to insert  
189 the partner’s name in the amended text. Some of the scale items also required minor amendments  
190 (e.g., ‘*Admitting their tastes are different from those of a friend*’) to reflect the informant’s  
191 perspective. Participants provided their ratings on the same scale as self-rating participants.

#### 192 *Statistical analysis*

193 To test for associations between the risks informants perceived for their partners and  
194 risks their partners perceived for themselves, we calculated Pearson  $r$  correlations between self-  
195 rated and informant-rated risk perceptions for each risk domain. To test whether informants’ risk  
196 perceptions correlated more highly with their partners’ risk perceptions for the same domain than  
197 for each other domain, we used the method proposed by Steiger [21, 22] for comparing  
198 dependent correlations, which involves comparing the correlation coefficients after applying  
199 Fisher’s  $r$ -to- $z$  transformation (see [22] for more details).

200 Domain differences in self-rated risk-taking likelihood were assessed with a one-way  
201 analysis of variance (ANOVA) on likelihood ratings, including domain (recreational, social,  
202 financial, health) as a repeated-measures factor. In the analysis of risk perceptions, we  
203 additionally included group (informant-ratings vs. self-ratings) in the ANOVA to test for group  
204 differences in risk perceptions.

205 To test for effects of the self-rating participant's age on their risk perceptions and the  
206 risk perceptions of their partner, we conducted a multiple regression analysis on risk perceptions  
207 in each domain. Age (as a continuous grand mean-centered predictor) and group (informant-  
208 ratings vs. self-ratings) were included as predictors in a first block (Model A). In a second block  
209 (Model B), an interaction term between age and group was included. In a final block (Model C),  
210 the interaction term was removed and a quadratic term for age was included to test for  
211 curvilinear effects of age on risk perception. The  $R^2$  change for Models B and C was assessed in  
212 comparison with Model A. An  $\alpha$  level of .05 was used in all analyses.

## 213 **Results**

214 Table 1 provides the Cronbach  $\alpha$  scores, showing reasonable levels of internal  
215 consistency of the scales. The positive intercorrelations in self-rated risk-taking likelihood (and  
216 risk perception) indicate that greater risk-taking likelihood (risk perception) in each domain was  
217 associated with greater risk-taking likelihood (risk perception) in each other domain. Regarding  
218 informant ratings, the intercorrelations were all positive, indicating that informants' perceptions  
219 of greater risk for their partners in one domain were associated with greater perceived risk for  
220 their partners in other domains (Table 1).

221 As shown in Table 2, the risks informants perceived for their partner correlated with the  
 222 risks their partner perceived for themselves in each domain.<sup>3</sup> In general, informants' risk  
 223 perceptions also correlated more highly with their partner's risk perceptions for the same domain  
 224 than with their partners' risk perceptions in other domains (Table 2).

225 Table 3 provides the mean group risk-taking likelihood and risk perception ratings.  
 226 Self-rated risk-taking likelihood was highest in the health domain, followed by the financial,  
 227 social, and recreational domains. A significant effect of domain was confirmed by the analysis of  
 228 variance (ANOVA;  $F(3,387) = 57.06, p < .001, \eta^2 = .31$ ). Regarding risk perception, informants  
 229 perceived similar risks for their partners as their partners perceived for themselves ( $F(1,258) =$   
 230  $0.11, p = .74$ ). Moreover, informants and their self-rating partners agreed about domain  
 231 differences in risk, perceiving the greatest risk in the health domain, followed by the financial,  
 232 recreational, and social domains. The ANOVA confirmed a significant effect of domain  
 233 ( $F(3,774) = 466.10, p < .001, \eta^2 = .64$ ) and showed no significant interaction.

234 Do people perceive greater (or less) risk according to the other's age? Table 4 provides  
 235 the results of the regression analyses on the risk perceptions of self-ratings participants and  
 236 informants. In the recreational, financial, and health domains, group (informant- vs. self-rating)  
 237 interacted with the age of the self-rating participant.<sup>4</sup> This result suggests that in these domains  
 238 the association between age and risk perception differed between self-rating participants and

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<sup>3</sup> We additionally conducted multiple linear regression analyses on partners' self-rated risk perceptions in each domain to test for moderating effects of informants' relationship with their partner (parent vs. other relations, adult children vs. other relations) and the absolute age difference between informants and their partners on the association between informant- and self-rated risk perceptions. Parent (vs. other relations) interacted with informant risk perceptions in the recreational domain (see Appendix C), such that the association between informant- and self-ratings was weaker for parent informants. There were no other significant interactions.

<sup>4</sup> According to a post-hoc power analysis with significance level ( $\alpha$ ) = .05 and effect sizes based on our regression analysis for each domain, our power to detect the significant age by group interaction was .95 in the recreational domain, .996 in the financial domain, and .74 in the health domain. Therefore, we had sufficient power to detect a significant age by group interaction on 74% to 99% of occasions.

239 informants (Model B; Table 4). In the recreational domain, self-rated risk perceptions increased  
240 linearly with age, whereas the risk perceptions of informants followed a quadratic trend with the  
241 age of their self-rating partner (Model C; Table 4).

242 Figure 1 provides the best fitting slopes for age on risks perceptions. Informants  
243 perceived that recreational risk for others vary little from age 18-56 years, but from thereon  
244 increase with age. Consequently, informants perceived more risk for their youngest partners than  
245 their partners perceived for themselves, and perceived slightly less risk for their oldest partners  
246 than their oldest partners perceived for themselves. In the financial domain, participants  
247 perceived greater risk for themselves as their age advanced from 18-87 years. Conversely, their  
248 informants did not perceive greater risk as their partner's age increased. Consequently,  
249 informants perceived greater risk for their younger partners and lower risk for their older partners  
250 than their partners perceived for themselves. Similarly, participants perceived greater health risks  
251 for themselves as their age increased from 18-87 years, whereas their informants did not perceive  
252 greater risk as their partner's age increased. In the social domain, self-rating participants and  
253 their informants perceived a gradual increase in risk with age.

254 In sum, informants perceived greater risks for younger social partners in the  
255 recreational, financial, and health domains than their partners perceived for themselves.  
256 Moreover, informants perceived less risk for their older social partners in these domains than  
257 their partners perceived for themselves. These findings speak against our hypothesis that people  
258 base their judgments of others primarily on age-related stereotypes, which would have led to a  
259 higher risk evaluation for older adults. Rather, our findings resonate with our alternative  
260 hypothesis that older adults estimate their own risks as higher than perceived by their social

261 partners. This may indicate that older adults evaluate their own risks in line with aging self-  
262 stereotypes.

## 263 **Study 2**

264 In Study 1, family members, partners, work colleagues, and close friends acting as  
265 informants perceived risk differently depending on the age of the social partners and differently  
266 to how their social partners perceived risk for themselves. Given that these results have potential  
267 implications for proxy decision-making, we were interested if these differences also bear out for  
268 making risky decisions on the behalf of social partners. Study 2 addressed this question by  
269 further exploring potential differences between how people of different ages make risky  
270 decisions and how their informants would make decisions for them (i.e. proxy decision-making).

## 271 **Methods**

### 272 *Participants*

273 A sample of 106 adults (53 younger adults, 18–35 years,  $M = 21.76$  years,  $SD = 4.75$ ;  
274 62% female; 53 older adults, 60–81 years,  $M = 69.11$  years;  $SD = 5.36$ ; 55% female) were  
275 recruited from the local community. All older adults passed the mini mental state examination as  
276 a screen for cognitive impairment [19] and none were excluded. Regarding education, 15%  
277 indicated high school as their highest level of education, 17% had completed college or third  
278 level education, 58% had completed an undergraduate degree, and 10% indicated post-graduate  
279 education as their highest level of education. Self-rating participants nominated a family  
280 member, partner, or close friend aged between 35-60 years ( $M = 47.62$ ;  $SD = 7.44$ ; 64% female)  
281 to report on their nominating partner. Informants had known their nominating partner at least one  
282 year ( $M = 27.05$ ;  $SD = 13.32$ ). The majority were parents (40%), sons or daughters (29%),  
283 spouses or partners (15%), siblings (3%), or other family members (4%), and the remaining were

284 friends or work colleagues (10%). Regarding education, 18% indicated high school as their  
285 highest education level, 23% had completed college or third level education, 44% had completed  
286 an undergraduate degree, and 12% indicated a post-graduate degree as their highest level of  
287 education. Ethical approval for the research protocol was granted by the institution ethics review  
288 board.

### 289 *Materials and Procedure*

290 *Self-ratings:* We designed 12 decision scenarios, divided equally into the health,  
291 financial, and social domain (Appendix D). Each scenario asked participants to make a decision  
292 for themselves. We also asked informants to make decisions on behalf of their partner. We did  
293 not include items in the recreational domain (e.g., “*Going camping in the wilderness*”) as people  
294 typically engage in such activities for personal pleasure, and thus, it may be difficult for  
295 informants to imagine making such decisions on behalf of their partner. The scenarios were  
296 provided on separate pages of a booklet. Participants indicated their likelihood of deciding in  
297 favor of the decision option described in the scenario on a 7-point scale, ranging -3 (*‘Extremely*  
298 *unlikely*’), 0 (*‘Not sure*’), to 3 (*‘Extremely likely*’). Participants also rated the risks they perceived  
299 for the decision option on a 7-point scale, ranging 0 (*‘Not at all risky*’) to 6 (*‘Extremely risky*’).

300 *Informant-ratings:* Informants received altered versions of the 12 scenarios, which  
301 instead asked for decisions on behalf of their partner (Appendix D). The scenarios were provided  
302 on separate pages of a booklet. The partner’s name was inserted into each scenario. Informants  
303 their likelihood of deciding in favor of the decision option on behalf of their partner and rated the  
304 risks they perceived for their partner.

### 305 *Statistical analysis*

306 As in Study 1, we calculated Pearson  $r$  correlations to test for associations between  
307 informants' risk perceptions and risks their partners perceived for themselves. Group differences  
308 (informant-rating vs. self-rating) and domain differences (social, financial, health) in risk  
309 perceptions and risk-taking likelihood were assessed with two-way analyses of variance  
310 (ANOVA), including group as a between-subjects factor and domain as a repeated-measures  
311 factor. As in Study 1, to test for effects of the self-rating participant's age on their risk  
312 perceptions and the risk perceptions of their partner, we conducted a multiple regression analysis  
313 on risk perceptions in each domain. Age (older vs. younger) and group (informant-ratings vs.  
314 self-ratings) were included as predictors in a first block (Model A). An interaction term between  
315 age and group was included in a second block (Model B). We conducted the same regression  
316 model to assess self-rated and informant-rated risk-taking likelihood.

## 317 **Results**

318 The Cronbach  $\alpha$  scores showed reasonable levels of internal consistency for most of the  
319 scales (Table 5). The intercorrelations in risk-taking were positive and significant for self-ratings  
320 only between the health and financial domains and for informant-ratings only between the  
321 financial and social and financial and health domains. This may reflect the contextual nature of  
322 the scenarios, due to their detailed descriptions, which may have increased the specificity of risk-  
323 taking across domains. The intercorrelations in risk perception across domains were in general  
324 positive and significant. The risk perceptions of informants correlated with their partner's risk  
325 perceptions in the financial domain ( $r = .22, p = .02$ ), but not in the social ( $r = .05, p = .61$ ), or  
326 health domains ( $r = -.05, p = .59$ ).<sup>5</sup> There were no significant correlations across domains. The

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<sup>5</sup>As in Study 1, we additionally conducted multiple linear regression analyses on partners' self-rated risk perceptions to test for moderating effects of informants' relationship with their partner and the absolute age difference between informants and their partners. These analyses yielded no significant moderating effects of relationship or informant-partner age differences on the association between informant- and self-rated risk perceptions (Appendix C).

327 low correlations between the risk perceptions of informants and their partners may reflect the  
328 contextual nature of the scenarios, which may have led to more idiosyncratic responding to the  
329 current scenarios compared to the DOSPERT in Study 1.

330 Informants rated a lower likelihood of taking a risk on behalf of their partners than self-  
331 rating participants indicated for themselves (Table 6). An analysis of variance (ANOVA)  
332 confirmed a significant effect of group (informant-rating vs. self-rating;  $F(1,212) = 4.41, p = .04,$   
333  $\eta^2 = .02$ ) on likelihood ratings. Informants and self-rating participants showed similar trends in  
334 risk-taking likelihood across domains, reporting highest risk-taking likelihood in the social  
335 domain, followed by the health and financial domains (Table 6). The ANOVA showed a  
336 significant effect of domain ( $F(2,424) = 137.20, p < .001, \eta^2 = .39$ ), but no interaction.

337 Regarding risk perceptions, informants perceived lower risks for their partner than self-rating  
338 participants perceived for themselves (Table 6), which was confirmed by a significant effect of  
339 group in the ANOVA on risk perceptions ( $F(1,212) = 8.03, p = .005, \eta^2 = .04$ ). Informants and  
340 self-rating participants agreed about domain differences in risk, perceiving greatest risk in the  
341 financial domain, followed by the health and social domains (Table 6). The ANOVA showed a  
342 significant effect of domain ( $F(2,424) = 211.20, p < .001, \eta^2 = .50$ ), but no interaction.

343 Table 7 shows the regression analyses on risk-taking likelihood. The age of the self-  
344 rating participant interacted with informant-rating versus self-rating in the financial and health  
345 domains, but not in the social domain (Model B; Table 7). With advancing age, self-rating  
346 participants rated lower risk-taking likelihood in the financial and health domains (Figure 2).  
347 Conversely, informants were not influenced by their partners' age. We tested for effects of age  
348 separately for self-ratings and informant-ratings. These analyses confirmed an effect of age on

349 self-ratings in the financial ( $\beta = -.50, p < .001$ ) and health ( $\beta = -.46, p < .001$ ) domains, but not  
 350 on informant-ratings in the financial ( $\beta = -.01, p = .94$ ) and health ( $\beta = .04, p = .70$ ) domains.

351 Table 7 provides the results of the regression analyses on risk perceptions. Age of the  
 352 self-rating participant interacted with informant-ratings versus self-ratings in the financial  
 353 domain (Model B; Table 7).<sup>6</sup> Self-rating participants, but not informants, perceived greater  
 354 financial risk in older age (Figure 2). Conversely, self-rating participants and informants both  
 355 perceived greater health risk in older age, which was confirmed by significant main effect of age  
 356 and no significant interaction between age and informant-ratings versus self-ratings in the  
 357 regression analysis (Model B; Table 7). Conversely, in the social domain, there was no  
 358 significant effect of age on risk perceptions (Model B; Table 7).

### 359 General Discussion

360 How do we perceive risks for others as they age? Do we generally believe that older  
 361 adults are more vulnerable across different life domains or are we, as we are for ourselves,  
 362 sensitive to differences in heightened risks across domains? The central finding of the current  
 363 studies is that the deviations of risk perceived for oneself and by others differ for younger and  
 364 older age groups and across life domains: in the recreational, financial, and health domains,  
 365 social partners believe that younger adults are more prone to risks than younger adults perceive  
 366 for themselves, and that older adults are less prone to risks than older adults perceive for  
 367 themselves. This concerns the group level. On the dyadic level, people were in fairly good  
 368 agreement with their social partners about the risks their partners faced.

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<sup>6</sup>According to a post-hoc power analysis with significance level ( $\alpha$ ) = .05 and effect sizes based on our regression analysis for each domain, our power to detect the significant age by group interaction on likelihood ratings was .99 in the financial domain and .98 in the health domain and on risk perceptions was .74 in the financial domain. Thus, we had sufficient power to detect a significant age by group interaction on 74% to 99% of occasions.

369 Previous work has relied heavily on gambling tasks as a method for studying age-  
370 related differences in risk taking [23]. Although gambling tasks provide valuable insights into  
371 behavior, research has revealed domain-specificity in risk taking [11,20]. Risk taking may  
372 comprise both a general factor that is common across domains, but differs from one person to  
373 another, and a domain-specific factor that differs from one domain to another [9]. Our current  
374 research revealed a four-domain structure to the scale we used to assess risk perceptions (see  
375 Appendix B), confirming the existence of domain-specificity in perceptions of risk. Yet, risk  
376 perceptions correlated highly across domains, indicative of a domain-general component of risk  
377 perception (Table 1). Domain-specificity in risk raises important questions about whether age  
378 differences are independent of context. The aim of our studies was to explore whether family  
379 members, partners, and close friends acting as informants perceive greater age-related risks as  
380 people perceive for themselves. If older adults perceive greater risk in some domains than in  
381 others because they are sensitive to their own vulnerabilities, then these vulnerabilities may also  
382 be perceptible to their family members, partners, and close friends. In fact, social partners have  
383 often been used as informants in clinical assessments of social vulnerabilities in older age  
384 [12,13]. Further, surrogate decision making for others about their medical treatment, finance, and  
385 social environment rests on the assumption that people can judge risk accurately for others.  
386 Using a novel methodological approach, we asked informants to rate the risks they perceived for  
387 their nominating partner.

388 In Study 1, the risks participants perceived for themselves were strongly associated with  
389 the risks perceived for them by their informants. Informants also agreed with their partners about  
390 domain differences in risk. In Study 1, both informants and self-rating participants perceived risk  
391 to be greatest in the health domain, followed by the financial, recreational, and social domains.

392 In Study 2, both groups perceived the decision-making scenarios to be most risky in the financial  
393 domain, followed by the health and social domains. However, while informants and their  
394 partners agreed about domain differences in risk, informants disagreed with their partners about  
395 how these risks change across adulthood. In the recreational domain, the risk perceptions of self-  
396 rating participants increased linearly with age from youngest to oldest adults. Conversely,  
397 informants perceived that risk for their partners changed little until 56 years, whereupon it was  
398 perceived to increase sharply with advancing age. Informants were sensitive to greater potential  
399 risks of engaging in recreational activities in older age. Moreover, informants perceived that their  
400 younger partners were more at risk when engaging in recreational activities than their younger  
401 partners perceived for themselves. This finding dovetails with reports of heightened impulsivity  
402 and sensation seeking in younger adulthood [24]. Sensation seeking is also linked to recreational  
403 risk taking in younger adulthood [25]. For example, Pizam et al. [26] found that when on a  
404 leisure trip, university students who scored high in combined risk-taking and sensation seeking  
405 were more likely to engage in risky recreational activities, such as hiking, camping, and open  
406 water swimming. Thus, younger adults perhaps misjudge the risks they face by underestimating  
407 their physical vulnerabilities.

408 Informants and their partners also disagreed about how financial risks change across  
409 adulthood (Figures 1 & 2). Informants perceived less financial risk for their older partners than  
410 their partners perceived for themselves. Study 2 further revealed that while participants were less  
411 likely to take a financial risk for themselves as their age increased, risk-taking of informants on  
412 behalf of their partners was not influenced by their partners' age. Financial advisors often  
413 recommend to older adults that they be prudent in their financial investments, as a loss to savings  
414 in later life could take many years to recover [27]. We speculate that older adults may be very

415 cautious in their financial decision-making, maybe even overestimating their vulnerabilities in  
416 financial contexts. Indeed, while some of the financial items we used in Study 1 and some of the  
417 financial scenarios in Study 2 concerned investments of income and savings, others described  
418 betting on a sporting event or using a credit card to make an online payment. Our findings seem  
419 to reflect a general tendency toward caution in financial contexts with advancing age, at least in  
420 comparison with the views of others. This is in line with the finding that older adults are less  
421 willing than younger adults to take risks on a range of monetary gambling tasks [4, 23, 28-31],  
422 although such tasks typically involve gambling on small and inconsequential monetary gains and  
423 losses (for a discussion of this issue see [32]).

424         In Studies 1 and 2, participants perceived greater health risks for themselves in older  
425 age. While informants also perceived greater health risks for their older partners in Study 1, they  
426 did not perceive significantly greater risks for their older partners in the more detailed scenarios  
427 in Study 2. However, there was some suggestion in Study 2 that participants perceived slightly  
428 more risk for themselves in older age than their partners perceived for them (Figure 2).  
429 Moreover, in Study 2, older adults were less likely than younger adults to take a health risk on  
430 their own behalf, but informants did not differ in their decision-making on behalf their younger  
431 and older partners. Together, these findings suggest that in the health domain people may be  
432 highly sensitive to their own health-related vulnerabilities. Indeed, many older adults choose not  
433 to renew their driver license, despite being unimpaired [33]. While health authorities strongly  
434 recommend daily physical activity in older age, many older adults feel that they are too  
435 physically vulnerable to engage in fitness activities [34]. Thus, overly cautious behavior has  
436 serious potential consequences for health and well-being in older age. Reduced mobility, which

437 may result from feelings of vulnerability, can lead to social isolation, which is associated with  
438 poor physical health [35] as well as loneliness and depression [36].

439         While informants and self-rating participants disagreed about how risks change across  
440 adulthood in some domains, they agreed that social risks differed little with age. The items we  
441 used in the social domain included admitting one's tastes differ from those of an authority figure  
442 or person of influence (Study 1) or sharing one's views with a journalist on a controversial issue  
443 (Study 2). As discussed earlier, with advancing age some situations can pose greater risk than  
444 others. However, informants and self-rating participants agreed that social risks do not increase  
445 in older age. Furthermore, in the social domain, informants reported that they were equally likely  
446 to take a social risk on behalf of their partners as their partners were to take a social risk for  
447 themselves.

448         Our findings have implications for research on age-related stereotypes. This field of  
449 enquiry has shown that older adults are perceived as fragile, dependent, physically handicapped,  
450 and in need of care [14,15]. These negative stereotypes have been shown to influence people's  
451 perceptions of older adults regardless of the target's actual physical or cognitive abilities [16].  
452 Hence, we expected that middle-aged informants would employ negative aging stereotypes,  
453 perceiving their older social partners as more vulnerable and at risk than their partners perceive  
454 for themselves. Yet, informants in our study actually perceived less risk for their older social  
455 partners in the recreational, financial, and health domains than their partners perceived for  
456 themselves. This indicates that aging stereotypes did not lead to exaggerated perceptions of  
457 vulnerability in older age. Moreover, on a dyadic level, informants' risk perceptions were  
458 positively associated with the risk perceptions of their partners, indicating that informants had  
459 similar perceptions of their partners' vulnerabilities as their partners had for themselves.

460 Therefore, when judging their older social partners' risks, people in younger age ranges  
461 seemingly do not draw solely upon broad age-related stereotypes but draw upon their personal  
462 knowledge of their partner.

463 Our studies cannot assess whether informants were more (or less) accurate than their  
464 self-rating social partners in judging the risks they face. However, our finding that older adults  
465 perceived greater risk for themselves in some domains than informants perceived for them  
466 suggests that older adults may draw on aging self-stereotypes. Previous research has shown that  
467 negative aging stereotypes can be internalized as early as in childhood and in later life re-emerge  
468 as self-stereotypes [17]. Negative aging self-stereotypes (e.g., that older people have poor  
469 memory), can even have detrimental effects on cognitive abilities in older age [18]. It is possible  
470 that older adults in our studies perceived, due to negative aging self-stereotypes of frailty, that  
471 they are more vulnerable, and thus, at greater risk than they truly are. Therefore, older adults may  
472 overestimate their vulnerabilities and risks in some domains life. This could have serious real-life  
473 implications as overly cautious behavior is associated with missed opportunities, which can lead  
474 to poorer physical health and well-being [35,36].

475 The current research also has limitations. First, we asked participants to report on their  
476 own risk behavior, rather than directly measure risk-taking. As our current interest was domain-  
477 specificity of risk perceptions across adulthood, we targeted self-reported behaviors in multiple  
478 domains. In Study 1, we based our survey items on those of the revised DOSPERT, which has  
479 been shown to predict real-world behavior [37]. In Study 2, we devised decision-making  
480 scenarios with the intention that they were applicable to people of a broad age range. While some  
481 of the sub-scales demonstrated reasonable Cronbach  $\alpha$  levels of internal consistency, others  
482 exhibited poorer levels, indicating that the items of some domains were less closely related. We

483 observed the lowest levels in the health domain in Study 2. Therefore, the broad domains we  
484 focused on presently should be treated with some caution as their breadth may conceal multiple  
485 sub-domains. For example, the health domain may comprise distinct medical, dietary, and  
486 exercise sub-domains.

487         Second, although our findings suggest that family members, partners, and close friends  
488 when acting as informants were able to detect vulnerabilities in their partner, some  
489 vulnerabilities (e.g., physical risks, '*Going camping in the wilderness*') may be more detectable  
490 to informants than others (e.g., health-related risks, '*Using a sunbed in a tanning studio*').  
491 Studies have shown that self-other agreement about personality traits depends on the  
492 observability or visibility of a person's characteristics [38]. Moreover, some vulnerabilities may  
493 not be detectable even to oneself, such as the risk one might face when '*Walking home alone at*  
494 *night in an unsafe area of town.*' The degree to which pairs of individuals are well acquainted  
495 and their relationship with each other also affects self-other agreement [39,40]. We chose  
496 informants who were highly familiar with their nominating partner. Informants had known their  
497 self-rating partners on average for more than 25 years in both studies, and the majority were  
498 family members. However, there was some indication in our data that acquaintanceship was  
499 important for informants' perceptions of their social partners. In Study 1, informants who were  
500 parents of their social partner exhibited weaker associations between their risk perceptions and  
501 their partners' risk perceptions in the recreational domain. Thus, extending previous research  
502 [39,40], acquaintanceship may be an important mechanism underpinning people's perception of  
503 the risks faced by others. Had we recruited informants who were less well acquainted with their  
504 social partner, we may have observed a much weaker association between their risk perceptions  
505 and perhaps greater reliance by informants on aging stereotypes. An implication of this finding is

506 that when using clinical tools to assess the vulnerabilities of older adults, such as the Social  
507 Vulnerability Scale (SVS, [12,13]), clinicians and researchers need to be cognizant that the  
508 informant's relation to the target older adult could influence their degree of insight into the  
509 target's vulnerabilities.

510 Finally, we asked whether people are sensitive to age-specific risks that others face. To  
511 answer this question, we compared the risk perceptions and risk behavior of self-rating  
512 participants with reports provided on their behalf by a nominated partner. It is important to note,  
513 however, that self-related risk perceptions are highly personal. Particular events or outcomes can  
514 be marked by varying levels of affect that are person-specific and the positive and negative  
515 feelings that people associate with particular outcomes of decision options inform their risk  
516 perceptions [41]. Moreover, positive and negative personal experiences (e.g., receiving a  
517 scornful criticism) can mark future decision options (e.g., disagreeing with an authority figure)  
518 with positive or negative emotions that influence decision-making [42]. We acknowledge that  
519 such influences of affect on self-related risk perceptions presumably would not be visible or  
520 observable to others. Yet, despite the personal relevance of risk perceptions, our findings showed  
521 that in many instances informants' risk perceptions were strongly associated with those of their  
522 partners, indicating that informants were able to detect risks faced by their partners.

### 523 *Conclusion*

524 As people grow older, they perceive greater risk in some domains than in others, leading  
525 to domain-specificity in risk-taking differences with age. Family members, partners, and close  
526 friends are sensitive to the vulnerabilities of others, but in some domains, perceive greater risk in  
527 younger age and less risk in older age than others perceive for themselves. When decision-  
528 making capacity is impaired, such as in older age, some high-risk decisions about healthcare and

529 treatment and important financial and social decisions are made not by oneself, but by others.  
530 Our findings suggest that for decisions involving risk, others may decide differently to how their  
531 social partners would decide for themselves. As informants perceived less risk in older age than  
532 older adults perceived for themselves, middle-age persons acting as surrogate decision-makers  
533 may make riskier decisions on another's behalf than their elderly family members, partners, and  
534 close friends would be willing to make for themselves.  
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Table 1. Study 1: Intercorrelations across domains for self-rated risk-taking likelihood and self-rated and informant-rated risks

Self-rating: Likelihood				
	Recreational	Social	Financial	Health
Recreational	(.65)			
Social	.67**	(.60)		
Financial	.68**	.63**	(.60)	
Health	.46**	.60**	.58**	(.50)
Self-rating: Risk Perception				
	Recreational	Social	Financial	Health
Recreational	(.78)			
Social	.53**	(.64)		
Financial	.60**	.44**	(.68)	
Health	.59**	.40**	.52**	(.69)
Informant rating: Risk Perception				
	Recreational	Social	Financial	Health
Recreational	(.68)			
Social	.45**	(.60)		
Financial	.29**	.28**	(.58)	
Health	.47**	.35**	.41**	(.64)

Note. \* $p \leq .05$ , \*\* $p \leq .01$ , 2-tailed significance test of the Pearson  $r$  correlation coefficient compared to zero. Cronbach  $\alpha$  values are in parenthesis.

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Table 2. Study 1: Correlations between informant-rated and self-rated risks

Self-rating	Informant rating			
	Recreational	Social	Financial	Health
Recreational	.46**	.26**†	.17*††	.26**
Social	.31**	.46**	.11††	.22*
Financial	.36**	.17††	.35*	.21*
Health	.19*††	.14††	.15††	.25**

Note. \* $p \leq .05$ , \*\* $p \leq .01$ , 2-tailed significance test of the Pearson  $r$  correlation coefficient compared to zero; † $p \leq .05$ , †† $p \leq .01$ , 2-tailed of the Pearson  $r$  correlation coefficient informant-ratings and self-ratings of the same domain compared to self-ratings of each other domain

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*Table 3.* Study 1: Mean group self-rated risk-taking likelihood and self-rated and informant-rated risk perceptions for each domain

	Self-rating: Likelihood	Self-rating: Risk Perception	Informant rating- Risk Perception
	<i>M (SD)</i>	<i>M (SD)</i>	<i>M (SD)</i>
Recreational	-1.57 (1.25)	3.59 (1.40)	3.46 (1.23)
Social	-1.05 (1.20)	2.12 (1.12)	2.21 (1.05)
Financial	-0.81 (1.41)	4.18 (1.14)	4.18 (1.00)
Health	-0.31 (1.13)	4.82 (1.02)	4.72 (0.99)

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Table 4. Study 1: Multiple linear regression analyses on self-ratings and informant-ratings of risk perception

Model	Parameter	Recreational Domain	Social Domain	Financial Domain	Health Domain
Model A	Age	.50**	.21**	.33**	.23**
	Group	-.05	.04	.00	-.05
	$R^2$	.25**	.22**	.11**	.06**
Model B	Age	1.07**	.48*	1.11**	.69**
	Group	-.05	.04	.00	-.05
	Age by group	-.60**	-.29	-.83**	.49*
	$R^2$ change	.036**	.008	.068**	.024*
Model C	Age	.65** (.30**)	.20**	.56** (.07)	.39** (.06)
	Group		.04		
	Age <sup>2</sup>	.01 (.25**)	.10	-.06 (.06)	-.08 (.17)
	$R^2$ change	.000 (.059**)	.009	.003 (.003)	.006 (.030)

690 Note. \* $p \leq .05$ , \*\* $p \leq .01$ ; The  $R^2$  change for Models B and C is in comparison with Model A.  
 691 For Model C, values not in parenthesis = self-ratings and value in parenthesis = informant  
 692 ratings.

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Table 5. Study 2: Intercorrelations across domains for self-rated and informant-rated risk-taking likelihood and risk perceptions

Self-rating: Likelihood			
	Social	Financial	Health
Social	(.41)		
Financial	.08	(.77)	
Health	.12	.33**	(.37)
Informant-rating: Likelihood			
	Social	Financial	Health
Social	(.45)		
Financial	.19*	(.62)	
Health	.11	.24*	(.18)
Self-rating: Risk Perception			
	Social	Financial	Health
Social	(.71)		
Financial	.09	(.73)	
Health	.22*	.22*	(.38)
Informant-rating: Risk Perception			
	Social	Financial	Health
Social	(.62)		
Financial	.29**	(.62)	
Health	.30**	.27**	(.47)

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Note. \* $p \leq .05$ , \*\* $p \leq .01$ , 2-tailed significance test of the Pearson  $r$  correlation coefficient compared to zero. Cronbach  $\alpha$  values are in parenthesis.

Table 6. Study 2: Mean group self-rated and informant-rated risk-taking likelihood and risk perceptions for each domain

	Self-rating: Likelihood	Informant-rating: Likelihood	Self-rating: Risk Perception	Informant-rating: Risk Perception
	<i>M (SD)</i>	<i>M (SD)</i>	<i>M (SD)</i>	<i>M (SD)</i>
Social	0.88 (1.10)	.77 (1.13)	2.66 (1.14)	2.32 (1.06)
Financial	-.70 (1.53)	-1.14 (1.19)	4.40 (1.00)	4.11 (0.97)
Health	0.36 (1.27)	.18 (1.10)	3.57 (0.96)	3.38 (0.93)

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Table 7. Study 2: Multiple linear regression analyses on self-ratings and informant-ratings of risk-taking likelihood and risk perception

Model	Parameter	Risk-taking likelihood			Risk perception		
		Social Domain	Financial Domain	Health Domain	Social Domain	Financial Domain	Health Domain
Model A	Age	.07	-.28**	-.23**	.01	.13	.15*
	Group	-.05	-.16*	-.07	-.15*	-.15*	-.10
	$R^2$	.01	.10**	.06**	.01	.04*	.03*
Model B	Age	.08	-1.10	-1.02**	.20	.65**	.36
	Group	-.04	-.98**	-.86**	.04	.37	.11
	Age by group	-.02	1.19**	1.15**	-.27	-.76**	-.31
	$R^2$ change	.000	.075**	.069**	.004	.030**	.005

738 Note. \* $p \leq .05$ , \*\* $p \leq .01$ ; The  $R^2$  change for Model B is in comparison with Model A.

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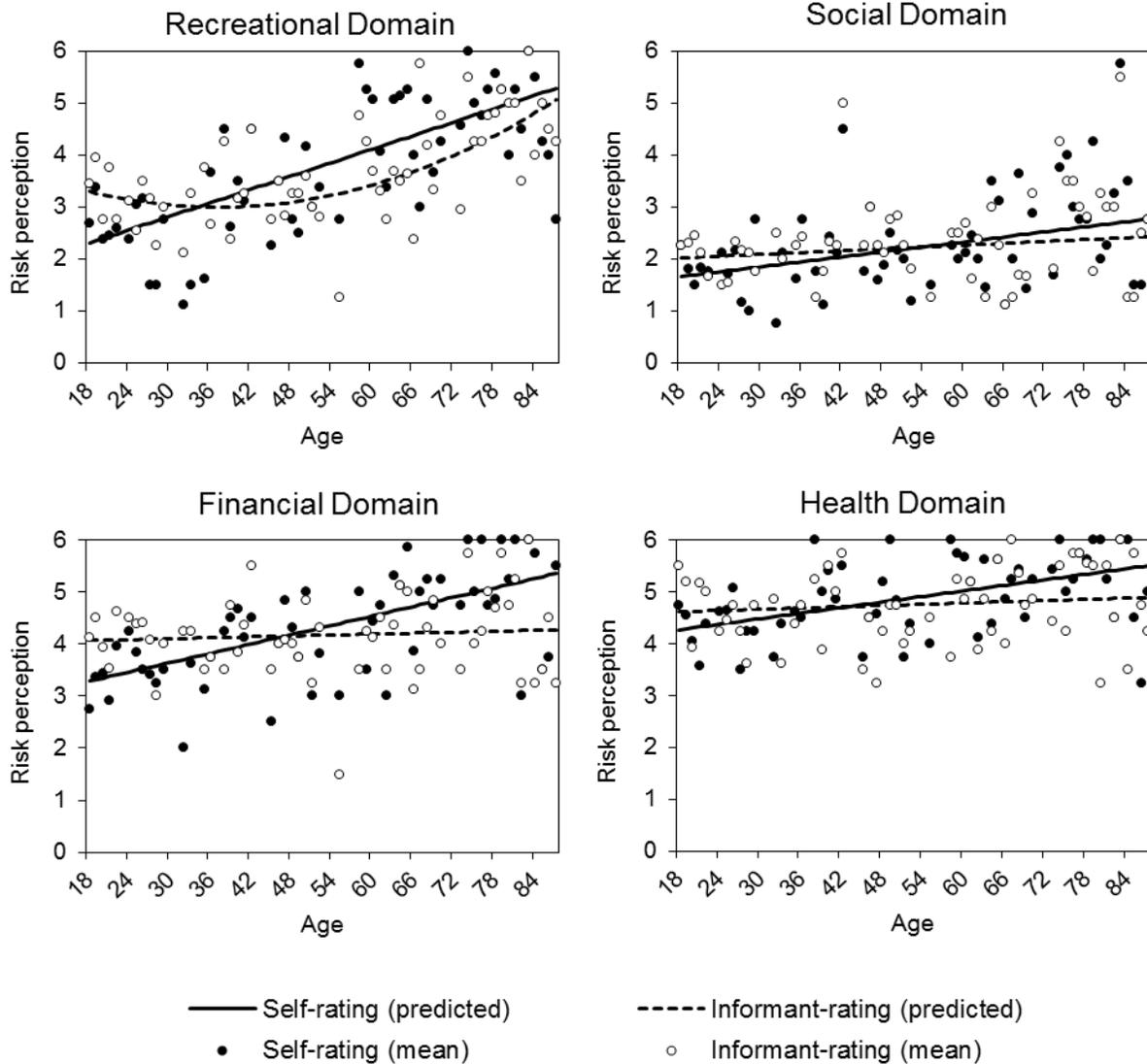
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752 Figure 1. *Self-rated risk perceptions and informant ratings with age in Recreational, Social,*

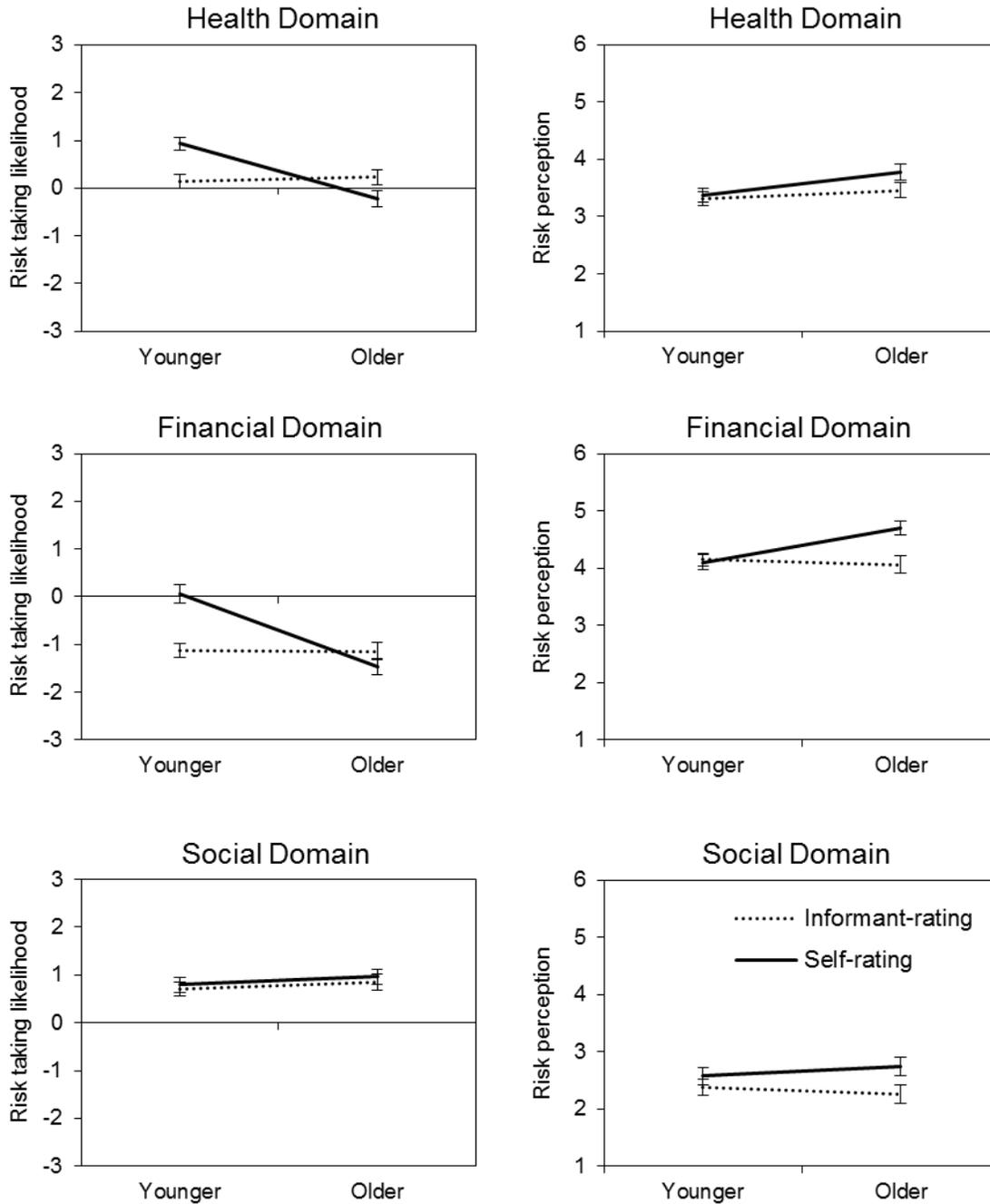
753 *Financial, and Health domains. Predicted slopes were estimated using a linear regression*

754 *analysis. Dots indicate the mean group values at each individual age containing at least one*

755 *participant.*

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759 Figure 2. Mean group self-rated and informant-rated risk perceptions and risk behavior with age  
 760 in the health, financial, and social domains. Error bars indicate the 95% confidence intervals.

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## APPENDIX A

*Table A1: Questionnaire items*

Risk Domain	Questionnaire Item
Recreational	1. Going camping in the wilderness
	2. Starting a new intense exercise routine
	3. Going winter swimming in an icy lake
	4. Traveling alone in an unfamiliar country
Social	1. Admitting your tastes are different from those of a friend
	2. Disagreeing with an authority figure or person of influence on a major issue
	3. Moving to a city far away from your close friends and family
	4. Speaking at a debate club in your local community
Financial	1. Betting on the outcome of a sporting event
	2. Investing in a very speculative stock on the stock market
	3. Using your credit card to pay for an item on an unfamiliar website
	4. Investing a considerable amount of your income or savings in a potentially highly lucrative new start-up firm
Health	1. Taking a ride on a motorcycle without wearing a helmet
	2. Using a sunbed in a tanning studio
	3. Driving a car without wearing a seat belt
	4. Walking home alone at night in an unsafe area of town

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**APPENDIX B**

767 Our exploratory factor analysis (FA) was conducted on self-rated risk perceptions in  
 768 Study 1 using Varimax rotation to test the scale's factor structure. Four factors were extracted  
 769 based on a criterion of eigenvalues  $> 1$  and together explained 59% of the variance. Regarding  
 770 the individual factors, Factor 1 explained 22%, Factor 2 explained 14%, Factor 3 explained 12%,  
 771 and Factor 4 explained 12% of the variance. Table B1 provides the rotated factor loadings for the  
 772 individual scale items. The factor loadings broadly confirm the four-domain structure of the  
 773 scale, such that the individual scale items generally loaded most heavily on their respective  
 774 factors.

*Table B1: Exploratory factor analysis on self-rated risk perceptions in Study 1*

Scale item	Factor 1	Factor 2	Factor 3	Factor 4
<b>Recreational domain</b>				
1. Going camping in the wilderness	.78			
2. Starting a new intense exercise routine	.63			
3. Going winter swimming in an icy lake	.70			
4. Traveling alone in an unfamiliar country	.72			
<b>Social domain</b>				
1. Admitting your tastes are different from those of a friend		.78		
2. Disagreeing with an authority figure or person of influence on a major issue		.77		
3. Moving to a city far away from your close friends and family	.63			
4. Speaking at a debate club in your local community		.73		
<b>Financial domain</b>				
1. Betting on the outcome of a sporting event		.44	.46	
2. Investing in a very speculative stock on the stock market			.85	
3. Using your credit card to pay for an item on an unfamiliar website	.41			.30
4. Investing a considerable amount of your income or savings in a potentially highly lucrative new start-up firm	.34		.79	
<b>Health domain</b>				
1. Taking a ride on a motorcycle without wearing a helmet				.79
2. Using a sunbed in a tanning studio	.48			
3. Driving a car without wearing a seat belt				.85
4. Walking home alone at night in an unsafe area of town	.58			

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**APPENDIX C**

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We conducted multiple linear regression analyses on self-rated risk perceptions in each domain to test for moderating effects of informants' relationship with their partner (parent vs. other relations, adult children vs. other relations) and the absolute age difference between informants and their partners on the association between informant- and self-rated risk perceptions. Tables C1 (Study 1) and C2 (Study 2) provide the results of these analyses. The only significant interaction was between parent (vs. other relations) and informant risk perceptions in the recreational domain in Study 1, indicating that the association between informant- and self-ratings was weaker for parent informants.

*Table C1.* Study 1: Multiple linear regression analyses on self-rated risk perceptions to assess moderating effects of informants' relationship with their partner and the absolute age difference between informants and their partners on the association with informant-rated risk perceptions

Parameter	Recreational Domain	Social Domain	Financial Domain	Health Domain
Risk perception: Informant	.49**	.34**	.21*	.28*
Parent vs. other relations	-.43**	-.16	-.47**	-.43**
Adult child vs. other relations	.13	.01	.03	-.06
Absolute age difference	.17	.19	.22*	.21
Risk perception: Informant by Parent vs. other relations	-.25**	-.03	.02	-.11

Risk perception: Informant by Adult child vs. other relations	-.10	.11	.15	.02
Risk perception: Informant by Absolute age difference	.01	.08	.05	-.04

786 Note. \* $p \leq .05$ , \*\* $p \leq .01$ .

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*Table C2. Study 2: Multiple linear regression analyses on self-rated risk perceptions to assess moderating effects of informants' relationship with their partner and the absolute age difference between informants and their partners on the association with informant-rated risk perceptions*

Parameter	Social Domain	Financial Domain	Health Domain
Risk perception: Informant	.21	.27	-.27
Parent vs. other relations	.20	-.15	.17
Adult child vs. other relations	.33*	.07	.24
Absolute age difference	-.09	.05	.02
Risk perception: Informant by Parent vs. other relations	-.12	-.13	.17
Risk perception: Informant by Adult child vs. other relations	-.13	.05	.24
Risk perception: Informant by Absolute age difference	.06	-.11	.02

788 Note. \* $p \leq .05$ , \*\* $p \leq .01$ .

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**APPENDIX D**

790 Study 2: Decision making scenarios

791 Health domain:

792 Scenario 1: Self-rating

793 *“Imagine that you have been involved in an accident and you are currently in hospital. You*  
 794 *injured your leg in the accident and one of your big toes is showing serious signs of infection.*  
 795 *The doctors caring for you explain that two options are available. One option is to remove your*  
 796 *infected toe, eliminating any risk of the infection spreading to other parts of the body. A second*  
 797 *option involves treating the infection with an antibiotic, which has a high chance of curing the*  
 798 *infection. However, if the antibiotic treatment fails, you might have to lose your entire foot. The*  
 799 *doctors warn that a decision must be made immediately. Please imagine that you must make a*  
 800 *decision.”*

801 *Likelihood rating: “How likely would you be to decide in favour of the antibiotic treatment*  
 802 *rather than amputating the infected toe?”*

803 *Risk perception: “How risky do you believe it would be for you to undergo the antibiotic*  
 804 *treatment rather than have your infected toe amputated?”*

805 Scenario 1: Informant rating

806 *“Imagine that [name] has been involved in an accident and is currently in hospital. [He/She] is*  
 807 *unconscious, but [his/her] condition is expected to improve and [he/she] will regain*  
 808 *consciousness soon. However, [name] injured [his/her] leg in the accident and one of [his/her]*  
 809 *big toes is showing serious signs of infection. The doctors caring for [name] explain that two*  
 810 *options are available. One option is to remove [his/her] infected toe, eliminating any risk of the*  
 811 *infection spreading to other parts of the body. A second option involves treating the infection*  
 812 *with an antibiotic, which has a high chance of curing the infection. However, if the antibiotic*  
 813 *treatment fails, [name] might have to lose [his/her] entire foot. The doctors warn that they*  
 814 *cannot wait for [name] to wake up and a decision must be made immediately. Please imagine*  
 815 *that you must make a decision on behalf of [name].”*

816 *Likelihood rating: “How likely would you be to decide in favour of the antibiotic treatment*  
 817 *rather than amputating the infected toe?”*

818 *Risk perception: “How risky do you believe it would be for [name] to undergo the antibiotic*  
 819 *treatment rather than have [his/her] infected toe amputated?”*

820 Scenario 2: Self-rating

821 *“Imagine that you need to have a wisdom tooth removed. You would prefer to undergo the*  
 822 *treatment using a general rather than a local anaesthetic as you suffer from severe dental*  
 823 *related anxieties. Your dentist explains that general anaesthetic is used rarely because of a*  
 824 *higher chance of side effects, which can include feeling sick and vomiting, shivering and feeling*  
 825 *cold, and damage to the mouth or teeth. Please imagine that you must make a decision.”*

826 *Likelihood rating: “How likely would you be to decide in favour of general anaesthetic?”*

827 *Risk perception: “How risky do you believe it would be for you to use general anaesthetic?”*

828 Scenario 2: Informant rating

829 *“Imagine that [name] needs to have a wisdom tooth removed. [He/She] would prefer to undergo*  
 830 *the treatment using a general rather than a local anaesthetic as [he/she] suffers from severe*  
 831 *dental related anxieties. [His/Her] dentist explains that general anaesthetic is used rarely*  
 832 *because of a higher chance of side effects, which can include feeling sick and vomiting, shivering*  
 833 *and feeling cold, and damage to the mouth or teeth. After consulting [his/he] dentist, [name] still*  
 834 *feels unsure and confused about what to do. As you know [him/her] well, [he/she] asks you to*  
 835 *decide on [his/her] behalf. Please imagine that you must make a decision on behalf of [name].”*

836 *Likelihood rating: “How likely would you be to decide in favour of general anaesthetic?”*

837 *Risk perception: “How risky do you believe it would be for [name] to use general anaesthetic?”*

838 Scenario 3: Self-rating

839 *“Imagine that you have been undergoing drug treatment for a medical condition. Unfortunately,*  
 840 *the drug treatment has not proven successful and your condition is becoming worse. Your doctor*  
 841 *would like to conduct further examinations to understand the cause of your condition. One*  
 842 *option is to conduct a range of blood tests that are relatively safe and that are not likely to cause*  
 843 *any further medical complications, but which could miss the cause of your condition and may*  
 844 *delay proper treatment. An alternative option is an invasive test that involves surgery. While the*  
 845 *surgery has a range of possible complications, it is also your best chance to get the correct*  
 846 *diagnosis of your condition. Please imagine that you must make a decision.”*

847 *Likelihood rating: “How likely would you be to decide in favour of the surgery?”*

848 *Risk perception: “How risky do you believe it would be for you to undergo the surgery?”*

849 Scenario 3: Informant rating

850 *“Imagine that [name] has been undergoing drug treatment for a medical condition.*  
 851 *Unfortunately, the drug treatment has not proven successful and [his/her] condition is becoming*  
 852 *worse. [His/Her] doctor would like to conduct further examinations to understand the cause of*  
 853 *[his/her] condition. One option is to conduct a range of blood tests that are relatively safe and*  
 854 *that are not likely to cause any further medical complications, but which could miss the cause of*  
 855 *[his/her] condition and may delay proper treatment. An alternative option is an invasive test that*  
 856 *involves surgery. While the surgery has a range of possible complications, it is also [his/her]*  
 857 *best chance to get the correct diagnosis of [his/her] condition. However, the drug treatment that*  
 858 *[name] is currently receiving is known to have mild cognitive effects, meaning that you must*  
 859 *consent to the medical procedure on [his/her] behalf. Please imagine that you must make a*  
 860 *decision on behalf of [name].”*

861 *Likelihood rating: “How likely would you be to decide in favour of the surgery?”*

862 *Risk perception: “How risky do you believe it would be for [name] to undergo the surgery?”*

863 **Scenario 4: Self-rating**

864 *“Imagine that you would like to get involved in a local fund raising event. The event involves*  
 865 *going winter swimming in an icy lake and is expected to raise a considerable sum of money for a*  
 866 *charity that you feel very strongly about. The event organizer has asked you for a final decision*  
 867 *on whether you will take part. Please imagine that you must make a decision.”*

868 *Likelihood rating: “How likely would you be to decide in favour of taking part in the fund*  
 869 *raising event?”*

870 *Risk perception: “How risky do you believe it would be for you to take part in the fund raising*  
 871 *event?”*

872 **Scenario 4: Informant rating**

873 *“Imagine that [name] would like to get involved in a local fund raising event. The event involves*  
 874 *going winter swimming in an icy lake and is expected to raise a considerable sum of money for a*  
 875 *charity that [name] feels very strongly about. The event organizer has asked [name] for a final*  
 876 *decision on whether [he/she] will take part. [name] feels that [he/she] has thought too much*  
 877 *about this decision and that [he/she] can no longer decide [himself/herself]. This may not be*  
 878 *typical of [name], but [he/she] trusts you to decide on [his/her] behalf. Please imagine that you*  
 879 *must make a decision on behalf of [name].”*

880 *Likelihood rating: “How likely would you be to decide in favour of [name] taking part in the*  
 881 *fund raising event?”*

882 *Risk perception: “How risky do you believe it would be for [name] to take part in the fund*  
883 *raising event?”*

884 Financial domain:

885 Scenario 1: Self-rating

886 *“Imagine that you recently inherited a considerable sum of money from a close friend and you*  
887 *have been considering whether to save the money or invest it in the stock market. You receive a*  
888 *call from your financial advisor recommending that you invest your inheritance in a new stock*  
889 *that has just entered the market and that is highly likely to yield a very large return. Your*  
890 *financial advisor explains that a decision must be made immediately. Please imagine that you*  
891 *must make a decision.”*

892 *Likelihood rating: “How likely would you be to decide in favour of investing in the stock?”*

893 *Risk perception: “How risky do you believe it would be for you to invest in the stock?”*

894 Scenario 1: Informant rating

895 *“Imagine that [name] recently inherited a considerable sum of money from a close friend and*  
896 *has been considering whether to save the money or invest it in the stock market. You receive a*  
897 *call from [his/her] financial advisor recommending that [name] invests [his/her] inheritance in*  
898 *a new stock that has just entered the market and that is highly likely to yield a very large return.*  
899 *The financial advisor explains that a decision must be made immediately. However, [name] is*  
900 *currently on holiday and you have no way of contacting [him/her], meaning you must decide on*  
901 *[his/her] behalf. Anticipating this possibility, [name] has asked that you decide on [his/her]*  
902 *behalf. Please imagine that you must make a decision on behalf of [name].”*

903 *Likelihood rating: “How likely would you be to decide in favour of [name] investing in the*  
904 *stock?”*

905 *Risk perception: “How risky do you believe it would be for [name] to invest in the stock?”*

906 Scenario 2: Self-rating

907 *“Imagine that you are approached by a friend who works as a bookmaker (someone who*  
908 *handles the placement of bets). The friend shares with you some inside knowledge about a horse*  
909 *that will race later today. If you bet on the horse you have a very high chance of winning, but the*  
910 *minimum bet is £200. Please imagine that you must make a decision.”*

911 *Likelihood rating: “How likely would you be to decide in favour of betting on the horse race?”*

912 *Risk perception: “How risky do you believe it would be for you to bet on the horse race?”*

913 Scenario 2: Informant rating

914 *“Imagine that [name] is approached by a friend who works as a bookmaker (someone who*  
915 *handles the placement of bets). The friend shares with [name] some inside knowledge about a*  
916 *horse that will race later today. If [name] bets on the horse [he/she] has a very high chance of*  
917 *winning, but the minimum bet is £200. [name] feels that [he/she] has thought too much about*  
918 *this decision and that he can no longer decide [himself/herself]. This may not be typical of*  
919 *[name], but [he/she] trusts you to decide on [his/her] behalf. Please imagine that you must make*  
920 *a decision on behalf of [name].”*

921 *Likelihood rating: “How likely would you be to decide in favour of [name] betting on the horse*  
922 *race?”*

923 *Risk perception: “How risky do you believe it would be for [name] to bet on the horse race?”*

924 Scenario 3: Self-rating

925 *“Imagine that you have been considering investing some of your income or savings in a new*  
926 *start-up firm in the local area. You have been seeking financial advice and your financial*  
927 *advisor contacts you to make you aware of a highly lucrative new start-up firm that is highly*  
928 *likely to yield a large return. A decision must be made today about whether to invest in the firm.*  
929 *Please imagine that you must make a decision.”*

930 *Likelihood rating: “How likely would you be to decide in favour of investing in the new start-up*  
931 *firm?”*

932 *Risk perception: “How risky do you believe it would be for you to invest in the new start-up*  
933 *firm?”*

934 Scenario 3: Informant rating

935 *“Imagine that [name] has been considering investing some of [his/her] income or savings in a*  
936 *new start-up firm in the local area. [He/She] has been seeking financial advice and [his/her]*  
937 *financial advisor contacts [him/her] to make [him/her] aware of a highly lucrative new start-up*  
938 *firm that is highly likely to yield a large return. A decision must be made today about whether to*  
939 *invest in the firm. However, [name] is taking part in an all-day event and cannot be contacted,*  
940 *meaning that you must decide on [his/her] behalf. Anticipating this possibility, [name] has asked*  
941 *that you decide on [his/her] behalf. Please imagine that you must make a decision on behalf of*  
942 *[name].”*

943 *Likelihood rating: "How likely would you be to decide in favour of [name] investing in the new*  
944 *start-up firm?"*

945 *Risk perception: "How risky do you believe it would be for [name] to invest in the new start-up*  
946 *firm?"*

947 Scenario 4: Self-rating

948 *"Imagine that you have recently been learning to play poker online using an official internet*  
949 *gambling website. You have been playing for small amounts of money and have been very*  
950 *successful. You are now offered the opportunity to raise your bets and invest £200. You are likely*  
951 *to win more than you invest. Please imagine that you must make a decision."*

952 *Likelihood rating: "How likely would you be to decide in favour of making the bet?"*

953 *Risk perception: "How risky do you believe it would be for you to make the bet?"*

954 Scenario 4: Informant rating

955 *"Imagine that [name] has recently been learning to play poker online using an official internet*  
956 *gambling website. [He/She] has been playing for small amounts of money and has been very*  
957 *successful. [name] is now offered the opportunity to raise [his/her] bets and invest £200.*  
958 *[He/She] is likely to win more than [he/she] invests. However, [name] feels that [he/she] has*  
959 *thought too much about this decision and that he can no longer decide [himself/herself]. This*  
960 *may not be typical of [name], but [he/she] trusts you to decide on [his/her] behalf. Please*  
961 *imagine that you must make a decision on behalf of [name]."*

962 *Likelihood rating: "How likely would you be to decide in favour of [name] making the bet?"*

963 *Risk perception: "How risky do you believe it would be for [name] to make the bet?"*

964 Social domain:

965 Scenario 1: Self-rating

966 *"Imagine that you recently shared your views with a journalist on a controversial social issue.*  
967 *You have expressed strong views on the subject and you are keen that your opinion reaches the*  
968 *public domain. You receive a call from the journalist explaining that the local magazine*  
969 *containing your comments will go to print today. The journalist would like a final approval to*  
970 *include your comments as the controversy around the issue has escalated in the past couple of*  
971 *days. Please imagine that you must make a decision."*

972 *Likelihood rating: “How likely would you be to decide in favour of publishing your comments?”*

973 *Risk perception: “How risky do you believe it would be for you to have your comments*  
974 *published?”*

975 Scenario 1: Informant rating

976 *“Imagine that [name] recently shared [his/her] views with a journalist on a controversial social*  
977 *issue. [name] has expressed strong views on the subject and is keen that [his/her] opinion*  
978 *reaches the public domain. You receive a call from the journalist explaining that the local*  
979 *magazine containing [name]’s comments will go to print today. The journalist would like a final*  
980 *approval to include [name]’s comments as the controversy around the issue has escalated in the*  
981 *past couple of days. However, [name] is currently on holiday and you have no way of contacting*  
982 *[him/her], meaning you must decide on [his/her] behalf. Anticipating this possibility, [name] has*  
983 *asked that you decide on [his/her] behalf. Please imagine that you must make a decision on*  
984 *behalf of [name].”*

985 *Likelihood rating: “How likely would you be to decide in favour of publishing [name]’s*  
986 *comments?”*

987 *Risk perception: “How risky do you believe it would be for [name] to have his comments*  
988 *published?”*

989 Scenario 2: Self-rating

990 *“Imagine that you have been involved in a dispute with a neighbour who recently has been*  
991 *playing loud music late at night. One option available to you is to make a formal complaint to*  
992 *the local authorities, but this could create further conflict between you and your neighbour.*  
993 *Please imagine that you must make a decision.”*

994 *Likelihood rating: “How likely would you be to decide in favour of making a formal complaint?”*

995 *Risk perception: “How risky do you believe it would be for you to make a formal complaint?”*

996 Scenario 2: Informant rating

997 *“Imagine that [name] has been involved in a dispute with a neighbour who recently has been*  
998 *playing loud music late at night. One option available to [name] is to make a formal complaint*  
999 *to the local authorities, but this could create further conflict between [name] and [his/her]*  
1000 *neighbour. [name] feels that [he/she] has thought too much about this decision and that [he/she]*  
1001 *can no longer decide [himself/herself]. This may not be typical of [name], but [he/she] trusts you*  
1002 *to decide on [his/her] behalf. Please imagine that you must make a decision on behalf of*  
1003 *[name].”*

1004 *Likelihood rating: “How likely would you be to decide in favour of [name] making a formal*  
1005 *complaint?”*

1006 *Risk perception: “How risky do you believe it would be for [name] to make a formal*  
1007 *complaint?”*

1008 Scenario 3: Self-rating

1009 *“Imagine that you recently contributed to an impromptu debate in your local community. The*  
1010 *debate attracted media attention as some of the issues raised are controversial. A journalist*  
1011 *would like to use some parts of the debate, including comments made by you, in a televised*  
1012 *segment in the local news that will be broadcasted later today. Please imagine that you must*  
1013 *make a decision.”*

1014 *Likelihood rating: “How likely would you be to decide in favour of using your comments in the*  
1015 *local news?”*

1016 *Risk perception: “How risky do you believe it would be for you to have your comments used in*  
1017 *the local news?”*

1018 Scenario 3: Informant rating

1019 *“Imagine that [name] recently contributed to an impromptu debate in [his/her] local*  
1020 *community. The debate attracted media attention as some of the issues raised are controversial.*  
1021 *A journalist would like to use some parts of the debate, including comments made by [name], in*  
1022 *a televised segment in the local news that will be broadcasted later today. However, [name] is*  
1023 *taking part in an all-day event and cannot be contacted, meaning that you must decide on*  
1024 *[his/her] behalf. Anticipating this possibility, [name] has asked that you decide on [his/her]*  
1025 *behalf. Please imagine that you must make a decision on behalf of [name].”*

1026 *Likelihood rating: “How likely would you be to decide in favour of using [name]’s comments in*  
1027 *the local news?”*

1028 *Risk perception: “How risky do you believe it would be for [name] to have [his/her] comments*  
1029 *used in the local news?”*

1030 Scenario 4: Self-rating

1031 *“Imagine that you have had an argument with someone working at the checkout in the local*  
1032 *supermarket. You feel that the checkout worker was very rude and worry that this could become*  
1033 *an issue if you are served by the same individual in the future. You are considering whether to*  
1034 *raise the issue with the store manager. Please imagine that you must make a decision.”*

1035 *Likelihood rating: “How likely would you be to decide in favour of raising the issue with the*  
1036 *store manager?”*

1037 *Risk perception: “How risky do you believe it would be for you to raise the issue with the store*  
1038 *manager?”*

1039 Scenario 4: Informant rating

1040 *“Imagine that [name] tells you that [he/she] had an argument with someone working at the*  
1041 *checkout in the local supermarket. [name] feels that the checkout worker was very rude and*  
1042 *worries that this could become an issue if [he/she] is served by the same individual in the future.*  
1043 *[name] is considering whether to raise the issue with the store manager. However, [he/she] feels*  
1044 *that [he/she] has thought too much about this decision and that [he/she] can no longer decide*  
1045 *[himself/herself]. This may not be typical of [name], but [he/she] trusts you to decide on*  
1046 *[his/her] behalf. Please imagine that you must make a decision on behalf of [name].”*

1047 *Likelihood rating: “How likely would you be to decide in favour of [name] raising the issue with*  
1048 *the store manager?”*

1049 *Risk perception: “How risky do you believe it would be for [name] to raise the issue with the*  
1050 *store manager?”*

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