THE GERONTOLOGICAL SOCIETY OF AMERICA®

Journals of Gerontology: Psychological Sciences
cite as: *J Gerontol B Psychol Sci Soc Sci*, 2019, Vol. XX, No. XX, 1–6
doi:10.1093/geronb/gbz113
Advance Access publication September 06, 2019

OXFORD

Research Report

Older Adults Show Diminished Sensitivity to Potential Losses in Social Bargaining

Yi Huang, PhD,[1] Jingwen Chai, BSocSc,[2] Lei Feng, PhD,[3] and Rongjun Yu, PhD[1,2*]

[1]NUS Graduate School for Integrative Sciences and Engineering, National University of Singapore, Singapore [2]Department of Psychology, National University of Singapore, Singapore [3]Department of Psychological Medicine, Yong Loo Lin School of Medicine, National University of Singapore, Singapore

*Address correspondence to: Rongjun Yu, PhD, Department of Psychology, National University of Singapore, Block AS4, #02-07, 9 Arts Link, Singapore, 117570. E-mail: psyyr@nus.edu.sg

Received: June 4, 2019; Editorial Decision Date: August 27, 2019

Decision Editor: Derek Isaacowitz, PhD

Abstract

Objectives: Leaders in many organizations are older adults who routinely make decisions in social bargaining situations. However, we know little about the age-related differences in strategic decision making.
Methods: In the current study (n = 182), using a modified Prisoner's Dilemma game (PDG), we examined two important intrinsic motivations for non-cooperation: fear of betrayal and greedy desire to exploit other people among young and older Chinese Singaporeans.
Results: Results showed that compared with young adults, older adults demonstrated an intact greed motive but a diminished fear motive in the PDG.
Discussion: Our findings suggest a diminished sensitivity to social threat or potential losses due to betrayal in older adults' social decision making. Older adults may have a declined ability to assess social threats even though they retain the motivation to gain an exploitive advantage.

Keywords: aging, cooperation, fear, greed

In many societies, older adults hold positions of authority and are actively engaged in making social decisions that have a far-reaching impact on the community. However, most of the social decision-making research involves young adults as participants, leaving the question of how older adults make social decisions largely unknown (Lim & Yu, 2015). Decision-making in older adults is heavily influenced by the emotional and motivational shifts in later years (Lockenhoff, 2018). According to Socioemotional Selectivity Theory (L. L. Carstensen, 1992), for older adults, as the end of life approaches and concerns for accomplishing long-term goals diminish, they become less focused on knowledge-related goals. In contrast, an increased present orientation emphasizes goals related to maintaining well-being, emotional satisfaction, and meaning (Charles, 2010). Based on this theory, a large body of research found that older adults demonstrate a stronger bias toward positive versus negative information, which is known as the "positivity effect" (Laura L Carstensen & Mikels, 2005). This "positivity effect" in older adults is also supported by findings in the social decision-making domain. For example, older adults pay greater attention to positive attributes when making consumer choices (Kim, Healey, Goldstein, Hasher, & Wiprzycka, 2008; Lockenhoff & Carstensen, 2008). Older people also perceive faces conveying cues of untrustworthiness as more trustworthy and approachable (Castle et al., 2012). Such bias for information of positive valence and a diminished receptiveness towards negative aspects of information may profoundly influence social decision making with old age. It is possible that when interacting with other

people, older adults would be less sensitive to negative signals, such as partners' negative intentions or emotions, or impending negative economic outcomes.

In addition, according to the life span theory, older people are more confronted with threats to their resources with age increase, and studies have shown that older adults demonstrate a stronger orientation towards maintenance and prevention of losses in self-reported and behavioral choice tasks (Ebner, Freund, & Baltes, 2006). Life span theory further proposes that older people tend to select personally relevant areas of functional domains to optimize developmental potential and compensate for losses, which is known as selective optimization with compensation (SOC) (Baltes & Baltes, 1990). This age-related prevention and compensation of losses may affect older adults' evaluation of potential losses in social interaction and their decision-making strategies to compensate for these losses. Furthermore, it was observed that older adults tended to focus on the negative behaviors of others when forming impressions of them, especially when social others behave badly and are being evaluated in the morality domain. (Hess, Popham, Dennis, & Emery, 2013). The negativity bias in impression formation suggests that older adults may tend to evaluate social others in a negative way and defect in social bargaining games. From these perspectives, it is also reasonable to hypothesize that when making interpersonal decisions, older adults may be more sensitive to the negative cues conveyed by their opponents, and more likely to defect when they are likely to be exploited.

It remains unclear that when making social decisions, whether older adults would be more sensitive to social threat. Specifically, we examine two important intrinsic motivations for non-cooperation in the Prisoner's Dilemma Game (PDG): fear of betrayal and the greedy desire to exploit other people (Ahn, Ostrom, Schmidt, Shupp, & Walker, 2001). We implement an incentivized repeated one-shot two-players PDG to elicit choice behavior that resonates with greed and fear by the manipulation of payoff parameters attached to each decision choice (cooperate or defect). Specifically, fear refers to the motive to avoid being the "sucker" by choosing noncooperation out of the concern that others would not choose cooperation in the PDG. The term greed here refers to the motive to gain more reward by choosing noncooperation with the expectation that others would choose to cooperate. We also measured participants' future time perspective (FTP) and tested whether the temporal horizon is correlated with different motives in PDG.

Method

Participants

The current study design entailed within-between factor interactions in a repeated-measures ANOVA. A power analysis was conducted using G*Power (Faul, Erdfelder, Buchner, & Lang, 2014), with a medium effect size (*f*) of 0.25, alpha of 0.05, and a power level of 0.9. The power analysis showed that at least 80 participants in total are needed. We conducted one original and one replication studies with independent samples. The two studies yielded similar results; therefore, we pooled the data from two studies and only the results of the pooled data are reported. Three participants in the older group failed to understand the task and were excluded from the analysis. The remaining 85 older Chinese Singaporean participants (age: 69.45 ± 5.13, mean ± *SD*, 32 males) and 97 young undergraduate participants (age: 22.35 ± 2.24, 34 males) took part in the study. All participants reported no history of cognitive or psychiatric impairments. The study was conducted in the language (Mandarin or English) preferred for each participant. All young participants chose English while the majority of old age participants chose mandarin as the use of the English language is not commonly adopted by the older people in Singapore culture (see Table 1). All participants provided informed consent and performed

Table 1. Demographic Information in Both Groups

	Young (n = 97)	Older (n = 85)	Reliability (Cronbach's α)
Age	22.35 (2.24)	69.45 (5.13)	
Gender	34 males	32 males	
Language administered	English (100%)	Mandarin (91.76%), English (8.24%)	
Education (years)	14.9 (1.68)	9.48 (3.30)	
SES	6.02 (1.40)	5.56 (1.55)	
MMSE	NA	29.69 (0.68)	0.34
GDS	NA	0.61 (1.24)	0.64
GAI	NA	0.72 (1.97)	0.74
PDQ	NA	7.58 (7.49)	0.86
FTP*	4.38 (0.91)	3.81 (0.92)	0.83

Note. Means and standard deviations in parentheses. SES = Social Economic Status; MMSE = Mini Mental State Examination. GDS = Geriatric Depression Scale, GAI = Geriatric Anxiety Inventory, PDQ = Perceived Deficit Questionnaire, FTP = Future Time Perspective scale.
*A subsample (32 young and 30 older adults) completed the FTP scale.

the session based on a protocol that was approved by the NUS Institutional Review Board. Participants received a show-up fee and additional pay-off depending on their performance in the task.

Procedure

Participant completed a battery of computerized decision-making tests that lasted for approximately 2 hr where one of the tasks was the PDG. Long breaks (15 min) were provided in between tasks to minimize fatigue. Older participants were screened using the Mini-Mental State Examination (MMSE) (Feng, Chong, Lim, & Ng, 2012). All participants presented adequate proficiency in their basic cognitive abilities, as shown in Table 1. Furthermore, older participants completed a battery of questionnaires to assess their neuropsychological status, including the Geriatric Depression Scale (Yesavage et al., 1983), Geriatric Anxiety Inventory (Pachana et al., 2007), Perceived Deficit Questionnaire (Sullivan, Hall, Bartolacci, Sullivan, & Adams, 2002), and subjective socioeconomic status (SES) (Adler, Epel, Castellazzo, & Ickovics, 2000). A subsample (32 young and 30 older adults) also completed the Future Time Perspective (FTP) scale by Laura L. Carstensen and Lang (1996). As participants of the young group were recruited from university, we assumed basic cognitive proficiency and did not perform these tests for them. All older participants reported normal cognitive function based on their assessment scores and the correlations of these scores with all experimental measurements were not significant, all p values > 0.05, suggesting that cognitive abilities were not a cause in explaining social cooperation.

In the modified Prisoner's Dilemma Game (PDG) (Ahn et al., 2001; De Dreu, Scholte, van Winden, & Ridderinkhof, 2014; Zheng, Kendrick, & Yu, 2016), the two social motives of greed and fear are induced by directly manipulating payoff outcomes based on the choices made by two players in the game. Participants face in every trial of the game a social dilemma over two possible choices, cooperate or not cooperate based on a payoff matrix, which informed the participant all possible payoff outcomes for both players depending on the choices. If both players chose to cooperate, both players received a reward (R). If both chose to defect, they each received a punishment (P). However, if one player chose not to cooperate while the other player chose to cooperate, the defector received a temptation amount (T) while the cooperator received a sucker amount (S), where T > S (see Figure 1A).

Using this formula, the motive of greed and fear can be concurrently manipulated by varying the difference between temptation and reward (T – R) for greed motive, and the difference between punishment and sucker (P – S) for fear motive, with a greater magnitude of the difference symbolizing a larger motive. In this case, high (low) greed occurs when there is a disproportionately high (low) reward for defection. High (low) fear occurs

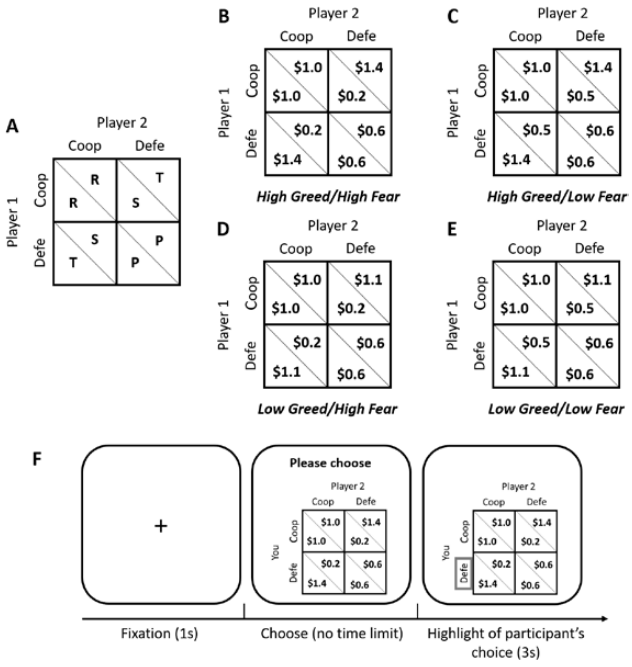

Figure 1. Payoff matrix of the PDG and task design. (A) If both players choose to cooperate, each player receives the reward (R). If both choose to not cooperate, each player receives the punishment (P). If Player 1 chooses not to cooperate while Player 2 chooses to cooperate, Player 1 receives the temptation (T) while Player 2 receives the sucker amount (S). The payoff matrices are designed such that T > R > P > S. High greed is induced by T – R = $1.40 – $1.00 = $0.40 in (B) and (C), and low greed by T – R = $1.10 – $1.00 = $0.10 in (D) and (E). High fear is induced by P – S = $0.60 – $0.20 = $0.40 in (B) and (D), and low fear by P – S = $0.60 – $0.50 = $0.10 in (C) and (E). (F) Timeline of events in the trial. Participants were instructed to make their decisions independently of each trial without time limit. The actual payoff outcome of each trial was not presented to the participant.

when there is a disproportionately high (low) price to be a "sucker." Consistent with previous studies (De Dreu et al., 2010; Zheng et al., 2016), high greed is induced when T – R = S$0.40, and low greed when T – R = S$ 0.10 at a one-to-one exchange rate to Singapore Dollar of possible bonus reimbursement. Similarly, high fear is induced when P – S = S$0.40, and low fear when P – S = S$0.10. This yielded a total of four conditions in the game: HighGreed/HighFear (HH), HighGreed/LowFear (HL), LowGreed/HighFear (LH), and LowGreed/LowFear (LL). Each condition was presented for 8 times in a fully intermixed and randomized order, leading to a sum of 32 trials.

Participants were instructed to make their decisions independently for each trial without time limit. They were told that, in each trial, they would face a different opponent whose identities were kept anonymous. Participants were tested individually, and they never met those opponents. The actual payoff outcome of each trial was not presented to the participant (Figure 1F). Thus, there was no expectation of reciprocity and the threat of punishment because the opponent had no chance to interact with the participant again in such a one-shot game. Before the actual

run, participants performed five practice trials and were asked questions to confirm their understanding of the task. A random trial was selected for the bonus reimbursement implementation.

Data Analysis and Results

Defection (non-cooperation) rate was subjected to a 2 (age: young vs. older) × 2 (greed: high vs. low) × 2 (fear: high vs. low) ANOVA (see Figure 2A for overall defection rate profiles). Consistent with previous findings, the main effects of greed [$F(1,180) = 53.29$, $p < 0.001$, $\eta_\rho^2 = 0.23$] and fear [$F(1,180) = 47.63$, $p < 0.001$, $\eta_\rho^2 = 0.21$] were significant. The main effect of age (young vs. older) was significant, $F(1,180) = 5.03$, $p = 0.03$, $\eta_\rho^2 = 0.03$, suggesting that older adults were more cooperative than young adults in PDG.

Importantly, age × fear interactions were significant, $F(1,180) = 29.91$, $p < 0.001$, $\eta_\rho^2 = 0.14$. Post hoc comparisons revealed that there was a fear-driven defection motive only in the young group, where high fear produced greater defection ($M \pm SD$: 0.76 ± 0.03) compared with low fear (0.53 ± 0.03), $p < 0.001$, but not in the older group [high fear (0.57 ± 0.03) vs. low fear (0.55 ± 0.03), $p = 0.33$] (Figure 2B). Furthermore, the interactions effect between age and greed were not significant, $F(1,180) = 3.75$, $p = 0.054$, $\eta_\rho^2 = 0.02$. Post hoc comparisons revealed that there was a greed-driven defection motive in both older and young groups, p's < 0.001 (Figure 2C). These results suggest that the defection of young adults was motivated by both greed and fear, but in older adults, the defections were only motivated by greed but not by fear. The interaction between greed and fear was also significant, $F(1,180) = 11.96$, $p = 0.001$, $\eta_\rho^2 = 0.06$. No other effects were significant, p's > 0.05. These patterns still hold after adding SES and years of education as covariates, suggesting that the observed findings cannot be simply explained by individual differences in SES or education. Moreover, while an independent sample t-test showed that there was a significant effect of age on FTP, $t(60) = 2.43$, $p = 0.02$, with older adults (3.81 ± 0.92) reporting more restricted temporal horizons than younger adults (4.38 ± 0.91), we did not find significant correlations between FTP and greed/fear effect in both young and older adults, p's > 0.05, possibly due to the small sample size.

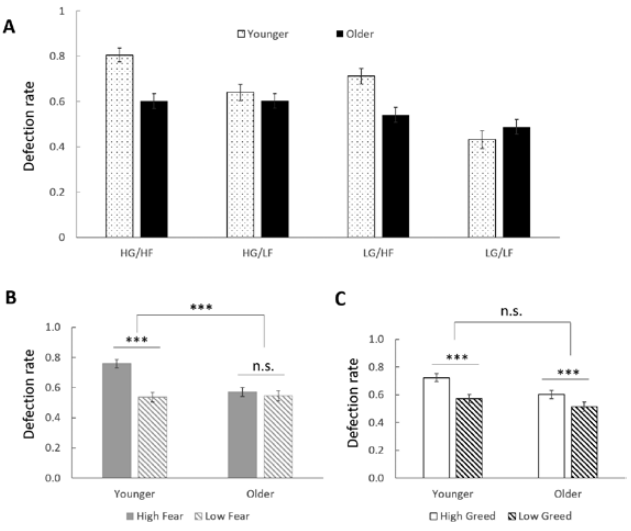

Figure 2. Behavioral results. (A) Defection rates in the PDG across all four conditions for both age groups. (B) The fear effect is not observed in the older group as there is no significant difference between high fear and low fear on defection rates, when compared with the young group. (C) A similar trend for greed effect is observed for both age groups. Participants in both groups are sensitive to greed. HG = high greed; LG = low greed; HF = high fear; LF = low fear. ***$p < 0.001$, n.s = not significant. The error bars indicate ±1 standard error.

Discussion

Our findings suggest that both greed and fear were important motivations driving noncooperation in young adults, whereas in older adults, non-cooperative behaviors were mainly driven only by greed—maximizing profit by exploiting others. Intriguingly, for older people, fear appears to play little role in motivating non-cooperation in the PDG.

In the Prisoner's Dilemma game, greed corresponds to the temptation to free-ride on the perceived cooperation of other players. The player who responds to greed asks, "If my opponent chooses to cooperate, how should I respond?" Greed, therefore, is based on the hypothetic positive intention of the opponent (i.e., choose to cooperate) and denotes the motive to receive more reward by exploiting the other party. Fear, on the other hand, denotes the prospection of being exploited. The player who responds to fear asks, "Given my opponent's noncooperation, how should I respond?" Although the other player's intention is unknown, response to the fear component is based on a hypothetic scenario carrying negative information (e.g., non-cooperation), therefore representing a perceived potential losses/social threat. Our findings indicate that older Chinese Singaporeans are less sensitive to the potential defection of other people, which is in line with the age-related "positivity effect" in the Western population (Reed, Chan, & Mikels, 2014). Older adults have an intact ability to focus on the favorable situation, considering how to exploit other's cooperation to maximize their self-interest. But older adults may tend to ignore the adverse condition, in which their own cooperation may be exploited, and behave like what young adults did in the low fear situation. Our studies extend the age-related "positivity effect" by showing that the noncooperation in older adults is selectively for exploiting others (greed) and not the apprehension of being exploited (fear). On the other hand, it seems that our findings do not support the age-related loss prevention and compensation theories, which suggest that older adults would be more sensitive to the potential losses and the negative cues expressed by others.

An alternative explanation for reduced fear in older adults is that older adults may be more likely than younger adults to trust a stranger or to display prosocial behavior toward a stranger from the outset of an interaction. Although studies indicate a negative bias of impression formation for older adults, participants in our study interacted with partners that were anonymous, and their reputations were unknown. In this ambiguous situation, it is possible that older adults may be more likely to approach an interaction with prosocial tendencies. For example, a study examining age-related differences in an iterated prisoner's dilemma game found that older adults cooperated more with selfish partners. This suggests the open possibility that older adults may be more susceptible to being taken advantage of (Mienaltowski & Wichman, 2019). Research also found that older adults respond less strongly to social exclusion, compared with young adults (Löckenhoff, Cook, Anderson, & Zayas, 2012). A recent meta-analysis on age-related differences in trust also revealed that older adults were more trusting than young adults in response to neutral and negative, but not positive indicators of trustworthiness (Bailey & Leon, 2019). The diminished processing of negative information such as untrustworthiness is consistent with other decision-making research that has demonstrated reduced anticipation of a future monetary loss but intact gain anticipation among older adults (Samanez-Larkin et al., 2007). Hence, it may be possible that older adults are less sensitive to negative cues, leading to increased trust, even with anonymous partners that are demonstrated in our study. The diminished fear motive or exaggerated trust in others may potentially make some older adults more vulnerable to monetary frauds, although whether older adults are disproportionately victimized by consumer fraud is still under debate (Ross, Grossmann, & Schryer, 2014). Future studies may explicitly examine the link between reduced sensitivity to social fear or enhanced social trust in laboratory settings and susceptibility to financial frauds in real-life situations.

Individuals' choices in PDG highly depend on how they forecast others' behaviors. One limitation in our study is that the exact psychological mechanisms that underpin cooperate vs. defect social decisions in older adults are still unclear. We do not know how participants portray their opponents in mind. Older participants may expect others to be more cooperative. Future studies should further test the effects of social expectations and how different expectations affect their decisions.

In summary, we observed an intact greed motive, but a diminished fear motive in the older Chinese Singaporean in the PDG Older adults may have a declined ability to assess social threats even though they retain the motivation to gain an exploitive advantage.

Funding

We acknowledge the Singapore Ministry of Education (MOE2016-T2-1-015) for financial support.

Author Contributions

R. Yu developed the study concept. J. Chai and Y. Huang collected and analyzed the data and drafted the manuscript with contributions from all the authors.

Conflict of Interest

None reported.

References

Adler, N. E., Epel, E. S., Castellazzo, G., & Ickovics, J. R. J. H. p. (2000). Relationship of subjective and objective social status with psychological and physiological functioning: Preliminary data in healthy, White women. *Health Psychology*, **19**(6), 586. doi:10.1037/0278-6133.19.6.586

Ahn, T.-K., Ostrom, E., Schmidt, D., Shupp, R., & Walker, J. (2001). Cooperation in PD games: Fear, greed, and history of play. *Public Choice*, **106**(1–2), 137–155. doi:10.1023/A:1005219123532

Bailey, P., & Leon, T. (2019). A systematic review and meta-analysis of age-related differences in trust. *Psychology and Aging*, **34**(5), 674–685. doi:10.1037/pag0000368

Baltes, P. B., & Baltes, M. M. (1990). Psychological perspectives on successful aging: The model of selective optimization with compensation. In P. B. Baltes & M. M. Baltes (Eds.), *Successful aging: Perspectives from the behavioral sciences* (pp. 1-34). New York, NY: Cambridge University Press. In (Vol. **1**, pp. 1–34).

Carstensen, L. L. (1992). Social and emotional patterns in adulthood: Support for socioemotional selectivity theory. *Psychology and Aging*, **7**(3), 331–338. doi:10.1037/0882-7974.7.3.331

Carstensen, L. L., & Lang, F. R. (1996). Future time perspective scale. Unpublished manuscript, Stanford University.

Carstensen, L. L., & Mikels, J. A. (2005). At the intersection of emotion and cognition: Aging and the positivity effect. *Current Directions in Psychological Science*, **14**(3), 117–121. doi:10.1111/j.0963-7214.2005.00348.x

Castle, E., Eisenberger, N. I., Seeman, T. E., Moons, W. G., Boggero, I. A., Grinblatt, M. S., & Taylor, S. E. (2012). Neural and behavioral bases of age differences in perceptions of trust. *Proceedings of the National Academy of Sciences of the United States of America*, **109**(51), 20848–20852. doi:10.1073/pnas.1218518109

Charles, S. T. (2010). Strength and vulnerability integration: A model of emotional well-being across adulthood. *Psychological Bulletin*, **136**(6), 1068–1091. doi:10.1037/a0021232

De Dreu, C. K., Greer, L. L., Handgraaf, M. J., Shalvi, S., Van Kleef, G. A., Baas, M.,…Feith, S. W. (2010). The neuropeptide oxytocin regulates parochial altruism in intergroup conflict among humans. *Science*, **328**(5984), 1408–1411. doi:10.1126/science.1189047

De Dreu, C. K., Scholte, H. S., van Winden, F. A., & Ridderinkhof, K. R. (2014). Oxytocin tempers calculated greed but not impulsive defense in predator-prey contests. *Social Cognitive and Affective Neuroscience*, nsu109. doi:10.1093/scan/nsu109

Ebner, N. C., Freund, A. M., & Baltes, P. B. (2006). Developmental changes in personal goal orientation from young to late adulthood:

From striving for gains to maintenance and prevention of losses. *Psychology and Aging*, **21**(4), 664. doi:10.1037/0882-7974.21.4.664

Faul, F., Erdfelder, E., Buchner, A., & Lang, A. (2014). *G* Power Version 3.1. 9.2 [Computer Software]*. Uiversität Kiel, Germany.

Feng, L., Chong, M. S., Lim, W. S., & Ng, T. P. (2012). The Modified Mini-Mental State Examination test: Normative data for Singapore Chinese older adults and its performance in detecting early cognitive impairment. *Singapore Medical Journal*, **53**(7), 458–462.

Hess, T. M., Popham, L. E., Dennis, P. A., & Emery, L. (2013). Information content moderates positivity and negativity biases in memory. *Psychology and Aging*, **28**(3), 853. doi:10.1037/a0031440

Kim, S., Healey, M. K., Goldstein, D., Hasher, L., & Wiprzycka, U. J. (2008). Age differences in choice satisfaction: A positivity effect in decision making. *Psychology and Aging*, **23**(1), 33–38. doi:10.1037/0882-7974.23.1.33

Lim, K., & Yu, R. (2015). Aging and wisdom: Age-related changes in economic and social decision making. *Frontiers in Aging Neuroscience*, **7**. doi:10.3389/fnagi.2015.00120

Lockenhoff, C. E. (2018). Aging and decision-making: A conceptual framework for future research - a mini-review. *Gerontology*, **64**(2), 140–148. doi:10.1159/000485247

Lockenhoff, C. E., & Carstensen, L. L. (2008). Decision strategies in health care choices for self and others: Older but not younger adults make adjustments for the age of the decision target. *Journals of Gerontology. Series B: Psychological Sciences and Social Sciences*, **63**(2), P106-109. doi:10.1093/geronb/63.2.P106

Löckenhoff, C. E., Cook, M. A., Anderson, J. F., & Zayas, V. (2012). Age differences in responses to progressive social exclusion: The role of cognition and socioemotional functioning. *Journals of Gerontology. Series B: Psychological Sciences Social Sciences*, **68**(1), 13–22. doi:10.1093/geronb/gbs042

Mienaltowski, A., & Wichman, A. (2019). Older and younger adults' interactions with friends and strangers in an iterated prisoner's dilemma. *Aging, Neuropsychology, and Cognition*, 1–20. doi:10.1080/13825585.2019.1598537

Pachana, N. A., Byrne, G. J., Siddle, H., Koloski, N., Harley, E., & Arnold, E. (2007). Development and validation of the Geriatric Anxiety Inventory. *International Psychogeriatrics*, **19**(01), 103–114. doi:10.1017/S1041610206003504

Reed, A. E., Chan, L., & Mikels, J. A. (2014). Meta-analysis of the age-related positivity effect: Age differences in preferences for positive over negative information. *Psychology and Aging*, **29**(1), 1. doi:10.1037/a0035194

Ross, M., Grossmann, I., & Schryer, E. (2014). Contrary to psychological and popular opinion, there is no compelling evidence that older adults are disproportionately victimized by consumer fraud. *Perspectives on Psychological Science*, **9**(4), 427–442. doi:10.1177/1745691614535935

Samanez-Larkin, G. R., Gibbs, S. E., Khanna, K., Nielsen, L., Carstensen, L. L., & Knutson, B. (2007). Anticipation of monetary gain but not loss in healthy older adults. *Nature Neuroscience*, **10**(6), 787. doi:10.1038/nn1894

Sullivan, M. J., Hall, E., Bartolacci, R., Sullivan, M. E., & Adams, H. (2002). Perceived cognitive deficits, emotional distress and disability following whiplash injury. *Pain Research and Management*, **7**(3), 120–126. doi:10.1155/2002/502984

Yesavage, J. A., Brink, T. L., Rose, T. L., Lum, O., Huang, V., Adey, M., & Leirer, V. O. (1983). Development and validation of a geriatric depression screening scale: A preliminary report. *Journal of Psychiatric Research*, **17**(1), 37–49. doi:10.1016/0022-3956(82)90033-4

Zheng, H., Kendrick, K. M., & Yu, R. (2016). Fear or greed? Oxytocin regulates inter-individual conflict by enhancing fear in men. *Hormones and Behavior*, **85**, 12–18. doi:10.1016/j.yhbeh.2016.07.003