

Motives Matter More With Age: Adult Age Differences in Response to Sociomoral Violations

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Moral judgments and emotional reactions to sociomoral violations are heavily impacted by a perpetrator's intentions and desires, which pose a threat to social harmony. Given that older adults are more motivated to maintain interpersonal harmony relative to younger adults, older adults may be more reactive to malicious desires. In three studies, we investigated adult age differences in moral judgments and emotional reactions to sociomoral violations. In all studies, participants read scenarios in which a perpetrator either (a) desired to harm another but nothing happened, or (b) harmed another accidentally without malicious desire. Study 2 incorporated additional scenarios designed to evoke anger and disgust without explicitly implicating another person to evaluate whether age differences emerge only when sociomoral violations against another are salient. In Study 3, we examined the combined effects of malicious desires and harmful outcomes by including scenarios in which (a) harmful desires were coupled with harmful outcomes, and (b) benign desires were coupled with benign outcomes. Predominantly across the studies, older adults judged perpetrators who desired to harm another more harshly but judged perpetrators who accidentally harmed another more leniently than younger adults. Emotional reactions generally corresponded with the differences in judgments. Taken together, this work suggests that desires more strongly impact older relative to younger adults' judgments and emotional reactions in sociomoral contexts.

Public Significance Statement

In reaction to sociomoral violations, older adults were less harsh and less negative than younger adults for accidental harms. However, older adults reported harsher character judgments and less sympathy than younger adults toward perpetrators who desired to harm someone else, even if no harm occurred. These findings highlight that sociomoral desires have greater impact on the moral judgments and emotional reactions of older relative to younger adults.

Keywords: aging, moral judgments, emotions, sociomoral violations

Supplemental materials: <https://doi.org/10.1037/xge0001578.sup>

Katrina and Joanna are in a weightlifting class. They are assigned to work together and take turns doing arm curls with 10-pound weights. Katrina really wants to drop a weight on Joanna's foot and break it. When it is Katrina's turn to do arm curls, Joanna steps back to provide her more room. Katrina drops the weight, and misses Joanna's foot, and Joanna is perfectly fine. What do you think of Katrina as a person? What emotions might you feel

toward Katrina who wanted to harm Joanna but did not? Now, it is Joanna's turn to do arm curls. Joanna has no desire to drop a weight on Katrina's foot and break it. As Joanna begins, the weight slips out of her sweaty hand and falls right on Katrina's foot, breaking it. What do you think of Joanna as a person? What emotions might you feel toward Joanna who caused harm to Katrina accidentally?

This article was published Online First May 2, 2024.

Tamar Kushnir served as action editor.

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The ideas and data appearing in this article have been previously disseminated at three different conferences. This research was partially supported by the National Science Foundation (Grant SES-1536260) and the National Institute on Aging (Grant R01-AG043533). Data and materials for this work are available via the Open Science Foundation (OSF) and can be found at: <https://osf.io/hcw5u/>.

Alyssa R. Minton served as co-lead for conceptualization, data curation, formal analysis, investigation, project administration, writing-original draft, and

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These types of questions have been prevalent in the field of moral and social psychology (Cushman, 2015; Haidt, 2001; Malle, 2021). Questions of morality—what is right or wrong, who is morally responsible for adverse outcomes—are consequential for survival and permeate everyday life. Moral judgments and emotional reactions can serve an evolutionary purpose of signaling who should be avoided in future interactions (Cushman, 2015). Emerging findings and perspectives underscore the integral coupling of moral judgments and emotional reactions that dynamically change throughout life (Decety & Howard, 2013). Scholars have demonstrated that the benevolence or malice of a person's intentions and desires—specifically the desire to cause harm to another—is an influential factor in determining moral judgments and emotional reactions (Cushman, 2008; Giner-Sorolla & Chapman, 2017; Hutcherson & Gross, 2011; Malle, 2021; Tangney et al., 2007). Moreover, research into early life developmental differences in moral judgments clearly demonstrates that as children age, they place greater weight on intentions relative to outcomes (Cushman et al., 2013; Heiphetz & Young, 2014), with notable affective and neural correlates (Decety & Howard, 2013). Despite the broad literature underscoring the role of intentions in moral judgments, there is relatively little known about how this relationship may change in later parts of the life span. As a result of motivational changes across the adult life span, there is good reason to expect adult age differences in moral judgments and emotions. Here we examined whether individuals of different ages make different moral judgments and/or have different emotional reactions in response to sociomoral violations that vary in the perpetrators' desires and outcomes.

Sociomoral Violations, Judgments, and Emotions

Moral judgments and emotional reactions to sociomoral violations are influenced by intentionality. Specifically, influential factors in judgments can be broken down into two dimensions: (a) benevolence or malice of the actor's intentions/desires and (b) abilities, skills, and resources of the actor that allow their intentions to be carried out (Hutcherson & Gross, 2011). Researchers have examined how moral judgments (e.g., moral character, blame, and punishment) and emotions (e.g., anger, disgust) can change by manipulating a perpetrator's desires and actions. Work by Cushman (2008) found that judgments of wrongness and permissibility of action were uniquely linked to perpetrators' malicious desires, whereas judgments of blame and punishment incorporated both desires and the causal connection between the harm and the perpetrator who caused it.

Although Cushman (2008) did not measure emotional reactions, other work has found that people experience different negative emotions when someone desires to harm another versus harms another accidentally (Giner-Sorolla & Chapman, 2017). Specifically, a desire to cause harm with no harmful consequence elicited disgust, whereas a harmful consequence without a desire to cause harm elicited anger (Giner-Sorolla & Chapman, 2017). This is consistent with a social functionalist account of moral emotions (Keltner et al., 2006), which focuses on how an emotion motivates the individual to engage in socially relevant behavior that is advantageous for social relations and how different situations or characteristics of the situation require sets of changes in behavior, cognition, and/or motivation (Hutcherson & Gross, 2011; Keltner et al., 2006). Feeling disgust in response to a sociomoral violation such as the desire to harm another could serve the

critical social function of identifying those who should be avoided. In contrast, feeling anger when a harmful consequence occurs, even if accidental, could signal the social function that reprimand is necessary. However, feeling sympathy or concern for someone who accidentally harmed another may signal to observers that the individual does not pose a direct, immediate threat to themselves. Importantly, though, such emotional reactions to sociomoral violations may depend on whether the violations are in direct contrast or even threaten one's goals, values, or priorities, which likely vary with age.

Aging, Sociomoral Violations, and Emotions

Adults of different ages might judge sociomoral violations differently. Indeed, developmental findings from early in the life span underscores a shift toward a greater emphasis on intentions in moral judgments with increased age (Cushman et al., 2013; Heiphetz & Young, 2014). For example, older (8 years old) versus younger (4 years old) children more harshly judge attempted harm (with a benign outcome) and less harshly judge accidental harm (Cushman et al., 2013). Moreover, these judgments have been linked to greater emotional responding, with younger versus older individuals showing greater emotional responding (Decety et al., 2012). Moreover, with increased age, greater connectivity was evident between brain regions involved in emotional responding and other regions involved in emotion regulation and cognition.

Given these developmental changes and the coupling of emotional responses and judgments, there are likely age differences later in the life span as well as a function of changes in motivation and emotion. Specifically, older adults might be more concerned about other's malicious intentions compared to younger adults, given lifespan changes in motivations, goals, and values posited by socioemotional selectivity theory (SST; Carstensen, 1992, 2006). SST posits that with advancing age and shrinking future time horizons, older adults focus more on emotionally fulfilling experiences and meaningful social relationships relative to younger adults. This motivational shift put forth by SST is reflected in both the emotional and social lives of older individuals. Decades of research highlight that aging individuals generally experience fewer negative emotions but a comparable, and sometimes increased, number of positive emotions compared to younger adults (Carstensen et al., 2000, 2011; Charles et al., 2001; Mroczek & Kolarz, 1998). Moreover, older relative to younger adults restructure their social networks to be comprised of a greater number of close social partners who engender emotionally fulfilling and positive relationships (English & Carstensen, 2014; Lang & Carstensen, 1994). When dealing with interpersonal conflict, older adults are more likely to use avoidant and less confrontational strategies relative to younger adults (Birditt et al., 2005; Birditt & Fingerman, 2003; Lefkowitz & Fingerman, 2003). When avoidant strategies cannot be deployed, older adults appear to actively infuse the situation with positive affect (Carstensen et al., 1995; Levenson et al., 1994). A greater focus on emotionally fulfilling relationships may be associated with a deep desire to maintain social harmony and to keep the peace within one's social environment, allowing for more positive and fewer negative emotions and social experiences. However, when people pose a threat to such social harmony or peacekeeping, older adults may react more strongly to those violators.

Given the deeply social nature of morality and moral judgments coupled with older adults' socioemotional goals, they might be more sensitive or reactive to sociomoral violations. Work by Hess

and colleagues (Hess & Auman, 2001; Hess et al., 1999, 2005) has supported this notion, finding that increased age was associated with greater sensitivity to trait diagnostic cues of morality (i.e., honesty). And when people's behavior is immoral, older adults may more heavily weigh this information to draw inferences and make judgments about the perpetrator's character and actions (e.g., trustworthiness) compared to younger adults through accrued social expertise. Younger adults do have basic knowledge of trait-diagnostic behaviors (Skowronski & Carlston, 1987), but it seems that older adults are more likely to apply that when making judgments than younger adults (Hess et al., 1999), even in instances in which additional information moderates the diagnostic value of behaviors (Hess et al., 2005). In fact, when presented with conflicting diagnostic information about a person's trustworthiness, younger adults were less likely than older adults to incorporate information relating to morality when making judgments (Hess et al., 2005). Taken together, with more social experience, older adults may be more sensitive to indicators of bad moral character, such as those who want to harm others. Additionally, older adults may be more reactive to threats to social harmony as a result of their motivational shifts toward emotionally meaningful social goals (Carstensen et al., 1999; Sorkin & Rook, 2006).

The Current Studies

Though research has explored adult age differences in social judgments (Hess & Auman, 2001; Hess et al., 1999, 2005), research has yet to examine adult age differences in response to sociomoral violations such as the desire to cause harm versus accidental harm. The following three studies sought to uncover whether older and younger adults' judgments and emotional reactions to sociomoral violators differed.

Based on previous research with younger adults, we expected the desire to cause harm would elicit harsher judgments coupled with more anger and disgust but less sympathy compared to when harm occurred accidentally. Here, we sought to explore whether older adults might differ from younger adults in their reactions to such scenarios. There are reasons to think there may be adult age differences. Specifically, older adults are more sensitive to important behavioral cues and trait diagnostic information when making social judgments than younger adults (e.g., Hess & Auman, 2001; Hess et al., 1999, 2005). Additionally, given older adults' shift toward socioemotional goals and values posited by SST, older adults may be more sensitive to a perpetrator's desire to cause harm as a potential threat to or violation of older adults' socioemotional goals of maintaining social harmony.

In Study 1, older and younger adults read scenarios in which a perpetrator either (a) desired to harm someone but nothing happened, or (b) someone was harmed accidentally without malicious intent. Insofar as adult age differences in sociomoral violations that varied in the desires of the perpetrator and outcomes had not previously been examined, we sought to broadly explore moral judgments and emotional reactions in Study 1. In Study 2, we sought to determine if age differences in moral judgments and emotions were specific to sociomoral contexts as opposed to negative emotional contexts more generally. As such, Study 2 built upon Study 1 by including additional scenarios designed to evoke anger and disgust without implicating another person to examine whether age differences emerge only when sociomoral implications are salient. In Study 3, we sought to determine whether perpetrator desires were the driving factor more so than harmful outcomes. Study 3 built

on the first two studies by examining the combined effects of malicious intent and harmful outcomes by including scenarios in which (a) harmful intentions were coupled with harmful outcomes, and (b) benign intentions were coupled with benign outcomes.

Study 1

Think back to Katrina and Joanna from the opening paragraph. Katrina desired to drop a weight on Joanna's foot and break it. Joanna moved away just in time and was completely fine. Joanna had no desire to drop a weight on Katrina's foot and break it, but Katrina's foot is still broken when the weight slips out of Joanna's sweaty hand and onto her foot. Are these two actions equally egregious depending on who observes them? The desire to cause harm to another and harm occurring accidentally can both be seen as violations, but it is unclear whether older and younger adults judge them in the same way. The goal of Study 1 was to determine whether older and younger adults differentially respond to these sociomoral violations. Participants read scenarios in which a perpetrator either (a) desired to harm someone but nothing happened (i.e., the desire/no consequence condition), or (b) someone was harmed accidentally without malicious intent (i.e., the no desire/consequence condition). After each scenario, participants made judgments about the perpetrator's moral character and their actions. They also indicated how much anger, disgust, and sympathy they felt toward the perpetrator described in the scenario. The results from Study 1 were intended to be a starting point from which we could further explore age differences in judgments and emotional reactions within a sociomoral domain.

Method

Transparency and Openness

For all studies, we report on how we determined our sample size, all data exclusions, all manipulations and measures in the study. All deidentified data, analysis scripts, and study materials are available on the Open Science Framework (OSF): <https://osf.io/hcw5u/>. Data were analyzed using R, Version 4.0.2 (R Core Team, 2019). The study's design and analysis were not preregistered.

It is important to note that although we borrowed heavily from Giner-Sorolla and Chapman (2017) in terms of their materials, it was not a direct replication. Specifically, in their work, participants were instructed to focus on either the person or the act, whereas we did not include this manipulation in the current studies. Moreover, because this work has rarely been applied to older adults, we wanted to learn more about how older and younger adults differentially respond to the desire to cause harm versus harm occurring accidentally. In pursuit of that goal, we included a number of dependent measures in an exploratory manner. Thus, we mention all the measures that were included here, but some of the results regarding those materials are not directly included in this article and instead are available on our OSF page.

Participants

Appropriate sample size was estimated using a power analysis in G*Power (Faul et al., 2007) based upon the interaction effect found in Giner-Sorolla and Chapman (2017). Because little work using similar methodologies has incorporated an older adult sample, we

decided to base our effect size estimate on available data rather than arbitrarily estimating an interaction effect size. Thus, we understand that the effect size in this power analysis does not reflect potential age differences. The power analysis used the following parameters: an alpha level of .05, 95% power to detect a difference between groups of $f = .25$ ($d = 0.5$). This power analysis indicated that we needed 210 total participants. To accommodate participants who failed attention checks¹ ($N = 25$, $n_{YA} = 21$, $n_{OA} = 4$), we collected data from 250 participants who were either 18–30 years old or 60–79 years old. As is the general standard in aging research focusing on emotion, we included younger adults (roughly 18–30 years old) and older adults (roughly 60–79 years old) as the comparison groups. These age ranges are sufficient to capture meaningful differences between younger and older adults in emotion.

Younger ($n = 112$; $M_{age} = 26.23$, $SD_{age} = 2.54$; 72% female, 27% male, 1% preferred not to answer) and older ($n = 113$; $M_{age} = 66.42$, $SD_{age} = 4.90$; 51% female, 49% male) adults were recruited to participate in this study via Amazon Mechanical Turk (MTurk). Participants were compensated \$3.00 for participating in this 30-min online survey. This study was reviewed by a university Institutional Review Board (IRB). All participants were required to provide informed consent.

Materials

Scenarios. We used the 16 moral scenarios² in Giner-Sorolla and Chapman's (2017) Study 3. For each scenario, there was a perpetrator and a target who was on the receiving end of the perpetrator's actions. As in Giner-Sorolla and Chapman (2017), there were two conditions: (a) the desire/no consequence condition, in which there was desire to cause harm to the target, but no harm occurred; and (b) the no desire/consequence condition, in which there was no desire to cause harm, but harm accidentally occurred. The Appendix contains all of the scenarios, and an example scenario for each condition is presented below:

Desire/No Consequence Condition. Jenny is taking a class in sculpture. She is assigned to work with a partner to weld together pieces of metal. Jenny wants to burn her partner's hand. Jenny starts welding the metal together, but her partner happens to let go and is not burned at all.

No Desire/Consequence Condition. Jenny is taking a class in sculpture. She is assigned to work with a partner to weld together pieces of metal. Jenny does not want to burn her partner's hand. Jenny only wants to weld together the metal. Jenny welds the metal, and her partner's hand is burned.

Moral Judgments. Borrowed from Giner-Sorolla and Chapman (2017), participants provided judgments about the perpetrator's moral character and their actions. Each measure is described in detail below. We used the same 7-point scale (1 = *not at all*, 7 = *extremely*) for the following measures unless otherwise stated.

Person Judgments. Participants evaluated the perpetrators' moral character on 10 items (e.g., how sick and twisted the perpetrator was, how screwed up the perpetrator was, how sadistic the perpetrator was). Responses were averaged across scenarios. Person judgments were comparably reliable for older ($\alpha^3 = .99$) and younger ($\alpha = .96$) adults.

Act Judgments. Participants evaluated the perpetrators' actions on 10 items (e.g., how responsible the perpetrator was for their actions, how much blame the perpetrator deserved, to what extent

the act was the perpetrator's fault). Responses were averaged across scenarios. Act judgments were comparably reliable for older ($\alpha = .95$) and younger ($\alpha = .90$) adults.

Emotion Endorsements. Emotion endorsements were broken down into nonverbal endorsements and emotion ratings, as in Giner-Sorolla and Chapman (2017). Each are described in detail below.

Nonverbal Emotion Endorsements. Nonverbal emotion endorsements were measured by presenting participants with three angry, three neutral, and three disgusted faces (two male actors, one female actor) borrowed from the NimStim Set of Facial Stimuli (Tottenham et al., 2009). Using a forced-choice question, participants indicated which set of faces best described their feelings toward the perpetrator. Additionally, participants indicated how much each set of faces corresponded to how they were feeling toward the perpetrator. These responses were averaged across scenarios to provide separate composite averages for anger ($\alpha = .89$), disgust ($\alpha = .91$), and neutral ($\alpha = .88$), with higher scores indicating greater endorsement of that particular emotion.

Emotion Ratings. Participants indicated how much they felt particular emotions toward the perpetrator. Emotion endorsements for anger (i.e., outraged, furious, angry) and for disgust (i.e., revolted, disgusted, sickened) were averaged across scenarios to create anger ($\alpha = .97$) and disgust ($\alpha = .98$) composite averages. We also included verbal ratings of sympathy (i.e., sympathy, concern, and compassion; $\alpha = .74$), borrowed from the Modified Differential Emotion Scale (mDES; Fredrickson et al., 2003). In adding sympathy, we reasoned that the accidental condition could potentially elicit feelings of sympathy, considering that harm occurred accidentally but, importantly, without harmful intent. Higher scores indicate a greater endorsement of that particular emotion.

Trait Disgust. We also included the 21-item Three-Domain Disgust Scale (TDDS; Tybur et al., 2009) as a measure of trait disgust for control purposes. Participants read each item and indicated to what extent it was disgusting. Responses were averaged ($\alpha = .92$), with higher scores indicating more trait disgust.

Procedure

The current study employed a 2 (age group: younger, older) \times 2 (condition: no desire/consequence, desire/no consequence) design, with age group and condition as between-subjects factors. Participants were randomly assigned to the desire/no consequence ($n = 104$, $n_{YA} = 51$,

¹ We included two attention checks in our study for data quality purposes. Within two scenarios, participants were asked if a person named Tim was in the scenario (yes/no response), and if anyone was harmed in the scenario (yes/no response). No scenario contained a character named Tim, and correct answers to whether anyone was harmed varied by condition (with "yes" being correct in the no desire/consequence condition and "no" being correct in the desire/no consequence condition). Participants who did not accurately answer these attention checks were assumed to not be paying attention.

² We edited one of the scenarios. We felt that the "Poison" scenario did not clearly convey the intention to cause harm. To that end, we added a sentence to make the intentionality more salient (i.e., "Steve hands Pat the cookies to hold while he cleans the counter"; see the Appendix).

³ For all dependent measures except nonverbal emotion endorsements, we calculated Cronbach's alpha by averaging responses to individual items across the eight scenarios (e.g., averaging responses to Item 1 of the person judgments across all scenarios), and then alphas were computed using each item's composite average across the scenarios.

$n_{OA} = 53$) or the no desire/consequence ($n = 121, n_{YA} = 61, n_{OA} = 60$) condition. After providing informed consent, participants were randomly presented with the eight scenarios. For each scenario and in the following order, participants: (a) indicated which of the face sets (anger, neutral, disgust) best described their feelings toward the perpetrator (i.e., forced choice nonverbal endorsement); (b) indicated how well each of the face sets best described their feelings toward the perpetrator (i.e., scaled nonverbal emotion endorsement); (c) provided moral judgments ratings; (d) provided emotion ratings; and (e) indicated the extent to which they were compelled by aggressive action tendencies.⁴ After all of the scenarios were presented, participants completed measures of trait disgust and trait aggression and a self-construal scale.⁵ Then participants completed a demographic questionnaire. Finally, participants were thanked and compensated for their participation.

Results

We conducted multilevel regressions for all of our analyses to account for nesting of scenarios within participant and for intercept variability between participants. We examined the intraclass correlation coefficients (ICCs) for the five dependent variables of interest, which is the ratio of variance explained by the multilevel structure and the variance of the outcome variable. ICCs ranged from .50 to .85, suggesting that participants' responses across the scenarios were highly dependent and that the multilevel framework is preferred. As such, we included a random intercept for scenario and a random intercept for participant for each analysis, unless there were model convergence issues. We explicitly note these cases as they occurred below and specify the random effect structure that we used instead. For each outcome, we included dummy coded age (ref = older adults), dummy coded condition (ref = no desire/consequence), and the Age Group \times Condition interaction. For disgust ratings, we included trait moral disgust as a covariate to account for observed age differences.⁶ For all analyses, sex was included as a covariate; we controlled for the unequal distribution of Sex \times Age Group to ensure that any age or condition or Age \times Condition differences were not attributable to sex.

For all studies, data were analyzed using R, Version 4.0.2 (R Core Team, 2019). Models were estimated using the "lmer()" function in the lmerTest package (Kuznetsova et al., 2017). Significance tests for main effects and interactions were summarized using the "anova()" function in the car package (Fox & Weisberg, 2019). Effect size estimates were generated via the "anova_stats()" function in the sjstats package (Lüdecke, 2020). Post hoc comparisons for the main effect of condition were computed using the "emmeans()" function in the emmeans package (Lenth, 2020), and p values were adjusted for multiple comparisons using Holm corrections. We decomposed significant interactions with a simple slopes analysis with the "sim_slopes()" function in the interactions package (Long, 2019). A positive estimate indicates that younger adults had a higher rating on that particular outcome variable than older adults. A negative estimate indicates that older adults had a higher rating for that particular outcome variable than younger adults. All test statistics can be reproduced via our R script available on our OSF page.

To streamline the analyses and avoid overwhelming readers, the results from the nonverbal emotion endorsements can be found in the [online supplemental materials](#). The findings generally indicated that anger and disgust endorsements were higher, but neutral

endorsements were lower, when the perpetrator desired to harm another even though no harm occurred (relative to when harm occurred accidentally without malicious intent). Moreover, older adults endorsed neutral expressions less than younger adults—especially when there was a desire to cause harm to another, even though no harm occurred. We did not find age differences in endorsements of anger or disgust facial expressions by condition. Importantly, based on literature examining age difference in emotion recognition, younger adults generally outperform older adults when detecting negative emotional facial expression (e.g., anger, sadness; Mill et al., 2009; Ruffman et al., 2008), especially at low expressive intensities and/or with shared overlapping facial cues (Minton & Mienaltowski, 2021; Mienaltowski et al., 2013, 2019). In light of these findings, any observed null findings on this dependent measure may be subject to alternative interpretations and are discussed sparingly in this article.

Moral Judgments

Person Judgments. Participants reported harsher judgments of moral character in the desire/no consequence condition ($M = 5.87, SD = 0.94, 95\% \text{ CI } [5.69, 6.06]$) compared to the no desire/consequence condition ($M = 2.82, SD = 0.85, 95\% \text{ CI } [2.67, 2.98]$), $F(1, 220) = 538.07, p < .001, \eta_p^2 = .253$. Moreover, regardless of condition, older adults ($M = 4.37, SD = 1.94, 95\% \text{ CI } [4.01, 4.73]$) reported harsher judgments of moral character compared to younger adults ($M = 4.10, SD = 1.57, 95\% \text{ CI } [3.80, 4.39]$), $F(1, 220) = 5.10, p = .025, \eta_p^2 = .003$.

These main effects were qualified by a significant two-way interaction, $F(1, 220) = 30.30, p < .001, \eta_p^2 = .019$. Specifically, older adults reported harsher judgments of moral character compared to younger adults in the desire/no consequence condition, $b = -0.87, SE = 0.17, t = -5.25, p < .001$. Conversely, older adults reported more lenient judgments of moral character than younger adults in the no desire/consequence condition, $b = 0.36, SE = 0.15, t = 2.32, p = .020$ (see Panel A of Figure 1).

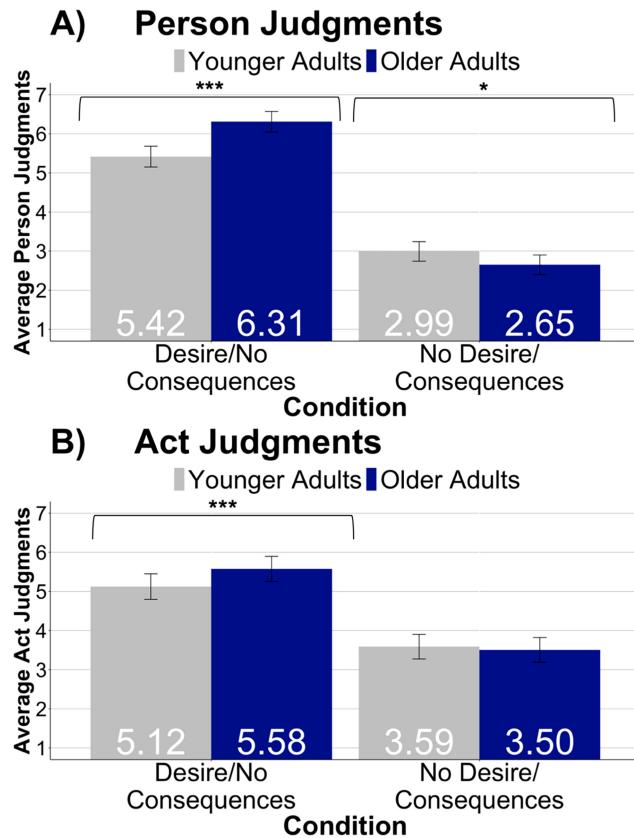
Act Judgments. Participants reported harsher act judgments in the desire/no consequence condition ($M = 5.36, SD = 0.84, 95\% \text{ CI } [5.19, 5.52]$) compared to the no desire/consequence condition ($M = 3.55, SD = 0.74, 95\% \text{ CI } [3.41, 3.68]$), $F(1, 220) = 197.91, p < .001, \eta_p^2 = .110$. This main effect of condition was qualified by a significant two-way interaction, $F(1, 220) = 6.54, p = .011, \eta_p^2 = .004$. Specifically, older adults reported harsher act judgments than younger adults in the desire/no consequence condition ($b = -0.44, SE = 0.16, t = -2.81, p = .01$), but not the no desire/consequence condition ($p = .50$; see Panel B of Figure 1).

⁴ For exploratory purposes, we included a measure of direct (e.g., insulting or hitting someone) and indirect (e.g., spreading negative information) aggressive action tendencies (Molho et al., 2017) as well as a measure of trait aggression in Studies 1 and 2. The results for aggressive action tendencies do not substantively contribute to the theoretical or empirical basis of this work, and thus will not be discussed further. Please refer to our OSF page for the results related to this measure.

⁵ For exploratory purposes, we included a measure of self-construal (D'Amico & Scrima, 2016; Singelis, 1994). The results from this measure do not contribute to the theoretical or empirical basis of this work, and thus will not be discussed further. The results can be found on our OSF page.

⁶ Older adults ($M = 4.78, SD = 1.42, 95\% \text{ CI } [4.51, 5.04]$) reported higher trait moral disgust than younger adults ($M = 3.63, SD = 1.54, 95\% \text{ CI } [3.35, 3.92]$), $F(1, 221) = 33.62, p < .001, \eta_p^2 = .132$.

Figure 1
The Moral Judgments of Younger and Older Adults in Study 1



Note. Mean person judgments (panel A) and act judgments (panel B) for older and younger adults in each condition in study 1. Responses for both person and act judgments ranged from 1 (*not at all*) to 7 (*extremely*). Confidence intervals are displayed. Error bars are 95% confidence intervals. See the online article for the color version of this figure.

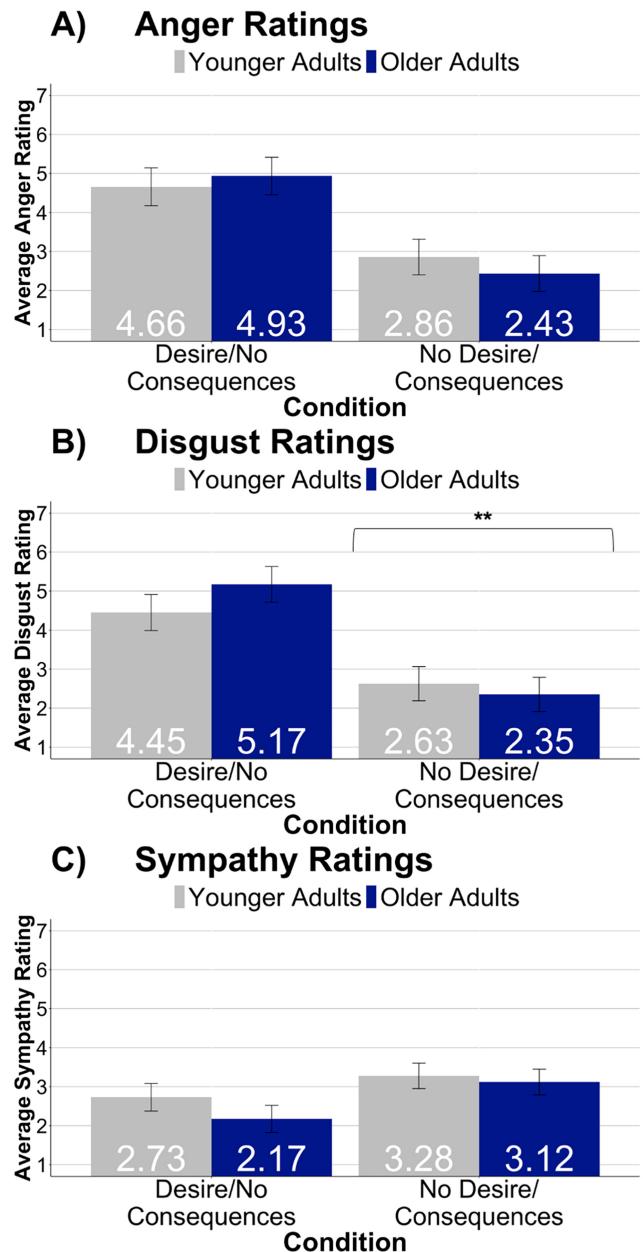
* $p < .05$. *** $p < .001$.

Emotion Ratings

Anger. Participants' anger ratings were significantly higher in the desire/no consequence condition ($M = 4.80$, $SD = 1.86$, 95% CI [4.67, 4.92]) compared to the no desire/consequence condition ($M = 2.65$, $SD = 1.86$, 95% CI [2.53, 2.77]), $F(1, 220) = 83.81$, $p < .001$, $\eta_p^2 = .050$. Neither the main effect of age group ($p = .726$) nor the interaction ($p = .071$) were significantly different. Older and younger adults' mean anger ratings in each condition are presented in Panel A of Figure 2.

Disgust. For this analysis, sex was not included as a covariate due to model convergence issues. Only trait moral disgust was included as a covariate. Participants' disgust ratings were significantly higher in the desire/no consequence ($M = 4.82$, $SD = 1.54$, 95% CI [4.52, 5.12]) compared to the no desire/consequence ($M = 2.49$, $SD = 1.29$, 95% CI [2.26, 2.72]) condition, $F(1, 220) = 146.90$, $p < .001$, $\eta_p^2 = .085$. Although the main effect of age group was not significant ($p = .302$), the two-way interaction was, $F(1, 220) = 11.88$, $p < .001$, $\eta_p^2 = .007$. Older adults reported significantly lower disgust ratings than younger adults in the no desire/consequence condition, $b = 0.78$, $SE = 0.25$, $t = 3.17$, $p < .001$, but there were no significant

Figure 2
The Emotional Reactions of Younger and Older Adults in Study 1



Note. Mean anger (panel A), disgust (panel B), and sympathy (panel C) ratings in study 1. Responses ranged from 1 (*not at all*) to 7 (*extremely*). Confidence intervals are displayed. Error bars are 95% confidence intervals. See the online article for the color version of this figure.

** $p < .01$.

age differences in the desire/no consequence condition ($p = .12$; see Panel B of Figure 2).

Sympathy. Participants' sympathy ratings were significantly lower in the desire/no consequence condition ($M = 2.54$, $SD = 1.10$, 95% CI [2.23, 2.66]) compared to the no desire/consequence condition ($M = 3.20$, $SD = 1.25$, 95% CI [2.97, 3.43]), $F(1, 220) = 17.91$, $p < .001$, $\eta_p^2 = .011$. Regardless of condition,

younger adults ($M = 3.03$, $SD = 1.35$, 95% CI [2.77, 3.28]) were more sympathetic than older adults ($M = 2.68$, $SD = 1.10$, 95% CI [2.47, 2.88]), $F(1, 220) = 3.91$, $p = .050$, $\eta_p^2 = .002$. The two-way interaction was not significant ($p = .217$; see Panel C of Figure 2).

Discussion

The desire to cause harm was particularly egregious for participants of both age groups. Participants reported harsher person and act judgments as well as more anger and disgust but less sympathy for perpetrators who desired to but did not successfully harm another compared to perpetrators who accidentally harmed another. However, some of these effects differed for older versus younger adults. Specifically, when perpetrators desired to but did not succeed at harming another, older adults judged their moral character and their actions more harshly than younger adults. Specifically, older adults' average person judgment ratings approached the ceiling of our scale (6.31 on a 7-point scale) in the desire/no consequence condition, potentially suggesting that the malicious intent of the perpetrators signaled poor moral character to older adults to a greater extent than younger adults. In contrast, when perpetrators accidentally harmed another, older adults judged the perpetrators' moral character less harshly and felt less disgusted than younger adults.

One way to interpret these findings is that older adults may be more reactive to the sociomoral violation of the desire to harm another. This dovetails with past work that has found that older adults are more sensitive to trait-diagnostic behavioral cues (e.g., honesty) when making morality-based inferences (e.g., trustworthiness) compared to younger adults (Hess & Auman, 2001; Hess et al., 1999, 2005). The results from this study contribute to the existing literature by demonstrating another influential factor in older adults' judgments within a moral domain: the desire to cause harm. When perpetrators desired to but did not harm another, older adults judged them as having worse moral character and reported greater disapproval of their actions compared to younger adults. What is interesting about the findings for act judgments is that older adults reported greater disapproval of the perpetrators' actions compared to younger adults in the desire/no consequence condition in which no actual harm occurred. However, when harm occurred accidentally and was not the result of malicious intentions, older adults reported less disgust and less harsh judgments of moral character compared to younger adults. Reasoning from SST (Carstensen, 1992, 2006), it could be the case that benign accidental harms are not as morally violating to older adults' socioemotional goals and values, leading them to evaluate the perpetrators' moral character less harshly and feel less disgust toward them compared to younger adults because after all, the perpetrators did not actually want to harm another. Taken together, it seems that older adults are more reactive to harmful intentions than they are to accidental outcomes.

Given that both of our conditions contained a violation against an explicit social other (e.g., Jenny's partner), we designed a second study to investigate specifically how a clear social component (or lack thereof) contributes to the observed pattern of age differences in moral judgments and emotional reactions. Past work by Hess et al. (2005) has also explored how age differences in moral judgments differ when behaviors had primary implications for the self versus others. They found that participants interpreted behaviors that had primary implications for others in terms of morality-related (rather than competence) traits, and this effect was stronger in older adulthood (Hess et al., 2005). Therefore, it does seem to be the case

that older adults are more sensitive to people's behaviors that might impact others, especially within a moral domain. In Study 2, we included additional scenarios designed to evoke anger and disgust without including an explicit social other. We reasoned that older adults might have been particularly sensitive to the fact that there was a direct social target in the scenarios in Study 1 and that older adults may not display this same sensitivity when explicit social others are removed from the scenarios. Could it be the case that when a social other and sociomoral content is limited, age differences in character judgments and emotion ratings may be reduced or eliminated? The goal of Study 2 was to answer this question.

Study 2

To determine if the observed age differences in moral judgments and emotions were specific to a sociomoral context, in Study 2, we added two scenario conditions designed to evoke the discrete emotions of anger and disgust. In the anger condition, perpetrators acted negligently (but not maliciously) and consequences ensued (e.g., starting a fire out of curiosity that damages a classroom). In the disgust condition, perpetrators acted in a conventionally disgusting manner (e.g., eating a French fry out of a dirty ashtray). Importantly, when designing these scenarios, we focused on key appraisals of anger and disgust, such as goal blockage (Hutcherson & Gross, 2011; Kuppens et al., 2003) and purity violations (e.g., contaminants entering the body; Rozin et al., 2008), respectively. Older and younger adults were randomly assigned to one of four conditions (i.e., desire/no consequence, no desire/consequence, anger, disgust). After each scenario, participants provided person and act judgments and then reported how much anger, disgust, and sympathy they felt toward the perpetrators described in the scenarios. Based on our findings from Study 1, we predicted that older adults would be particularly sensitive to sociomoral violations, specifically the desire to harm another. In the new scenarios with limited sociomoral context (i.e., no explicit social target on the receiving end of the perpetrator's actions), older and younger adults may not differ in their moral judgments and emotional reactions. If perceptions of sociomoral violations are a contributing factor to older adults' experience of negative emotions and moral judgments, then age differences in either the no desire/consequence or desire/no consequence conditions may emerge but not necessarily in the anger or disgust conditions.

Method

Participants

Prior to conducting this study, appropriate sample size was determined using a power analysis in G*Power (Faul et al., 2007) and was based on the smallest interaction effect size for person judgments that we found in Study 1. This analysis indicated that we needed 434 total participants (roughly 54 per group) to detect differences between eight groups of $f = .20$ ($d = 0.4$) with 95% power and at an alpha level of .05. To accommodate participants who failed the attention checks ($n_{OA} = 55$, $n_{YA} = 107$), we collected data from 629 participants who were either 18–30 years old or 55–79 years old. The attention checks were the same as the ones used in Study 1.

Younger ($n = 249$; $M_{age} = 25.38$, $SD_{age} = 2.38$, age range: 18–30 years, 38% female, 61% male, 1% preferred not to answer) and older ($n = 218$; $M_{age} = 62.43$, $SD_{age} = 4.49$, age range: 55–77 years, 53% female, 47% male) adults were recruited to participate in this

study via MTurk. Participants were compensated \$3.00 for participating in this 30-min online survey. This study was reviewed by a university IRB. This work was not preregistered. All participants were required to provide informed consent.

Materials

Scenarios. Study 2 included the same 16 scenarios used in Study 1. In addition, we created eight disgust and eight anger scenarios. When creating these scenarios, we focused on appraisals of goal divinity/purity and goal blockage, respectively. The new anger and disgust scenarios contained the same perpetrator in the desire/no consequence and no desire/consequence scenarios in Study 1. For the anger scenarios, we focused on appraisals of goal blockage in that goal blockage is likely to result in anger (Hutcherson & Gross, 2011; Kuppens et al., 2003). For the disgust scenarios, we focused on appraisals and violations of purity, as these are the most common elicitors of core disgust (Rozin et al., 2008). Importantly, the anger and disgust scenarios did not explicitly include a social other like the desire/no consequence and no desire/consequence scenarios. The scenarios are included in the Appendix, but examples of the newly created anger and disgust scenarios using the same protagonist (i.e., Jenny) as the example scenarios provided in Study 1 are presented below.

Anger Condition. Jenny is taking a class in sculpture. She is using a brand-new torch to weld together pieces of metal. Jenny decides to use the torch on a nearby desk to see if it will burn. The desk catches on fire very quickly and the fire gets out of control. The fire destroys all of the welding equipment in the classroom and all sculpture classes get cancelled for the rest of the year due to the damage.

Disgust Condition. Jenny is taking a class in sculpture. She is using a brand-new torch to weld together pieces of metal. Jenny decides to use the torch on her arm to see if it will burn. Jenny moves the torch closer to her arm and singes her skin, making the whole classroom smell like burning flesh. Smelling her burnt skin in the air, Jenny wonders what it would taste like, so she licks the blistering spot on her arm.

Dependent Variables. For Study 2, person judgments and act judgments were measured in the same manner as Study 1. Person judgments were comparably reliable for older ($\alpha = .94$) and younger ($\alpha = .90$) adults. Similarly, act judgments were comparably reliable for older ($\alpha = .79$) and younger ($\alpha = .77$) adults.

Regarding emotion endorsements, we decided to assess only emotion ratings of anger, disgust, and sympathy. We did not include the nonverbal emotion endorsements as we did in Study 1 based on the rationale provided in Study 1 (i.e., older adult difficulties in nonverbal emotion detection). Ratings of disgust ($\alpha = .95$) and sympathy ($\alpha = .85$) were measured in the same manner as in Study 1. In creating the novel anger scenarios, we decided to adjust the way verbal endorsements of anger were measured in Study 2. In Study 1, participants indicated how “angry,” “outraged,” and “furious” they were at the perpetrator. This triad conflates anger and outrage, with the latter carrying connotations of morality (Hechler & Kessler, 2018; Salerno & Peter-Hagene, 2013). Therefore, we decided to separately measure “anger” with the triad “anger,” “annoyed,” and “irritated” ($\alpha = .95$; from the mDES, Fredrickson et al., 2003) and “outrage” with the triad “outraged,” “furious,” and “appalled” ($\alpha = .97$). Participants indicated to what extent

they felt a particular emotion toward the perpetrator on a 7-point scale (1 = *not at all*, 7 = *extremely*).

Control Variables. As in Study 1, we included the same trait aggression (Brief Aggression Questionnaire; Webster et al., 2014; $\alpha = .89$) and trait disgust (TDDS; Tybur et al., 2009; $\alpha = .92$) measures. These measures were included to serve as control variables to determine if there were preexisting differences in trait aggression and trait disgust between conditions.

Procedure

The current study employed a 2 (age group: younger, older) \times 4 (condition: no desire/consequence, desire/no consequence, anger, disgust) design, with age group and condition as between-subjects factors. After providing informed consent, participants were randomly assigned to either the desire/no consequence ($n = 121$, $n_{YA} = 62$, $n_{OA} = 59$), no desire/consequence ($n = 111$, $n_{YA} = 64$, $n_{OA} = 47$), anger ($n = 114$, $n_{YA} = 51$, $n_{OA} = 63$), or disgust ($n = 121$, $n_{YA} = 60$, $n_{OA} = 61$) condition. For each scenario and in the following order, participants (a) provided moral judgments, (b) provided emotion ratings, and (c) indicated aggressive action tendencies.⁷ After all of the scenarios were presented, participants completed the TDDS, Brief Aggression Questionnaire, and the same demographic questionnaire as in Study 1. Lastly, participants were thanked and compensated for their participation.

Results

As in Study 1, we conducted multilevel regressions for all of our analyses to account for nesting of scenarios within participant and for intercept variability between participants. ICCs ranged from .53 to .71, suggesting that participants’ responses across the scenarios were highly dependent and that the multilevel framework is preferred. As such, we included a random intercept for scenario and a random intercept for participant for each analysis. For each outcome, we included dummy-coded age (ref = older adults), dummy-coded condition (ref = no desire/consequence), and the Age Group \times Condition interaction. For disgust ratings, we included trait moral disgust and trait pathogen disgust as covariates to account for observed age differences.⁸ In addition, sex was included as a covariate in the

⁷ We decided to include a measure of aggressive action tendencies in Study 2 to be consistent with Study 1. As in Study 1, we do not feel that the results from the aggressive action tendencies contribute significantly to this work, and thus we have not included them here. Instead, they can be found on our OSF page.

⁸ Older adults ($M = 4.57$, $SD = 1.47$, 95% CI [4.37, 4.76]) reported higher trait moral disgust than younger adults ($M = 4.17$, $SD = 1.47$, 95% CI [3.99, 4.36]), $F(1, 459) = 8.64$, $p = .003$, $\eta^2_p = .018$. The two-way interaction was significant, $F(3, 459) = 4.80$, $p = .003$, $\eta^2_p = .030$. In the anger condition, older adults ($M = 5.02$, $SD = 1.34$, 95% CI [4.64, 5.41]) reported higher trait moral disgust than younger adults ($M = 3.96$, $SD = 1.52$, 95% CI [3.58, 4.34]), $t_{\text{Welch}}(111.05) = 3.96$, $p < .001$. In the disgust condition, older adults ($M = 4.57$, $SD = 1.43$, 95% CI [4.21, 4.94]) reported higher trait moral disgust than younger adults ($M = 4.02$, $SD = 1.54$, 95% CI [3.62, 4.42]), $t_{\text{Welch}}(118.04) = 2.05$, $p = .043$. No age differences emerged in the desire/no consequence ($p = .128$) or no desire/consequence ($p = .175$) conditions. In addition, younger adults ($M = 4.57$, $SD = 1.23$, 95% CI [4.41, 4.72]) reported higher trait pathogen disgust than older adults ($M = 4.11$, $SD = 1.30$, 95% CI [3.93, 4.28]), $F(1, 459) = 15.47$, $p < .001$, $\eta^2_p = .033$.

analyses because of the unbalanced sex distribution for older and younger adults.

The same functions and packages used in Study 1 were also used in Study 2. To streamline the reporting of the results, we do not report the full test statistics for the post hoc comparisons for the main effect of condition if there was a significant Age Group \times Condition interaction. We mainly chose to focus on reporting Age Group \times Condition interactions rather than main effects of condition because of our predictions regarding age differences in specific conditions. All test statistics can be reproduced via our R script available on OSF, though we do report means, standard deviations, and 95% CI [lower, upper] here to highlight the condition differences.

Manipulation Check

To ensure that our anger and disgust conditions appropriately elicited anger and disgust, respectively, regardless of age, we conducted a 4 (condition) \times 3 (emotion) mixed factorial analysis of variance with condition as a between-subject factor and emotion as a within-subject factor. The analysis revealed main effects of condition, $F(3, 463) = 17.48, p < .001, \eta_p^2 = .197$, and emotion, $F(2, 926) = 95.34, p < .001, \eta_p^2 = .171$, which were qualified by a Condition \times Emotion interaction, $F(6, 926) = 51.16, p < .001, \eta_p^2 = .249$. To probe the significant interaction, we conducted pairwise comparisons to determine which emotion was rated most highly in each condition—specifically within the anger and disgust conditions. In the anger condition, anger ratings ($M = 4.07, SD = 1.58, 95\% \text{ CI } [3.77, 4.36]$) were significantly higher than disgust ratings ($M = 3.48, SD = 1.68, 95\% \text{ CI } [3.17, 5.79]$), $t(926) = 0.58, p = .001$, and sympathy ratings ($M = 3.14, SD = 1.56, 95\% \text{ CI } [2.66, 3.43]$), $t(926) = 0.92, p < .001$. In the disgust condition, disgust ratings ($M = 4.86, SD = 1.34, 95\% \text{ CI } [4.62, 5.10]$) were significantly higher than anger ratings ($M = 3.64, SD = 1.59, 95\% \text{ CI } [3.35, 3.92]$), $t(926) = 1.22, p < .001$, and sympathy ratings ($M = 3.27, SD = 1.37, 95\% \text{ CI } [3.02, 3.51]$), $t(926) = 1.91, p < .001$. Importantly, these results indicate that anger was elicited to a greater extent than disgust and sympathy in the anger condition. Likewise, disgust was elicited to a greater extent than anger and sympathy in the disgust condition. Taken together, these results indicate that the anger and disgust conditions were appropriately evocative of the intended emotions.

Moral Judgments

Person Judgments. Participants' person judgments varied significantly by condition, $F(3, 458) = 83.52, p < .001, \eta_p^2 = .070$. Participants reported the harshest judgments of moral character in the desire/no consequence condition ($M = 5.37, SD = 1.18, 95\% \text{ CI } [5.16, 5.58]$), followed by the disgust condition ($M = 4.48, SD = 0.90, 95\% \text{ CI } [4.32, 4.64]$), and then the anger condition ($M = 3.77, SD = 0.76, 95\% \text{ CI } [3.63, 3.91]$). Person judgments were lowest in the no desire/consequence condition ($M = 3.02, SD = 0.89, 95\% \text{ CI } [2.86, 3.19]$).

Although the main effect of age group was not significant ($p = .298$), the two-way interaction was, $F(3, 458) = 4.71, p = .003, \eta_p^2 = .004$. Older adults reported harsher judgments of moral character than younger adults in the desire/no consequence condition ($b = -0.47, SE = 0.17, t = -2.72, p = .01$). However, older adults reported more lenient judgments of moral character compared to

younger adults in the no desire/consequence condition ($b = 0.42, SE = 0.18, t = 2.31, p = .02$). Older and younger adults' person judgments did not significantly differ in the disgust ($p = .86$) or the anger ($p = .11$) conditions (see Panel A of Figure 3).

Act Judgments. Act judgments varied significantly by condition, $F(3, 458) = 38.86, p < .001, \eta_p^2 = .034$. Act judgments in the desire/no consequence condition ($M = 4.90, SD = 0.89, 95\% \text{ CI } [4.63, 4.89]$) were significantly higher than act judgments in both the anger ($M = 4.76, SD = 0.69, 95\% \text{ CI } [4.63, 4.89]$) and disgust ($M = 4.48, SD = 0.58, 95\% \text{ CI } [4.37, 4.58]$) conditions, which were not significantly different. Act judgments were significantly lower in the no desire/consequence condition ($M = 3.72, SD = 0.89, 95\% \text{ CI } [3.55, 3.88]$).

Although the main effect of age group was not significant ($p = .861$), the two-way interaction was, $F(3, 458) = 5.96, p = .001, \eta_p^2 = .005$. Older adults reported harsher act judgments compared to younger adults in the anger condition ($b = -0.36, SE = 0.14, t = -2.47, p = .01$). However, older adults reported more lenient act judgments than younger adults in the no desire/consequence condition ($b = 0.43, SE = 0.15, t = 2.95, p < .001$). Older and younger adults' act judgments did not vary in the desire/no consequence ($p = .26$) or the disgust ($p = .19$) conditions (see Panel B of Figure 3).

Emotion Ratings

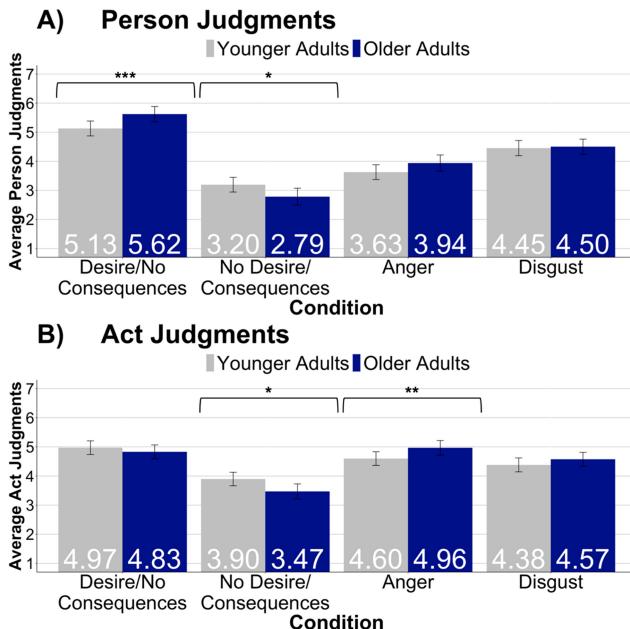
Anger.⁹ Participants' anger ratings varied significantly by condition, $F(3, 458) = 19.68, p < .001, \eta_p^2 = .018$. Specifically, anger ratings in each condition were significantly different from each other, with anger ratings being the highest in the desire/no consequence condition ($M = 4.81, SD = 1.46, 95\% \text{ CI } [4.55, 5.07]$), followed by the anger condition ($M = 4.07, SD = 1.58, 95\% \text{ CI } [3.77, 4.36]$) and then the disgust condition ($M = 3.64, SD = 1.59, 95\% \text{ CI } [3.35, 3.92]$). Anger ratings were lowest in the no desire/consequence condition ($M = 3.08, SD = 1.46, 95\% \text{ CI } [2.80, 3.35]$).

Although the main effect of age group was not significant ($p = .917$), the two-way interaction was, $F(3, 458) = 4.10, p = .007, \eta_p^2 = .004$. Older adults reported significantly lower anger ratings than younger adults in the no desire/consequence condition ($b = 0.84, SE = 0.29, t = 2.88, p < .001$). However, older and younger adults' anger ratings did not significantly differ in the anger ($p = .25$), disgust ($p = .10$), or the desire/no consequence ($p = .98$) conditions (see Panel A of Figure 4).

Disgust. Participants' disgust ratings varied significantly by condition, $F(3, 456) = 47.77, p < .001, \eta_p^2 = .042$. Specifically, disgust ratings in the desire/no consequence ($M = 4.82, SD = 1.47, 95\% \text{ CI } [4.55, 5.08]$) and disgust ($M = 4.86, SD = 1.34, 95\% \text{ CI } [4.62, 5.10]$) conditions did not significantly differ from each other, but both were significantly higher than disgust ratings in the anger ($M = 3.48, SD = 1.68, 95\% \text{ CI } [3.17, 5.79]$) condition. Disgust ratings were lowest in the no desire/consequence condition ($M = 2.78, SD = 1.63, 95\% \text{ CI } [2.46, 3.08]$).

Although the main effect of age group was not significant ($p = .383$), the two-way interaction was, $F(3, 456) = 3.77, p = .011$,

⁹ We reran the same analysis with the old composite anger from Study 1. The pattern of results were the same. Statistics can be found in the R script available on our OSF page.

Figure 3*The Moral Judgments of Younger and Older Adults in Study 2*

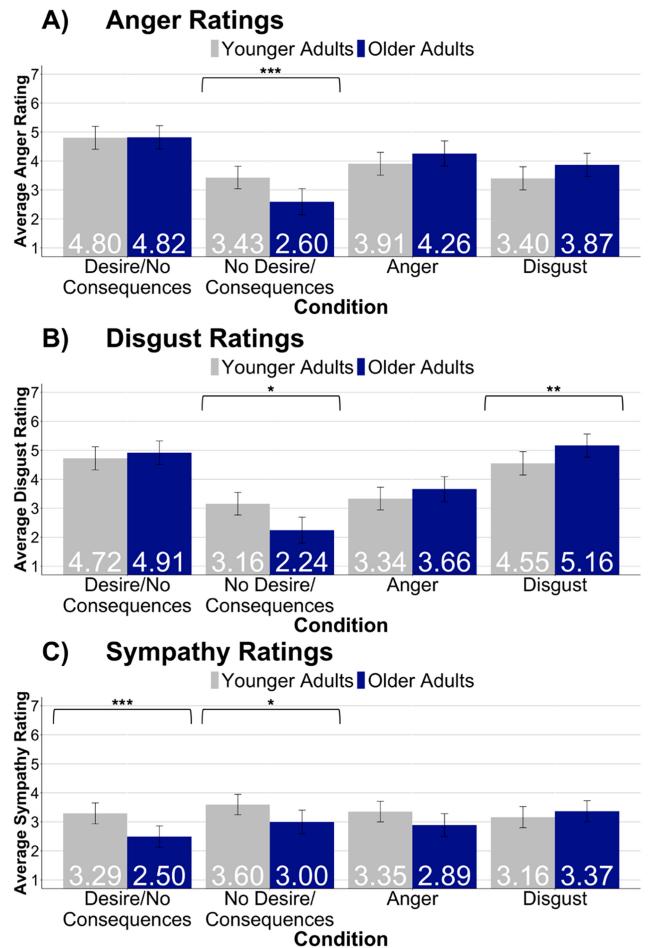
Note. Mean person judgments (panel A) and act judgments (panel B) for older and younger adults in each condition in study 2. Responses for both person and act judgments ranged from 1 (*not at all*) to 7 (*extremely*). Confidence intervals are displayed. Error bars are 95% confidence intervals. See the online article for the color version of this figure.

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

$\eta_p^2 = .003$. Older adults reported significantly lower disgust ratings than younger adults in the no desire/consequence condition ($b = 0.59$, $SE = 0.27$, $t = 2.17$, $p = .03$). However, older adults reported significantly higher disgust ratings than younger adults in the disgust condition ($b = -0.65$, $SE = 0.26$, $t = -2.50$, $p = .01$). Older and younger adults' disgust ratings did not significantly differ in the desire/no consequence ($p = .39$) or the anger ($p = .47$) conditions (see Panel B of Figure 4).

Sympathy. A main effect of condition emerged for sympathy ratings, $F(3, 558) = 3.76$, $p = .011$, $\eta_p^2 = .003$. However, pairwise comparisons with Holm corrections applied to account for six comparisons did not reveal any significant differences between the conditions (p 's $> .168$). Sympathy ratings were (nonsignificantly) higher in the no desire/consequence condition ($M = 3.34$, $SD = 1.49$, 95% CI [3.06, 3.62]) compared to the anger ($M = 3.15$, $SD = 1.56$, 95% CI [2.86, 3.43]), disgust ($M = 3.27$, $SD = 1.37$, 95% CI [3.02, 3.51]), and desire/no consequence ($M = 2.90$, $SD = 1.33$, 95% CI [2.67, 3.14]) conditions.

Regardless of condition, younger adults ($M = 3.36$, $SD = 1.43$, 95% CI [3.18, 3.53]) had higher sympathy ratings compared to older adults ($M = 2.94$, $SD = 1.43$, 95% CI [2.75, 3.13]), $F(1, 458) = 8.59$, $p = .004$, $\eta_p^2 = .003$. This main effect was qualified by a significant two-way interaction, $F(3, 458) = 2.82$, $p = .037$, $\eta_p^2 = .003$. Older adults reported significantly lower sympathy ratings than younger adults in the desire/no consequence condition ($b = 0.76$, $SE = 0.26$, $t = 2.95$, $p < .001$), and in the no desire/consequence condition ($b = 0.59$, $SE = 0.27$, $t = 2.19$, $p = .03$), but

Figure 4*The Emotional Reactions of Younger and Older Adults in Study 2*

Note. Mean anger (panel A), disgust (panel B), and sympathy (panel C) ratings for older and younger adults in each condition in study 2. Responses ranged from 1 (*not at all*) to 7 (*extremely*). Confidence intervals are displayed. Error bars are 95% confidence intervals. See the online article for the color version of this figure.

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

were no different in the anger ($p = .11$) or disgust ($p = .37$) conditions (see Panel C of Figure 4).

Discussion

In Study 2, we examined how younger and older adults differentially responded to and judged perpetrators who committed socio-moral violations or norm violations. One goal of Study 2 was to explore whether the anger and disgust experiences of older and younger adults would emerge in response to more conventional anger- and disgust-eliciting scenarios. For these scenarios, we wanted to directly test if there were age differences in judgments and emotions to an angering or disgusting action and outcome without focusing on desires. Replicating Study 1, older adults (relative to younger adults) made harsher judgments of moral character when a perpetrator desired to harm another even though no harm actually occurred

but made more lenient judgments of moral character when harm occurred accidentally. In addition, though not a direct replication of Study 1, older (relative to younger) adults reported more lenient act judgments when harm occurred accidentally. Generally, older adults were less reactive to accidental harms. As in Study 1, older adults reported less disgust and sympathy than younger adults in the no desire/consequence condition. Interestingly, older adults also reported less anger than younger adults in the no desire/consequence condition, which we did not find in Study 1 (though older adults' anger ratings were nonsignificantly lower than younger adults).

Generally, this pattern is consistent with our interpretation that harmful outcomes (but not harmful intentions) may be less important for older adults' emotional reactions than for younger adults' emotional reactions. When perpetrators harm another accidentally, younger adults reported significantly more disgust, anger, and sympathy than older adults. Also of note, here we observed higher levels of disgust in the disgust condition for older relative to younger adults when controlling for age differences in trait pathogen disgust. The extant literature indicates that older adults experience comparable levels of disgust relative to younger adults in their daily lives (Gross et al., 1997). In this study, however, the disgust condition involved social norm violations, to which older adults may be more sensitive. In contrast to the emotion conditions, there were more generally consistent age differences in response to the sociomoral conditions.

Study 3

The results from Studies 1 and 2 suggest that older adults are specifically more sensitive to sociomoral violations resulting from malicious desires. Older adults may be less concerned about harmful outcomes and instead, they may be more attuned to harmful desires. However, the designs of Studies 1 and 2 do not allow us to make such claims regarding desires versus outcomes, given that we did not examine malicious intentions with a harmful outcome. Thus, we conducted a third experiment to examine the effects of harmful intent *and* harmful outcome on older and younger adults' moral judgments and emotional reactions.

Specifically, in Study 3, we added conditions in which the perpetrators described in the scenarios either desired to and successfully harmed another (i.e., the desire/consequence condition) or did not desire to and did not harm another (i.e., the no desire/no consequence condition). The primary focus of Study 3 was the comparison of older and younger adults' moral judgments and emotional reactions to perpetrators who harmed another and either desired to do so or did not desire to do so. We predicted that, consistent with the previous studies, older adults would judge perpetrators who harm others accidentally more leniently than younger adults. However, when that same harm was paired with malicious desire, older adults might report much harsher person and act judgments and greater negative emotions (i.e., anger or disgust) compared to younger adults. We did not expect to see age differences in the outcomes of interest when perpetrators did not intend to and did not harm others.

Method

Participants

Appropriate sample size was determined using a power analysis in G*Power (Faul et al., 2007) and was based on the smallest

interaction effect size for person judgments that we found in Study 1. This analysis indicated that we needed 434 total participants (roughly 54 per group) to detect differences between eight groups of $f = .20$ ($d = 0.4$) with 95% power and at an alpha level of .05. To accommodate participants who failed the attention checks¹⁰ ($n = 185$), we collected data from 618 participants who were either 18–30 years old or 55–80 years old.

The final sample ($N = 433$) used in the following analyses included 217 older adults ($M = 71.37$, $SD = 5.21$, 55–80 years; 65% female, 34% male, 1% preferred not to answer) and 216 younger adults ($M = 25.48$, $SD = 3.14$, 18–30 years; 61% female, 38% male, 1% preferred not to answer). Participants were recruited from MTurk and Prolific and were compensated \$3.00 or \$4.25, respectively, for completing this 30-min online survey, respectively. This work was not preregistered. All participants were required to provide informed consent.

Materials

Scenarios. The desire/no consequence and no desire/consequence scenarios in Studies 1 and 2 were also included in Study 3. We also added two conditions in which the desire to cause harm and the accidental outcome were fully crossed. Specifically, we manipulated (a) whether the perpetrator desired to harm another person, and (b) whether there was a harmful outcome. In the desire/no consequence condition, there was a desire to cause harm but no harm occurred. In the no desire/consequence condition, there was no desire to cause harm but a harmful consequence occurred accidentally. In the desire/consequence condition, there was a desire to cause harm and harm occurred. In the no desire/no consequence condition, there was no desire to cause harm and no harm occurred. Examples of the new conditions using the same protagonist (i.e., Jenny) as the examples scenarios provided in Studies 1 and 2 are presented below. All scenarios can be found on our OSF page.

Desire/Consequence Condition. Jenny is taking a class in sculpture. She is assigned to work with a partner to weld together pieces of metal. Jenny wants to burn her partner's hand. Jenny welds the metal and the heat from the torch travels up the metal rod and her partner's hand is burned.

No Desire/No Consequence Condition. Jenny is taking a class in sculpture. She is assigned to work with a partner to weld together pieces of metal. Jenny does not want to burn her partner's hand. Jenny only wants to weld together the metal. Jenny starts welding the metal together and the heat from the torch travels up the metal rod, but her partner happens to let go and is not burned at all.

Dependent Variables. Person judgments and act judgments were measured in the same manner as Studies 1 and 2. Person judgments were comparably reliable for older ($\alpha = .98$) and younger ($\alpha = .96$) adults. Similarly, act judgments were comparably reliable for older ($\alpha = .95$) and younger ($\alpha = .93$) adults. Ratings of anger ($\alpha = .97$), disgust ($\alpha = .98$), and sympathy ($\alpha = .71$) were measured the same way as Study 2. Participants indicated to what extent they felt a particular emotion toward the perpetrator on a 7-point scale

¹⁰ The first attention check was: "In the scenarios you just read, did someone desire to harm another person?" (yes/no). The second attention check was: "In the scenarios you just read, was someone harmed?" (yes/no). The correct answer to these questions depends on the condition to which the participants were randomly assigned.

($1 = \text{not at all}$, $7 = \text{extremely}$). Aggressive action tendencies were not measured in Study 3. Trait disgust was measured using the same measure as in the previous studies (i.e., TDDS; Tybur et al., 2009).

Procedure

Study 3 employed a 2 (age group: younger, older) \times 4 (condition: desire/no consequence, no desire/consequence, desire/consequence, desire/no consequence) design, with age group and condition as between-subjects factors. After providing informed consent, participants were randomly assigned to one of four possible conditions: (a) desire/consequence ($n = 112$, $n_{YA} = 54$, $n_{OA} = 58$), (b) no desire/consequence ($n = 105$, $n_{YA} = 54$, $n_{OA} = 51$), (c) desire/no consequence ($n = 107$, $n_{YA} = 53$, $n_{OA} = 54$), or (d) no desire/no consequence ($n = 109$, $n_{YA} = 55$, $n_{OA} = 54$). For each scenario, participants provided person and act judgments and emotion ratings. After all of the scenarios were presented, participants completed the trait disgust measure (TDDS; Tybur et al., 2009), and the same demographic questionnaire as Studies 1 and 2. Lastly, participants were thanked and compensated for their participation.

Results

As in Studies 1 and 2, we conducted multilevel regressions for all of our analyses to account for nesting of scenarios within participant and for intercept variability between participants. ICCs ranged from .71 to .86, suggesting that participants' responses across the scenarios were highly dependent and that the multilevel framework is preferred. As such, we included a random intercept for scenario and a random intercept for participant for each analysis. For each outcome, we included dummy coded age (ref = older adults), dummy coded condition (ref = no desire/consequence), and the Age Group \times Condition interaction. For disgust ratings, we included trait moral disgust as a covariate to account for observed Age \times Condition differences.¹¹

The same functions and packages used in Studies 1 and 2 were also used in Study 3. To streamline the reporting of the results, we do not report the full test statistics for the post hoc comparisons between condition differences if there was a significant Age Group \times Condition interaction. As in Study 2, we mainly chose to focus on reporting Age Group \times Condition interactions rather than main effects of condition because of our predictions regarding age differences in specific conditions, but also because fully crossed investigations of intent and outcome in moral scenarios are already well studied (Cushman, 2015). All test statistics can be reproduced via our R script available on OSF, though we do report means, standard deviations, and 95% CI [lower, upper] here to highlight the condition differences.

Moral Judgments

Person Judgments. Participants' person judgments significantly varied by condition, $F(3, 425) = 230.23$, $p < .001$, $\eta_p^2 = .184$. Although participants' person judgments were not significantly different between the desire/consequence condition ($M = 5.54$, $SD = 1.30$, 95% CI [5.30, 5.79]) and the desire/no consequence condition ($M = 6.02$, $SD = 0.89$, 95% CI [5.85, 6.19]), they were both significantly higher than person judgments in the no desire/consequence condition ($M = 3.02$, $SD = 0.82$, 95% CI

[2.86, 3.18]) and the no desire/no consequence condition ($M = 2.76$, $SD = 0.84$, 95% CI [2.60, 2.92]).

Although the main effect of age group was not significant ($p = .058$), the two-way interaction was, $F(3, 425) = 14.28$, $p < .001$, $\eta_p^2 = .011$. Older adults reported significantly harsher person judgments compared to younger adults in the desire/consequence condition ($b = -1.11$, $t = -6.25$, $p < .001$). Conversely, in the no desire/consequence condition, older adults reported more lenient person judgments compared to younger adults ($b = 0.47$, $t = 2.58$, $p = .010$). Older and younger adults' person judgments did not significantly differ in the desire/no consequence condition ($p = .34$) or the no desire/no consequence ($p = .50$; see Panel A of Figure 5).

Act Judgments. Participants' act judgments varied significantly by condition, $F(3, 425) = 132.25$, $p < .001$, $\eta_p^2 = .114$. Participants' act judgments were highest in the desire/consequence ($M = 5.53$, $SD = 1.05$, 95% CI [5.33, 5.73]) and desire/no consequence ($M = 4.43$, $SD = 0.94$, 95% CI [5.25, 5.61]) conditions, followed by the no desire/consequence condition ($M = 3.73$, $SD = 0.73$, 95% CI [3.58, 3.87]), and then the no desire/no consequence condition ($M = 3.06$, $SD = 0.95$, 95% CI [2.88, 3.24]).

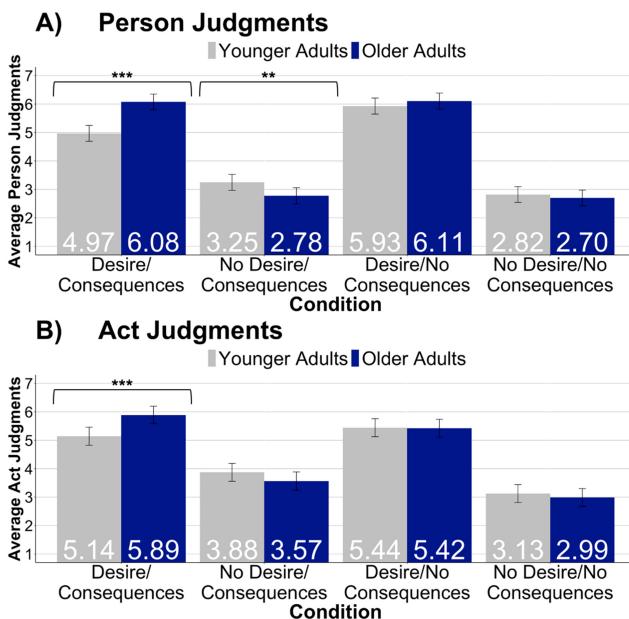
Although the main effect of age group was not significant ($p = .429$), these condition differences were qualified by an Age Group \times Condition interaction, $F(3, 425) = 7.23$, $p < .001$, $\eta_p^2 = .007$. Older adults reported harsher act judgments compared to younger adults in the desire/consequence condition ($b = -0.75$, $SE = 0.17$, $t = -4.35$, $p < .001$). However, older and younger adults' act judgments did not significantly differ in the desire/no consequence ($p = .91$), no desire/consequence ($p = .08$), or the no desire/no consequence ($p = .42$) conditions (see Panel B of Figure 5).

Emotion Ratings

Anger. Participants' anger ratings varied significantly by condition, $F(3, 425) = 54.69$, $p < .001$, $\eta_p^2 = .051$. Specifically, anger ratings were highest in the desire/consequence condition ($M = 4.97$, $SD = 1.46$, 95% CI [4.69, 5.24]) but were not significantly different from participants' anger ratings in the desire/no consequence condition ($M = 4.59$, $SD = 1.70$, 95% CI [4.27, 4.92]). Anger ratings in both these conditions were significantly higher than anger ratings in the no desire/consequence condition ($M = 2.91$, $SD = 1.25$, 95% CI [2.67, 3.15]), which were significantly higher than participants' anger ratings in the no desire/no consequence condition ($M = 2.23$, $SD = 1.21$, 95% CI [2.00, 2.46]).

Although the main effect of age group was not significant ($p = .401$), the two-way interaction was significant, $F(3, 425) = 2.65$, $p = .048$, $\eta_p^2 = .003$. Older adults' anger ratings were significantly higher than younger adults' anger ratings in the

¹¹ Although neither the main effect of age group ($p = .076$) nor condition ($p = .212$) were significant, the two-way interaction was significant, $F(3, 425) = 3.07$, $p = .028$, $\eta_p^2 = .007$. In the no desire/no consequence condition, older adults ($M = 3.66$, $SD = 1.56$, 95% CI [3.24, 4.09]) reported higher trait moral disgust than younger adults ($M = 3.17$, $SD = 1.31$, 95% CI [2.82, 3.52]), $t_{\text{Welch}}(98.46) = 2.23$, $p = .028$. In addition, in the no desire/consequence condition, older adults ($M = 3.53$, $SD = 1.74$, 95% CI [3.04, 4.01]) reported higher trait moral disgust than younger adults ($M = 3.15$, $SD = 1.74$, 95% CI [2.77, 3.52]), $t_{\text{Welch}}(94.43) = 2.44$, $p = .016$. No age differences in the desire/consequence ($p = .673$) or the desire/no consequence ($p = .419$) conditions.

Figure 5*The Moral Judgments of Younger and Older Adults in Study 3*

Note. Mean person judgments (panel A) and act judgments (panel B) for older and younger adults in each condition in study 3. Responses ranged from 1 (*not at all*) to 7 (*extremely*). Confidence intervals are displayed. Error bars are 95% confidence intervals. See the online article for the color version of this figure.

** $p < .01$. *** $p < .001$.

desire/consequence condition ($b = -0.72$, $SE = 0.27$, $t = -2.71$, $p = .010$). Older and younger adults' anger ratings did not significantly differ in the desire/no consequence condition ($p = .37$), no desire/consequence condition ($p = .55$), or the no desire/no consequence condition ($p = .59$; see Panel A of Figure 6).

Disgust. Although the main effect of age group was not significant ($p = .437$), participants' disgust ratings varied significantly by condition, $F(3, 425) = 85.60$, $p < .001$, $\eta_p^2 = .078$. Specifically, disgust ratings were higher in the desire/consequence condition ($M = 5.03$, $SD = 1.46$, 95% CI [4.76, 5.30]) compared to the no desire/consequence condition ($M = 1.91$, $SD = 1.19$, 95% CI [1.68, 2.14]), $t(425) = -2.67$, $p_{adj} < .001$, and the no desire/no consequence condition ($M = 2.33$, $SD = 1.29$, 95% CI [2.08, 2.58]), $t(425) = 3.11$, $p < .001$. The same pattern held for the desire/no consequence condition ($M = 4.83$, $SD = 1.70$, 95% CI [4.51, 5.16]) compared to the no desire/consequence, $t(425) = -2.57$, $p < .001$, and no desire/no consequence conditions, $t(425) = 3.00$, $p < .001$. Disgust ratings in the desire/no consequence and desire/consequence conditions did not significantly differ ($p = .326$) nor did disgust ratings in the no desire/consequence and no desire/no consequence conditions ($p = .064$). These condition differences did not vary by age group ($p = .310$; see Panel B of Figure 6).

Sympathy. Participants' sympathy ratings varied significantly by condition, $F(3, 425) = 4.441$, $p = .004$, $\eta_p^2 = .004$. Surprisingly, sympathy ratings were significantly higher in the desire/consequence condition ($M = 3.02$, $SD = 1.52$, 95% CI [2.73, 3.30]) compared to the desire/no consequence condition ($M = 2.46$, $SD = 1.11$, 95% CI [2.25, 2.67]) and to the no desire/no consequence condition ($M = 2.39$, $SD = 1.16$, 95% CI [2.17, 2.61]) but were not significantly

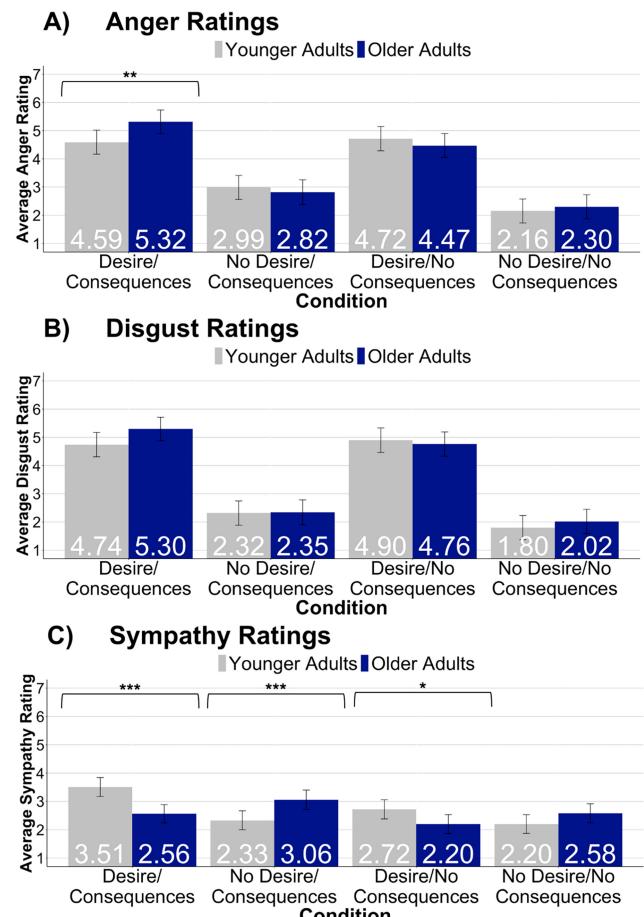
different from sympathy ratings in the no desire/consequence condition ($M = 2.69$, $SD = 1.12$, 95% CI [2.47, 2.90]).

Although the main effect of age group was not significant ($p = .434$), the two-way interaction was significant, $F(3, 425) = 11.24$, $p < .01$, $\eta_p^2 = .011$. Younger adults reported higher sympathy ratings than older adults in the desire/consequence condition ($b = .95$, $SE = 0.23$, $t = 4.16$, $p < .001$) and the desire/no consequence condition ($b = 0.52$, $SE = 0.23$, $t = 0.52$, $p = .03$). However, in the no desire/consequence condition, older adults had significantly higher sympathy ratings than younger adults ($b = -0.72$, $SE = 0.23$, $t = -3.08$, $p < .001$; see Panel C of Figure 6).

Discussion

In Study 3, we aimed to parcel out the effects of malicious desire and harmful outcomes on older and younger adults' moral judgments and emotional reactions. The age differences in moral judgments and emotional reactions to perpetrators who desired to harm another and

Figure 6
The Emotional Reactions of Younger and Older Adults in Study 3



Note. Mean anger (panel A), disgust (panel B), and sympathy (panel C) ratings for older and younger adults in each condition in study 3. Responses ranged from 1 (*not at all*) to 7 (*extremely*). Confidence intervals are displayed. Error bars are 95% confidence intervals. See the online article for the color version of this figure.

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

succeeded at doing so (i.e., desire/consequence condition) and perpetrators who did not intend to but accidentally harmed another (i.e., the no desire/consequence condition) allowed us the parcel out the unique effect of the desire to harm another in older adults' judgments and emotions. Compared to harming another accidentally and unsuccessfully harming another despite malicious intentions, desiring to and successfully harming another is particularly egregious for older relative to younger adults, leading them to judge perpetrators' moral character and actions more harshly and experience greater anger than their younger adult counterparts. Conversely, when perpetrators harmed another accidentally, older adults judged them more leniently than younger adults. Regarding the emotion ratings, older and younger adults' disgust ratings were no different in any of the conditions. Interestingly, older adults were significantly less sympathetic to and more angry at perpetrators who intended to and successfully harmed another person compared to younger adults, which runs contrary to evidence for an age-related reduction in experiences of anger in later adulthood (Kunzmann & Grühh, 2005; Lawton et al., 1992). Thus, it seems that younger and older adults' moral judgments and emotional reactions are impacted by both perpetrator's intentions and outcomes, but malicious intentions are particularly egregious for older relative to younger adults.

Combined Analyses Across Studies

Though the findings from these three studies suggest that malicious relative to benign desires have greater impact on older versus younger adults, some effects did not replicate across the three studies but are still generally consistent with these patterns. In an attempt to resolve inconsistencies, we pooled the data from the desire/no consequence and no desire/consequence conditions from the three studies. We conducted the same multilevel regressions, accounting for participant, scenario, and study. From the pooled data, we found consistent Age Group \times Condition interactions (see the bottom of Figure 7). Specifically, older adults were less harsh and less negative than younger adults for accidental harms. However, older adults reported

harsher person judgments and less sympathy than younger adults when there was a desire to cause harm but no harm occurred. The full statistical results can be found in the [online supplemental materials](#). Thus, although some of the findings are inconsistently significant in a particular study, the general pattern of findings across the studies suggests that malicious versus benign intentions have greater impact on the moral character judgments of older relative to younger adults.

In addition, to examine the relationship of the moral judgments and emotions across the studies, we conducted additional correlational analyses (full results can be found in the [online supplemental materials](#)). We examined age differences in the correlations between the judgments and emotional responses. First, we found that person and act judgments were highly correlated. Most importantly, we found that the correlations between the judgments and emotions were notably strong overall, and significantly more so for older versus younger adults. These findings underscore the integral link between emotions and judgments and provide novel insight showing that for older relative to younger adults, emotional reactions and moral judgments are more tightly coupled.

General Discussion

In the current work, we explored age differences in reactions to sociomoral violations. The overall pattern (see Figure 7) across the studies suggests that older adults are more sensitive to intentions, as they judge perpetrators with malicious intentions more harshly than younger adults but more leniently when harm is inflicted accidentally. Specifically, from the combined analyses, when no harm occurred but perpetrators desired to do so, older adults reported harsher judgments of moral character compared to younger adults. In contrast, we found that older adults judged perpetrators who accidentally harmed another and their actions more leniently than younger adults. Moreover, older adults reported significantly less disgust and anger than younger adults when perpetrators harmed another accidentally. We did not have specific predictions for age differences

Figure 7

Summary of the Findings Across the Three Studies As Well As the Analyses With the Pooled Data

Pooled Analyses				
Dependent Variable	Main effect of age group	Main effect of condition	Interaction	
Person Judgments	✓ OA > YA	✓ Desire/No Consequence > No Desire/Consequence	✓	<u>Desire/No Consequence: OA > YA</u> <u>No Desire/Consequence: OA < YA</u>
Act Judgments	✓ OA < YA	✓ Desire/No Consequence > No Desire/Consequence	✓	<u>Desire/No Consequence: OA ≈ YA</u> <u>No Desire/Consequence: OA < YA</u>
Anger Ratings	✓ OA < YA	✓ Desire/No Consequence > No Desire/Consequence	✓	<u>Desire/No Consequence: OA ≈ YA</u> <u>No Desire/Consequence: OA < YA</u>
Disgust Ratings	✓ OA < YA	✓ Desire/No Consequence > No Desire/Consequence	✓	<u>Desire/No Consequence: OA ≈ YA</u> <u>No Desire/Consequence: OA < YA</u>
Sympathy Ratings	✗ OA ≈ YA	✓ Desire/No Consequence < No Desire/Consequence	✓	<u>Desire/No Consequence: OA < YA</u> <u>No Desire/Consequence: OA ≈ YA</u>

Note. Check marks (✓) indicate that the effect was significant. X marks indicate that the effect was not significant. OA = older adults; YA = younger adults. See the online article for the color version of this figure.

in person versus act judgments but included the act judgments to be comprehensive in our data collection and to maximize data variability. From the follow-up correlation analyses, the act and person judgments were highly correlated. As such, though they measure different moral judgments, the harshness or leniency for older versus younger adults generally tracks. Also, it should be noted that when no harm occurred, there is essentially no act to judge, which could partially explain the lack of an age difference in act judgments in the desire without consequence condition.

Taking a granular look at what might contribute to these age differences in moral judgments and emotional reactions, SST posits that older adults value meaningful interpersonal connections with close others, maintaining interpersonal harmony, and preserving goodwill toward others (Carstensen, 1992, 2006; Carstensen et al., 1999; Lang & Carstensen, 1994; Sorkin & Rook, 2006). This in turn produces positivity in the social and emotional lives of older adults. However, deeply valuing certain aspects of social life do not come cost-free; holding certain values predisposes someone to being sensitive to and aware of contexts where they are violated. Indeed, a number of studies conducted by Hess and his colleagues (e.g., Hess & Auman, 2001; Hess et al., 1999, 2005) have supported the claim that older adults are attentive to important behavioral cues and trait diagnostic information when making morality-based judgments. In our work, older adults were particularly sensitive to the desire to cause harm, as evidenced by their harsher judgments of moral character and disapproval of perpetrators' actions compared to younger adults. Conversely, when a perpetrator harms another accidentally, older adults reported more lenient judgments and less negativity (generally) compared to younger adults because the accidental harm was not the result of malicious intentions.

Implications

Our work highlights age differences in judgments and emotional reactions in response to someone who has committed a moral transgression, which has implications for how legal decisions are made within a courtroom. Our work in combination with other work highlights the role of emotion in jury decisions within a court room and how people evaluate a person who has committed a moral transgression (Bright & Goodman-Delahunt, 2006; Salerno & Peter-Hagene, 2013). Second, our manipulation of the desire to cause harm and harm occurring accidentally highlights the importance of intentionality, which is a central component in the distinction in the severity of criminal offenses. Intentions differentiate first-degree and second-degree murder, and our work importantly demonstrates how the desire to cause harm impacts both older and younger adults' moral judgments and emotional reactions. Malicious intentions with and without outcomes are particularly egregious for older relative to younger adults, which has important implications for punishment recommendations, which could vary by age.

Moreover, our work can lend insight into misinformation and political polarization, given that there is a great deal of research demonstrating that older adults are heavily impacted by online misinformation (Brashier & Schacter, 2020). Given that cues and stimuli used to perpetuate misinformation are often viciously emotionally negative and morally charged, our work suggests that older adults may be more sensitive to information that speaks to someone's (bad) moral character and be more likely to act on their attitudes and judgments. This interpretation is consistent with work conducted

by Hess and Auman (2001), suggesting that increased age was associated with using negative moral information to a greater extent when forming impressions of others.

Limitations and Future Directions

The scenarios included in the current study included a perpetrator and a target, both of whom were not personally relevant to the participant. Given that older adults emphasize and prioritize close, meaningful interpersonal relationships as posited by SST (Carstensen et al., 1997, 1999; Kunzmann et al., 2002), the extent to which anger and disgust are experienced could be even more pronounced when the target is a close other compared to when the target is a stranger. In addition, participants' judgments of the perpetrator's moral character and disapproval of the act could be even greater in response to moral violations against a close other. Future work should explore the closeness of the target and examine how younger and older adults' responses to sociomoral violations could differ when the social closeness of the target is manipulated (e.g., the perpetrator intends to cause harm to a spouse/partner vs. a stranger). Moreover, past research found that the age of the transgressor (young vs. old) influences the level of blame and forgiveness, with less blame and greater forgiveness assigned to older transgressors (Miller et al., 2009). As such, future research could use the scenarios in the current study and manipulate the age of the transgressor and examine how younger and older adults differentially react to social transgressions committed by either a younger or older adult.

Contemporary perspectives not only consider the integration of motivation and emotion with moral judgments, but also cognition (e.g., Decety & Howard, 2013). From the early life developmental literature, findings have linked increased theory of mind competency to a greater emphasis on intent (Killen et al., 2011). Given that older adults demonstrate increased difficulties with a wide range of theory of mind tasks relative to younger adults (Henry et al., 2013), it is possible that adult age differences in theory of mind competencies may be related to the increased coupling of emotional responses and moral judgments for older versus younger adults. Future work in this area could provide even greater insight into age differences in moral judgments.

Although the scenarios used in the current study have been used in other work (Cushman, 2008; Giner-Sorolla & Chapman, 2017), some may not consider them entirely naturally occurring in everyday life. Future research should replicate this work and incorporate real-life examples analogous to our experimental conditions to determine if these findings only hold for the scenarios used in the current and previous research. Using real-life court examples would help to establish the generalizability of our findings beyond what is observed here using self-report and hypothetical scenarios, especially because the findings from all three studies were generally consistent but not a direct replication.

Constraints on Generality

Given our interests in understanding adult age differences in responses to sociomoral violations, our target populations included adults between the ages of 18–30 or 55–80. These age ranges are sufficient to capture meaningful differences between younger and older adults in emotion, as based on previous findings in the literature. We have no reason to believe that the results depend on other characteristics of the participants, materials, or context.

Our samples were predominately White and U.S. residents, so our findings may not extend to people in other societies. There is research demonstrating cultural variability in moral judgments (Barrett et al., 2016; Hamilton et al., 1983). In small-scale societies, intentions appear to play a smaller role in forming moral judgments relative to large-scale societies. Other cross-cultural work indicates that different cultures place lesser or greater emphasis on mental state inferences (McNamara et al., 2019). In cultures that place lesser versus greater emphasis on mental states, moral judgments are more influenced by outcome relative to intentions. Such findings provide an interesting future direction for work on age differences in moral judgments, which may vary as a function of culture. Specifically, we interpret our findings to suggest that older adults likely focus on intent to preserve general social harmony. Interestingly, in other cultures, the opposite has been observed; to preserve relationships, intent is deemphasized (McNamara et al., 2019). This cultural difference raises some interesting questions. How is it that the desire to preserve social relationships might lead adults in one culture to focus on intent, but in another culture deemphasize intent? With the same goal of preserving social harmony, why might people of different cultures approach this endeavor in different ways? Unfortunately, the current data cannot address these important questions, which pave the road for fruitful future research.

Conclusion

Across three studies, we generally found that older adults judged perpetrators such as Jenny who wanted to burn her partner's hand but was unsuccessful as having worse moral character and reported judgments of her actions compared to younger adults. When Jenny burned her partner's hand accidentally, older adults were more lenient and felt less disgusted by Jenny compared to younger adults. When Jenny desired to and successfully burned her partner's hand, older adults were more angry (but not disgusted) and judged them to have worse moral character than younger adults. Our work contributes to the existing literature by highlighting an important influential factor—the desire to cause harm—in understanding age differences in moral judgments and emotional reactions.

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Appendix

Scenarios Used in Study 1 and Study 2

Scenario 1: Burn

Desire/No Consequence Condition

Jenny is taking a class in sculpture. She is assigned to work with a partner to weld together pieces of metal. Jenny wants to burn her partner's hand. Jenny starts welding the metal together, but her partner happens to let go and is not burned at all.

No Desire/Consequence Condition

Jenny is taking a class in sculpture. She is assigned to work with a partner to weld together pieces of metal. Jenny does not want to burn her partner's hand. Jenny only wants to weld together the metal. Jenny welds the metal, and her partner's hand is burned.

Anger Condition

Jenny is taking a class in sculpture. She is using a brand-new torch to weld together pieces of metal. Jenny decides to use the torch on a nearby desk to see if it will burn. The desk catches on fire very quickly and the fire gets out of control. The fire destroys all of the welding equipment in the classroom and all sculpture classes get canceled for the rest of the year due to the damage.

Disgust Condition

Jenny is taking a class in sculpture. She is using a brand-new torch to weld together pieces of metal. Jenny decides to use the torch on her arm to see if it will burn. Jenny moves the torch closer to her arm and singes her skin, making the whole classroom smell like burning flesh. Smelling her burnt skin in the air, Jenny wonders what it would taste like, so she licks the blistering spot on her arm.

Scenario 2: Construction

Desire/No Consequence Condition

Tom works at a construction site. He is holding a 50-pound steel beam that belongs on the ground below. Tom's supervisor is on the

ground below, taking a break. Tom wants to throw the beam onto his supervisor and break his legs. Tom drops the beam, the supervisor walks beneath the beam, and the beam happens to miss Tom's supervisor, who is just fine.

No Desire/Consequence Condition

Tom works at a construction site. He is holding a 50-pound steel beam that belongs on the ground below. Tom's supervisor is on the ground below, taking a break. Tom does not want to drop the beam on his supervisor and break his legs. Tom only wants to put the beam where it belongs. Tom drops the beam, the supervisor walks beneath the beam, and the beam hits the supervisor and breaks his legs.

Anger Condition

Tom works at a construction site. He is holding a 50-pound steel beam and wonders how quickly it will fall to the ground. Tom drops the beam, which falls onto the ground and breaks a brand-new forklift, suspending all construction work for the entire day. In all, the damages and delay to the project cost about \$75,000.

Disgust Condition

Tom works at a construction site. He is holding a 50-pound steel beam and wonders how quickly it will fall to the ground. Tom drops the beam, which falls onto the ground below. Tom goes to retrieve the beam and notices some worms on the ground next to the beam. Tom picks up one of the worms, bites into it, and its guts squish out into his mouth and down his chin.

Scenario 3: Darts

Desire/No Consequence Condition

Kevin is eating at a diner when a man challenges him to a game of darts. The man throws his darts very well and gets a very high score. Kevin wants to hit the man's hand with a dart and pierce it. Kevin throws his dart, the man reaches out, but the dart happens to miss the man and hits the board harmlessly.

(Appendix continues)

No Desire/Consequence Condition

Kevin is eating at a diner when a man challenges him to a game of darts. The man throws his darts very well and gets a very high score. Kevin does not want to hit the man's hand with a dart and pierce it. Kevin only wants to hit the dart board. Kevin throws his dart, the man reaches out, and Kevin hits his hand and pierces it.

Anger Condition

Kevin is eating at a diner and decides to play a game of darts. Kevin decides to throw a dart with his eyes closed to see if he can still hit the target. Kevin throws his dart, misses the dartboard, and the dart ricochets off the wall hitting an expensive, antique mirror, shattering it. Some of the glass shards spray out toward a few tables and all of the food at those tables needs to be thrown away for safety reasons.

Disgust Condition

Kevin is eating at a diner and decides to play a game of darts. Kevin decides to throw a dart with his eyes closed to see if he can still hit the target. Kevin throws his dart, misses the dartboard, and the dart ricochets off the wall and onto the floor across the room. Kevin goes to pick up the dart and notices a French fry in an ash tray on a nearby table. Kevin takes the fry out of the ash tray and eats it.

Scenario 4: Dentist

Desire/No Consequence Condition

Bruce is a dentist filling in a patient's cavity. He must drill into the patient's tooth just above a major nerve. Bruce wants to hit the patient's nerve in order to cause the patient excruciating pain. Bruce switches the drill to a higher speed and starts drilling but misses the nerve. The patient undergoes no pain at all.

No Desire/Consequence Condition

Bruce is a dentist filling in the cavity of his patient. He must drill into the patient's tooth just above a major nerve. Bruce does not want to hit the patient's nerve, nor to cause the patient excruciating pain. Bruce only wants to drill out the cavity. Bruce switches the drill to a higher speed, hits the nerve, and causes the patient excruciating pain.

Anger Condition

Bruce is a dentist filling the cavity of his patient. Bruce goes into the storage closet to grab a drill that he needs to fill the cavity. Bruce takes the drill from the storage closet and decides to try to flip the drill in the air and catch it. Bruce flips the drill and it falls quicker than he is expecting. As a result, Bruce drops the drill, breaking the drill and badly damaging the floor. The office must limit their scheduling until they are able to replace the drill.

Disgust Condition

Bruce is a dentist filling the cavity of his patient. Bruce goes into the storage closet to grab a drill that he needs to fill the cavity. As Bruce is heading out of the storage closet, he accidentally drops the drill on the floor. He goes to pick up the drill, but sees a discarded bloody rubber

glove next to the trash can. Bruce picks up the rubber glove, pulls down his face mask, and sucks the dried blood off of the glove.

Scenario 5: Hair

Desire/No Consequence Condition

Maria is a hairdresser cutting a customer's hair. The haircut is almost finished. There is one more piece of hair to trim, and it is right beside the customer's ear. Maria wants to cut a piece of the customer's ear. Maria goes to trim the last piece of hair at a sharp angle, but just then the customer sneezes and Maria misses the ear. The haircut is finished and the customer is perfectly fine.

No Desire/Consequence Condition

Maria is a hairdresser cutting a customer's hair. The haircut is almost finished. There is only one more piece of hair to trim, and it is right beside the customer's ear. Maria does not want to cut off a piece of the customer's ear. Maria only wants to cut the hair and finish the job. Maria trims the hair at a sharp angle and cuts off a piece of the customer's ear.

Anger Condition

Maria is a hairdresser practicing styling hair on a mannequin. Maria is almost finished styling and just needs to blow-dry the hair. Maria notices that the plug for the blow-dryer is wet, but she decides to plug in the blow-dryer anyway. The outlet short circuits from the wet plug and starts an electrical fire. The fire quickly spreads to the rest of the salon and causes \$500,000 worth of damage to the building and styling equipment.

Disgust Condition

Maria is a hairdresser practicing styling hair on a mannequin. Maria is almost finished styling and just needs to blow-dry the hair. Maria plugs in the blow-dryer and causes the outlet to short circuit, starting an electrical fire. Maria quickly puts out the fire but notices a piece of hair on her workstation that got burned. She wonders what the burnt hair tastes like, so Maria picks up the smoldering piece of hair, rolls it into a ball, and chews into the wiry, burnt hairball.

Scenario 6: Poison

Desire/No Consequence Condition

Steve, Ken, and Pat are roommates. There is a rat in their apartment, and Ken made some cookies with rat poison to kill the rat before leaving for the weekend. Steve sees the cookies on the counter. Steve wants to poison Pat and make him very ill. Steve hands Pat the cookies to hold while he cleans the counter, but Pat is distracted and leaves the cookie untouched.

No Desire/Consequence Condition

Steve, Ken, and Pat are roommates. There is a rat in their apartment, and Ken made some cookies with rat poison to kill the rat before leaving for the weekend. Steve sees the cookies on the counter. Steve does not want Pat to eat the cookie and become very ill. Steve thinks Pat knows not to eat the cookie and will leave it

untouched. In fact, Steve is wrong, and Pat has no idea about the poison. Steve hands Pat the cookies to hold while he cleans the counter, and Pat eats a cookie and becomes very ill.

Anger Condition

Steve lives by himself. There is a rat in his apartment, and he wants to make some cookies to kill the rat before leaving for the weekend. As he is making the cookies, Steve decides to also put rat poison on the kitchen counters and all over the carpet in his living room, ignoring the warning on the container that states to not use the poison on surfaces. Steve leaves for the weekend, and when he returns, he sees that the counter and carpet have been badly damaged from the poison. The countertops, carpets, and the floor underneath need to be completely replaced at great expense.

Disgust Condition

Steve lives by himself. There is a rat in his apartment, and he wants to make some cookies to kill the rat before leaving for the weekend. As he is making the cookies, Steve decides to also put rat poison on the kitchen counters and all over the carpet in his living room. Steve leaves for the weekend, and when he returns, he sees the rat dead on the kitchen floor. Steve picks up the dead rat and sees some maggots on it. He picks a couple of maggots off of the dead rat, places them under his tongue, and sucks on them for a while before spitting them out on the floor.

Scenario 7: Stand

Desire/No Consequence Condition

John is walking through a carnival. He comes to a stand where you can punch a mechanical target to win a prize. The owner of the stand happens to be squatting beneath the target. John wants to hit the owner and break his nose. John punches toward the target, the owner stands up, and John happens to miss the owner, who is just fine.

No Desire/Consequence Condition

John is walking through a carnival. He comes to a stand where you can punch a mechanical target to win a prize. The owner of the stand happens to be squatting beneath the target. John does not want to hit the owner and break his nose. John only wants to hit the target. John punches toward the target, the owner stands up, and John hits the owner and breaks his nose.

Anger Condition

John is walking through a carnival. He comes to a stand where you can punch a mechanical target to win a prize. The game is designed for children, but John wants to win the prize. John punches the target so hard that he breaks it. As a result, the stand has to be shut down for the rest of the carnival.

Disgust Condition

John is walking through a carnival. He comes to a stand where you can punch a mechanical target to win a prize. John punches the target and wins a small stuffed animal as a prize. As John is walking away from the stand, he drops the stuffed animal by accident. John picks up the stuffed animal but realizes that it has fallen into a pile of vomit on the ground. He does not have anything to clean the vomit, so John wipes the vomit off of the stuffed animal with his bare hands—licking his hand after each wipe.

Scenario 8: Train

Desire/No Consequence Condition

Amy is sitting in a crowded train station on her way to a job interview. She is about to put her feet up on the seat across her to relax. Just then she notices a passenger rushing to catch his train. Amy wants the passenger to trip and break his ankle. Amy puts her feet up on the seat across from her to trip the passenger, but the passenger happens to run by without tripping at all.

No Desire/Consequence Condition

Amy is sitting in a crowded train station. She is about to put her feet up on the seat across from her to relax. Just then she notices a passenger rushing to catch his train. Amy does not want the passenger to trip and twist his ankle. Amy only wants to put her feet up. Amy puts her feet up, and the passenger trips over her and twists his ankle.

Anger Condition

Amy is in a crowded train station. As she comes to the top of the escalator up to the train platform, the heel of her shoe gets stuck in the escalator, jamming it. The train arrives at just that moment and Amy runs for her train without picking up her shoe, even though missing the train and taking the next one would only set her back a couple of minutes. As a result, the shoe gets pulled under the escalator, completely destroying the motor, and puts the escalator out of order for 2 weeks.

Disgust Condition

Amy is in a crowded train station. As she comes to the top of the escalator up to the train platform, the heel of her shoe gets stuck in the escalator. Amy takes her shoe off and pulls it out of the escalator. As she's walking to the bench to put her shoe back on, Amy steps in a puddle of urine. Amy sits down and wrings out her urine-soaked sock, puts it back on her foot, wipes her hands on her pants, and without washing her hands, takes a bag of granola out of her purse and begins eating it.

Received February 19, 2023

Revision received January 26, 2024

Accepted February 17, 2024 ■