Morality Through Familiar Eyes: How Moral Convictions and Repeated Exposure Influence Cognitive Functions

Abdulaziz AlHothi

University of Chicago

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Abstract

Moral convictions—deeply held beliefs about right and wrong—are typically considered rigid and resistant to change, often driven by intuitive emotional responses rather than deliberative reasoning. However, psychological research suggests that repeated exposure to stimuli enhances familiarity, which can, in turn, shape attitudes and cognitive processing. This study investigates the role of familiarity as a potential mechanism influencing moral convictions, with a specific focus on how repeated exposure to socio-political issues modulates attention and decision-making. Using an eye-tracking paradigm, participants completed a decision-making task in which they selected between two protest-related images, each associated with a socio-political issue that varied in familiarity and moral conviction intensity. Fixation duration, a key measure of cognitive engagement, was analyzed to determine whether highly familiar and morally charged topics reduce deliberative processing. Statistical analyses, including mixed-effects models and ANOVA, revealed that higher familiarity with a topic significantly predicted stronger moral conviction, supporting the hypothesis that exposure reinforces intuitive moralization. Additionally, familiarity and moral conviction were found to negatively predict fixation duration, suggesting that these factors decrease attention allocation, potentially bypassing cognitive scrutiny. These findings highlight the cognitive effects of exposure-driven familiarity on moral attitudes, contributing to a deeper understanding of how repeated interactions with socio-political content influence moral judgment. The implications of this research extend to digital media consumption, political polarization, and strategies for promoting critical thinking in moral discourse.

Introduction

The open casket of Emmett Till's brutalized body shocked the conscience of a nation. Published in 1955 on the covers of Jet magazine and The Chicago Defender, the repeated exposure to this haunting image triggered a collective moral awakening, fueling the growing civil rights movement. However, familiarity does not always align with social justice. A striking

example is the 1964 campaign ad Daisy, which featured a young girl counting down as a nuclear explosion loomed ominously (Johnson, 1964). Through repeated exposure, the ad framed voting against the opposing candidate as a moral imperative, leveraging fear and emotion as a political tool rather than an appeal to reason or justice. These two contrasting examples illustrate the power of repeated exposure in shaping moral conviction, regardless of justice and consensus. Cognitive psychology research suggests that topic familiarity -a product of repeaed exposure– plays a critical role in shaping attitudes and judgments. The mere exposure effect (Zajonc, 1968) describes how repeated exposure to a stimulus fosters a sense of preference or fluency, even in the absence of deliberate reasoning. In moral contexts, where moral judgments tend to rely on inuitive processing (Haidt,2001), repeated exposure to socio-political content could solidfy moral stances, reinforcing certainty and reducing cognitive scrutiny. This view reinforces the idea of moral beliefs as systems of heuristics to streamline the cognitive load in decision-making (Krebs, 2008; Machin & Dunbar, 2016). While the behavioral effects of moral convictions have been thoroughly studied (Skitka & Morgan, 2014), little is known about the effects of moral convictions on cognitive functions. Moreover, there is no literature that reviews the influence of topic familiarity, a product of repeated exposure, is associated with with morally charged beliefs. Consequently, this study will examine the relationship between topic familiarity, moral convictions and general cognitive functions and measures related to decision-making.

Literature Review

The Automaticity of Moral Judgment and the Role of Emotions

Moral judgments are characteristically fast, as they often arise from automatic, intuitive processes rather than lengthy deliberation (Haidt, 2001). Moral evaluations are typically made faster than non-moral evaluations in decision-making contexts, bypassing lengthy cognitive processing associated with deliberation (Van Bavel et al., 2012). The immediacy aligns with the intuitive process of moralization, where preferences transform into moral convictions through emotional and social mechanisms (Rozin, 1999). Emotions such as disgust, anger, and empathy, are critical in this transformation, serving as core mechanisms in moralization, providing an

intuitive basis for moral judgment (Helion & Ochsner, 2016; Rozin, 1999). This automaticity explains why moral beliefs become powerful and immediate, rooted in emotional responses rather than cognitive reasoning, and can be often held with a rigid, uncompromising certainty. Physiological evidence further supports the role of emotions in moral judgment. Decisions involving moral convictions elicit measurable physiological and emotional arousal (Garrett, 2019). Additionally, neuroscience literature demonstrates that in moral decision-making tasks, higher activity is measured in the ventromedial prefrontal cortex (vmPFC), responsible for subjective value coding, compared to the dorsolateral prefrontal cortex (dlPFC), associated with cost-benefit analysis (Decety, 2024). These findings highlight the antithetical relationship between deliberative cost-benefit analysis and emotionally charged moral convictions. While moral convictions are emotional and intuitive, they are not reinforced by lengthy cognitive processing.

The Role of Deliberative Cognitive Processes in Moral Convictions

While emotions dominate the formation of moral judgments, deliberative processes can still influence the development and flexibility of moral convictions. Moral convictions, defined as rigid and inflexible beliefs that are resistant to change, often arise from quick, emotionally driven processes (Skitka et al., 2005). These convictions' intuitive and unyielding nature contrasts with deliberative cognitive processes that promote flexibility and situational adaptability (Cecchini, 2023; Skitka & Morgan, 2014). Emotion regulation, for instance, facilitates deliberative processes, allowing for more reflective moral judgments (Helion & Ochsner, 2016). Furthermore, deliberation can counter the rigidity of moral convictions by fostering context-sensitive flexibility in moral judgments (Bartels, 2008a). Deliberation and purposeful cognition introduce an element of adaptability that contrasts with the inflexibility of strong moral convictions. However, much of the research on cognitive processes in moral decision-making remains theoretical or philosophical, with limited experimental studies confirming these perspectives empirically (Fiedler & Glöckner, 2015a).

Familiarity, Reduced Attention, and Moral Conviction Through Exposure

Exposure and familiarity with socio-political issues might play a role in how our cognition and emotions are impacted. A meta-analysis by Montoya et al. (2017) found that excessive exposure to stimuli is associated with positive affect and reduces attention. This meta-analysis suggests that familiarity feeds into the emotional response while simultaneously inhibiting attention allocation, which is one of the cognitive processes essential for deliberation (Young & Claypool, 2010). Moreover, unconscious familiarity correlates more with attitude formation than conscious recognition (Hansen & Wänke, 2009). The reduction in attention that results from familiarity and repeated exposure could be one of the mechanisms involved in moral conviction. Familiarity's reduction in attentive engagement suggests that high exposure can foster rigid, intuitive, and emotionally charged moral stances by limiting any opportunities for critical evaluation (Bartels, 2008b; Hansen & Wänke, 2009). While the effects of mere exposure on attention have been established in cognitive psychology literature, very few research papers have explored this effect as a mechanism for moral convictions. With familiarity serving as a proxy measure for high exposure (Hansen & Wänke, 2009; Montoya et al., 2017), I predict that repeated exposure facilitates moral conviction through evoking positive emotions and attenuating deliberative cognitive processes.

Eye-Tracking's Potential Insight in Moral Decision-Making

Eye fixation duration is a reliable measure of attention allocation in adults v and cognitive resources in the context of decision-making (Jang et al., 2020). Additionally, fixation duration may indicate higher demands on memory and cognitive processes (Goldberg & Helfman, 2010; Wang et al., 2014; Zagermann et al., 2018). While there are few studies that utilize eye-tracking in the domain of moral judgment and decisions (Fiedler & Glöckner, 2015b), There are no studies looking at moral conviction that feature eye-tracking as a modality for measuring cognition. Eye-tracking can provide insight into how attention and other deliberative cognitive processes are modulated in the presence of sociopolitical issues with a measured familiarity and moral conviction score. Fixation duration will be operationalized as a measure of attention and cognitive

processing. I hypothesize that sociopolitical issues that are more familiar and with a higher moral conviction score will reduce the total fixation duration. Furthermore, the number of fixations have been a relevant indication of cognitive load in decision-making trials (Zagermann et al., 2018). Since moral convictions are involved with fast intuitive decisions, I suspect that they reduce the cognitive load experienced in decision-making. Accordingly, I also hypothesize that large differences in moral convictions and topic familiarity will result in a smaller count of fixation occurences, optimizing a more efficient cognitive load during decision-making.

Current Study

The moral psychological literature demonstrates that moral convictions— inflexible and rigid moral beliefs—are, by default, emotional and intuitive. Furthermore, moral psychology research reveals that emotional regulation, as well as deliberative cognitive processes, shape moral beliefs to be more flexible and less rigid. Conversely, the Hansen and Wänke (2009) study indicates that familiarity, which stems from repeated exposure, reduces attention allocation and shapes emotional and cognitive engagement with social attitudes. However, no studies examine the relationship between familiarity or repeated exposure to moral convictions. This gap presents a compelling case to examine how familiarity and attention interact to shape moral conviction, and whether familiarity is one of the mechanisms by which moral convictions occur. In this study, I will examine the research gap through two primary questions: What is the relationship between familiarity and moral conviction, and does familiarity and moral conviction predict attention allocation? My first hypothesis posits that topic familiarity will be positively correlated with stronger moral convictions. Topic familiarity, which acts as a measure of exposure, is hypothesized to facilitate moral conviction by bypassing deliberative cognitive processes and engaging intuitive emotional responses. This reasoning stems from findings on the mere exposure effects, which link repeated exposure to positive affect and intuitive engagement (Hansen & Wänke, 2009; Montoya et al., 2017), and the work on moral conviction, which establishes moral conviction as inflexible and universalized moral beliefs associated with emotions and automatic responses (Cecchini, 2023; Skitka & Morgan, 2014). The second hypothesis predicts that the

difference between the two choices in topic familiarity and moral conviction will negatively predict attention allocation in the context of decision-making tasks. Trials with high difference in topic familiarity and moral conviction will predict reduced fixation duration as a measure of attention allocation. This prediction aligns with prior research demonstrating that familiar stimuli demand less cognitive effort (Young & Claypool, 2010), as well as the view that intuitive moral convictions form in the absence of deliberative scrutiny. Finally, the third hypothesis predicts that moral conviction and topic familiarity will be negatively associated with the count of fixation occurences. Since fixation count indicates cognitive load experienced during decision-making, the higher the difference in moral conviction and topic familiarity, the easier the decision-making process and thus less cognitive load will be experienced.

Methods

To test the first hypothesis, I will utilize an experiment that examines attention allocation in the context of decision-making. The experiment is designed to measure neural activity in the brain regions during moral decision-making, with eye-tracking utilized as a method to confirm participants' attention. The experiment includes a pretest survey on 42 various socio-political issues, where familiarity and moral convictions are measured for each participant. Familiarity is measured on a 4-point scale (not familiar to very familiar). Moral conviction is measured by calculating the average of two questions using a 5-point scale: "To what extent is your position on ____ a reflection of your core moral beliefs and convictions?" and "To what extent is your position on ___ connected to your beliefs about fundamental right and wrong?" (Skitka & Morgan, 2014). Additionally, support is also measured on a 7-point scale (from -3 to +3) to differentiate between moral convictions and political support. The experiment consists of a decision-making task where in each trial participants view two photographs showing protestors for or against the socio-political movements measured in the pretest survey. The sample contains 34 participants and 3,621 trials (an average of 107 trials per participant) after data cleaning. The sample size of 34 participants balances feasibility and statistical power, given the repeated-measures design, where each participant contributes data across 107 trials, effectively increasing the study's

statistical sensitivity. The decision-making task also features thumbs-up or thumbs-down icons next to the photos to indicate whether the protestors are supporting or opposing the issue. These icons will show range of overall support levels across trials and minimize potential collinearity between support and moral conviction ratings. In each decision-making task (which consists of 107 trials for each participant), all issues rated as familiar are featured at least once. The total number of familiar issues ranges from 24 to 40. As the two photographs appear on the screen, participants have 4 seconds to respond before the program automatically proceeds to the next trial. All stimuli are presented in E-prime 2.0 (Psychology Software Tools, Pittsburgh, PA, USA). Participants' eyes are tracked during the experiment using an EyeLink 1000 Plus Eye Tracker (SR Research, Ontario, Canada). The eye-tracking device is utilized to confirm participants' attention and record the eye-tracking measures: fixations and saccades. Fixations are instances where the eye sustains its gaze on a specific item or location (Laan et al., 2015), while a saccade is a rapid eye movement that shifts the gaze between two fixation points (Ross et al., 2001). The total fixation duration is calculated as the sum of the duration of all fixations within the window, indicating the stimuli's onset until the participant's response is recorded. Pearson's correlation coefficient will be calculated between familiarity ratings and moral conviction scores to test the first hypothesis. Additionally, a binomial test will be used to test how often the issue with the highest moral conviction score is also the issue with the highest familiarity rating. To test the second hypothesis, a mixed-effects regression model will be used to inspect how familiarity and moral conviction predict total fixation duration. The mixed-effects model is used because fixation duration is an idiosyncratic measure that can differ from person to person (Holmqvist et al., 2011). The eye tracking raw files were converted into ASCII files which contain automatically coded and time-stamped events such as eye fixations and saccades. The fixation duration was defined as the sum total of the duration of each fixation that occurred within the response time window for a specific trial that features two topics. Trials with fixation duration of less than 100 ms were discounted. Fixation duration was counted for fixations which fell on the area of interest which includes the two protester pictures , as well as the topic and the thumbs-up/thumbs-down.

Results

General Results

Table 1

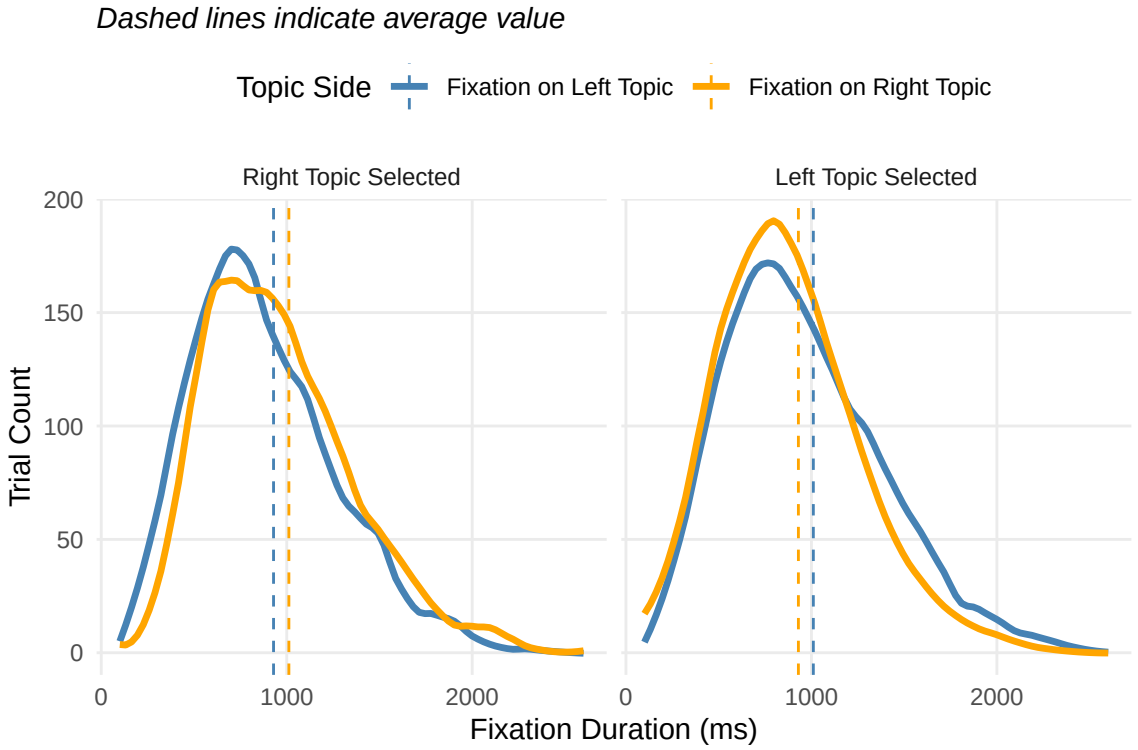
Summary Statistics of Fixation Data

Variable	Mean	Standard Deviation
Fixation Duration (Right) (ms)	969	393
Number of Fixations (Right)	5	2
Fixation Duration (Left) (ms)	971	411
Number of Fixations (Left)	5	2

In the time-constrained selection trials, participants on average spent 2.71 seconds to complete a topic-selection trial, with a standard deviation of 624 milliseconds. Within the response time report, the eye-tracker detected that participants spent an average fixation time of 1.94 seconds, with a standard deviation of 562 milliseconds. An average of 9.8 fixation occurences were registered per trial , with a standard deviation falling within 2.9 occurences.The fixation rate , which was calculated as the percentage of fixation time by the response time , was found to average around 70.9%, with a standard deviation of 9.3%.

Figure 1

Trial Fixation duration frequency distribution for left and right topics.



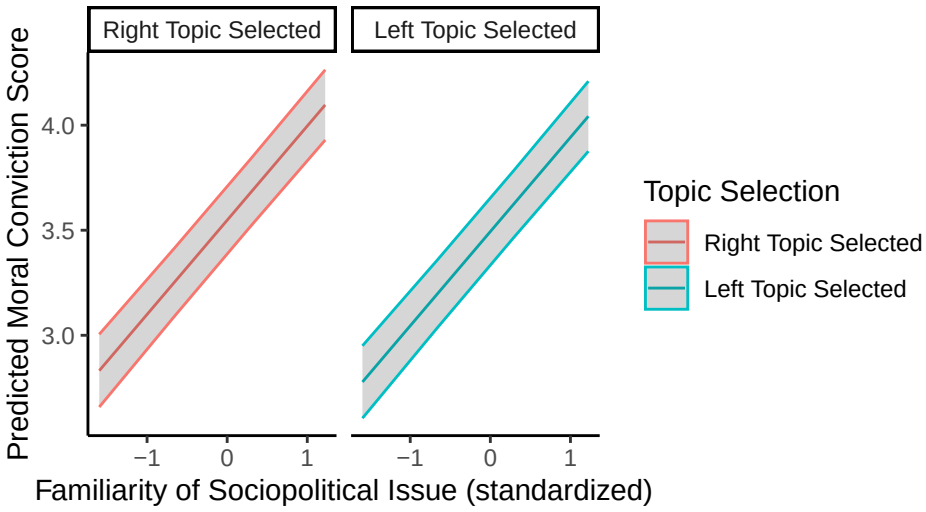
As Table 1 highlight, the average fixation duration and number of fixations across the left and right topics were fairly close across all trials. Where Figure 1 further illustrates the closeness of the eye-tracking values across the two opposing topics across trials throughout both selections. Through an one-way ANOVA test , it was confirmed that the selection of a topic on the left or right did not influence the response time in a meaningful way ($F(1 , 3326) = 0.6$, $p = 0.44$). However , a one-way anova test show that participants fixated more on the topic that they selected ($F(1 , 3326) = 32.95$ $p<0.001$). Figure 1 confirms this finding , as the mean fixation value of the chosen topic is higher than the unchosen one in both scenarios.

Topic Familiarity As a Predictor of Moral Convictions

In running a linear mixed-effects regression model, the familiarity of the sociopolitical issue was the strongest positive predictor of moral convictions ($\beta=0.448$, $p<0.001$) when either topic was selected as shown in Figure 2. On the other hand , the support variable was not

Figure 2

The effect of topic familiarity on moral conviction score.The shades illustrate 95% high density intervals.



significant in predicting moral convictions(β=-0.011, p=0.546).This suggests that the repeated exposure to an issue shapes the intensity of the moral beliefs more so than the political support for this issue.Through a Pearson correlation test, moral conviction and topic familiarity were also positively correlated (0.325, p <0.001), where most of the highly familiar sociopolitical issues were highly moralized , as Figure 3 illustrates. Other demographic factors , including religiosity, did not significantly predict moral conviction scores.

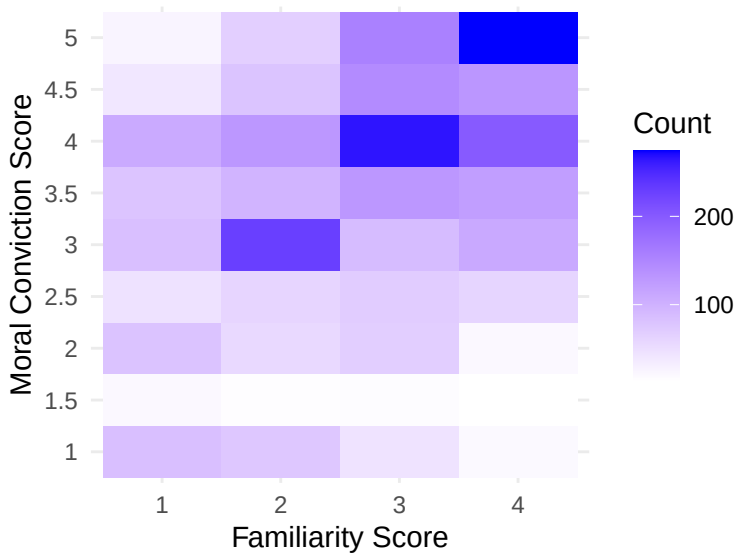
Topic Familiarity and Moral Convictions in Predicting Fixation Duration

In analyzing the response time and eye-tracking variables, the independent variables of interest were operationalized through involving the two topics presented to the participant. Moral conviction was measured as the the difference between the moral conviction scores of consistent and inconsistent items, where the moral socre of the inconsistent item was subtracted from that of the consistent item.

$$\textbf{Moral Conviction Difference} = \textbf{Moral Conviction Score}_{\textbf{consistent item}} - \textbf{Moral Conviction Score}_{\textbf{inconsistent item}}$$

Figure 3

The count of topics across familiarity and moral conviction score

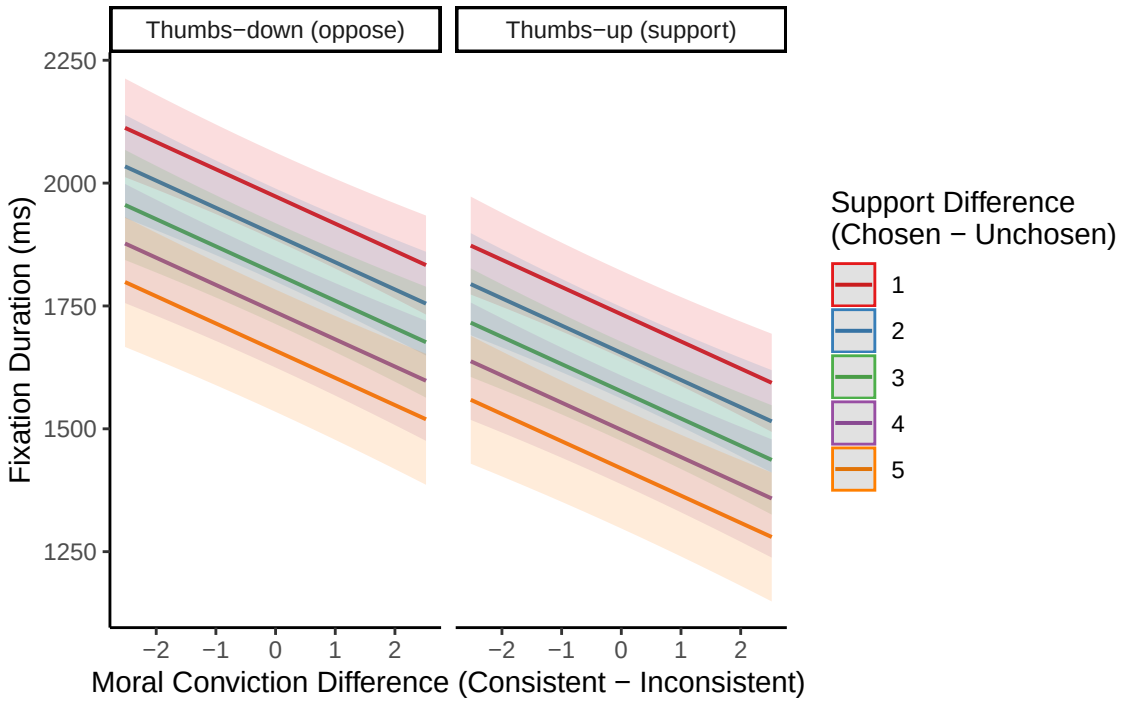


Familiarity was measured similarly, where the familiarity score for the inconsistent item was also subtracted from the familiarity score of the inconsitent item. The same logic was also applied to operationalizing the political support variable. A linear mixed-effects regression analysis was conducted to examine the relationship between fixation duration and several predictors. Fixation duration was modeled as the dependent variable, wiuth differences in political support, topic familiarity , and moral conviction scores -as well as other covariates, entered as fixed effects. To account for repeated measures and idiosyncratic differences in gaze-movement patterns, random intercept were included for participants.

The protest indication variable, which indicates whether the trial featured a thumbs-up or a thumbs-down next to the topics, was the strongest predictor in the model, trending negatively with fixation duration (β=-239.601, $p<0.001$). This means that when the trial features a thumbs-up indicator instead of a thumbs down, the fixation duration time is severely reduced, translating in a more effective attention allocation when the protestors are seen as supporting the cause than when they are opposing it. The difference in moral conviction scores was also a statistically significant

Figure 4

The effect of moral conviction difference, political support difference, and protest indication on eye fixation duration.The shades illustrate 95% high density intervals.

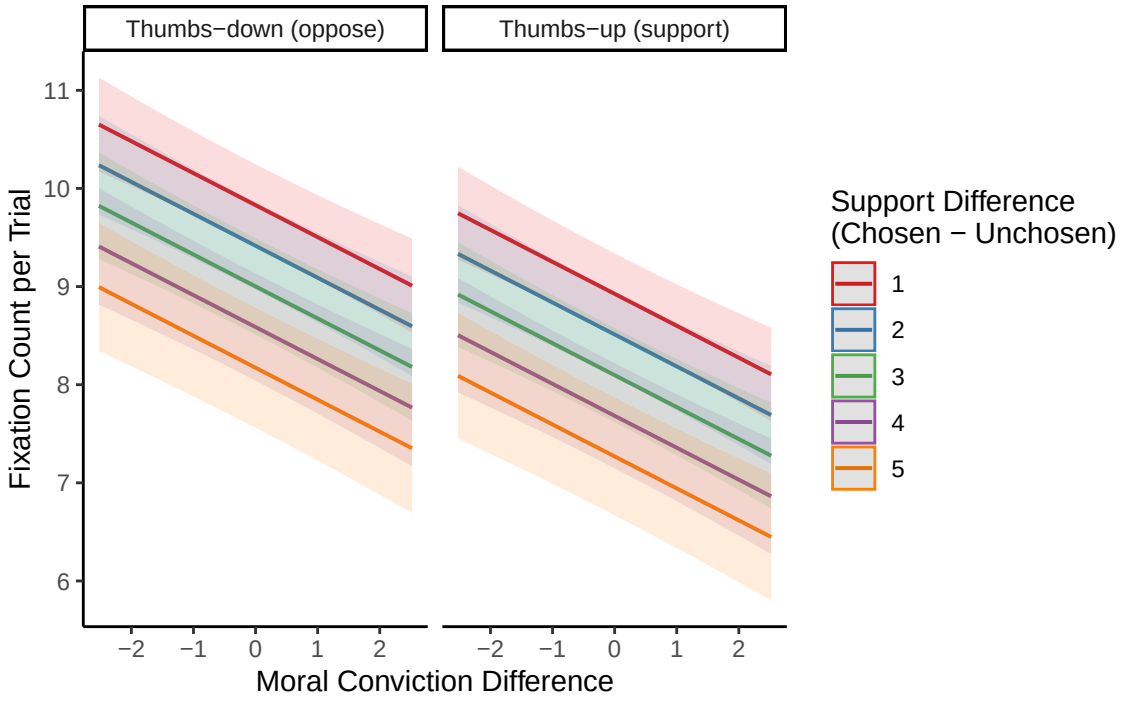


negative predictor of fixation duration (β=-55.383, p<0.001). Indicating that the more a topic is moralized than the other, the more effective the attention allocation is. Topic familiarity was statistically significant in two different forms: the difference of topic familiarity significantly reduced fixation duration (β=-25.276, p=0.007), and the topic familiarity of the left image specifically was an even stronger negative predictor of fixation duration (β=-47.58, p<0.001). The strong predictive value of the left-hand topic's familiarity may reflect a scanning bias induced by habitual left-to-right reading. Since readers of the English lanugage are accustomed to beginning their visual exploration on the left, initial attention is more readily allocated to left-side stimuli. The interaction between the differences of topic familiarity and moral conviction scores were negative, but not statistically significant (β=-15.399, p=0.071). Figure 4 illustrates the effect of the difference in moral conviction, political support difference, and protest indication as predictors of

eye fixation duration (attention allocation).

Figure 5

The effect of moral conviction difference, political support difference, and protest indication on fixation count.The shades illustrate 95% high density intervals.

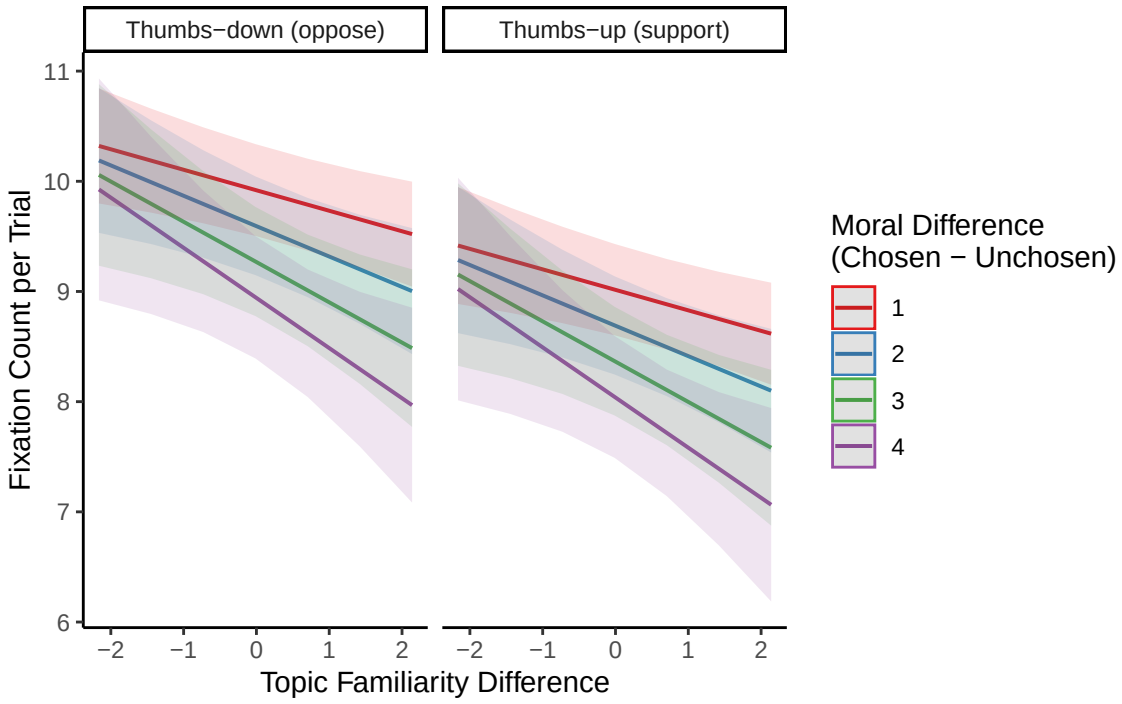


Moral Convictions and Topic Familiarity as Predictors of Cognitive Load

As a main effect, difference in moral convictions were statistically significant in negatively predicting fixation count (β=-0.326, p<0.001), as well as differences in topic familiarity (β=-0.096, p=0.048). Furthermore , the interaction between moral convictions and topic familiarity were statistically significant in negatively predicting fixation count , with a small effect (β=-0.09, p=0.041). Protest Indication (whether the trial featured a thumbs-up or thumbs-down) was the strongest negative predictor of fixation count (β=-0.904, p<0.001). Difference in political support was also statistically significant in reducing the fixation count (β=-0.414, p<0.001). as Figure 5 and Figure 6 indicate, moral convictions and topic familiarity drive a reduction in fixation counts per trial. Which indicates the role that moral convictions and topic familiarity play

Figure 6

The effect of the interaction of moral convictions and topic familiarity on fixation count. The shades illustrate 95% high density intervals.



in optimizing the cognitive load in decision-making. However, the difference in moral conviction illustrates a sharper negative trend in fixation count than differences in topic familiarity.

Discussion

Topic familiarity was a strong predictor of moral convictions for sociopolitical issues (β=0.448, p<0.001), supporting the hypothesis that repeated exposure to a sociopolitical issue is positively associated with strong moral convictions. Furthermore, both moral convictions (β=-55.383, p<0.001) and topic familiarity (β=-25.276, p=0.007) were statistically significant in negatively predicting fixation duration , which serves as a measure of attention allocation (Papageorgiou et al., 2014). This finding means that higher differences in moral conviction and topic familiarity resulted in participants allocating less attention when making a decision. This finding supports previous literature in stating that moral convictions and moral judgments tend to

be intuitive and automatic , rather than attentive and deliberative (Cecchini, 2023; Skitka & Morgan, 2014). The findings also align with the effect of repeated exposure, measured as topic familiarity, to be associated with reduced attention allocation (Hansen & Wänke, 2009; Young & Claypool, 2010).

The findings extended also to the fixation count per trial , where fixation counts were used to indicate decision complexity and difficulty, as participants needed more fixations to gather necessary information to make informed decisions (Callaway et al., 2021). The experiment found that as main effects, moral convictions (β=-0.326, $p<0.001$) and topic familiarity (β=-0.096, $p=0.048$) were statistically significant in being negatively associated with fixation count during trials. The results also highlight an interaction between topic familiarity and moral convictions that is statistically significant in negatively predicting fixation counts (β=-0.09, $p=0.041$). This finding indicates that repeated exposure of a certain sociopolitical issue, may exacerbate the effect of moral convictions on cognitive deliberation. The results support the idea that both repeated exposure (Hansen & Wänke, 2009; Young & Claypool, 2010) and moral convictions attenuate cognitive and deliberative functions like attention allocation (Cecchini, 2023; Skitka et al., 2005). The current study also builds on these findings by elaborating on the interaction of both topic familiarity and moral convictions in the context of decision-making.The findings also reinforce prior literature on moral intuitions streamline cognitive processes in decision-making (Van Bavel et al., 2012). Difference in moral convictions reliably resulted in faster responses (β=-59.19, $p<0.001$) as well as difference in topic familiarity (β=-37, $p=0.001$), supporting the notion that judgments stemming from strong moral convictions tend to be more automatic and fast. Decisions involving high contrast in the two topics in terms of moral convictions were also easier to make, which aligns with the notion that moral systems reduce decision costs by reducing the resources required for decision-making (Boyer, 2008), such as visual attention. The findings of the paper also align with the existing social psychology literature which looks at moral judgments as value-based decision which stabilize decision-making processes (Cohen et al., 2023). This study also extends on Skitka and Mullen (2002) view of moral convictions as inflexible and extreme

moral beliefs, by establishing the effects of moral convictions on cognitive functions in decision-making context. By finding a correlation and a statistically significant positive association between moral convictions and topic familiarity, the results of this study suggests that repeated exposure may be a mechanism of moral conviction formation, This study aims to address a critical gap in moral psychology by exploring the intersection of familiarity, attention and moral conviction. While existing research examined moral convictions in terms of neural and behavioral effects, few studies explore the mechanisms of moral conviction in terms of cognitive processes. This study offers the novel approach of utilizing eye-tracking to measure allocated cognitive resources in moral context. Eye-tracking builds upon prior findings that recognizes both morality and familiarity's disposition towards intuition rather than deliberation. Through this approach, the role of familiarity as a mechanism for moral conviction may help explain the escalating moral divide in the age of constant exposure through social media. Understanding familiarity's role as a factor in cognitive processes in moral context could inform strategies for media literacy programs or educational interventions to promote critical thinking in the ever-changing socio-political landscape. While this study may not explain familiarity as a causal factor, it will lay the foundations for future research to investigate the interplay between familiarity, moral conviction and deliberative cognitive processes.

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