



The Impact of Determined Behavior on Ratings of Determinism and Outlook

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Introduction

Background

- Determinism claims that all events, including human choice behavior, are caused by external events (e.g., a person's environment and evolutionary history); whereas indeterminism, or free will, maintains that a decision can emanate solely from within (i.e., independent of external influences).
- The capacity for independent choice within an indeterministic perspective may encourage moral responsibility, whereas some suggest a deterministic perspective does not allow for individuals to be held morally responsible (Myers, 2008).
- Deterministic views have expanded and popularized in recent years (Twenge et al., 2004). A deterministic position has been seen to be helpful in therapeutic settings, as it releases individuals from the pressure of creating the outcomes in the world around them.
- Alternatively, findings regarding autonomy, decision-making, and learned helplessness all suggest that individuals benefit psychologically from viewing themselves as independent beings (Ryan & Deci, 2006).
- One factor implicated in learned helplessness is the participant's perceived locus of control. Locus of control is the degree to which an individual believes their behavior is controlled by forces outside (external) or inside of themselves (internal). A deterministic position aligns with an external locus of control, whereas an indeterministic position aligns with an internal locus of control (Genschow et al., 2022; Maier & Seligman, 2016).
- Previous research in our lab found differences in participant's valence ratings of deterministic and free will passages depending on whether the passage concluded with a negative outcome (e.g., ignoring a child in need) or a positive outcome (e.g., helping a child). The results revealed that, while the mere description of a deterministic universe was perceived negatively, a positive outcome reduced the negativity.

Current Experiment

- Investigated whether observing an effect of an action provides a protective function against the perceived negative valence of determinism. The manipulations of the current experiment were focused on the behavioral utility of actions, timing of actions, and measured the affective responses to statements of determinism, optimism, and locus of control.

Method

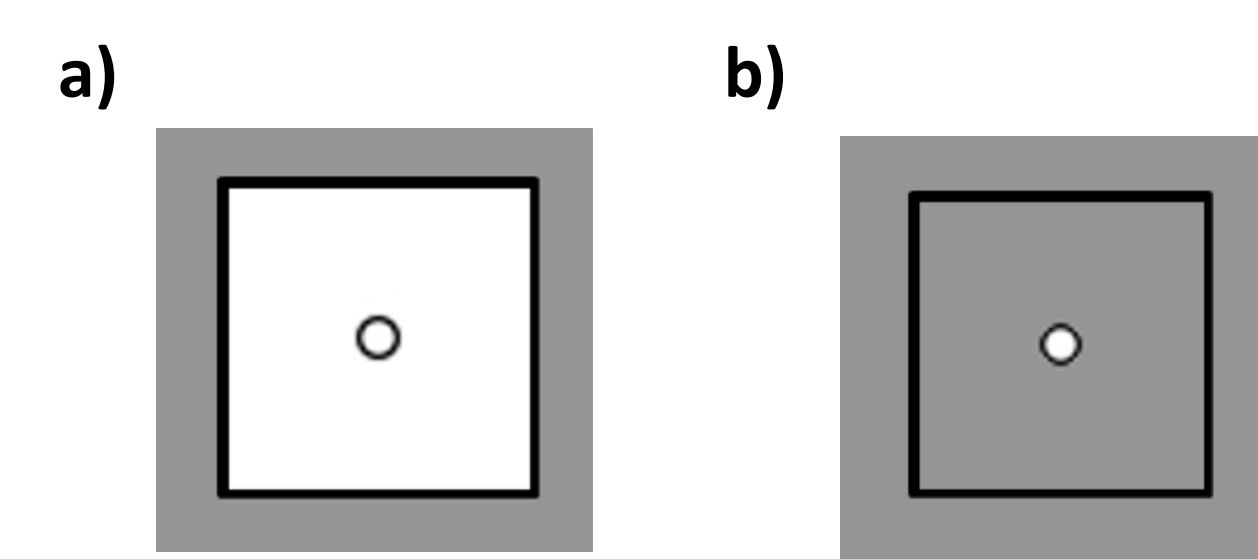
- Participants:** 252 participants were recruited from Amazon's Mechanical (MTurk) systems.

Procedure

- Participants were presented with an instruction screen, then a task. The task involved the presentation of a square outline (4"x 4") that was filled white and occasionally gray throughout a 5-minute period. All participants were asked to click the white box. After the task, participants were asked to fill out multiple subsets of items over the valence of deterministic statements on a revised version of the Free Will and Determinism Scale, optimism ratings and current mood from the Short Warwick-Edinburgh Mental Well Being Scale, and from the Multidimensional Locus of Control Inventory.
- Determinism and free will were manipulated by varying the instructions participants received prior to the start of the task (see the table below).
- To manipulate behavioral utility, for half of the participants in each group, a response to the box changed its color (high behavioral utility [positive]), whereas, for the remaining participants, clicking the box didn't change anything (low behavioral utility [negative]) and the box was set to turn gray every 20 s.
- Half of the participants were instructed to click a white box each time it appeared (i.e., determinism), and the other half were told to click the white box whenever they wanted (i.e., free will). Additionally, Participants then assessed deterministic perspectives, and personal optimism and agency.

Group	Instructions (Free Will v Determinism)	Utility (Positive or Negative)
PFW	A box will appear white or gray. Whenever you want, wherever you want, and however much you want, please click the white box (FW)	High (pos.)
NFW	A box will appear white or gray. Please click the white box each time it appears (Det.)	Low (neg.)
ND	A box will appear white or gray. Please click the white box each time it appears (Det.)	Low (neg.)
PD	A box will appear white or gray. Please click the white box each time it appears (Det.)	High (pos.)

Note. Experimental design used. Utility refers to whether clicking the box changed the color from white to grey. P – Positive, N – Negative, FW – Free Will, D - Determinism



Note. a) The white box that participants were instructed to click. For participants in the positive groups (PD and PFW), clicking the white square caused it to be replaced with the gray square (b). For participants in the negative groups (ND and NFW), clicking the white square had no nominal effects, and the square alternated between white and gray automatically.

Results

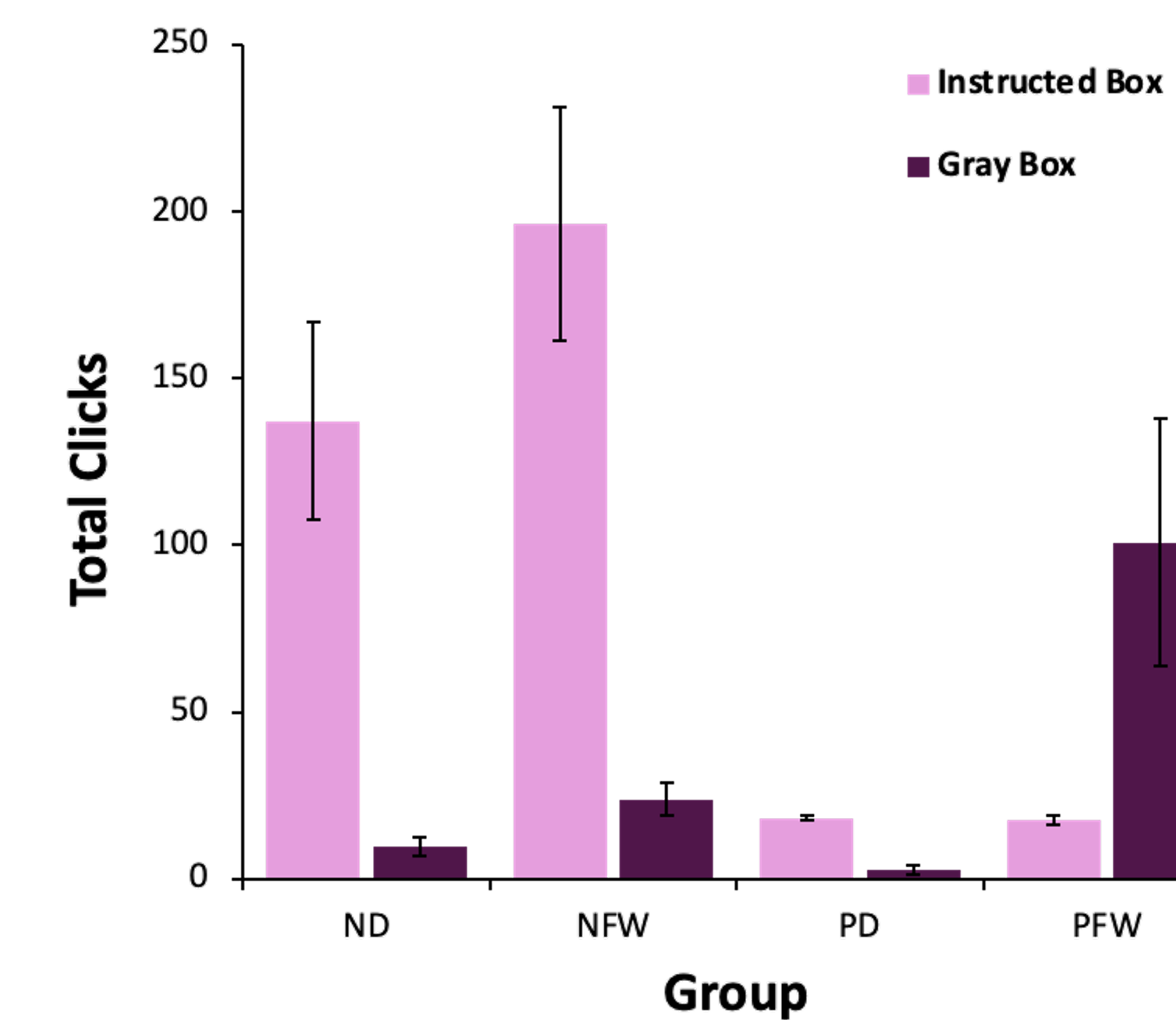


Figure 1. A repeated measures analysis of variance (ANOVA) was performed on total clicks with behavioral utility (positive [P] vs. negative [N]) and group (free will [FW] vs. determinism [D]) as between-subjects factor and trial type (instructed box vs. gray box) as the within-subjects factor. There was a main effect of behavioral utility, of group, of trial type, and a significant trial type by behavioral utility interaction, $F_s > 10.61, p < .001$. These results, however, were qualified by a significant behavioral utility by group by trial type interaction, $F(1, 202) = 7.95, p = .005$. There was no behavioral utility by group interaction or a trial type by group interaction, $F_s < 1$. Follow-up tests using a Bonferroni correction revealed that PD and PFW did not differ in the number of clicks to the white box, $p = .98$, but did differ in the number of clicks to the gray box, $p = .001$. In contrast, ND and NFW did differ in number of clicks to the white box, $p = .04$, but did not differ in number of clicks to the gray box, $p = .56$.

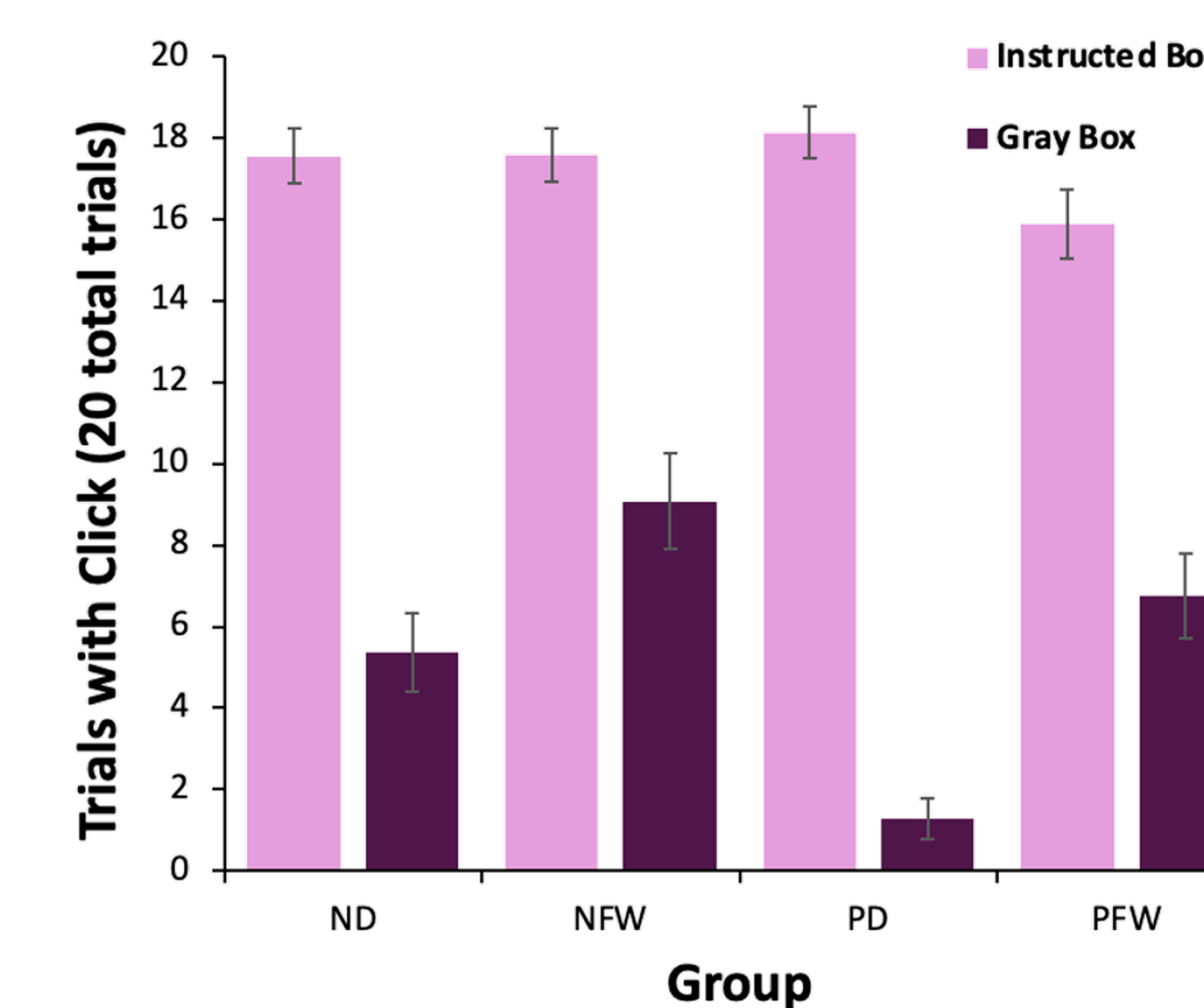


Figure 2. A repeated measures ANOVA was performed on number of trials with a click with behavioral utility (positive [P] vs. negative [N]) and group (free will [FW] vs. determinism [D]) as between-subjects factor and trial type (instructed box vs. gray box) as the within-subjects factor. There was a main effect of behavioral utility, of group, and of trial type, $F_s > 11.83, p < .001$. There was also a significant behavioral utility by trial type interaction and a group by trial type interaction, $F_s > 148.37, p < .03$, and a marginal behavioral utility by group by trial type interaction, $F(1, 202) = 2.88, p = .09$. The behavioral utility by group interaction was nonsignificant, $F < 1$. Follow-up tests using a Bonferroni correction were performed on the two 2-way interactions and on the marginal 3-way interaction. For the behavioral utility by trial type interaction, the results revealed that both the positive and negative utility conditions had more trials with a click with the instructed box than the gray box, $p < .001$. For the group by trial type interaction, there was no difference between free will and determinism on the instructed box trials, $p = .11$, but there was a difference between the two groups on the gray box trials, $p < .001$. For the three-way interaction, follow-up tests revealed that PD and PFW differed significantly on both the instructed box trials and the gray box trials, $p < .02$. In contrast, groups ND and NFW did not differ on trials with a click for the instructed white box, $p = .98$, but did differ on the gray box trials, $p = .003$.

	FWD Score	Trials with Instructed White Box Click	Trials with Gray Box Click	Optimism Score	Locus of Control Score
FWD Score	-				
Trials with Instructed White Box Click	-.168*	-			
Trials with Gray Box Click	.292*	-.141*	-		
Optimism Score	.237*	-.043	.09	-	
Locus of Control Score	-.026	.074	.024	.606*	-

Table 1. The statistically significant correlations have an *. Trials with instructed click are negatively correlated with FWD score. Trials with gray box click are positively correlated with FWD score. Optimism score is positively correlated with FWD score. Optimism score is positively correlated with locus of control score.

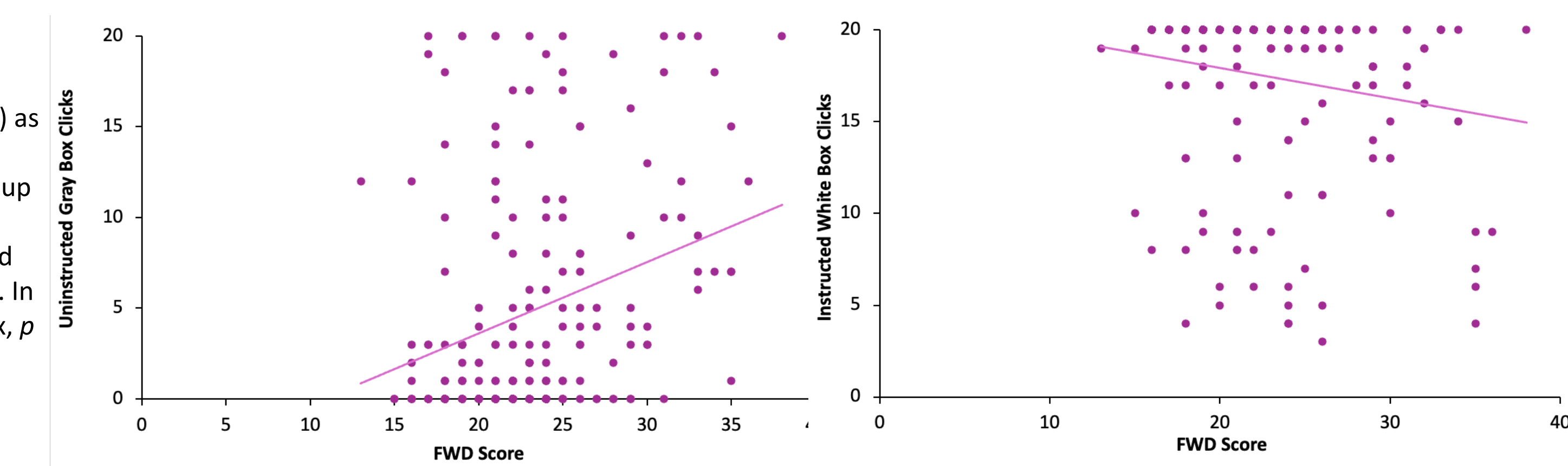


Figure 3. Positive relationship between uninstructed gray box clicks and score of ratings of free will and determinism scale.

Figure 4. Negative relationship between instructed white box click and ratings of free will and determinism scale.

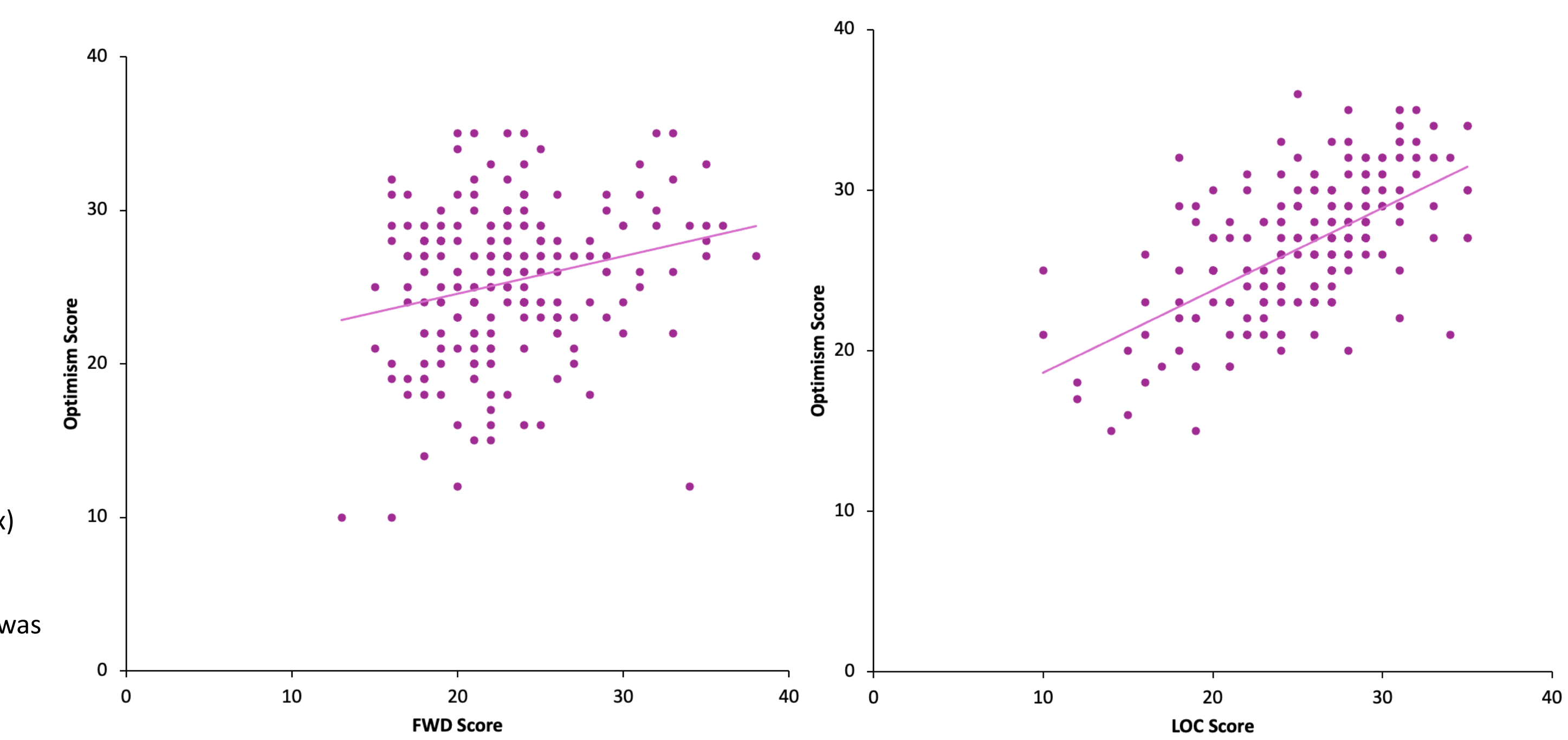


Figure 5. Positive relationship between optimism scores and ratings of free will and determinism score.

Figure 6. Positive relationship between optimism score and locus of control score.

Discussion

- The results revealed that participants that had high behavioral utility (i.e., the positive groups) clicked the instructed white box a similar amount, regardless of whether they were in the FW or Determinism group, but high utility participants that were given the free will instructions (PFW) clicked the uninstructed gray box more than the high utility participants that were given the determinism instructions (PD). This difference suggests that the free will instructions to click the white box "whenever, wherever, and however much" resulted in more clicks overall.
- When looking at the number of trials with a click to the instructed white box vs. the uninstructed gray box, the results revealed that participants in the PFW group had fewer trials with a click to the instructed box but had more trials with a click to the gray box than the PD group. In contrast, number of trials with a click to the instructed box did not differ between the NFW and ND groups, but the NFW had more trials with a click to the gray box than the ND group. These results might suggest that participants are more likely to exercise their free will and choose *not* to respond to the gray box when behavioral utility is high.
- Correlational analyses revealed that participants in both the determinism groups still had pessimistic views of determinism, despite high functional utility of the response in PD group. More clicking during instructions to click (det.) was correlated with less favorable views of FWD scale, while no instructions to click (free will) showed more favorable views of FWD. Perhaps, being able to exercise freewill led to better views of FWD.
- Analyses also found that those with less favorable views of determinism also reported lower optimism. Lower optimism was reported with lower external locus of control scores. When comparing the positive and negative groups, the analysis found that optimism discriminated these high and low behavioral utility groups the most. The lower utility (negative) group was apparent by higher optimism, which was not what was hypothesized. However, it is possible that these results are due to a sort of cognitive dissonance or opponent emotional state. Cognitive dissonance is the discomfort that a person feels when their behavior does not match their beliefs, and an opponent emotional state is when an emotional state is high so when it is gone the opposite emotion is enacted to bring the individual back to a state of homeostasis. The frustration experienced by having no functional utility which was seen with more total clicks in negative groups, may have been replaced with optimism once the trials were done.

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