

The Altruistic Mind: Investigating the Impact of Mindfulness Meditation and Relaxation on Altruistic Behaviour in a Virtual Supermarket Environment

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Introduction

Altruism: Selfless acts involving personal sacrifice, driven by empathy, can enhance self-image and well-being. However, high levels may impair group accountability and performance. (Pfattheicher et al., 2022; Hwang & Bowles, 2012).

Mindfulness: Awareness of thoughts, emotions, sensations, and surroundings, leading to clarity and resilience (Kabat-Zinn, 2023), enhancing immune function, sleep quality, and well-being (Holas & Jankowski, 2013).

Relaxation: Rooted in mindfulness, listening to relaxing music helps reduce stress and promotes emotional regulation (Lazorko, 2024; Nathoo, 2016).

Virtual Reality: Captures the essence of psychological presence in virtual worlds (Berkman & Akan, 2024) and enhances ecological validity for observing social behaviour (Ashfaq, 2022).

Previous Research

Limited findings on all concepts combined, some explored separately or in various combinations:

Altruism and Relaxing Music—Emotional slow-tempo music enhances helping behaviours. However, Faster upbeat music is claimed to increase energy and alertness, but not altruism (Wu et al., 2025).

Altruism and Mindfulness —Short mindfulness practices increase empathy and altruistic behaviours (Malin & Gumpel, 2022; Berry et al., 2018). Eight-week mindfulness programs enhance altruism in high-cost situations but may reduce it in low-cost scenarios (Xie et al., 2023). Mindfulness might also decrease motivation for tasks seen as meaningless (Hafenbrack & Vohs, 2018).

Virtual Mindfulness, Relaxation and Altruism — Higher levels of mindfulness positively correlate with perceiving natural beauty. However, Mindful VR did not improve relaxation or altruism, as no significant differences were found (Glennon, 2024).

Dispositional Mindfulness — May confound intervention results, so it is crucial to control for baseline mindfulness post-intervention to better isolate treatment effects (Rutherford, 2011).

Discussion

No significant differences in altruistic measures were found across intervention groups, even after controlling for mindfulness. The mindfulness group spent more time helping, suggesting it may enhance focus on effortful actions. Emotionally slower music did not impact altruism, possibly due to brief exposure or low emotional relevance (Wu et al., 2025). Possible CFE effects may have obscured intervention impacts, as participants tended to pick all or none of the potatoes (Šimkovic & Träuble, 2019). While this study improves ecological validity using VR for realistic scenarios, the results contradict the hypotheses and challenge previous research suggesting mindfulness increases altruism (Berry et al., 2018; Malin & Gumpel, 2022; Xie et al., 2023). Strengths include the use of realistic VR and a diverse sample, and controlling trait mindfulness, boosting generalisability and analytical rigour.

Limitations include the short intervention length (~2 min), which may not be sufficient for behavioural effects, as longer mindfulness practices are generally needed (Kabat-Zinn, 1990). This minimal approach might have hindered maintaining mindfulness and increased anxiety due to VR technical issues. Sample variability (age, neurodiversity, VR familiarity) could have affected the findings and limited intervention effect detection (McBee, 2010). **Future research** should extend the intervention duration and enhance emotional engagement through avatar expressions, tone, and rewards. Additionally, refining outcome measures to capture intervention effects and target more specific samples could improve ecological validity.

Implications- VR has potential in education and training, especially for understanding altruistic behaviours with tailored interventions. Customising VR experiences for specific demographics could enhance their impact on altruism and offer practical applications.

Despite current null findings, the research provides insights into studying helping behaviour and emphasises the need for more engaging and targeted interventions in future studies.

Hypotheses

Participants in the mindfulness and relaxation conditions will show greater altruistic behaviour, measured by how much they help and how long they assist, than those in the control group. Additionally, greater helping is expected in the mindfulness group compared to the relaxation group.

Method

Design & Participants

A one-way between-subjects ANCOVA. Three IVs: guided mindfulness, relaxation music and control . Two DVs measured: the amount of potatoes collected and the time spent helping. Covariate: Trait mindfulness (Brown & Ryan, 2003).
N = 153 (51 per group), Age 18–72 (M = 31.4, SD = 12.57). Convenience sample from the University of Staffordshire and social media. Randomly assigned to groups (Ledford, 2018). Gender: M = 33, F = 116, NB = 3, Prefer not to say = 1.

Procedure

- Ethical approval granted; all ethical considerations assured.
- Participants listened to audio (or none), then completed a VR shopping task to collect three items in two shopping aisles.
- In the second aisle, a female avatar dropped 11 potatoes with an “Oh no!” prompt.
- Trait mindfulness measured post-task via MAAS
- Debriefed.

Analytic Strategy

Outliers were checked (one was removed as the data would become non-normal; Clark-Carter, 2024). Skewness and kurtosis fell within the accepted range with some minor violations (Clark-Carter, 2024). All assumptions were met. Two one-way between-subjects ANCOVAs were conducted with MAAS as a covariate.



Results

Table 1

The adjusted mean scores and standard error for each dependent variable under each condition when including the covariate MAAS.

Conditions	DV	M	SE
Guided Mindfulness	Time Spent Helping in Seconds	25.67	2.54
	Amount of Potatoes Collected	7.54	.697
Relaxation Music	Time Spent Helping in Seconds	22.31	2.56
	Amount of Potatoes Collected	7.40	.695
Control	Time Spent Helping in Seconds	23.23	2.54
	Amount of Potatoes Collected	7.79	.698

- Two one-way between-subjects ANOVAs were conducted for the two DVs. Revealing the amount of potatoes collected between groups was non-significant. Additionally, there was no significant difference in the time spent helping between groups. Both ANOVAs revealed a very small effect size (Cohen, 1988).
- Two one-way between-subjects ANCOVAs were conducted, comparing the scores for each DV between the IVs while controlling for participants trait mindfulness. Results showed no significant difference in both DVs across the IVs after accounting for the MAAS as the covariate.
- Additionally, no significant heterogeneity for the regression slopes was found (when including the interaction between the IV and the covariate in the analysis) in both DVs.

Sensitivity Analysis

The multivariate outliers detected when conducting both ANCOVAs were removed from the analysis to observe their impact on the ANCOVA outcome by plotting Cooks Distance vs. Leverage values. The removal of the multivariate outliers did not impact the main outcomes of the analysis, as no significance was found, meaning that ANCOVA was reasonably robust to the multivariate outlier.