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Mindfulness: A double-edged sword for prosociality? Investigating the impact of trait mindfulness on cooperation styles using the IPUC game

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Abstract

The present study investigates whether dispositional trait mindfulness predicts cooperative behavior in intergroup contexts, using the Intergroup Parochial and Universal Cooperation (IPUC) game as a behavioral measure. The IPUC game distinguishes between weak parochial cooperation, strong parochial cooperation, universal cooperation, and egoism. Trait mindfulness was assessed via the Five Facet Mindfulness Questionnaire (FFMQ) in a sample of N = 232 U.S. participants (Democrats and Republicans) recruited via Prolific.

Results indicate that overall mindfulness did not significantly predict contributions to any cooperative pool. However, mindfulness was a significant negative predictor of egoistic behavior (pool 4; $B = -1.44$, $p = .002$), suggesting that more mindful individuals retain fewer resources for themselves. Exploratory analyses identified Nonreactivity as the primary facet driving this effect, and mindfulness emerged as a positive predictor of relative ingroup cooperation — the shift from self-interest toward ingroup welfare. This effect held across political affiliations. Group identification and political identity did not significantly influence cooperative behavior, potentially due to the hypothetical nature of the game's incentive structure.

These findings suggest that mindfulness reduces egoistic impulses which increases overall cooperation, but cannot predict a specific style of cooperation.

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1. Introduction

The question of what factors cause people to engage in prosocial behavior is of great interest in social and behavioral science, as human communities depend on the willingness of individuals to participate in behaviors that promote collective well-being (Capraro, 2023).

Prosocial behavior is an umbrella term that includes various behaviors, dispositions, and processes but can be briefly described as actions intended to benefit others (Batson & Powell, 2003; Eisenberg & Miller, 1987; Hart & Hart, 2023; Penner et al., 2005).

Consequently, identifying the psychological processes that promote such behaviors has become of great interest in contemporary social psychology (Yi & Mahmud, 2022).

In the ever-growing field of prosociality research, mindfulness has repeatedly been linked to this behavior (Yi & Mahmud, 2022).

Mindfulness was proposed to enhance social functioning by fostering empathy, compassion, and perspective-taking (Donald et al., 2018; Hafenbrack et al., 2019). It was therefore investigated whether cultivating an open and aware state of mind enables individuals to respond to situational and interpersonal cues with greater sensitivity and reduced automatic bias. (Oyler et al., 2021).

Despite the growing enthusiasm for mindfulness as a method to promote prosocial behavior, its relationship with prosociality seems to be more complex (Schindler & Friese, 2021).

Meta-analytic findings suggest a significant, positive relationship between mindfulness and various prosocial outcomes, such as helping, sharing, and cooperating (Donald et al., 2018).

In recent research, there is also an increasing number of authors who have not only failed to find a positive connection, but have even suggested a negative association between mindfulness and Prosocial behavior (Corbi et al., 2024; Feruglio et al., 2022; Schindler & Friese, 2021; Poulin et al., 2021a, 2021b).

Highlighting methodological weaknesses and identifying factors under which the positive association may be reversed, raises the question of how new measurement instruments might affect the relationship between the two constructs (Schindler & Friese, 2021; Schindler & Pfattheicher, 2021). To address the conflicting findings this study aims to evaluate the effects of mindfulness on prosocial behavior by implementing the Intergroup Parochial and Universal Cooperation IPUC game (Aaldering & Böhm, 2020). This innovative economic game is capable of measuring actual prosocial behavior and allows for the distinction between different forms of cooperation, which are often conflated in other games. (Aaldering & Böhm, 2020; Grigoryan et al., 2022). According to current literature, mindfulness has never been studied in connection with the IPUC game.

The objective of this thesis is therefore to provide a more nuanced understanding of the relationship between mindfulness and prosocial behavior by addressing this methodological gap. The IPUC game offers the opportunity to examine how mindfulness affects prosocial behavior, when having to distinguish between in- and outgroups (Aaldering & Böhm, 2020; Grigoryan et al., 2022). Some existing research assumes that mindfulness generally reduces intergroup bias (Chang et al., 2023; Fuochi

et al., 2023; Oyler et al., 2021). However, the boundary conditions of these effects remain insufficiently researched (Doucerain & Benkirane, 2025).

Moreover there may be distinctions between the different facets of mindfulness in relation to cooperation styles (Fuochi et al., 2023; Mattes, 2019; Schindler & Pfattheicher, 2021). While previous research suggested that some aspects of mindfulness such as *Nonreacting* tend to promote prosocial behavior, there is disagreement over *Nonjudging*,which might have the opposite effect under certain conditions (Fuochi et al., 2023; Schindler & Pfattheicher, 2021). By implementing the IPUC game together with the FFMQ this thesis, furthermore, aims to explore how within-group cooperation might be influenced by different facets of mindfulness. In summary, this thesis explores the following central research question: To what extent does dispositional mindfulness influence actual cooperative behavior in complex social dilemmas where a distinction between in-group benefit and universal cooperation is required?

2. Theoretical Background

This chapter provides the theoretical foundation for the investigation by examining the two core constructs: mindfulness and prosocial behavior. First, mindfulness is explored and second, the social psychological mechanisms of prosociality are discussed, specifically focusing on intergroup relations.

2.1. Mindfulness

In recent years, mindfulness has gained great popularity in the Western world (Chems-Maarif et al., 2025; Zhang et al., 2021; Yi & Mahmud, 2022). Although many

different definitions can be found in the literature, mindfulness is commonly defined as the intentional, present-moment, and non-judgmental directing of attention (Bishop et al., 2004; Chems-Maarif et al., 2025; Kabat-Zinn, 1994; Nilsson & Kazemi, 2016). This phenomenon can be described as presence of mind or attentiveness to the present (Chems-Maarif et al., 2025). In psychological research, mindfulness is often defined as the interplay of two main components: monitoring (the act of paying attention) and acceptance (an attitude of openness and non-judgment) (Bishop et al., 2004; Creswell, 2016)

2.1.1 Origins of the concept

The concept goes back to ancient Buddhist tradition where it is rooted in ethical traditions and therefore linked to a moral compass (Condon, 2018; Nilsson & Kazemi, 2016; Thapaliya et al., 2018).

Mindfulness in Buddhism is therefore not a neutral concept and it was criticized that psychology and medicine have removed the concept from its original ethical context (Anālayo, 2019; Purser, 2019). The ethical neutrality of modern mindfulness carries the risk that mindfulness no longer has the effects originally associated with it and non-judgmental mindfulness could lead to the promotion of more self-centered processes rather than fostering compassion (Condon, 2018).

In contrast to this critique stands the idea of recontextualization**,** which comprehends the transfer of mindfulness into Western science as a conscious and necessary translation. (Kabat-Zinn, 2011; Lee & Young, 2018). Mindfulness is understood as a “universal human ability” that goes beyond specific religious or cultural boundaries (Kabat-Zinn, 2011; Purser, 2014) In this sense, embedding the concept within the framework of modern science should be seen as a form of secularization that

makes mindfulness accessible to people who would otherwise be excluded due to religious barriers. (Kabat-Zinn, 2011; Lee & Young, 2018).

2.1.2. Mindfulness in clinical psychology

The most common definition of mindfulness in Western science comes from Jon Kabat-Zinn, whose work in the late 1970s was fundamental to the scientific recognition of the concept (Lee & Young, 2018). Kabat-Zinn defines mindfulness as the awareness that unfolds when one turns to the immediate experience in the here and now with a deliberate and non-judgmental attitude (Chems-Maarif et al., 2025; Kabat‐Zinn, 2011; Lee & Young, 2018).

He popularized the term as part of the Mindfulness-Based Stress Reduction (MBSR) program that was designed to help patients with chronic pain and stress-related illnesses but is now used in a wide variety of clinical and non-clinical settings (Kabat‐Zinn, 2011; Lee & Young, 2018; Schindler, 2020). The main goal of MBSR is to cultivate non-judgmental awareness of the present moment and participants can learn to recognize stress triggers early on, break out of automatic stress responses, and strengthen their resilience and self-compassion (Condon, 2017; Kabat‐Zinn, 2011; Lee & Young, 2018).

MBSR serves as the basis for many other mindfulness-based interventions, such as mindfulness-based cognitive therapy and is one of the best-known and most intensively researched mindfulness training programs worldwide (Kabat‐Zinn, 2011; Kreplin et al., 2018; Lee & Young, 2018). Meta-research supports Kabat-Zinn's clinical observations and finds evidence for the effectiveness of MBSR (Grossman et al., 2003; Zhang et al., 2021).

While there appear to be positive effects on physical conditions such as chronic pain or high blood pressure (Creswell, 2016; Szymonik & Szopa, 2024), MBSR seems to be most effective for increasing overall quality of life and resilience (Grossman et al., 2003; Zhang et al., 2021). Although mindfulness interventions are widely used in the clinical context, their effectiveness is also examined critically (Creswell, 2016; Dam et al., 2017;Goldberg et al., 2019; Purser, 2014).

2.1.3. Mindfulness in social psychology

Mindfulness research expanded as social psychologists began employing controlled laboratory experiments to investigate social variables such as prosocial behavior and empathy (Karremans & Papies, 2017; Lee & Young, 2018). Social psychology uses existing models (e.g., on emotion regulation or the self) to explain how mindfulness changes attention processes and the perception of one's own self y (Karremans & Papies, 2017).

The work of Bishop et al. took the concept from a clinical description to a testable operational definition by proposing the two-component model that created a theoretical framework for defining mindfulness as a specific psychological process (Bishop et al., 2004; Keng et al., 2011). These two components work together and consist of self-regulation of attention and a curious, accepting orientation toward experience (Bishop et al., 2004). While self-regulation ensures that attention remains in the here and now, orientation ensures that this perception is characterized by a friendly and accepting mood (Bishop et al., 2004; Keng et al., 2011).

This description of the functional mechanisms was expanded upon by Brown's contribution that proposes mindfulness not merely as a temporary state, but as an enduring and fundamental capacity of consciousness that exists in individuals to

varying degrees. (Brown et al., 2007; Keng et al., 2011; Tomlinson et al., 2017). This trait is characterized by receptive attention, which functions like a sensor that registers everything that is happening in the present moment and can be understood as the opposite of selective attention. Unlike models that emphasize active cognitive regulation, their approach focuses on a state of bare attention that allows for a non-judgmental, non-evaluative registration of internal and external stimuli (Brown et al., 2007; Keng et al., 2011).

The current state of research on mindfulness is characterized by a heterogeneity of definitions that is reflected in a multitude of existing mindfulness scales which makes it difficult to combine existing studies to an overall concept (Bergomi et al., 2012; Chems-Maarif et al., 2026; Dam et al., 2017).

2.1.4. Trait and state mindfulness

Central to the empirical understanding of mindfulness is the differentiation between trait mindfulness and state mindfulness, as it determines whether the focus lies on long-lasting psychological attributes or immediate situational experiences (Bergomi et al., 2012; Brown et al., 2007; Keng et al., 2011).

State mindfulness describes the intensity of mindfulness at a very specific, temporally limited moment, often experienced during or immediately after a formal exercise (Bergomi et al., 2012; Keng et al., 2011). It is therefore a transient quality of consciousness and a dynamic phenomenon, as it can fluctuate within minutes or even seconds (Brown & Ryan, 2003; Mahmood et al., 2016; Zarka et al., 2021). Studies indicate that state mindfulness can be induced through conscious direction of attention or formal meditation practice (Creswell, 2016; Maloney et al., 2023).

Mindfulness-based interventions such as MBCT or MBSR use specific meditation techniques (e.g., body scan) to induce a high level of state mindfulness (Creswell, 2016;Mahmood et al., 2016; Maloney et al., 2023). The State Mindfulness Scale SMS and the Toronto Mindfulness Scale TMS are two established measurement tools used to assess this state, but although these scales aim to measure mindfulness immediately following a practice, they have been criticized for the fact that a retrospective self-report of such a volatile state can lead to memory biases (Chems-Maarif et al., 2026; Dam et al., 2017).

Trait mindfulness refers to a person's general, enduring tendency to be mindful and present in daily life and is understood as a relatively stable personality trait (Bergomi et al., 2012; Keng et al., 2011). In the academic literature, this is frequently referred to as dispositional mindfulness, distinguishing it from transient states (Tomlinson et al., 2017).

Although trait mindfulness is defined as a predisposition it can be modified through training and it was shown that meditation experience significantly influences and enhances it (Creswell, 2016; Keng et al., 2011). Nevertheless meditation practice is not a precondition for possessing trait mindfulness but the practice acts as a catalyst that amplifies an already existing predisposition (Brown et al., 2007; Creswell, 2016; Keng et al., 2011; Tomlinson et al., 2017).

Trait mindfulness can, however, significantly predict the frequency of everyday mindful states, and individuals with high trait mindfulness tend to experience state mindfulness more frequently and with greater intensity (Borghi et al., 2024; Senker et al., 2020). Additionally, higher trait scores can help individuals enter mindful states more quickly and deeply, while the repeated experience of these states during meditation can increase trait mindfulness in the long term (Kiken et al., 2015).

Current research describes the interaction as dynamic and reciprocal and since both dimensions seem to reinforce each other the relationship is often referred to as an upward spiral (Borghi et al., 2024; Senker et al., 2020). In practice, the intertwining of these two levels can therefore make it difficult to distinguish them clearly (Borghi et al., 2024).

However the study of trait mindfulness as a stable personality trait offers several advantages, particularly in the context of behavior patterns and provides good predictive power for both intrapersonal (self-regulation, psychological resilience, well-being) and interpersonal (relationship satisfaction, forgiveness) outcomes (Bergomi et al., 2012).

While one-dimensional approaches such as the MAAS focus primarily on the capacity for attention and awareness (Brown & Ryan, 2003), multidimensional models understand mindfulness as an interplay of various skills that allow for differentiation between the various characteristics of mindfulness so that a specific mindfulness profile can be identified (Baer et al., 2008; Bergomi et al., 2012).

2.2. Prosocial Behavior

Prosocial behavior is a broad spectrum of actions that are beneficial to others and aim a positive outcome for individuals or groups or promote their well-being (Böckler, 2019; Dovidio et al., 2017; Schroeder & Graziano, 2015). It can be defined as any voluntary act intended to benefit another person and is motivated by prosocial motivations, which implies that the actor has a choice between several options and is not compelled to perform these actions, nor does the action result from external pressure or a legal obligation (e.g., paying taxes) (Böckler, 2019; Dovidio et al., 2017; Penner et al., 2005; Schroeder & Graziano, 2015). The term encompasses both

behaviors and dispositions (such as personality traits, states, or motivations) as well as processes (Dovidio et al., 2017; Penner et al., 2005). It can be understood as a multidimensional phenomenon that cannot be explained by a single theory, but rather involves the integration of various disciplines such as psychology, biology, economics, and philosophy (Bhogal & Farrelly, 2019)

Behaviors associated with prosocial behavior include altruism, cooperation, heroism, fairness, and trustworthiness (Böckler, 2019; Böckler et al., 2016; Dovidio et al., 2017; Penner et al., 2005). In social psychological research, prosocial behavior is often distinguished from a multilevel perspective to systematically capture influencing factors (Dovidio et al., 2017; Penner et al., 2005). While at the micro level, the focus is on intraindividual factors, the meso-level examines interpersonal interactions in specific situations, with a focus on concrete behaviors such as helping, sharing, or cooperating (Dovidio et al., 2017; Penner et al., 2005). Finally, the macro level examines prosocial actions in a broader context, such as within groups or organizations. (Dovidio et al., 2017; Schroeder & Graziano, 2015).

Although prosocial behavior is judged by the benefits it brings to the recipient, the person acting can also benefit but it's not the primary goal of the action (Dovidio et al., 2017; Schroeder & Graziano, 2015).

In economic decision-making contexts, prosocial behavior is primarily defined as acting in situations of interdependence in which the well-being of others is promoted (Thielmann et al., 2021). In this context, prosociality can be manifested as cooperation in social dilemmas where collective interests conflict with self-interest (Parks, 2018, Van Lange et al., 2013). In contrast to purely selfish behavior, cooperation includes any form of social interaction that benefits other players and aims to maximize the common

good or achieve collective goals which often involves personal costs for the actor (Cuadrado et al., 2017; Van Lange et al., 2013).

Economic games offer an opportunity to investigate prosocial behavior in standardized experiments and to compare prosocial tendencies across different groups (Thielmann et al., 2021). The Public Goods Game is a common economic game designed to study cooperation and social dilemmas in groups. In this game participants must decide how many of their resources (e.g., tokens) they want to contribute to a common pool and while keeping the tokens presents a safe and predictable choice, cooperation (contributing to a public pool) only leads to a greater benefit if other players cooperate as well (Thielmann et al., 2021).

Cooperation is thus demonstrated by the decision to accept personal costs to achieve a common goal and maximize mutual benefit even though there is an incentive to act selfishly (Thielmann et al., 2021).

2.2.1. Prosociality and Intergroup Relations

When looking at the dynamics between in- and outgroups it was demonstrated that individuals tend to behave more prosocially toward members of their ingroup (Everett et al., 2015; Nakagawa et al., 2022). A strong sense of identification with a group can encourage prosocial behavior toward one's own group (Bruner et al., 2013; Monik & Parzuchowski, 2023; Tidwell, 2005) and interestingly, even lead individuals to shift their focus from their own interests to the good of the community (Hoenow & Pourviseh, 2023; Sotnik et al., 2023).

Ingroup favoritism can be explained by social identity theory which suggests that part of the self-concept is based on the membership in social groups (e.g.,

nationality) which makes individuals aim for positive distinctiveness by evaluating the own group as superior to the outgroup in order to increase personal self-worth (Fiedler et al., 2018; Nakagawa et al., 2022; Tajfel & Turner, 2000). People seem to feel a close affinity to who they share a common trait with, which then leads them to favoring members of their own group when it comes to resource allocation (Everett et al., 2015; Nakagawa et al., 2022 ;Tajfel & Turner, 2000).

The minimal group paradigm shows that even assigning individuals to a group based on trivial characteristics immediately leads to a preference for the ingroup (Guimond, 2023; Kurzban, 2005; Tajfel et al., 1971). Curiously, this effect occurs even when group assignment is completely random and the participants were explicitly told that the assignment was meaningless (Kurzban, 2005; Tajfel et al., 1971). These findings suggest that the mere perception of a categorical boundary is sufficient to create a sense of belonging for an ingroup and generate measurable ingroup favoritism regardless of prior interaction (Everett et al., 2015; Durrheim et al., 2016; Nakagawa et al., 2022).

Ingroup bias is also explained by bounded generalized reciprocity, according to which people assume that members of the ingroup will treat them more fairly and cooperatively than members of an outgroup (Nakagawa et al., 2022; Yamagishi & Kiyonari, 2000). This bias often results in parochialism, a social orientation where cooperation and altruism are restricted to the ingroup (Baumgärtner et al., 2014). The IPUC game provides the methodological framework for this distinction by identifying two different forms of parochialism (Aaldering & Böhm, 2020). It allows for a distinction between weak parochial cooperation **(**benefiting the ingroup) and strong parochial altruism (benefiting the ingroup while simultaneously harming the outgroup) **(**Aaldering & Böhm, 2020). Furthermore, it reveals a form of universal cooperation that

extends beyond both groups (Aaldering & Böhm, 2020). This distinction is central to the later analysis of this thesis, as it allows for an investigation into whether mindfulness promotes a process of deprovincialisation (Fuochi et al., 2023; Pettigrew, 2011). Deprovincialisation refers to a shift in perspective where the individual moves away from a self-centered or group-centered focus toward a more open and accepting attitude that includes out-group members as equally worthy of concern (Pettigrew, 2011; Verkuyten et al., 2022). Recent research suggests that specific mindfulness facets are positively associated with higher levels of deprovincialisation, thereby fostering more inclusive intergroup outcomes and reducing prejudice (Fuochi et al., 2023; Oyler et al., 2021).

Recent findings suggest that individuals could behave strategically cooperatively with the ingroup because they worry that uncooperative behavior could give them a bad reputation within their own group, and they want to protect their reputation (Horita & Hamada, 2024). In addition, ingroup bias seems to be particularly evident when the salience of the intergroup situation is increased by the presence or mention of outgroup members (Nakagawa et al., 2022). Such a scenario is depicted in the following IPUC game, in which the outgroup is identified as the opposing political party (Aaldering & Böhm, 2020).

The ingroup empathy bias is a specific manifestation of the general ingroup bias that focuses on the emotional capacity to feel and resonate with suffering or pain (Fourie et al., 2017; Hou et al., 2025; Vanman, 2016). This bias leads to an empathy gap among outgroup members, but it was suggested to be formable and can be reduced through a conscious shift in perspective and dialogue with members of the outgroup (Fourie et al., 2017; Vanman, 2016; Wang et al., 2015). Ingroup empathy often occurs intuitively, whereas helping the outgroup involves a conscious decision in which costs

and benefits are weighed, especially when the help requires significant effort or resources (Everett et al., 2017; Fourie et al., 2017).

This bias may manifest itself in parochial altruism that is decomposed in a tendency to benefit the ingroup along with a tendency to ignore, derogate, and harm rivaling outgroups (Choi & Bowles, 2007; Rusch, 2016).

Interventions that train mindfulness and compassion have been suggested reduce ingroup bias, and it appears that mindfulness can decrease intergroup bias and reduce differences in the perception of empathy between ingroups and outgroups by promoting cognitive flexibility (Donald et al., 2018; Fuochi et al., 2023; Oyler et al., 2021; Zheng et al., 2023).

The following chapter aims to give more insight into the relationship of mindfulness and the way this influences our interactions with others.

3. Literature review and hypotheses

This chapter aims for a synthesis of current research to derive the theoretical basis for the study's hypotheses. The impact of mindfulness on social behavior has been a common subject of research in recent years (Yi & Mahmud, 2022). Although the initial focus was mainly on the positive effects (Donald et al., 2018) , there are an increasing number of studies that challenge the positive reputation of mindfulness and examine the potential downsides of mindfulness (Schindler, 2020 ; Hafenbrack et al., 2019; Corbi et al., 2024 ;Guo et al., 2022, 2023; Poulin et al., 2021).

3.1. Positive link between mindfulness and prosocial behavior

According to a bibliometric analysis of global research trends on prosocial behavior, mindfulness is a very frequently occurring keyword in academic publications

on prosocial behavior (Yi & Mahmud, 2022). Mindfulness is identified as one of the most important predictors of prosocial behavior, and recent research has particularly focused on how meditation practices can promote prosocial behavior (Yi & Mahmud, 2022).

Mindfulness has been proposed to influence social functioning by fostering empathy, compassion, and perspective-taking (e.g. Condon et al., 2013; Weng et al., 2013). The meta-analysis by Donald et al. suggests that mindfulness significantly increases prosocial behavior, both as a stable trait as well as through mindfulness-based- interventions (Donald et al., 2018). Several aspects and effects of mindfulness have been proposed as possible mechanisms. Since mindfulness can enhance the ability to direct attention, this could increase the likelihood that individuals in a social context will be able to perceive when others need help and develop a greater capacity for perspective-taking which in turn leads them to be more likely to provide assistance (Hafenbrack et al., 2019; Donald et al., 2018; Lv et al., 2021).

Furthermore, mindfulness has been linked to experiencing more positive emotions and better regulation of affective emotions, which increases the likelihood of acting compassionately and helps to suppress egoistic impulses (Hafenbrack et al., 2019; Donad et. al. 2018; Meng & Meng, 2020). In addition mindfulness has been suggested to influence executive functions (Vago & Silbersweig, 2012) as it promotes decentering (Bednar et al., 2020; Lebois et al., 2015), de-automatization of biased responses (Fuochi et al., 2023), and non-attachment to one's own thoughts (Sys et al., 2024; Vago & Silbersweig, 2012). It can thus help to reduce prejudices and biases (Fuochi et al., 2023; Oyler et al., 2021), as one’s own thoughts appear more flexible and are perceived as mental events rather than as fixed truths (Bednar et al., 2020; Lebois et

al., 2015) which fosters empathetic understanding and thereby makes it more likely that people will choose to act in a prosocial way (Donald et al. 2018).

Recent research suggests that mindfulness can also be an effective way to reduce intergroup prejudice (Chang et al., 2023; Oyler et al., 2021). It seems that the decrease in automaticity prevents people from reacting impulsively to stereotypes, and increased cognitive flexibility allows them to better adopt the perspectives of others (Oyler et al., 2021). Additionally, mindfulness can help people experience less stress in social situations, enabling them to act more openly and helpfully in such settings (Bailey et al., 2023; Hafenbrack et al., 2019; Oyler et al., 2021). *Observing* appears to be a consistent predictor of more positive attitudes toward out-groups (Fuochi et al., 2023).

Furthermore, the facets *Describing* and *Nonjudging* correlate significantly with increased "deprovincialization," which describes the ability to no longer perceive one's own group as the universal standard and open up to the perspectives of others (Fuochi et al., 2023). Mindfulness was suggested to help, in the sense of de-automation, to perceive the world in a less stereotypical way and thus to view other social groups with greater openness and acceptance (Fuochi et al., 2023;Vago & Silbersweig, 2012).

Mindfulness training has been associated with promoting outgroup altruism (Zheng et al., 2023). After a brief mindfulness intervention, participants exhibited significantly higher levels of altruism and helpful behavior toward members of ethnic outgroups compared to the control group, as mindfulness was able to reduce parochial empathy and training appeared to help reduce the tendency toward ingroup empathy (Zheng et al., 2023). In summary, mindfulness could be an effective way to break down the automatic boundaries between groups, thereby fostering a more universal form of empathy that could promote prosocial behavior toward outgroups (Fourie et al., 2017;

Oyler et al., 2021; Zheng et al., 2023).

Therefore, it should be expected that people who score particularly high on mindfulness will exhibit more cooperative behavior.

3.2. Negative link between mindfulness and prosocial behavior

Although Donald et al. (2018) is considered one of the most influential studies in the field of mindfulness and prosocial behavior, the positive findings of the meta-analysis have also been criticized and challenged (Dam et al., 2017; Kreplin et al., 2018; Schindler, 2020). One such point of criticism is the high degree of heterogeneity regarding the definitions encompassed by the term mindfulness, which complicates the comparability of existing studies (Levit- Binnun et al., 2021; Schindler, 2020).

As previously discussed, a consensus on a uniform definition of mindfulness remains elusive. Beyond the fundamental distinction between trait and state mindfulness, self-report measures for trait mindfulness often capture divergent constructs rather than a single unified phenomenon (Bergomi et al., 2012). Furthermore, critics argue that many studies reporting a positive impact of mindfulness on prosocial behavior are characterized by significant methodological shortcomings, such as insufficient sample sizes (Chang et al., 2023; Furnell et al., 2024). There is also a noted concern regarding publication bias, where positive outcomes are overemphasized while null findings or potential negative effects are frequently underreported or neglected (Schindler, 2020; Schindler & Pfattheicher, 2021).

In addition prosocial behavior was mainly examined by using self-report measures which are susceptible to social desirability and do not necessarily reflect

actual behavior in everyday life (Feruglio et al., 2022; Kreplin et al., 2018; Schindler, 2020; Schindler & Friese, 2021).

Studies measuring prosocial behavior as actual charitable giving or contribution in an economic game were often unable to replicate the positive effects (Corbi et al., 2024; Feruglio et al., 2022; Schans et al., 2022; Schindler & Pfattheicher, 2021). Other findings indicate that sub aspects of trait mindfulness might even be linked negatively to actual prosocial actions (Schindler & Pfattheicher, 2021). For instance the facet *Nonjudging* of the FFMQ could diminish the moral obligation to help others, since individuals might accept their own negative states without judgment (Schindler & Pfattheicher, 2021). Persons with a high score on *Nonjudging* might be less hard on themselves when they make mistakes, especially in situations that would normally trigger feelings of guilt, and they experience a reduced urge to quickly eliminate or compensate for this unpleasant feeling through a prosocial act (Schindler & Pfattheicher, 2021).

Moreover, the prosocial effects of mindfulness appear not to be uniform across all individuals. Evidence suggests that the relationship between mindfulness and helpful behavior is moderated by an individual's self-construal(Poulin et al., 2021a, 2021b). (Poulin et al., 2021a, 2021b). Specifically, mindfulness appears to amplify an individual's pre-existing social goals and can increase prosociality among those with an interdependent self-construal, but may actually decrease it among those with a more independent self-construal (Poulin et al., 2021; Tse, 2022).

Interestingly the same effects could also be achieved when the self-image was artificially manipulated through priming (Poulin et al., 2021a, 2021b).This finding suggest that mindfulness could unintentionally encourage selfish behavior by shifting

the focus more strongly toward one's own needs and goals (Poulin et al., 2021; Tse, 2022).

Consistent with this assumption, mindfulness also negatively moderates the relationship between intelligence and prosocial behavior and increased mindfulness among highly intelligent individuals leads to less prosocial behavior(Guo et al., 2023). Mindful and intelligent people might have better emotional regulation, which helps them experience less emotional stress when confronted with the suffering of others (Guo et al., 2023).

In a recent study it was pointed out that mindfulness has different effects depending on one's personality type and tends to be counterproductive for people who are poor self-regulators, as it causes them to lose sight of their needs and identity (Thakur & Baumann, 2024).

Other recent findings on the impact of mindfulness training on pro-environmental decisions, in which participants had to complete decision-making tasks involving a conflict of interest between their own self-interest and the well-being of the environment, showed that mindfulness training led to a decrease in sustainable and prosocial decisions (Corbi et al., 2024). This study supports the assumption that the effect of mindfulness on actual prosocial behavior might be highly dependent on the context (Corbi et al., 2024).

Mindfulness could therefore lead people to behave less prosocially, as a state of acceptance reduces their urge to act to achieve social goals (Poulin et al., 2021), and a reduced sense of guilt leads them to engage in fewer compensatory actions to alleviate it (Feruglio et al., 2022; Schindler & Friese, 2021). Mindfulness, by facilitating emotional regulation, could thus also inhibit prosocial behavior (Poulin et al., 2021;

Schindler & Friese, 2021). Consequently, it can be expected that people who are particularly mindful will exhibit less cooperative behavior.

3.3. Research Questions and Hypotheses

Given the current state of literature it seems unclear in which direction the effect of mindfulness on prosocial behavior lies. Whether mindfulness promotes cooperation or causes opposite effects is therefore the research question of this study.

Since the current evidence regarding the effect of mindfulness on prosocial behavior is contradictory, with reports of both positive (Donald et al., 2018) and negative effects (Guo et al., 2023; Poulin et al., 2021), two competing hypotheses for each form of cooperation style of the IPUC Game are proposed below.

H 1a: Mindful Persons will show more universal cooperation

H 1b Mindful persons will show less universal cooperation.

H 2a: Mindful people will show more weak parochial cooperation.

H 2b Mindful people will show less weak parochial cooperation.

H 3a: Mindful people will show more strong parochial cooperation

H 3b: Mindful people will show less strong parochial cooperation.

4. Methods

This chapter describes the methodology used to investigate the relationship between mindfulness and cooperation. It outlines the study design, the recruitment of the sample, and the specific operationalization of the constructs using the group

identification measure, the FFMQ and the IPUC game (Aaldering & Böhm, 2020; Baer et al., 2006, Doosje et al., 1995).

4.1. Present study

The present study aims to investigate how multidimensional trait mindfulness relates to cooperative behavior in intergroup contexts. To address the methodological challenges identified in current research, the following solutions are proposed to overcome limitations of discussed research.

First, prosocial behavior is measured using an objective behavioral measurement, specifically an economic game, which helps avoid potential issues associated with using self-reports (Schindler, 2020; Schindler & Pfattheicher, 2021). While existing studies have examined the influence of mindfulness on prosocial behavior in economic games, this link has never been investigated using the IPUC game (Aaldering & Böhm, 2020).

Implementing this measurement offers the unique possibility to isolate weak parochialism from universal cooperation (Aaldering & Böhm, 2020). This allows for a precise investigation into whether mindfulness fosters a broad, inclusive deprovincialization or merely refines existing ingroup preferences (Fuochi et al., 2023; Oyler et al., 2021). Furthermore, the use of the FFMQ enables a facet-based approach, which allows for the examination of individual facets of mindfulness to determine differences between the subaspects of mindfulness (Baer et al., 2006; Bergomi et al., 2012)

4.2. Participants

This study's questionnaire was implemented using the web application SoSci Survey, and data collection was conducted via the online recruitment platform Prolific. A power analysis was performed for the study's primary analysis, a simple linear regression, using G*Power 3.1 (Faul et al., 2009). The required sample size was determined based on a meta-analysis which examined the relationship between mindfulness and prosocial behavior (Donald et al., 2018). This meta-analysis found a small to medium association (d = .37) between mindfulness and other-report measures of prosocial behavior (Donald et al., 2018). For the present study, this value was converted into an R^2 value leading to an effect size of R^2= 0,033. Given an α-error probability of 0.05 and a desired power (1-beta) of 0.8, the a priori power analysis indicated a recommended sample size of at least 232 participants (Faul et al., 2009). Inclusion criteria required participants to be at least 18 years of age and proficient in English, as the survey was conducted in that language which was ensured by Prolific's pre-screening filters.

To enable the formation of natural groups for the research design, participants were further required to be U.S. citizens and identify as either a Democrat or a Republican. These criteria were implemented using Prolific's pre-screening filters and were cross verified through self-report items at the start of the questionnaire.

Before beginning, all participants were presented with an instruction page providing general information about the study's purpose and a request for informed consent.

It was required to complete all fields. In instances where participants were unable to provide responses to the mandatory questions, their data was deemed incomplete and therefore not included in the analysis.

Recruitment was concluded once the target sample size was reached. The final sample consisted of 232 participants. Demographic data were collected via Prolific's pre-screening filters. The final sample had an average age of 38.5 years (*SD* = 12.34), ranging from 18 to 80 years. Regarding gender identity, 53% (*n* = 123) of participants identified as female, approximately 47% (*n* = 108) as male, and one participant preferred not to disclose their gender. In terms of political affiliation, approximately 60% (*n* = 139) of the participants identified as Democrats, while approximately 40% (*n* = 93) identified as Republicans. For additional information on the sample characteristics, see Appendix C.

4.3. Procedure

The survey itself consisted of 4 conditions. To form two natural groups needed for the IPUC game participants were asked about their political affiliation and had to identify as either Democrats or Republicans. If participants did not identify with either group, they were eliminated from the study. Second they were asked about the identification with their group with four statements of the group identification measure (Doosje et. al 1995). These were formulated according to their political group, either from the perspective of the Democrats or the Republicans. Next the full version of the FFMQ consisting of 39 items was conducted (Baer et al., 2006). Finally, after completing the mandatory test questions to verify that participants had understood the instructions, they were able to make their contributions in the IPUC game (Aaldering & Böhm, 2020) .The average duration of the study was approximately 15.75 minutes (*M* = 945.3 s, *SD* = 471.6 s), with completion times ranging from 4.1 to 50.3 minutes.

Table 1

Reliability of Group Identity and FFMQ

Scale / Facet	McDonald's ω [95% CI]	Cronbach's α [95% CI]
Group Identity (4 items)	.922 [.906, .938]	.914 [.876, .952]
Observing	.827 [.781, .862]	.825 [.778, .859]
Nonjudging	.921 [.900, .936]	.920[.899, .935]
Acting with awareness	.892 [.868, .913]	.864 [.837, .886]
Describing	.881 [.849, .906]	.877 [.844, .903]
Nonreactivity	.773 [.714, .819]	.751 [.684, .796]
FFMQ Total Score	.839 [.810, .869]	—

Note. For the FFMQ total score, only McDonald's omega is reported as it provides a more robust estimate for multidimensional scales compared to Cronbach's alpha.

Internal consistency for all primary measures was evaluated using McDonald's omega (ω) and Cronbach's alpha (α) (Table 1). As specified in current psychometric literature, McDonald's omega was prioritized as it provides a more robust estimate of reliability by allowing for unequal factor loadings (Mattes, 2019). The reliabilities of the individual facets fall within a good to excellent range (see Table 1). Of particular note are the *Nonjudging* (ω = .92), *Acting with awareness* (ω = .89) and *Describing* (ω = .88) facets, which demonstrate very high internal consistency (Mattes, 2019). The *Nonreactivity* facet yielded the lowest reliability (ω = .77), which is consistent with previous research findings that often report lower values for this dimension compared to the other mindfulness facets (Lecuona et al., 2021; Mattes, 2019). This may be due to the higher cognitive complexity required for participants to evaluate these specific

items (Mattes, 2019). However, the value remains well above the conventional threshold of .70, indicating sufficient reliability for further analysis.

The FFMQ Total Score (ω = .84) also showed good reliability. It is important to note that certain items from *Observing* (M1, M11, M20), one item from the *Acting with Awareness* facet (M28) and one *Nonreactivity* facet (M29) correlated negatively with the total scale during initial checks. This is often observed in non-meditating samples, where the tendency to observe experiences may not initially align with other non-judgmental or aware components of mindfulness (Mattes, 2019).

The group identity scale demonstrated excellent reliability (ω = .92). It confirms that the participants' psychological identification with their ingroup was measured with high precision. Overall, the psychometric properties provide a stable foundation for the planned regression analyses.

4.5. FFMQ

Five Facet Mindfulness Questionnaire was chosen to measure trait mindfulness because it is considered one of the most comprehensive and robust instruments in current research design, despite the general limitations of self-report procedures (Lecuona et al., 2021). The questionnaire consists of 39 items that evaluate five dimensions of mindfulness with a five-point Likert scale used for the scale (Baer et al., 2006). Participants are asked to rate statements with what describes best their opinion or is generally true for them, ranging from 1 (never or very rarely true) to 5 (very often or always true).

The five dimensions *Observing, Describing, Acting with awareness, Nonjudging* and *Nonreactivity* represent five distinct areas of competence (Baer et al., 2008).

The first dimension, *Observing*, refers to the conscious perception and attention to both internal and external stimuli (Baer et al., 2008). This includes physical sensations, thoughts, and emotions as well as sensory impressions such as sounds or visual details (Baer et al., 2008; Bergomi et al., 2012). This facet primarily reflects sensory and cognitive alertness to the environment and one's own self (Bergomi et al., 2012). “I pay attention to sensations, such as wind in my hair or sun on my face." (Baer et al., 2006).

Describing reflects the ability to make these experiences accessible by language.It refers to the skill to label perceived inner experiences and to put them into words precisely (Baer et al., 2008; Bergomi et al., 2012). The focus here is on clearly identifying and naming feelings and thoughts (Baer et al., 2008). "I’m good at finding words to describe my feelings” (Baer et al., 2006).

The third dimension, *Acting with awareness*, focuses on undivided concentration on the current activity in the here and now (Baer et al., 2008). It can be understood as the functional counterpart to acting on “autopilot,” in which individuals function mechanically while their attention is disconnected from the present situation. (Baer et al., 2008; Bergomi et al., 2012). All items measuring Acting with awareness are formulated negatively since they measure states of inattention like “I find myself doing things without paying attention"(Baer et al., 2006).

While the previous three facets are considered components that monitor attention, the following two facets can be described as attitudinal components. This attitude determines which response, such as stress, is triggered by the perception.

Nonjudging of inner experience refers to a non-judgmental attitude towards one's own mental states (Baer et al., 2006). Instead of evaluating thoughts or feelings as good, bad, or inappropriate, they are accepted in a neutral manner (Baer et al., 2008). In this subscale all items are phrased negatively, as it concerns refraining from the habit of

making automatic judgments like "I tell myself I shouldn't be feeling the way I'm feeling"(Baer et al., 2006).

Finally, *Nonreactivity* to inner experiences describes the tendency to allow thoughts and feelings to come and go without being immediately carried away by them or reacting impulsively to them (Baer et al., 2008; Bergomi et al., 2012). This facet enables a form of distancing, through which emotions can be consciously perceived without immediately controlling the individual's behavior like "When I have distressing thoughts or images, I just notice them and let them go "(Baer et al., 2006). For a detailed overview of the individual items assigned to each facet, please refer to Appendix B.

The division into these five facets makes the FFMQ a comprehensive tool that integrates various theoretical currents of mindfulness research (Bergomi et al. 2012,Lecuona et al., 2021) Measuring mindfulness as a multidimensional construct can furthermore help to minimize problems of social desirability or misinterpretations (Aguado et al., 2015; Durmaz et al., 2019). By asking about specific behaviors rather than abstract concepts, the measurement becomes more objective and less susceptible to participants' preexisting knowledge of the concept of mindfulness (Durmaz et al., 2019).

Furthermore the ability of the FFMQ to statistically isolate specific facets of mindfulness is particularly essential for investigating complex social behaviors, such as those required in the IPUC game (Fuochi et al., 2023).

4.6. IPUC Game

The IPUC game offers a precise distinction when measuring cooperative behavior, since it can distinguish between different strategies to cooperate in a nested

social dilemma, as self-interest, parochial interest, and universal interest are in conflict with each other (Aaldering et al., 2018; Aaldering & Böhm, 2020). For one, players can decide whether they want to benefit only their ingroup (weak parochial cooperation) or maximize the overall outcome for all groups (universal cooperation), furthermore there is also the option of favoring the ingroup while actively harming the outgroup (strong parochial cooperation) (Aaldering & Böhm, 2020; Wit & Kerr, 2002a, 2002b).

The following description of the IPUC game instructions and procedure follows the paradigm established by Aaldering and Böhm (Aaldering & Böhm, 2020).

Participants are told they are assigned to a four-person team based on their political affiliation and interact with an opposing team of four members from the other party. Each participant receives an endowment of 10 chips, which they can distribute freely among the 4 pools. The task represents a complex social dilemma where participants had to decide how to allocate their chips among four options, reflecting different prosocial and intergroup motivations. Pool 1 represents within-group cooperation, where every chip invested was doubled and divided equally among the four team members (a return of 0.5 chips per member). Pool 2 has the same payout as pool 1 but adds an outgroup harming component: every chip invested also resulted in a loss of 0.25 chips for each member of the opposing team, thereby measuring parochial altruism or intergroup harm. Pool 3 serves as a measure of universal cooperation since each chip invested is multiplied by 3.2 and shared equally among all eight members of both teams (a return of 0.4 chips per person). Finally, pool 4 allows participants to keep chips for themselves.

The IPUC Game can thus distinguish more clearly between the motives behind prosocial behavior by measuring subtle preferences and helps to more realistically capture the complexity of social interaction, namely between universal prosocial

behavior (benefiting everyone), weak parochialism (benefiting only the in-group), strong parochialism (benefiting the in-group while harming the out-group) and egoism (Aaldering et al., 2018; Aaldering & Böhm, 2020; Grigoryan et al., 2022).

Playing the game for only one round without feedback and under full anonymity ensures that motives such as reputation and reciprocity are ruled out (Gächter & Herrmann, 2008; Schneider & Shields, 2022). This design allows for the behavioral disentanglement of intrinsic individual preferences from strategic or reactive behavior (Aaldering & Böhm, 2020; Reuben & Suetens, 2009).

Before the actual task starts participants are provided with detailed written instructions (see Appendix B) and required to pass comprehension questions to ensure they understand the payout consequences for both their own and the opposing team. The amount of chips allocated to the pools served as the measure.

4.7. Group identification measure

To assess the level of identification with their respective political group, a four-item scale was employed (Doosjse et al., 1995). This measure is widely used to capture the cognitive and affective components of social identification (Chesterman et al., 2021). The items were adapted to refer to the participant's political affiliation (Democrat or Republican). Responses were recorded on a 7-point Likert scale, ranging from 1 (strongly disagree) to 7 (strongly agree), where higher scores indicate a stronger sense of belonging and attachment to the ingroup (Chesterman et al., 2021). A complete list of the items is provided in Appendix B.

4.8. Ethics and Open Science

To ensure the scientific integrity and reliability of the psychological research conducted in this study, the principles of transparency and open science were followed. Transparency was maintained through a public declaration of the research design, methodology, and analysis plan prior to data collection: https://aspredicted.org/wz7c5.pdf

This procedure ensures that the hypotheses and methods are established a priori, thereby preventing the potential for questionable research practices. To facilitate better comprehension and enable replication, the study's pre-registration, the collected data, and the analysis are accessible at the following link: https://osf.io/36v2a/

Although no formal ethical approval was sought from an institutional review board for this study, all research procedures were conducted in strict accordance with the ethical guidelines for research involving human participants (Deutsche Gesellschaft für Psychologie [DGPs] & Berufsverband Deutscher Psychologinnen und Psychologen [BDP], 2016).

Participation was entirely voluntary and conducted on a fully anonymous basis. Prior to the commencement of the study, all participants were required to provide informed consent. They were explicitly informed of their right to withdraw from the study at any time, without providing a reason and without any negative consequences. Furthermore, the study utilized exclusively established and non-invasive psychometric instruments, such as the Five Facet Mindfulness Questionnaire, which is a widely validated measure in psychological research (Lecuona et al., 2021; Mattes, 2019). Finally, the IPUC game was implemented without any form of participant deception, ensuring that all information provided regarding the task and the interaction was accurate.

5. Results

In this chapter, the findings of the empirical investigation are presented. First results of the main analyses are presented, which examines how trait mindfulness relates to the distribution of resources across the different IPUC cooperation pools (Aaldering & Böhm, 2020). Additional exploratory findings are also reported to provide a comprehensive picture of the data.

5.1. Main results

Prior to the main analyses, the assumptions for linear regression were evaluated. For all models, the independence of residuals was confirmed by Durbin-Watson statistics ranging from 1.89 to 2.15, indicating no significant autocorrelation. Casewise diagnostics for pools 3 and 4 revealed no influential outliers. For pools 1 and 2, while a few outliers were present, their Cook's distance values remained well below 1.0 (max. D = 0.12), suggesting no undue influence on the results. Visual inspection of the residuals versus predicted plots showed patterns typical of discrete allocation data and floor effects, while Q-Q plots indicated that the models were sufficiently robust against minor deviations from normality given the sample size (N = 232).

The robust descriptive analysis using a non-parametric bootstrapping procedure (1,000 resamples) revealed that pool 4 was the dominant strategy among participants, with a significantly higher mean allocation (M =3.3, 95% CI [2.900, 3.717]) compared to the other three pools (see Table A2 in Appendix C). A visual representation of the contribution distributions for each behavioral strategy measured in the IPUC game (weak parochialism, strong parochialism, universal cooperation, and egoism) can be found in Figure 8 in Appendix C.

To examine the influence of mindfulness on decision-making behavior within the IPUC game, four simple linear regression analyses were conducted using the FFMQ total score as the predictor (Table 2). Regarding contributions to pool 1, pool 2, and pool 3, no statistically significant effects of mindfulness were observed. For pool 1, the model showed no explanatory power (B= .25, p = .48).

Table 2

Main analysis: Summary of simple linear regressions FFMQ overall score

Analysis	Term	*B*	95% CI	*β*	*SE*	*p*-value
Pool 1		1.312	[-1.13, 3.76]		1.241	.291
	Mindfulness	0.253	[-0.46, 0.97]	0.046	0.364	.487
Pool 2		1,919	[0.46, 3.38]		0.744	.011*
	Mindfulness	0.080	[-0.34, 0.50]	0.024	0.216	.713
Pool 3		0.540	[-2.48, 3.56]		1.543	.727
	Mindfulness	0.535	[-0.35, 1.42]	0.078	0.452	.238
Pool 4		8.160	[5.04, 11.28]		1.594	< .001***
	Mindfulness	-1.437	[-2.35, -0.52]	-0.199	0.467	.002**

Note. Pool 1 Model: Adjusted R^2: *-.002*.
Pool 2 Model: Adjusted R^2: *-0.004.*
Pool 3 Model: Adjusted R^2 .002.
Pool 4 Model: Adjusted R^2 *.04.*
B = unstandardized regression coefficient; *CI* = confidence interval; *β* = standardized regression coefficient; *SE* = standard error. * $p < .05$, ** $p < .01$., *** $p < .001$

Similarly, no significant relationship was found for pool 2 (B= .080, p =.713) pool 3 (B = .54, p = .238) and These findings suggest that general mindfulness in this sample is not a direct predictor for an increase in contributions to collective pools.

In contrast, the analysis for pool 4 yielded a statistically highly significant relationship. Mindfulness emerged as a significant negative predictor for the resources retained in the private pool (B = - 1.44, p = .002, adjusted R^2 = .04). The model explains 4.0% of the variance. This finding suggests that higher mindfulness is associated with a significant reduction for egoistic impulses. In summary, mindfulness seems to be a significant negative predictor of pool 4 within this sample. The effect of trait mindfulness in the IPUC game appears to lie less in an active increase of specific collective contributions and primarily in the reduction of egoistic tendencies.

5.2. Explorative analysis

For the exploratory analyses involving all five mindfulness facets as predictors, regression diagnostics were conducted for each pool to ensure model stability. Given the conceptual overlap between mindfulness facets, particular attention was paid to multicollinearity. The maximum condition index was 22.41, which is well below the threshold of 30, and Variance Inflation Factors remained within acceptable limits, indicating no problematic redundancy among the predictors. Like the main models, visual inspection of the residuals indicated slight heteroscedasticity and heavy tails in the Q-Q plots. However, the linear regression framework is considered robust to such deviations in samples of this size (N= 232) (Ernst & Albers, 2017; Feng et al., 2022). Furthermore, Cook's distance confirmed that no influential outliers (all D < 1.0) disproportionately affected the exploratory results.

The descriptive distribution of the five mindfulness dimensions of the FFMQ is presented in Figure 2 in Appendix C. The distribution is showing a broad range of scores without extreme ceiling or floor effects. The detailed frequency distributions of the individual facets of mindfulness are presented graphically in Appendix C (Figures 3–7).

As displayed in Table 3, none of the models for pools 1–3 explained substantial variance in allocation behavior (R^2s = .01–.03), and no individual mindfulness facet reached statistical significance ($p > .27$).

Table 3

Explorative analysis: summary of multiple regression analyses with FFMQ facets

Predictor	Pool 1 (β)	Pool 2 (β)	Pool 3 (β)	Pool 4 (β)
Observing	-.018	-.034	-.022	.064
Describing	.177	.092	-.086	-.085
Nonjudging	-.030	-.036	.112	-.063
Nonreactivity	.024	.122	.110	-.190*
Acting with Awareness	.005	.031	.024	-.053
R^2	.012	.026	.028	.061*
F	0.553	1.216	1.281	2.950*
p	.751	.302	.273	.013*

Note. β = standardized regression coefficient. Significance is highlighted for Pool 4 where the overall model and the facet Nonreactivity reached statistical significance. *$p < .05$, ** $p < .01$., *** $p < .001$

Consistent with the main analysis only pool 4 reached statistical significance. For the private pool the model accounted for approximately 6 % of the variance, with a significant negative effect of *Nonreactivity* (β= *-.19; p* = .011).

Higher scores on *Nonreactivity* were associated with smaller investments in pool 4, indicating that higher levels of non-reactive mindfulness are associated with less egoistic decision tendencies. All other mindfulness facets showed no meaningful effects on any of the pools and therefore seem not to play a significant role in determining the decision to contribute to cooperative pools.

The fact that mindfulness emerged as a significant predictor for pool 4 in both the main analysis (total score) and the exploratory analysis (*Nonreactivity*) underscores the robustness of this finding.

To gain further insights into the present data, the impact of identification with one's own group (Democrats or Republicans) on weak (pool 1) and strong (pool 2) parochialism was examined (Table 4). The descriptive analysis of the group identity measure revealed a strong sense of identification among participants. The distribution is negatively skewed, indicating a ceiling effect where most espondents reported high levels of group belonging (see Figure 1 Appendix C)

Two simple linear regression were conducted to determine if the degree of group identification predicts participants' cooperative behavior with their ingroup (Table 4). For pool 1, group identification was not a significant predictor of contributions (B = 0.17, p =.262). Similarly, no significant relationship was found for pool 2 (B = -0.02, p = .893). The negligible variance explained by these models (Adjusted $R^2 \leq .001$) indicates that the participants' identification with their ingroup did not drive their sharing decisions, so neither the amount participants contributed to the benefit of their

own group nor their tendency to engage in behaviors that favor the ingroup at the expense of the outgroup was influenced by the identification with the political party. To investigate the specific dynamics between self-interest and ingroup welfare, an exploratory analysis was conducted using a calculated score for relative ingroup cooperation, defined as the numerical difference between contributions to pool 1 (weak parochial cooperation) and pool 4 (egoism).

Table 4

Explorative analysis: Summary of simple linear regression analyses for group identification predicting contributions to pool 1 and pool 2

Analysis	Term	*B*	95% CI	*β*	*SE*	*t*	*p*-value
Pool 1		1.212	[-0.491, 2.916]		0.865	1.402	.162
	Group Identification	0.168	[-0.126, 0.463]	.074	0.149	1.126	.262
Pool 2		2.313	[0.423, 4.203]		0.959	2.411	.017*
	Group Identification	-0.022	[-0.349, 0.304]	-.009	0.166	-0.135	.893

Note. pool 1 adjusted R squared: .001;pool 2 adjusted R squared: .000
B = unstandardized regression coefficient; *CI* = 95% confidence interval; *β* = standardized regression coefficient; *t* = test statistic. * $p < .05$, ** $p < .01$., *** $p < .001$

In research on intergroup dilemmas, it is common to use measures of difference to reflect the relative preference for one group over another (Ruffle & Sosis, 2005).The decision to implement this measure was specifically driven by the findings of the

primary analysis, which revealed that mindfulness significantly reduced participants' egoistic tendencies. Since the main analysis showed that trait mindfulness primarily impacted the private pool rather than absolute ingroup cooperation, relative ingroup cooperation serves as a measure to capture how individuals reduce their egoistic impulses to contribute relatively more in favor of their ingroup.

A simple linear regression analysis was conducted to examine the effect of mindfulness on relative ingroup cooperation (Table 5). The overall model was statistically significant, F=6.26, p= .013) accounting for 2.2% of the variance (Adjusted R^2 = .022). Mindfulness was found to be a significant positive predictor of relative ingroup cooperation (B =1.70, ß= .16, p = .013), suggesting that as trait mindfulness increases, so does the willingness to prioritize the ingroup over one's own interests, as the focus shifts toward cooperation with one's own group.

Table 5

Explorative analysis: simple linear regression predicting relative ingroup cooperation

Term	B	95% CI	β	SE	*p*-value
	-6.848	[-11.39, -2.31]	—	2.305	.003**
Mindfulness	1.690	[0.36, 3.02]	0.163	0.675	.013*

Note. Adjusted R-squared: .022.
B = unstandardized regression coefficient; CI = 95% confidence interval; β = standardized regression coefficient; SE = standard error. * $p < .05$, ** $p < .01$., *** $p < .001$

To further explore the data, a multiple regression analysis was conducted with the five FFMQ mindfulness facets as predictors of relative ingroup cooperation (Table 6). The multifaceted model did not reach statistical significance (F= 1.91, p= .093, Adjusted R^2 = 0.019). A comparison of the two models reveals that the aggregate mindfulness score

is a more robust predictor of the shift to ingroup welfare than the individual facets. While the Adjusted R^2 decreased from .022 to .019 when breaking mindfulness down into its subdimensions, collinearity diagnostics (all VIF < 1.5) confirmed that this lack of significance is not due to redundant overlap between the facets. Instead, it suggests that the influence on relative cooperation arises from a global mindful disposition rather than being driven by one specific facet.

Table 6

Explorative Analysis: multiple regression with facets of FFMQ as predictors of relative ingroup cooperation

Outcome	Term	B	95% CI	β	SE	*p*-value
Relative ingroup cooperation		-6.299	[-11.02, -1.58]		2.397	.009**
	Observing	-0.349	[-1.29, 0.59]	-0.054	0.477	.465
	Describing	0.750	[-0.14, 1.64]	0.121	0.453	.099
	Nonjudging	0.142	[-0.65, 0.93]	0.028	0.402	.724
	Nonreactivity	0.810	[-0.26, 1.72]	0.119	0.509	.113
	Acting with Awareness	0.219	[-0.66, 1.09]	0.039	0.444	.622

Note. Adjusted R-squared: 0.019
B = unstandardized regression coefficient; *CI* = confidence interval; *β* = standardized regression coefficient; *SE* = standard error. * $p < .05$, ** $p < .01$., *** $p < .001$

Independent samples t-tests were conducted to examine whether there were significant differences between Democrats and Republicans regarding relative ingroup

cooperation and pool 2 (Table 7). For the relative ingroup cooperation no statistically significant difference was found between Democrats (M = -0.73, SD = 4.63) and Republicans (M = -1.72, SD = 4.13), t = 1.676, p = .095. While Democrats showed a descriptively higher mean, this difference did not reach statistical significance. This indicates that political affiliation was not a primary driver of how individuals prioritized their private gains relative to the benefits of their ingroup.

Similarly, the analysis for pool 2 revealed no significant differences between the political groups, t = -0.548, p = 0.584 . The mean scores for Democrats (M = 2.11, SD = 2.58) and Republicans (M = 2.30, SD = 2.64) were nearly identical, suggesting that political affiliation does not predict the willingness to actively harm the outgroup in this sample.

Table 7

Explorative analysis: independent samples t-tes comparing political affiliation

Variable	Group	N	M	SD	*t*	df	*p*-value
RIC	Democrat	139	-0.726	4.625	1.676	230	.095
	Republican	93	-1.722	4.132			
Pool 2	Democrat	139	2.108	2.584	-0.548	230	.584
	Republican	93	2.301	2.683			

Note. N = sample size; M = mean; SD = standard deviation; t = test statistic; df = degrees of freedom. * $p < .05$, ** $p < .01$., *** $p < .001$

To determine whether the motivation to benefit one's own group was driven by a desire to simultaneously harm the outgroup, a paired samples t-test was conducted to compare the mean scores of pool 1 and pool 2 (Table 8). The results indicate no statistically significant difference between Pool 1 (M = 2.17, SD = 2.37) and Pool 2 (M

= 2.19, *SD* = 2.62). The effect size, as measured by Cohen's *d*, was negligible (*d* = -0.004). This finding suggests that the outgroup harming component acted neither as a deterrent nor as an additional incentive for cooperation in this sample.

Table 8

Explorative Analysis: Paired samples t-test

Measure	N	M	SD	t	df	*p*-value	Cohen's d
Pool 1	232	2.169	2.368	-0.064	231	.949	-0.004
Pool 2	232	2.186	2.620				

Note. *N* = sample size; *M* = mean; *SD* = standard deviation; *t* = test statistic; *df* = degrees of freedom. Cohen's *d* represents the effect size. * $p < .05$, ** $p < .01$., *** $p < .001$

To investigate the potential moderating role of political affiliation on the relationship between mindfulness and relative ingroup cooperation a moderation analysis was performed (Table 9).

The overall model was statistically significant, explaining approximately 3.8% of the variance ($F = 4.07$, $p = .008$, Adjusted $R^2 = .038$). In this model, neither the main effect of mindfulness ($B = -0.81$, $p = .734$) nor the main effect of political affiliation ($B = -4.45$, $p = .357$) reached statistical significance. Crucially, the interaction between mindfulness and political affiliation also did not reach significance ($B = 1.67$, $p = .235$). This suggests that the influence of mindfulness on relative ingroup cooperation remains consistent across the political spectrum. The non-significant interaction demonstrates that the psychological mechanism remains robust regardless of political identity.

To assess whether mindfulness also reduces the classic preference for the ingroup over a universal collective, another exploratory regression was conducted with

a therefore-calculated ingroup bias (pool 1 -pool 3) as the dependent variable (Table 10). In contrast to the results for relative ingroup cooperation, mindfulness was not a significant predictor of ingroup bias (*B*= -0.282, *p* = .670). This suggests that while mindfulness shifts resources from the self to the ingroup, it does not diminish the preference for the ingroup over a universal collective.

Table 9

Explorative Analysis: Moderation Analysis

Term	B	95% CI	β	SE	*p*-value
	-0.239	[-16.53, 16.05]	—	8.268	.966
Mindfulness (M)	-0.811	[-5.50, 3.88]	-0.078	2.381	.734
Political Affiliation (A)	-4.451	[-5.05, 14.00]	-0.491	4.825	.357
M * A	-1.668	[-1.10, 4.43]	0.648	1.402	.235

Note. Adjusted R-squared: 0.038
B = unstandardized regression coefficient; *CI* = 95% confidence interval; β = standardized regression coefficient; *SE* = standard error. * $p < .05$, ** $p < .01$., *** $p < .001$

Table 10

Exploratory Analysis: Simple Linear Regression Predicting Ingroup Bias

Term	B	95% CI	β	SE	p-value
	0.772	[-3.66, 5.21]	—	2.252	.732
Mindfulness (M)	-0.282	[-1.58, 1.02]	-0.028	0.660	.670

Note. Adjusted R-squared: < .001.
B = unstandardized regression coefficient; *CI* = 95% confidence interval; β = standardized regression coefficient; *SE* = standard error. Ingroup bias is defined as the difference between contributions to pool 1 and pool 2 .

6. Discussion

6.1. Results of the main analysis

The primary goal of this study was to investigate whether mindfulness can predict a specific cooperation style in the IPUC Game. Based on the available data, this could not be confirmed. The results demonstrate that mindfulness does not act as a predictor of one of the three cooperative pools but instead could play a role in regulating self-interested behavior. While these results suggest that reduced contributions to the egoistic pool generally leads mindful people to behave more cooperatively, a specific strategy could not be predicted. Therefore, hypothesis 1a-3a could not be confirmed. This is consistent with previous research that found no significant effect between mindfulness and prosocial behavior in economic games (Feruglio et al., 2022; Schans et al., 2022; Schindler & Pfattheicher 2021). This could be because self-reports that found a positive association do not measure actual behavior, as is the case in economic games (Feruglio et al., 2022; Schans et al., 2022; Schindler & Pfattheicher 2021).

While no significance was confirmed for the three cooperative options (pool 1, pool 2, pool 3), mindfulness emerged as a significant negative predictor for the private pool (pool 4) in the main analysis. The significant negative impact of mindfulness on pool 4 contributions indicates a clear reduction in egoistic impulses. Due to the fixed-sum structure of the IPUC game, any resources not allocated to the private pool are necessarily redistributed among the prosocial options (pools 1, 2, and 3) (Aaldering & Böhm, 2020). The absence of significant effects in any single prosocial pool suggests that mindfulness does not promote one specific type of prosociality. Instead, it appears that mindfulness acts as a catalyst that reduces the salience of personal monetary rewards (Feruglio et al., 2022), thereby allowing individuals to follow their pre-existing prosocial tendencies. In this view, mindfulness facilitates prosocial behavior not by imposing a new motivation, but by 'clearing the path' through the reduction of self-interest (Hafenbrack et al., 2019).

6.2. Results of the explorative analysis

The explorative analysis identifies *Nonreactivity* as the primary driver of this inhibitory effect. The analysis revealed a significant negative relationship between *Nonreactivity* and contributions to pool 4, while other facets remained non-significant. *Nonreactivity* is defined as the capacity to perceive internal impulses without feeling the need to act upon them immediately (Schans et al., 2022). This finding suggests that *Nonreactivity* serves as a regulatory buffer against immediate, self-serving impulses as high *Nonreactivity* can inhibit the automatic enactment of egoistic choices (Feruglio et al., 2022; Schans et al., 2022). Interestingly, the lack of significance for the *Nonjudging*

facet supports the idea that while accepting one's thoughts is part of mindfulness, it does not necessarily lead to behavioral inhibition; it may even reduce the distress such as feelings of guilt or shame associated with selfish desires (Feruglio et al., 2022; Lecuona et al., 2021). In contrast, *Nonreactivity* specifically targets decoupling automatic impulses from social action and can serve as a critical buffer against egoistic motives in competitive environments (Feruglio et al., 2022; Lecuona et al., 2021; Schans et al., 2022).

In addition to mindfulness, the role of social identity was explored to determine whether the intensity of political affiliation predicts parochial cooperation. Contrary to expectations derived from social identity theory, which posits that stronger group identification typically amplifies ingroup favoritism and outgroup discrimination (Hoenow & Pourviseh, 2023; Durrheim et al., 2016; Khadka, 2024; Tajfel & Turner, 2004), the present results found no such relationship. Identification with one’s political party was not a significant predictor for either weak parochialism or strong parochialism. The negligible variance explained by these models indicates that sharing decisions in the IPUC game were independent of how strongly participants identified with their respective political groups. This suggests that in this experimental setting, the parochial choices were likely driven by other factors than political identity strength. This could be explained by this lack of real incentives in this study. Sincet this version of the IPUC game used only hypothetical payouts the scenario may not have been sufficient to trigger identity-based conflicts or preferences (Balliet et al., 2014; Masella et al., 2012; Thielmann et al., 2016).

To better understand the trade-off between self-interest and group benefits, an exploratory analysis focused on relative ingroup cooperation (the difference between contributions to pool 1 and pool 4). This measure serves as an indicator of the extent to

which participants are willing to reduce their egoistic impulses in favor of their own political group. This approach was chosen because primary analysis indicated that mindfulness does not necessarily increase absolute cooperation but significantly reduces egoism. The results of the simple linear regression demonstrate that trait mindfulness is a significant positive predictor of relative ingroup cooperation. This suggests that as individuals become more mindful, their willingness to prioritize the ingroup over their own interests increases (Hafenbrack et al., 2019). In the context of social dilemmas, this shift indicates that mindfulness could facilitate a movement away from individual utility maximization toward a more group-oriented allocation (Feruglio et al., 2022; Iwamoto et al., 2020).

An investigation into the individual facets of the FFMQ provided further methodological insights into the structure of this effect. The multiple regression model, including all five facets as predictors, did not reach statistical significance, but the fact that the total score remains a more robust predictor than any single facet suggests a synergistic effect of the mindfulness construct (Azizi et al., 2021; Schans et al., 2022). It seems that the interplay between dimensions collectively facilitates the balance between the self and the ingroup.

In addition, the exploratory analysis revealed that political affiliation did not significantly influence social resource allocation in this sample. No statistical differences were found for relative ingroup cooperation or strong parochial cooperation. While Democrats showed a descriptively higher mean in relative ingroup cooperation compared to Republicans, the lack of significance suggests that political identity was not the primary driver of the trade-off between private gain and group benefit. These findings again are contrary to expectations derived from social identity theory, which posits that stronger group identification typically amplifies in-group favoritism and

out-group discrimination (Khadka, 2024; Tajfel & Turner, 2004). As mentioned above, the absence of this effect could be due to the fact that in the game scenario of the present study, investing in the pools was not linked to an actual payout. Research suggests that identity-based biases are often activated by real interdependence (Balliet et al., 2014; Masella et al., 2012). Without a real payoff, the need to defend one's political group may have been insufficient. (Balliet et al., 2014; Masella et al., 2012; Thielmann et al., 2016).

The results of the paired samples t-test between Pool 1 and Pool 2 suggest that group dynamics one would expect to arise from such strong group identities as political affiliation did not come into play in this setting. The outgroup-harming component of the IPUC game acted neither as an additional incentive nor as a deterrent for participants. Participants were equally willing to contribute regardless of whether it harmed the political opponent, reinforcing the conclusion that the political divide was not a salient conflict-driver in this experimental setting (Chakravarty et al., 2016).

The exploratory moderation analysis revealed that the relationship between mindfulness and relative ingroup cooperation is not significantly altered by political affiliation. While the main effect of mindfulness was non-significant within this specific interaction model, the interaction between mindfulness and political identity also failed to reach significance. This lack of a significant interaction suggests that the psychological mechanism by which mindfulness facilitates a shift from egoistic impulses toward collective prioritization remains consistent across the political spectrum. These findings support the conceptualization of mindfulness as a fundamental regulatory system that recalibrates the balance between the self and others independently of ideological convictions (Hafenbrack et al., 2019; Schindler & Pfattheicher, 2021).

By reducing the salience of monetary rewards and mitigating personal egoistic impulses, mindfulness appears to facilitate a more ingroup-oriented focus (Feruglio et al., 2022; Iwamoto et al., 2020). This finding could be relevant for research on political fragmentation, as it suggests that trait mindfulness could serve as a buffer against egoism, even in highly polarized social contexts (Chakravarty et al., 2016; Hoenow & Pourviseh, 2023).

While mindfulness significantly modulates the balance between self-interest and ingroup welfare, it appears to have no impact on the boundary between parochial and universal cooperation in this sample. This pattern suggests that mindfulness primarily fostered a reduction in egoistic impulses without necessarily dissolving the social categorization that leads to a preference for one's own group over a broader collective (Dang et al., 2020; Schweda et al., 2019). Consequently, these findings indicate that while mindfulness can encourage individuals to prioritize their group over themselves, it may not inherently reduce the selective favoritism of the ingroup when compared to a universal outgroup (Aaldering & Böhm, 2020; Hafenbrack et al., 2019).

The results of the exploratory analysis regarding political identity provide evidence of the robustness of the mindfulness effect, which seems to extend even beyond political affiliations. The absence of a significant difference between Democrats and Republicans in terms of relative cooperation, as well as the non-significant moderation effect, indicate that the reduction in selfishness induced by mindfulness might be a fundamental psychological process (Mosleh et al., 2020; Schweda et al., 2019).

This suggests that mindfulness may be a tool that, while not directly promoting prosocial behavior, at least reduces self-interest, regardless of the ideological lens through which a person views the social world (Hafenbrack et al., 2019; Oyler et al.,

2021). For research, this means that mindfulness has a positive effect on social interaction and that this effect extends beyond partisan political identities (Mosleh et al., 2020).

6.3. Limitations

Despite the significant findings, several limitations of the present study must be acknowledged. First, in this study, mindfulness was measured solely as a trait. Although the concepts of state and trait mindfulness are interrelated the results would be more meaningful if both could be assessed to gain a more precise understanding of how they influence behavior. Future research should employ experimental designs, involving mindfulness interventions, to establish a causal link (Rahrig et al., 2024; Simonsson et al., 2021).

Another limitation of the current study is the lack of baseline measures for individual prosocial tendencies. While the results suggest that mindfulness strengthens idiosyncratic predispositions by reducing egoistic impulses, this mechanism could not be directly tested. Future research should employ a pre-post manipulation design to address this. In such a setup, participants would play the IPUC game twice, once at baseline and once following a mindfulness induction. This would allow researchers to test whether mindfulness allows to reveal an individual's original behavioral tendency. For instance, a person with a baseline inclination toward universal cooperation would be expected to increase their contributions to pool 3 even further after the manipulation. Such a design would provide empirical evidence for the theory that mindfulness facilitates prosociality by diminishing self-centered barriers rather than creating a uniform prosocial motive (Hafenbrack et al., 2019; Iwamoto et al., 2020).

Furthermore, the study utilized a hypothetical version of the IPUC game where participants played for fictional chips rather than real monetary incentives. Research in experimental economics suggests that the absence of financial stakes can lead to a hypothetical bias, where participants may show higher levels of prosociality or lower levels of strategic caution than they would in incentive-compatible settings (Thielmann et al., 2016) This may have influenced the observed intensity of both ingroup love and outgroup hate motives (Halevy et al., 2011).

Another limitation of the present study concerns the variability in participants' completion times. While all datasets were screened for completeness, no time-based exclusion criteria (e.g., excluding 'speeders') were applied. The descriptive analysis revealed a high standard deviation in completion time, with a minimum completion time of only 4.1 minutes. In online research, such a broad range suggests heterogenous levels of participant engagement and potential distractions in the uncontrolled online environment (Aust et al., 2012). Specifically, very fast completion times may indicate satisficing behavior, where participants provide answers without full cognitive effort to minimize time spent on the task (Douglas et al., 2023). Although Prolific generally provides high-quality data, the lack of a minimum time threshold means that 'noise' from inattentive responding cannot be fully ruled out as a factor influencing the results (Buchanan & Scofield, 2018; Douglas et al., 2023). Future research should implement objective attention checks or predefined time-filters to further enhance data stringency (Aust et al., 2012).

In addition, the cultural context of the study is a significant limitation. The data were collected exclusively within the United States, an individualistic society currently experiencing extreme levels of affective polarization (Dimant, 2023; Oc et al., 2018). Findings regarding the role of mindfulness in intergroup cooperation might differ

substantially in collectivist cultures, where group cohesion and social harmony are emphasized differently (Balliet et al., 2016). In such cultures, the relationship between mindfulness and ingroup loyalty might be even more pronounced, or the regulatory function of mindfulness could manifest through different social norms (Baumgartner & Morgan, 2019).

Finally, the reliance on self-report measures for mindfulness, political identity may introduce social desirability bias (Baumgartner & Morgan, 2019). Future studies could supplement these with behavioral markers or physiological data. Moreover, longitudinal research is needed to determine if mindfulness training can reduce political polarization over time rather than just predicting static social preferences (Rahrig et al., 2024; Simonsson et al., 2021). Exploring the underlying mechanisms, such as reduced cognitive depletion or enhanced emotion regulation, remains a vital task for further research (Baumgartner & Morgan, 2019; Rahrig et al., 2024; Ramstetter, 2021).

6.4. Conclusion and suggestions for further research

The primary objective of this thesis was to investigate whether trait mindfulness is linked to prosocial behavior when group boundaries are salient to be able to distinguish between different forms of cooperation. The results can help to provide a more nuanced view and indicate that mindfulness appears to be a double-edged sword for cooperation in intergroup settings.

On one hand, the findings help explain why previous research often reported positive correlations between mindfulness and prosociality. The present data confirms that mindfulness can act as a significant inhibitory mechanism against egoistic self-interest (Feruglio et al., 2022; Schans et al., 2022). Mindful individuals seem better equipped to overcome the automatic urge to maximize

personal gain, facilitating a shift toward collective benefits (Baumgartner & Morgan, 2019; Lecuona et al., 2021).

On the other hand, the results clarify the nature of this shift. While mindfulness significantly reduced egoistic behavior and increased relative ingroup cooperation, it did not lead to an explicit or uniform increase in universal cooperation. This suggests that mindfulness does not impose a new, globally prosocial motivation. Instead, as a fundamental regulatory system, it seems to clear the path by lowering the significance of personal monetary rewards (Feruglio et al., 2022), thereby allowing individuals to act upon their strongest existing collective orientations (Furnell et al., 2024; Schindler & Pfattheicher, 2021). In an intergroup context, this means that mindfulness can foster prosociality by recalibrating the balance between the self and the group, though this effect remains primarily contained within the boundaries of the ingroup rather than extending to a universal level.

Building on these findings, future research should address several specific research questions to advance our understanding of the complex relationship between mindfulness and intergroup cooperation.

Under what social contexts does mindfulness moderate the shift from egoism to in-group cooperation? The present study suggests that mindfulness facilitates a movement away from individual utility maximization toward group-oriented allocation, but the boundary conditions of this effect remain unclear. Future work should investigate whether this shift is more pronounced in contexts where group identity is highly salient, when intergroup competition is framed as zero-sum, or when group norms explicitly prioritize collective welfare over individual gain (Chakravarty et al., 2016; Hoenow & Pourviseh, 2023).

What specific contributions do different mindfulness facets, particularly Nonreactivity, make to the reduction of self-interest? While this study identified *Nonreactivity* as the primary driver of egoism reduction, the mechanisms by which this facet operates require further investigation. Future research should examine whether *Nonreactivity* functions by decoupling automatic impulses from behavioral enactment, by reducing the salience of monetary rewards, or by enhancing cognitive control in competitive environments (Feruglio et al., 2022; Schans et al., 2022). Additionally, the role of other facets should be explored in more detail (Lecuona et al., 2021; Schindler & Pfattheicher, 2021).

How do real versus hypothetical incentives interact with mindfulness to shape intergroup behavior? Given that hypothetical stakes may lead to overestimation of prosocial preferences (Bühren & Kundt, 2015; Ernst et al., 2025), future studies should replicate these findings using incentivized versions of the IPUC game to determine whether the observed effects of mindfulness on egoism reduction and relative ingroup cooperation hold under real monetary consequences (Bühren & Kundt, 2015; Thielmann et al., 2016).

By addressing these questions, future research can build upon the present findings to develop a more comprehensive understanding of how mindfulness shapes social behavior in an increasingly polarized world.

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Appendix A

Declaration usage of external tools for this study

I hereby declare, that the following tools have at least partly been used to assist for the respectively declared functions:

- DeepL (https://www.deepl.com/translator) was used as a dictionary as well as to improve certain in advance structured and phrased words or sentences.
- Scribbr (https://www.scribbr.at/zitieren/generator/) to assist with creating the first draft of the references list.
- Jenni AI (https://jenni.ai/) was used for research purposes as well as providing examples for specific formatting rules. Furthermore it was used as thesaurus and dictionary for statistical terms.
- Different search algorithms have been used for literature and knowledge acquisition

Appendix B

Group identity measure

Note. The items for group identification are adapted from "Perceived Intragroup Variability as a Function of Group Status and Identification," by B. Doosje, N. Ellemers, and R. Spears, 1995, *Journal of Experimental Social Psychology*, *31*, pp. 410–436 (https://doi.org/10.1006/jesp.1995.1018). Copyright 1995 by Elsevier. Used for academic purposes.

Identification with the respective political ingroup was measured by the following four item scale covering the cognitive, evaluative and affective aspects of identification (Doosje et al., 1995).

1. "I identify with other [Democrats/Republicans]."
2. "I see myself as a [Democrat/Republican]."
3. "I am glad to be a [Democrat/Republican]."
4. "I feel strong ties with other [Democrats/Republicans]."

Participants were asked to rate their agreement with the following statements on a 7-point Likert scale (ranging from 1 = *strongly disagree* to 7 = *strongly agree*).

FFMQ

Note. The items of the Five Facet Mindfulness Questionnaire are reproduced from "Using Self-Report Assessment Methods to Explore Facets of Mindfulness," by R. A. Baer, G. T. Smith, J. Hopkins, J. Krietemeyer, and L. Toney, 2006, *Assessment*, *13*, pp. 27–45 (https://doi.org/10.1177/1073191105283504). Copyright 2006 by SAGE Publications. Used for academic purposes.

The Five Facet Mindfulness Questionnaire was used to measure dispositional mindfulness (Baer et al., 2006). The scale consists of 39 items, which participants rated on a 5-point Likert scale (1 = *never or very rarely true*, 5 = *very often or always true*) (Baer et al., 2006). Items marked with **(R)** were reverse-scored before analysis. While the items are grouped by their respective facets in this appendix for organizational clarity, they were presented to participants in a randomized sequence during the study to minimize potential order effects (Baer et al., 2008; Bednar et al., 2020).

1. Observing (8 items)

I pay attention to sensations, such as the wind in my hair or sun on my face.

I notice how foods and drinks affect my thoughts, bodily sensations, and emotions.

I pay attention to sounds, such as clocks ticking, birds chirping, or cars passing.

I am humble about the things I don't know.

I pay attention to physical experiences, such as the touch of clothing on my skin.

I enjoy smelling the flowers and other things in nature.

I notice visual elements in art or nature, such as color, shapes, or textures.

I pay attention to how my emotions affect my thoughts and behavior.

2. Describing (8 items)

I'm good at finding words to describe my feelings.

I can easily put my beliefs, opinions, and expectations into words.

It's hard for me to find the words to describe what I'm thinking. **(R)**

I have trouble explaining how I feel other than saying "I'm okay" or "I'm not okay." **(R)**

When I have a sensation in my body, it's difficult for me to describe it. **(R)**

Even when I'm terribly upset, I can find a way to put it into words.

My natural tendency is to put my experiences into words.

I can usually describe how I feel at the moment in considerable detail.

3. Acting with Awareness (8 items)

When I do things, my mind wanders off and I'm easily distracted. **(R)**

I don't pay attention to what I'm doing because I'm daydreaming, worrying, or otherwise distracted. **(R)**

I am easily distracted. **(R)**

I am focused on the present moment.

I rush through activities without being really attentive to them. **(R)**

I do jobs or tasks automatically without being aware of what I'm doing. **(R)**

I find myself doing things without paying attention. **(R)**

I find it difficult to stay focused on what's happening in the present. **(R)**

4. Non-judging of Inner Experience (8 items)

I criticize myself for having irrational or inappropriate emotions. **(R)**

I tell myself I shouldn't be feeling the way I'm feeling. **(R)**

I believe some of my thoughts are abnormal or bad and I shouldn't be thinking them. **(R)**

I make judgments about whether my thoughts are good or bad. **(R)**

I tell myself that I shouldn't be thinking the way I'm thinking. **(R)**

I think some of my emotions are bad or inappropriate and I shouldn't feel them. **(R)**

When I have distressing thoughts or images, I judge myself as good or bad. **(R)**

I disapprove of myself when I have irrational ideas. **(R)**

5. Non-reacting to Inner Experience (7 items)

I perceive my feelings and emotions without having to react to them.

I watch my feelings without getting lost in them.

When I have distressing thoughts or images, I step back and notice them without reacting.

In difficult situations, I can pause without immediately acting.

When I have distressing thoughts or images, I just notice them and let them go.

I watch my thoughts without taking them literally.

When I have distressing thoughts or images, I usually feel calm soon after.

IPUC

Note. The experimental design and participant instructions for the Intergroup Parochial and Universal Cooperation (IPUC) game are reproduced from "Parochial Versus Universal Cooperation: Introducing a Novel Economic Game of Within- and Between-Group Interaction," by H. Aaldering and R. Böhm, 2020, *Social Psychological and Personality Science, 11*(1), p. 36 (https://doi.org/10.1177/1948550619841627).

The experimental design and participant instructions for the Intergroup Parochial and Universal Cooperation game were adopted directly from the original protocol developed by Aaldering and Böhm (Aaldering & Böhm, 2020). To ensure high methodological fidelity, all instructions and game settings were adopted without modification from the protocol by Aaldering and Böhm (Aaldering & Böhm, 2020). The only difference concerned the reward structure, as the original study used real monetary incentives, whereas this study employed a hypothetical payout scenario.

There are four options on how to invest your money.

Option 1: Pool A.

You and the other members of your team can choose to invest in Pool A. Every chip invested
in pool A will be multiplied by two and divided equally among the four team members, including yourself.

Put differently: Investing 1 chip in Pool A, results in 0.5 chips for all team members, including yourself (a total of 2 chips for your team). Likewise, if your team member invests 1
chip in Pool A, you and the other members will also receive 0.5 chips.

Remember- these chips represent real money: 1 chip equals 0.50 pound.

Note that if you do not invest in pool A, but your team members do, you will still receive
chips, hence money (0.5 chips per invested chip in the pool). Similarly, if you choose to invest, but your team members do not invest, they will still all receive 0.5 chips per chip that
you have invested. When returning the investments, we will not investigate who contributed
how much. The total investments in Pool A will simply be divided equally among all team
members.

Now remember there is another team, the Democrats. The Democrats similarly have a Pool A
to which they can contribute chips with the same value. For them, too, each chip invested in
their Pool A results in 0.50 chips for each member of the Democrats.

Option 2: Pool B

You and the other members of your team can choose to invest in Pool B. Every chip invested
in pool B will be multiplied by two and divided equally among the four team members, including yourself, but also subtract some from the other team's outcome.
Put differently: Investing 1 chip in Pool B, results in 0.5 chips for all team members, including yourself (a total of 2 chips for your team), but also results in a loss of 0.25 chips to
each of the members of the Democrats (a total loss of 1 chip for the other team). Likewise, if
your team member invests 1 chip in Pool B, you and the other members will also receive 0.5
chips, and each of the four members of the Democrats will lose 0.25 chips.
Note that if you do not invest in pool B, but your team members do, you will still receive
chips (0.5 chips per invested chip in the pool). Similarly, if you choose to invest, but your
team members do not invest, they will still all receive 0.5 chips per chip that you have invested. When returning the investments, we will not investigate who contributed how much. The total investments in Pool B will simply be divided equally among all team members.
The Democrats similarly have a Pool B to which they can contribute chips. For them, too,
each chip invested in their Pool B results in 0.50 chips for each member of their Democrat
team, but also a loss of 0.25 chips for each member of your team, the Republicans.

Option 3: Pool C

There is one other pool to which in which you can invest: Pool C. In Pool C, investing 1 chip
will be multiplied by 3.2 and divided equally among the members of both your team, and the

other teams. For example, if you invest 1 chip, this yields 3.2 chips for your and the other
team combined. That means a return of 0.40 chips per group member of the Republicans (a
total of 1.6 chips for your team). Additionally, it also yields to 0.40 pounds per member of
the Democrats (a total of 1.6 chips for the other team).
Thus, if someone in your group invests 1 chip in pool C, all members of the Republicans,
including yourself, as well as all members of the Democrats, will receive 0.40 chips.
Similarly, if a member of the Democrats invests 1 chip in pool C, all members of the Democrats, as well as all members of the Republicans, including yourself, will receive 0.40
chips.
Put differently: When someone, regardless of team membership, invests a chip in Pool C, all
members of both teams, including yourself, will receive 0.40 chips

Option 4: Keep to self

Finally, you can also keep the endowment to yourself. If you keep 1 chip to yourself, only
you will receive exactly 1 chip, adding to your final outcome. That is, neither your team members nor members of the Democrats will receive anything.
Again, you can choose how much of those 10 chips endowment you would like to keep to
yourself.

Summary

In summary, investments in Pool A, Pool B and Pool C have different consequences for the
final outcomes.
Option 1 Pool A**:** Investing 1 chip in Pool A yields 0.5 chips to all your team members,

including yourself.

Option 2 Pool B: Investing 1 chip in Pool B yields 0.5 to all your team members, including

yourself. It also yields a loss o**f** 0.25 chips to all the members of the Democrats.

Option 3 Pool C**:** Investing 1 chip in Pool C yields 0.4 chips to all players, including yourself, your other three team members, and all four members of the Democrats.

Option 4 Keep to self: Keeping 1 chip to yourself yields 1 chip only for yourself.

Appendix C

Descriptives Tables

Table A1

Sample demographics: Gender and U.S. political affiliation

Category	Group	Frequency (n)	Percent (%)
Gender	Female	123	53.0
	Male	108	46.6
	Prefer not to say	1	0.4
U.S. political affiliation	Democrat	139	59.9
	Republican	93	40.1

Note. Values represent self-reported demographic information. Sample size = 232.

Figure 1

Group Identity

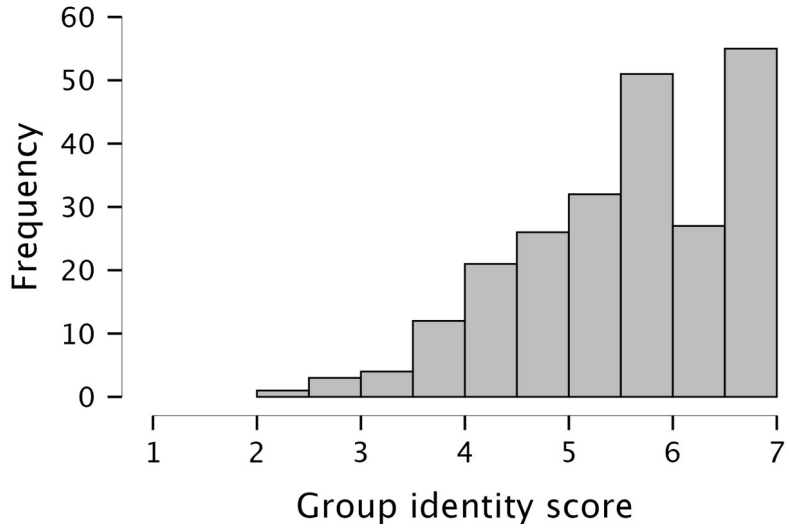
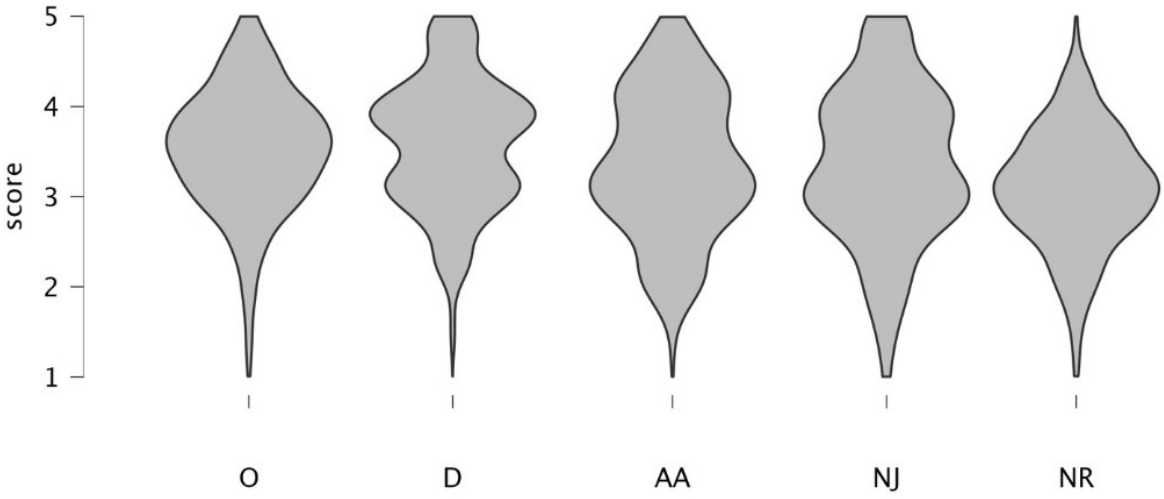


Figure 2

Violinplots of FFMQ Facets



Note. Observing (O), Describing (D), Acting with Awareness(A), Nonjudging (NJ) and Nonreacting (NR) Violin plots show the density of participants' score of the five facets of the FFMQ with wider sections indicating more frequent responses.

Figure 3

Distribution of Observing scores (FFMQ)

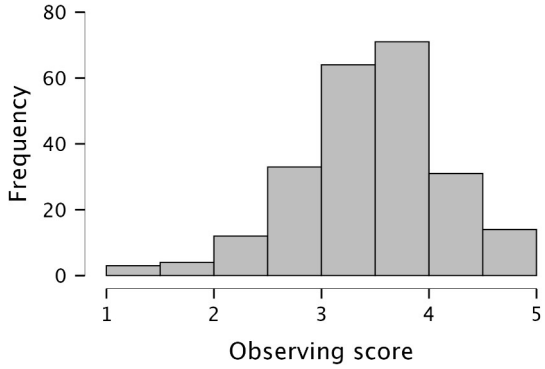


Figure 4

Distribution of Describing score (FFMQ)

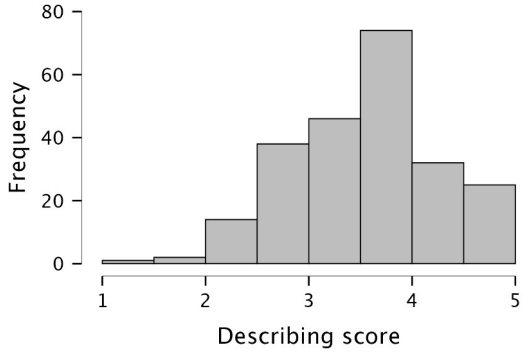


Figure 5

Distribution of Acting with awareness score (FFMQ)

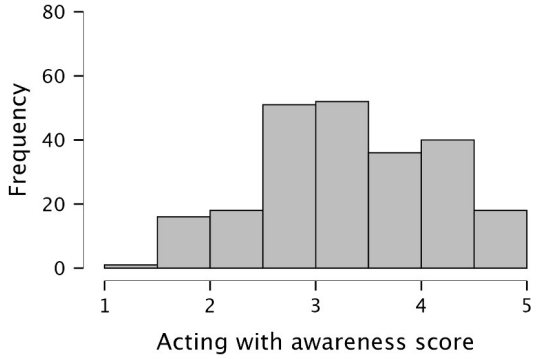


Figure 6

Distribution of Nonjudging scores

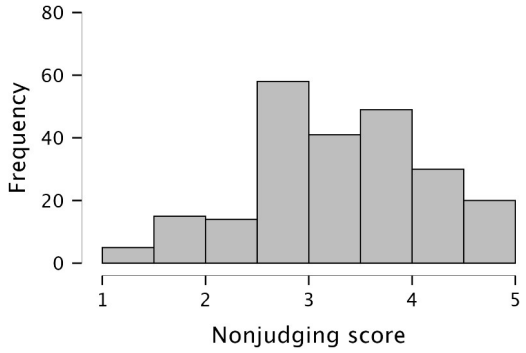


Figure 7

Distribution of Nonreacting score

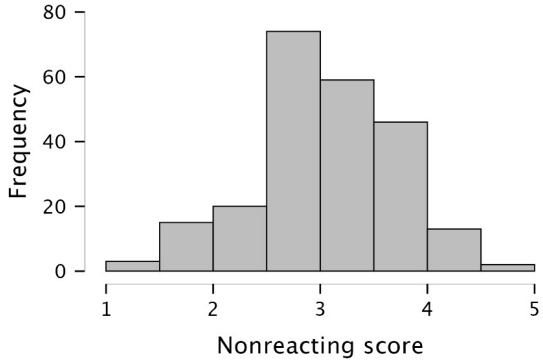
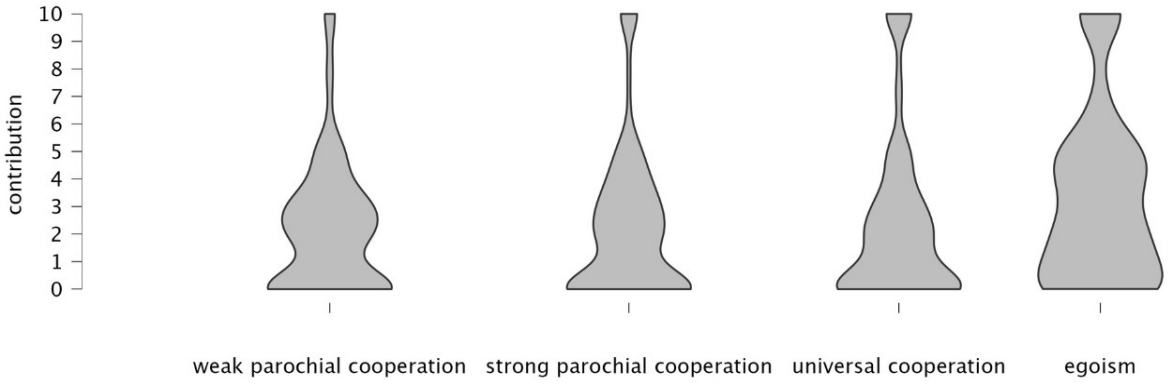


Figure 8

Distribution of contribution in the IPUC Game



Note. weak parochial cooperation (pool 1), strong parochial cooperation (pool 2), universal cooperation (pool 3), egoism (pool 4). Violin plots show the density of participant contributions (0–10 chips) to the four different pools of the IPUC game, with wider sections indicating more frequent responses.

Table A2

Estimated mean values and robust 95% confidence intervals for the four examined pools of the IPUC game

Condition	Mean (M)	Lower Bound (95% CI)	Upper Bound (95% CI)
Pool 1	2.169	1.888	2.497
Pool 2	2.186	1.850	2.516
Pool 3	2.350	1.977	2.725
Pool 4	3.295	2.900	3.717

Note: Confidence intervals were calculated using non-parametric bootstrapping to minimize bias due to the distributional characteristics of the IPUC game.The values are based on a bootstrapping procedure with 1,000 resamples.

Abstract

Der Zusammenhang zwischen Achtsamkeit und prosozialem Verhalten wurde in der Sozialpsychologie oft untersucht, die Befundlage bleibt jedoch widersprüchlich. Während metaanalytische Befunde auf einen positiven Zusammenhang hindeuten, berichten einige Studien Nullergebnisse oder sogar negative Effekte, insbesondere wenn prosoziales Verhalten durch objektive Verhaltensmaße statt durch Selbstberichte erfasst wird. Die vorliegende Studie adressiert diese methodische Lücke, indem sie untersucht, ob dispositionelle Trait-Achtsamkeit kooperatives Verhalten in einem komplexen Intergruppenkontext vorhersagt mit Hilfe der Verwendung des Intergroup Parochial and Universal Cooperation (IPUC) Games.

Das IPUC-Game ermöglicht die Unterscheidung zwischen vier verschiedenen Verhaltensstrategien: schwacher parochiale Kooperation (Begünstigung der Eigengruppe), starker parochialer Kooperation (Begünstigung der Eigengruppe bei gleichzeitiger Schädigung der Fremdgruppe), universeller Kooperation (Begünstigung aller Spielenden) und Egoismus (Einbehalten der Ressourcen für sich selbst). Zur Messung der Trait-Achtsamkeit wurde der Five Facet Mindfulness Questionnaire (FFMQ) eingesetzt, der fünf Dimensionen erfasst: Beobachten, Beschreiben, Handeln mit Bewusstsein, Nicht-Urteilen und Nicht-Reagieren. Zusätzlich wurde die Identifikation der Teilnehmenden mit ihrer politischen Eigengruppe mit hilfe einer etablierten Gruppenidentitätsskala erhoben. Die Daten wurden über die Online-Rekrutierungsplattform Prolific gesammelt, mit einer Gesamtstichprobe von N = 232 US-amerikanischen Teilnehmenden, die sich als Demokraten oder Republikaner identifizierten, was die Bildung natürlicher Intergruppenkonstellationen ermöglichte.

Die Hauptanalyse ergab, dass die allgemeine Trait-Achtsamkeit keine der drei kooperativen Pools signifikant vorhersagte. Diese Befunde deuten darauf hin, dass Achtsamkeit in Intergruppenkontexten nicht als direkter Treiber spezifischer prosozialer Verhaltensweisen fungiert. Achtsamkeit erwies sich jedoch als signifikant negativer Prädiktor für egoistisches Ressourcenbehalten (Pool 4; B = −1,44, p = ,002, adjustiertes R^2 = ,04), was darauf hindeutet, dass achtsamere Personen weniger dazu neigen, persönlichen monetären Gewinn zu priorisieren. Aufgrund der Nullsummenstruktur des IPUC-Games impliziert diese Reduktion des Egoismus eine Umverteilung von

Ressourcen hin zu kollektiven Optionen, ohne dass ein einzelner prosozialer Pool signifikant davon profitierte.

Explorative Analysen lieferten weitere Differenzierungen. Unter den fünf FFMQ-Facetten wurde Nicht-Reagieren als primärer Treiber des reduzierten Egoismus identifiziert ($\beta = -,19$, $p = ,011$), was darauf hindeutet, dass die Fähigkeit, innere Impulse wahrzunehmen, ohne ihnen unmittelbar nachzugeben, als regulativer Puffer gegen eigennütziges Verhalten wirkt. Darüber hinaus war Trait-Achtsamkeit ein signifikant positiver Prädiktor für relative Eigengruppenkooperation (definiert als Differenz zwischen Beiträgen zum Eigengruppenpool und zum privaten Pool) was darauf hindeutet, dass achtsamere Personen Ressourcen vom Eigeninteresse hin zur Eigengruppe verlagern. Dieser Effekt zeigte sich konsistent über politische Zugehörigkeiten hinweg, da eine Moderationsanalyse keine signifikante Interaktion zwischen Achtsamkeit und politischer Identität ergab.

Entgegen den Vorhersagen der sozialen Identitätstheorie sagte die Gruppenidentifikation die parochiale Kooperation nicht signifikant voraus. Auch die politische Zugehörigkeit zeigte keinen signifikanten Einfluss auf relative Eigengruppenkooperation oder starken Parochialismus, was möglicherweise das Fehlen realer monetärer Anreize im hypothetischen Spieldesign widerspiegelt.

Zusammenfassend legen die Befunde nahe, dass Achtsamkeit primär als hemmender Mechanismus gegenüber egoistischen Impulsen wirkt und nicht als einheitlicher Förderer prosozialen Verhaltens. In Intergruppenkontexten äußert sich dieser regulatorische Effekt in einer relativen Verschiebung vom Eigeninteresse hin zum Wohl der Eigengruppe, ohne sich auf universelle Kooperation auszudehnen. Diese Ergebnisse tragen zu einem differenzierteren Verständnis der Beziehung zwischen Achtsamkeit und prosozialem Verhalten bei und unterstreichen die Bedeutung differenzierter Verhaltensmaße in zukünftiger Forschung.