# How Power Divides Us. Unveiling the Impact of Autonomy and Influence in Joint Simon Task

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# How Power Divides Us

## Unveiling the Impact of Autonomy and Influence in Joint Simon Task

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## Abstract

Understanding how power dynamics affect collaboration is crucial in teamwork and shared decision-making. This study examines how autonomy (freedom to act independently) and influence (ability to impact others) shape self-other integration, measured by the Joint Simon Effect. Based on theories of power and social interaction, it is hypothesized that lower autonomy and higher influence enhance self-other integration, with autonomy moderating the impact of influence. A 2x2 factorial design manipulated autonomy and influence across four conditions. Participants completed the Joint Simon Task, and reaction times were analysed. Contrary to expectations, no significant effects of autonomy, influence, or their interaction were found. These findings suggest that the relationship between power dynamics and self-other integration may depend on unexamined factors. Future research should explore variables such as task engagement and interpersonal familiarity and refine power measures to understand better their role in shaping collaboration and empathy.

## Layman's Abstract

This study examines how power dynamics, specifically autonomy (freedom to act independently) and influence (the ability to affect others), affect how people coordinate their actions with others. Understanding these dynamics is important for improving teamwork and collaboration in everyday settings. We tested whether having less autonomy or more influence would make people integrate their actions with others more closely. Participants worked on tasks designed to measure how well they coordinated their reactions with their partner´s actions. Surprisingly, we found no evidence that autonomy or influence, or the combination of the two, had a clear effect on how well people synchronized their actions. These findings suggest that other factors, like how engaged people are in the task or how familiar they are with their partner, might play a role. Future studies could explore these factors to better understand how power dynamics shape interaction and teamwork.

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## Power in Social Contexts

Power plays a pivotal role in shaping social interactions, influencing how individuals relate to and perceive one another. Defined as the capacity to direct, control, or impact others' behaviour within a group or community (Munro, 2024), power can significantly affect the quality of social interactions. High-power individuals are often thought to prioritize their own goals and needs, sometimes at the expense of attentiveness to others. This tendency, known as reduced self-other integration, raises an important question: Do those with power always consider others less? Understanding how power affects interpersonal dynamics is essential for fostering collaboration and empathy in both professional and social settings.

Existing research suggests that power dynamics can affect cognitive and behavioural processes. For instance, high-power individuals often demonstrate self-serving tendencies, such as diminished sensitivity to others' perspectives (Magee & Smith, 2013). However, these effects are not universal. Factors such as cultural norms, organizational structures, and task settings appear to moderate how power influences self-other integration (Hofstede, 1984; House et al., 2004). While collectivist societies emphasize shared goals that mitigate power´s self-serving effects, individualistic cultures may amplify them. Despite these insights, much remains unclear about how specific dimensions of power, such as autonomy and influence, interact to shape social dynamics. This gap in knowledge forms the basis of the current study, which seeks to unravel the nuanced effects of power on self-other integration.

## Addressing Gaps in Power Research

While previous research has shown that power impacts self-other integration by shaping attentiveness and interpersonal sensitivity, specific dimensions of power – autonomy (the

freedom to act independently) and influence (the ability to affect others) – remain underexplored. These dimensions may interact in meaningful ways to shape outcomes, especially in horizontal power structures where hierarchy is less pronounced.

Research suggests that autonomy may act as a moderating factor, amplifying or mitigating the effects of influence depending on the level of independence it affords (Lammers et al., 2016). Additionally, power dynamics are context-sensitive (Magee & Smith, 2013), meaning that autonomy and influence may yield different outcomes depending on how they interact. For example, high autonomy could reduce interdependence, but influence may compensate by fostering alignment and shared goals in joint tasks.

### *Focus on Horizontal Power Dimensions*

The current study addresses this gap by explicitly distinguishing between autonomy and influence and examining their combined effects on self-other integration. By focusing on horizontal power dimensions, often neglected in previous research, this study aims to enhance our understanding of how power dynamics shape interpersonal coordination. Specifically, the Joint Simon Task – a validated behavioural measurement of self-other integration – provides an objective approach to quantifying variations in integration across differing levels of autonomy and influence. The Joint Simon Task offers a precise and validated approach to understanding how individuals coordinate their actions with others (Sebanz et al., 2003). By incorporating this methodology, the study provides an opportunity to uncover unique cognitive and emotional pathways that may reveal new insights into the interplay between autonomy, influence, and social coordination. Specifically, the Joint Simon Task allows us to measure how individual levels of autonomy and influence affect their ability to integrate their actions with others during joint tasks, moving beyond self-report measures that dominate previous research.

### *Effect of Autonomy*

We hypothesize that individuals with high autonomy, who may experience greater independence, will exhibit less self-other integration than those with low autonomy, as autonomy may reduce interdependence in social contexts, thereby diminishing the need for shared task representation.

### *Effect of Influence*

Individuals with high influence are expected to show more self-other integration than those with low influence, though the effect of influence may be less pronounced compared to autonomy, is also hypothesized. Influence fosters alignment by encouraging shared goals and enhancing perceived interdependence, which is critical for successful collaboration.

### *Interaction Effect Between Autonomy and Influence*

We hypothesize an interaction effect between autonomy and influence, where autonomy moderates the relationship between influence and self-other integration. Specifically, we predict that the impact of influence will be stronger for individuals with high autonomy contexts, as influence compensates for reduced interdependence by promoting alignment and coordination.

By disentangling these dimensions, the study seeks to enhance our understanding of how power operates in interpersonal contexts, offering potential applications for improving collaboration and empathy in various social and organizational settings.

## Scientific Background

### Powers Impact on Self-Other Integration

The influence of power on self-other integration is well-documented in psychological research. Studies have shown that high-power individuals often prioritize their perspectives and interests, often at the expense of empathy and understanding for others (Magee & Smith, 2013;

van der Weiden et al., 2021). Self-other integration refers to the cognitive and behavioural process through which individuals incorporate the actions, goals, and intentions of others into their own task representation (Sebanz et al., 2003). For example, individuals with high power tend to focus on self-serving goals, reducing their ability to adapt to others' needs (Magee & Smith, 2013). Similarly, van der Weiden and colleagues (2021) found that high-power individuals exhibited diminished attentiveness to their partners during joint tasks, impairing their capacity for self-other integration. Their study used vertical power manipulations, such as seating participants on high or low chairs, to simulate hierarchical roles revealing that high-power participants incorporated their co-actors' actions into their task planning significantly less than low-power participants.

Reduced attentiveness and empathy among high-power individuals align with theoretical frameworks that suggest power increases social distancing (Guinote, 2017). Power has been shown to affect self-other integration, typically leading to reduced integration by diminishing attentiveness to others and prioritizing self-serving goals (Magee & Smith, 2013). For example, individuals with high power often exhibit reduced perspective-taking, as their elevated status minimizes the necessity of adapting to others' needs or viewpoints (Galinsky et al., 2006). This tendency can have significant implications in collaborative contexts, where successful outcomes often depend on high levels of empathy and integration to align team members' actions and goals (Dolk et al., 2014).

## Dimensions of Power: Autonomy and Influence

### *Autonomy and Self-Other Integration*

Autonomy and influence represent two critical, yet distinct, dimensions of power. Autonomy can decrease independence and reduce interdependence, potentially diminishing self-

other integration in dyadic contexts. Research has suggested that effective self-other integration requires shared task representation, which may become less prominent when individuals prioritize independence over collaboration (Sebanz et al., 2003). Similarly, autonomy satisfies individuals' desire for control, often at the expense of attentiveness to others, further reducing integration during joint tasks (Galinsky et al., 2006). In leadership contexts, for example, autonomy-driven leaders may focus on achieving goals independently, inadvertently undermining team cohesion and joint task performance (Sebanz et al., 2003).

These findings suggest individuals with high autonomy, while empowered by agency, may exhibit less self-other integration compared to those with low autonomy.

### *Influence and Self-Other Integration*

Influence, on the other hand, represents the capacity to affect others' actions and decisions. High influence is associated with greater alignment in joint tasks, as it fosters social coordination and shared goals (Magee & Smith, 2013; Stenzel et al., 2014). Studies have demonstrated that individuals with high influence can facilitate effective joint action by creating a sense of perceived agency in their co-actors, thereby promoting self-other integration (Stenzel et al., 2014). In contrast to autonomy, influence supports team alignment by enhancing mutual dependence and promoting a collaborative approach to task completion, particularly in non-hierarchical group structures (Stenzel et al., 2014). However, compared to autonomy, the effects of influence may be less pronounced, as influence primarily supports alignment rather than challenging the fundamental independence-interdependence dynamic.

### *Comparing Autonomy and Influence*

Research suggests that interdependency in joint tasks fosters shared action representations, enhancing coordination and self-other integration. Competitive or

interdependent contexts can activate shared goals, merging individuals' behaviours into a unified task representation (Ruys & Arts, 2010). While autonomy may hinder this process by emphasizing independence, influence facilitates it by encouraging alignment and shared responsibility for task outcomes (Ruys & Aarts, 2010). In contrast to autonomy, which may reduce reliance on others, interdependence enhances self-other integration by creating shared goals and synchronized action plans. The interplay between autonomy, influence, and interdependence can provide a nuanced understanding of how power shapes social coordination (Ruys & Aarts, 2010). Understanding this interplay is particularly important in collaborative work environments, where balancing individual agency and group alignment is critical for success (Ruys & Aarts, 2010).

### *Horizontal Power Dimensions*

Despite these findings, existing research has often overlooked the impact of non-hierarchical (horizontal) power dimensions, such as autonomy and influence. Horizontal dimensions are particularly relevant in real-world settings, where power does not always align with strict hierarchical structures. This gap highlights the need for further investigation into how these dimensions interact to shape interpersonal coordination and attentiveness. Unlike vertical power structures, which emphasizes clear hierarchies, horizontal dimensions reflect more flexible, lateral forms of power distribution that can vary based on task demands and interpersonal dynamics (Sebanz et al., 2003)

## The Joint Simon Task as a Measure of Self-Other Integration

### *Introducing the Joint Simon Task*

One paradigm that addresses these methodological limitations is the Joint Simon Task, which has been extensively used to study self-other integration in collaborative contexts

(Sebanz et al., 2003; Dolk et al., 2014). The Joint Simon Task adapts the traditional Simon Task – a well-established experimental paradigm designed to investigate stimulus-response compatibility effects – into a shared task environment (Hommel et al., 2004). In the standard Simon Task, participants respond to non-spatial stimulus features (e.g., colour or shape) presented in spatially varying locations. When the location of the stimulus corresponds spatially with the required response, participants typically respond faster and more accurately, a phenomenon referred to as the Simon Effect (Simon & Rudell, 1967; Proctor & Vu, 2006). The Joint Simon Task extends this paradigm by involving two participants creating an opportunity to study cognitive coordination in joint actions (Sebanz et al., 2003; Dolk et al., 2014).

***Methodology of the Joint Simon Task***

In the Joint Simon Task, participants are seated side by side in front of a computer screen and share a response apparatus, such as a keyboard with two keys (Sebanz et al., 2003). Each participant is responsible for responding to a specific subset of stimuli. For example: Participant A is tasked with pressing a key when a diamond appears on the screen; Participant B is tasked with pressing a key when a square appears on the screen. Stimuli are presented one at a time and can appear on either the left or right side of the screen. This spatial arrangement introduces the possibility of congruence or incongruence between the stimulus location and the required response. Congruent trails: The stimulus appears on the same side as the response key (e.g., a diamond on the left side of the screen for Participant A). Incongruent trials: The stimulus appears on the opposite side from the response key (e.g., a diamond on the right side of the screen for Participant A) (Sebanz et al., 2003; Dolk et al., 2014).

Participants complete the task in an altering-response format, meaning that only one person responds to each stimulus while the other remains passive. This shared configuration

ensures that participants must coordinate their responses with their partners and monitor each other´s actions (Atmaca et al., 2011).

### *The Joint Simon Task and Its Interpretation*

The Joint Simon Effect (JSE) is calculated as the difference in reaction times (RTs) between congruent and incongruent trials: JSE = RT congruent – RT incongruent. A larger Joint Simon Effect indicates a greater level of interference on incongruent trials, reflecting the participant´s ability to integrate their co-actors' tasks into their own cognitive framework (Sebanz et al., 2003; Ruys & Aarts, 2010). This is interpreted as evidence of self-other integration – the cognitive merging of one´s own and another´s action plans to facilitate joint task performance (Dolk et al., 2014). The Joint Simon Effect provides insight into how individuals incorporate their partner´s actions into their own task planning (Sebanz et al., 2006).

During the task, participants must continuously monitor their partner´s responses to ensure smooth transitions between turns. This requires the development of a shared cognitive representation of the task, which includes both their own and their partner´s response mappings (Atmaca et al., 2011; Ruys & Aarts, 2010fe). The interference observed in incongruent trials reflects the extent to which participants have integrated their partner´s task into their own cognitive system (Sebanz et al., 2003; Dolk et al., 2014).

### *Moderating Factors of the Joint Simon Effect*

**Demographic and Cultural Influences:** The Joint Simon Effect is sensitive to various social and contextual factors, making it a reliable tool for studying self-other integration. It reflects self-other integration because it measures how individuals incorporate their partner´s actions into their own task planning, highlighting the shared cognitive and attentional processes required for effective coordination (Sebanz et al., 2003). For example, demographic factors such

as sex have been found to impact integration scores, with some studies indicating that men and women may exhibit different levels of coordination in joint tasks (Sebanz et al., 2003). Cultural factors also moderate the Joint Simon Effect, for example, collectivist societies may exhibit higher integration scores due to their focus on shared goals (Hofstede, 1984).

Similarly, age-related differences in cognitive processing speeds can impact reaction times, potentially confounding results when age is not controlled. Critiques of earlier studies of the Joint Simon Task have highlighted the need to control for these demographic variables more rigorously, as failure to do so can confound results and obscure the specific effects of power dynamics (Sebanz et al., 2003; Dolk et al., 2014).

**Intentionality and Perceived Agency:** Moderating factors like co-actor intentionality and agency perception play a critical role in self-other integration. The Joint Simon Effect demonstrates that integration depends not only on physical co-actors but also on imagined ones, highlighting social cognitive mechanisms over physical cues. For instance, it has been suggested that the Joint Simon Effect is modulated by the perceived agency of a co-actor, regardless of their intentionality (Stenzel et al., 2014). Their study showed that participants exhibited a Joint Simon Effect when they believed their co-actor had control over their actions, even if the co-actor´s movements were computer-generated. This suggests that the perception of agency, rather than actual intentionality, is crucial for self-other integration in joint tasks.

**Contextual and Social Settings:** The study by Ruys and Aarts (2010) underscores that competitive or interdependent settings activate shared action representations, supporting the hypothesis that high influence facilitates self-other integration by fostering alignment and goal-sharing. These findings highlight the importance of contextual factors in moderating the Joint Simon Effect.

While other societal factors and cultural norms, such as those found in collectivist versus individualistic societies, may also affect self-other integration (Hofstede, 1984), these factors are beyond the scope of the current study. By controlling for demographic variables like sex and age, we aim to reduce confounding effects and enhance the precision of our findings. This focus on minimizing external variability ensures that the study produces results that can specifically highlight the impact of power dynamics on self-other integration, rather than being diluted by unrelated factors.

**Bridging Gaps in Research**

While previous studies have demonstrated the utility of the Joint Simon Task for measuring self-other integration, most research has focused on hierarchical power dynamics or individual differences in attentiveness. For example, van der Weiden and colleagues (2021) examined the effects of vertical power manipulations using physical elevation (e.g., participants seated on high or low chairs to simulate high or low power) and found that high-power participants exhibited reduced self-other integration compared to low-power participants. While this method effectively captured hierarchical dynamics, it is limited in its applicability to real-world power relationships, as it does not address horizontal power dimensions such as autonomy and influence.

Moreover, studies emphasizing vertical power often overlooked the role of non-hierarchical settings, where power relationships are more fluid and situational rather than directed by formal authority. This gap is particularly important in collaborative environments, where autonomy and influence operate dynamically to shape interpersonal coordination. Without addressing these dimensions, previous research risks providing an incomplete picture of how power affects joint action in diverse social and organizational contexts.

The current study builds on this prior research by using the Joint Simon Task to examine the effects of autonomy and influence as distinct dimensions of power. By addressing the methodological limitations of earlier studies and introducing horizontal power manipulations, we aim to uncover the nuanced ways in which power shapes self-other integration. This approach not only captures the subtleties of power dynamics in non-hierarchical relationships but also reflects real-world interactions more accurately, where roles and influence are often distributed rather than imposed (Hofstede, 1984).

By controlling for sex and age differences in dyads and focusing on behavioural metrics rather than self-reports, the current study provides a more precise investigation of how these two power dimensions impact coordination during joint tasks. Additionally, the reliance on the Joint Simon Task allows us to disentangle cognitive and attentional mechanisms underlying self-other integration, offering insights into the fundamental processes that drive coordination in shared activities.

**Research Objectives and Implications**

This thesis examines how autonomy and influence – two key dimensions of power – affect self-other integration in joint tasks. High-power individuals often prioritize self-interest and show reduced empathy (Magee & Smith, 2013; Guinote & Cai, 2016). However, the relationship between autonomy and self-other integration is complex. While autonomy can promote agency and independence, it may also hinder interdependence and attentiveness to others, potentially reducing self-other integration in collaborative contexts (Lammers et al., 2016). Autonomy, as defined in this study, refers to the ability to act independently without reliance on others, while influence is conceptualized as the capacity to affect others' decisions and actions. Clarifying this

relationship helps to address inconsistencies in the literature and provides a more nuanced understanding of power dynamics.

Additionally, this study examines autonomy as a potential moderator of influence´s effects, a concept grounded in theories of power interdependence. In contexts where autonomy is high, influence may serve as a compensatory factor, fostering alignment in joint tasks. Conversely, low-autonomy contexts might amplify influence´s impact by promoting stronger social coordination. This approach allows the study to explore the interactive dynamics of these power dimensions in shaping self-other integration.

This study aims to deepen our understanding of how power, conceptualized as autonomy and influence, affects self-other integration in dyadic interactions. Specifically, it investigates autonomy as a distinct component of power that may exert a unique and potentially negative effect on self-other integration compared to influence. By integrating insight from previous research (e.g., van der Weiden et al., 2021), this study addresses a research gap by exploring how autonomy moderates influence´s effects on self-other integration. Unlike prior studies, which have primarily focused on hierarchical power structures (e.g., vertical power manipulations), this research emphasizes horizontal power dimensions, reflecting real-world collaborative contexts where roles and influence are often fluid.

Using the Joint Simon Task, this study quantifies self-other integration and examines its variations across differing levels of autonomy and influence. This methodological approach provides an objective measure of self-other integration, avoiding biases associated with self-reported data and enabling precise examination of power dynamics (Sebanz et al., 2003; Dolk et al., 2014). The primary question is: How do autonomy and influence as facets of power affect self-other integration during joint tasks? To address this question, the study proposes three hypotheses:

**Main Effect of Autonomy**: Individuals with high autonomy, who are more independent, will exhibit less self-other integration than those with low autonomy, who are more interdependent.

**Main Effect of Influence**: Individuals with high influence will show more self-other integration than those with low influence, though this effect may be less pronounced compared to autonomy

**Interaction Effect**: Autonomy will moderate the effect of influence, with the impact of influence on self-other integration being stronger for individuals with high autonomy.

By addressing these hypotheses, the study highlights theoretical and methodological contributions. Examining autonomy and influence in tandem offers a more precise understanding of their distinct and combined effects on interpersonal dynamics, an area often overlooked in traditional hierarchical power studies. This dual focus not only deepens our comprehension of how power dynamics operate in dyadic interactions but also underscores the relevance of examining power as a multidimensional construct beyond hierarchical frameworks. Furthermore, the use of the Joint Simon Task as a validated behavioural measure provides robust, objective insights into self-other integration. By relying on objective metrics rather than self-reports, the study minimizes bias and enhances the reliability of findings, setting a strong foundation for future research on power dynamics and coordination in joint tasks.

## Method

### Design

This analysis investigates the relationship between power dynamics and self-other integration by examining how autonomy and influence affect individuals' cognitive processing in

a joint task through the Joint Simon Effect. The dependent variable is self-other integration, assessed via the Joint Simon Effect, which captures reaction time differences between spatially congruent and incongruent stimuli. The study employed a 2x2 between-subjects factorial design, manipulating two independent variables: autonomy (low vs. high), and influence (low vs. high).

To ensure sufficient statistical power for the 2x2 ANOVA, the power analysis was conducted with an effect size (*f*) of 0.25 based on previous research (van der Weiden et al., 2022), an alpha error probability of .05, and a desired statistical power of .80. This analysis guided the determination of the sample size, ensuring adequate sensitivity to detect medium-sized effects. Although no prior study has combined the analysis of power and its theoretical counterparts (autonomy and influence) with a 2x2 factorial design, this approach was deemed robust enough to capture the anticipated effects. This design allowed for assessing the main effects of autonomy and influence, as well as their interaction effect on self-other integration.

**Participants**

To achieve statistical power, a sample size of 180 participants was targeted and evenly distributed across the four conditions varying in levels of autonomy and influence, resulting in 23 participants for the first condition (High influence, low autonomy); 23 participants for the second condition (Low influence, high autonomy); 22 participants for the third condition (High influence, high autonomy); and lastly, 22 participants for the fourth condition (Low influence low autonomy). For a detailed overview of the four conditions, please refer to Appendix A Table 1.

However, the final sample included only 34 participants due to recruitment constraints, limiting statistical power and generalizability. Participants ranged in age from 19 to 31 years ($M$ = 23.88, $SD$ = 3.23), with the majority being female ($n$ = 26, 76.5%), while 23.5% were male ($n$

= 8). Eligible participants were aged 18 or older with normal or corrected-to-normal vision. Recruitment of participants took place on social media, public postings, and university announcements at the faculty of social science at Leiden University. Participants were able to choose between monetary compensation or study credits, with payments of €3.75 plus a €1 bonus or 1 credit plus a €1 bonus.

Participants were assigned to dyads, paired based on age and gender to control for demographic variability. This manual matching process minimized potential confounding variables associated with interpersonal dynamics, ensuring that observed differences in self-other integration stemmed from autonomy and influence manipulations.

## Measures

### *Self-Other Integration – Dependent Variable*

The Joint Simon Task was employed to assess cognitive processing related to self-other integration. Participants used a computer-based system to complete the Joint Simon Task, with stimuli presented on a stationary computer screen positioned at eye level. Responses were collected via a standard response box designed to detect reaction times with millisecond accuracy.

Stimuli were either in the shape of squares or diamonds, presented at either the left or right of the screen. Participants were instructed to respond by pressing a designated key as quickly and accurately as possible whenever their assigned target stimulus (e.g., a square for Participant A or a diamond for Participant B) appeared on the screen while ignoring non-target stimuli (e.g., the diamond for Participant A or the square for Participant B). Both participants ignored the spatial location of the stimulus, which could appear on the left or right of the screen.

The task sequence involved the following steps: (1) a fixation cross appeared at the centre of the screen for 250 milliseconds, (2) the stimulus was displayed for 150 milliseconds, and (3) participants had a response window of up to 1800 milliseconds, starting during the stimulus presentation. Feedback on response accuracy was displayed for 300 milliseconds, followed by an inter-trial of 1750 milliseconds. This structured timing ensured consistent intervals between trials and minimized variability.

The task commenced with twelve practice trials performed in their dyad (in a go/no-go format), where participants responded only to target stimuli while withholding responses to non-target stimuli (Verbruggen & Logan, 2008), allowing them to familiarize themselves with the procedure. The main task comprised 320 trials (160 congruent and 160 incongruent), divided into five blocks and equally distributed within the dyads, ensuring that both parts had the same number of trails. Congruent trials were defined as those where stimulus location (left or right) spatially aligned with the participant´s assigned response side, facilitating faster reaction times due to spatial compatibility. In contrast, incongruent trials featured stimuli on the opposite side of the response key, creating a conflict that required additional cognitive processing and typically resulted in slower reaction times. This distinction between congruent and incongruent trials allowed for the analysis of reaction time differences attributable to spatial compatibility effects.

Self-other integration was measured via Joint Simon Effect scores, calculated as the difference in reaction times between congruent and incongruent trials: mDS = mRT incongruent – mRT congruent. Higher scores indicate stronger self-other integration indicating participants effectively incorporated their partner´s task into their own cognitive processes. Lower scores suggested weaker integration, reflecting reduced attentiveness to the shared nature of the task.

The Joint Simon paradigm underscores how individuals incorporate a co-actor´s task into their own response planning, revealing the interplay between shared cognitive representations and task performance.

### *Operationalization of Autonomy*

Autonomy was operationalized through the structure of the payoff systems, which varied based on the level of control participants had over their compensations, independent of their partners' performance.

**High Autonomy**: In conditions of high autonomy, participants' rewards were determined solely by their individual performance. Reaction times in the task were directly tied to each participant´s compensation, ensuring that their partner´s performance had no bearing on their earning. This setup granted participants complete independence, emphasizing individual responsibility and control over their outcomes.

**Low Autonomy**: In conditions of low autonomy, compensation depended on the combined performance of both participants. Each participant´s earnings were significantly impacted by their partner´s outcomes, creating a mutual dependency. This structure limited individual control and autonomy, as the payoff was contingent upon collaborative performance rather than individual success alone.

### *Operationalization of Influence*

Influence was manipulated by varying the extent to which one participant´s performance impacted both their own and their partner´s rewards.

**High Influence**: In conditions of high influence, participants had a significant impact on both their own and their partner´s outcomes. Their performance affected 50% of their partner´s

compensation, emphasizing a shared responsibility for outcomes. This interconnected payoff structure highlighted the degree of influence each participant exerted within the dyad.

**Low Influence**: In conditions of low influence, participants had minimal impact on their partner´s outcomes. Compensations for each participant were determined largely or entirely by their own performance, with little or no influence on the partner´s reward. This setup reflected a more isolated dynamic, with limited interplay between participants' actions.

***Resulting Conditions Across Dyad Types - Independent Variables***

The combination of these two dimensions – autonomy (high vs. low) and influence (high vs. low) – produced four distinct conditions distributed across three dyad types:

**Dyad 1:** High Influence and Low Autonomy. Bonus payments depended equally on both participants 'performances, ensuring mutual dependence and restricting individual control.

**Dyad 2:** Low Influence and High Autonomy. Bonuses were determined solely by individual performance, minimizing mutual influence and allowing participants complete control over their outcomes.

**Dyad 3a:** High Influence and High Autonomy. Bonuses reflect individual performance but also influence 50% of the partner´s reward. This created a dynamic where participants retained control over their own outcomes while simultaneously impacting their partner´s compensation.

**Dyad 3b:** Low Influence and Low Autonomy. Bonuses depended equally on individual and partner performance, limiting both autonomy and influence. Participants experienced significant mutual dependence, with restricted control over their own and their partner´s rewards.

By systematically varying autonomy and influence in this manner, the study aims to explore how these variables interact to impact task performance, interaction dynamics, and self-other integration within the Joint Simon Task. For a detailed overview of the four conditions, please refer to Appendix A, Table 1.

### *Manipulation Check - Questionnaire*

Participants completed a post-task questionnaire to assess perceived autonomy and influence (See Appendix B – Post-Simon Questionnaire). The questionnaire measured participants' subjective perceptions across four key areas (1) two items assessing the degree of influence participants perceived they had over their partner´s performance (measuring perceived influence); (2) two items regarding their feelings of independence from their partner´s actions (measuring perceived autonomy); (3) one item evaluating their subjective sense of power within the interaction; and (4) one item assessing their overall mood (good vs. bad). Responses were captured on a 9-point Likert scale ranging from 1 (“Not at all”) to 9 (“To a great extent”). Higher scores represented greater levels of perceived influence, autonomy, power, or positive mood. This structured format provided a systematic way to evaluate participants' subjective experiences, supporting the interpretation of the objective task-based measures of self-other integration.

## Procedure

Participants were recruited through social media, public postings, and university platforms such as the SONA system. After expressing interest, participants were screened for eligibility and provided an online information letter that detailed the study´s purpose, procedures, and ethical considerations. Participants were required to review this letter before signing the consent form to indicate their informed consent. Upon successful enrolment,

participants were assigned to one of four experimental conditions and paired based on age and gender to minimize demographic variability.

On the day of the experiment, participants arrived at a designated laboratory space, were greeted by a researcher, and were reminded to maintain quiet during the session to avoid communication with each other and minimize distraction. The experimental setting consisted of two chairs facing a shared screen, a response box to capture their responses during the task, and once more the information letter in physical form, even though no new information had been added. They then signed a physical consent form, reiterating their informed consent in alignment with ethical protocols and confirming their understanding of the study´s requirements. This was followed by a brief verbal overview of the task to ensure participants were adequately prepared. During the execution of the task, the researchers remained outside of the experimental room to avoid external distractions.

Once the program started instructions were displayed on the computer in front of the participating dyad, enabling participants to move to the next slide whenever both of them were ready. The slides included practice trails, role-specific instructions, and explanations of the pay-off structure relevant to the experiment setting ranging between the four conditions. Participants completed a brief practice session followed by five main blocks of the Joint Simon Task, each lasting approximately three minutes, with 10-second breaks in between blocks. After the task, participants filled out a questionnaire regarding their experience and perceptions of autonomy and influence during the experiment. Additional questions captured demographic details (e.g., gender, age, handedness, seating position) to provide contextual data and clarify any confounding variables in the analysis.

After completing both the task and questionnaire, participants were provided with a debriefing letter explaining the significance of their contributions and allowed to ask questions, if they had any. To facilitate compensation, participants completed an online form to securely provide bank details. This ensured that all data handling adhered to privacy and ethical standards.

**Statistical Analyses**

A 2x2 factorial Analysis of Variance (ANOVA) was conducted to evaluate the impact of autonomy and influence on self-other integration, as determined by performance on the Joint Simon Task. Data were screened for out-of-range data and outliers using z-scores and boxplots to ensure integrity and appropriateness for ANOVA. No extreme values for self-other integration remained after screening. Reliability of measures was assessed using Cronbach´s alpha to confirm internal consistency, while a manipulation check (independent sample t-test) verified the efficacy of the experimental design. Randomization checks were also performed to ensure balanced characteristics across experimental conditions. Key assumptions of ANOVA were tested before analysis: (1) Normality: The Shapiro-Wilk test confirmed normal distribution within each factor level, (2) Homogeneity of Variance: Levene's Test indicated equality of variance across groups, and 3) Independence: The study design ensured no overlapping responses among participants.

Descriptive statistics including means, standard deviations, and score ranges, were computed to summarize self-other integration across experimental conditions. A factorial ANOVA was conducted, and in the event of significant interactions, simple effects analyses were planned to explore differences between conditions. Effect sizes, expressed as partial eta-squared ($\eta^2$), were calculated to evaluate the practical significance of the findings.

Data analysis was conducted using SPSS version 27.0 (IBM Statistics for Windows, Armonk, NY, USA). A significance level of $\alpha = .05$ was adopted for all statistical tests.

### Ethics

The local ethics review committee of the establishment of Psychology of Leiden University permitted the study (2024-02-29-A. van der Weiden-V1-5305) on 13-03-2024. Informed consent was obtained digitally and physically, emphasizing voluntary participation and confidentiality.

## Results

### Data Validation

The dataset was screened for out-of-range data, setting a cut-off range of 250 ms to 500 ms for valid reaction times (RTs), ensuring that responses were neither too fast (e.g., guessing) nor too slow (e.g., disengagement). All recorded RTs fell within this specified range, as they ranged from 285 ms to 475 ms, confirming the validity of the data in this regard. Additionally, the dataset was reviewed for outliers using z-scores to identify values more than three standard deviations from the mean. This approach ensures the data fell within a reasonable range and was not influenced by extreme values. For the variable self-other integration, no outliers were detected, as all z-scores fell within the acceptable range. These results suggest that the data is clean and appropriate for further analysis without excluding any participants.

### Descriptive Statistics

Self-other integration, representing the difference in reaction times to incongruent versus congruent stimuli, ranged from –26.749 to 48.706 ($M = 10.623$, $SD = 17.362$). A positive mean indicated slower reaction times on incongruent trials compared to congruent trials. On average,

participants took longer to respond to incongruent stimuli, reflecting the expected difficulty of processing incongruent information. The mean reaction time for incongruent trials was 373.159 ms (*SD* = 44.652), while the mean reaction time for congruent trials was 362.536 ms (*SD* = 40.859). A paired t-test showed a significant difference between the two conditions ($t$ (33) = 3.567, $p$ = .001), with a mean difference of 10.623 ms *(95% CI [4.564, 16.681]).* This result confirms the presence of a significant joint Simon effect, indicating that participants consistently exhibited slower reaction times for incongruent stimuli compared to congruent stimuli. The high standard deviation suggests considerable individual differences in performance on the joint task, which may have been influenced by factors beyond autonomy and influence.

**Randomization Check**

Before conducting the two-way ANOVA, a randomization check ensured that participants were evenly distributed across the four experimental conditions. The participants were evenly assigned across the four experimental conditions: high influence – low autonomy ($n$ = 10), low influence – high autonomy ($n$ = 8), high influence – high autonomy ($n$ = 8), and low influence – low autonomy ($n$ = 8). However, in two of the between-subject conditions, there were no male volunteers, making it impossible to statistically check for gender, and consequently, the gender distribution was not balanced.

**Table 2**

*Descriptives for Age by Experimental Condition*

| Condition | N | Mean Age (years) | SD | SE |
|---|---|---|---|---|
| C1 (High influence – Low autonomy) | 10 | 23.4 | 2.41 | 0.763 |
| C2 (Low influence – High autonomy) | 8 | 24.3 | 4.06 | 1.436 |
| C3 (High influence – High autonomy) | 8 | 23.9 | 3.48 | 1.231 |
| C4 (Low influence – Low autonomy) | 8 | 24.1 | 3.52 | 1.246 |

**Note.** Age was measured in years. Mean reaction time scores per condition are presented in milliseconds (ms).

**Counterbalancing Check**

A counterbalancing check was conducted to assess whether seating positions (left vs. right) and stimulus type (diamonds vs. squares) affected reaction time (RT) variance across the four conditions. A 2 (seating position: left vs. right) x 2 (stimulus type: diamonds vs. squares) factorial ANOVA was employed. The results indicated no significant main effect of seating position, $F(1, 30) = .04$, $p = .848$, $\eta^2 = .001$, but a significant main effect of stimulus type was observed, $F(1,30) = 4.69$, $p = .038$, $\eta^2 = .135$. Participants responding to square stimuli exhibited greater RT differences than those responding to diamond stimuli. The interaction between seating position and stimulus type was not significant, $F(1,30) = .68$, $p = .416$, $\eta^2 = .022$. To address this, stimulus type was accounted for in subsequent analyses to control for its impact on RT variance.

**Table 3**

*Estimated Marginal Means for Reaction Time by Stimulus Type*

| Stimulus Type | Mean RT Difference (ms) | SE | 95% CI Lower | 95% CI Upper |
|---|---|---|---|---|
| Diamonds | 4.53 | 4.07 | -3.78 | 12.8 |
| Square | 16.99 | 4.07 | 8.68 | 25.3 |

**Note.** Reaction time differences (RT) are presented in milliseconds (ms). Mean differences are based on response to congruent versus incongruent stimuli.

**Manipulation Checks**

Manipulation checks were conducted using questionnaire responses to assess participants' perceptions of autonomy, influence, and power. No significant main effect of autonomy was detected, $F(1,30) = .004$, $p = .949$, $\eta^2 < .001$, or interaction with influence, $F(1,30) = .38$, $p = .721$, $\eta^2 = .004$. Similarly, no significant main effect of influence was detected, $F(1,30) = .56$, $p = .462$, $\eta^2 = .018$, nor was there a significant interaction effect with autonomy, $F(1,30) = .77$, $p = .388$, $\eta^2 = .025$. Subjective power did not significantly differ between conditions either, $F(1,30) = .02$, $p = .833$, $\eta^2 = .001$

These results indicate that the manipulations of autonomy and influence were not effective in creating perceptible differences in participants' subjective experience of autonomy, influence, and power.

**Assumption Checks**

All necessary assumptions for conducting the ANOVA, including normality and homogeneity of variance, were checked and satisfied. The Shapiro-Wilk test confirmed normality ($W = .984$, $p = .8768$), and Levene's test indicated no significant violation of homogeneity of variance ($F = 2.415$, $p = .086$). For a visual representation of the data

distribution across experimental conditions, see Figure 1 in Appendix B. These assumption checks indicate that the data met the necessary criteria for conducting an ANOVA, supporting the validity of the statistical tests. For a detailed description of the assumption checks, please refer to Appendix C.

**Two-Way ANOVA**

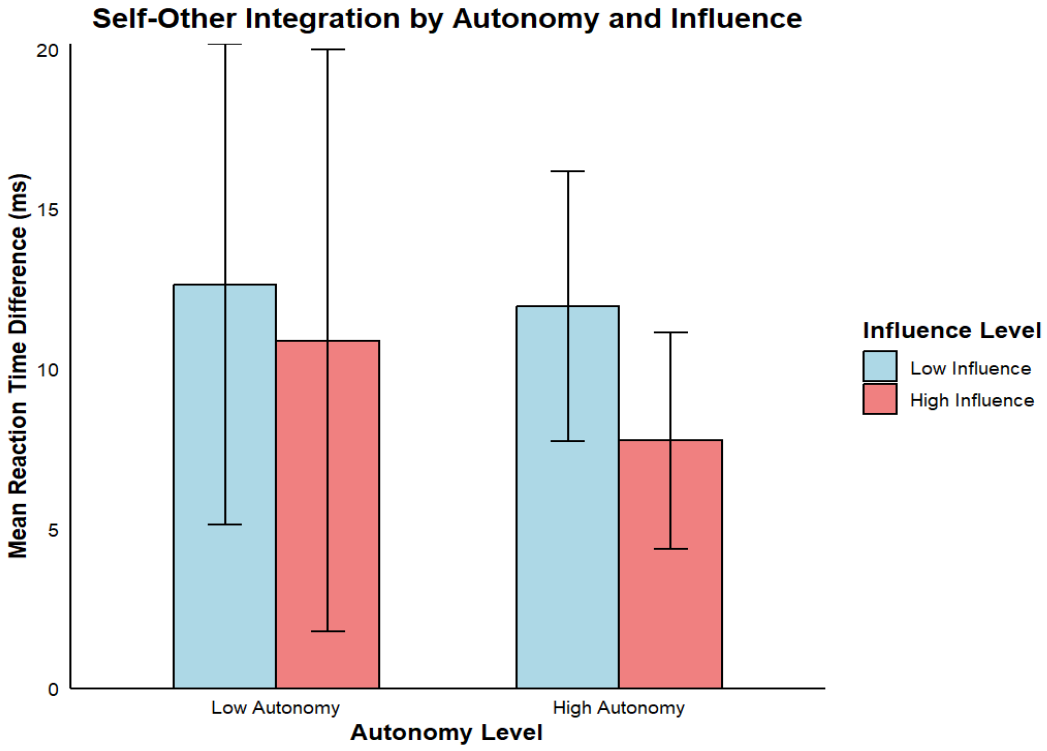
A two-way ANOVA was conducted to examine the effects of influence and autonomy on self-other integration. The analysis revealed no significant main effect of influence, $F(1, 30) = .257$, $p = .616$, $\eta^2 = .0085$, indicating no substantial difference in self-other integration between low and high-influence groups. Similarly, the main effect of autonomy was not significant, $F(1, 30) = .100$, $p = .754$, $\eta^2 = .0033$, suggesting autonomy levels did not significantly affect self-other integration. The interaction effect between influence and autonomy on self-other integration was also not statistically significant, $F(1, 30) = .039$, $p = .845$, $\eta^2 = .0013$.

The interaction plot (see Figure 2) illustrates the distribution of mean reaction time differences (ms) for self-other integration across experimental conditions. Error bars, representing standard deviations, highlight variability within groups, which may explain the non-significant findings. For additional support regarding assumption checks, see Figure 1 in Appendix C.

**Figure 2**

*Mean Reaction Time Differences by Autonomy and Influence*

Mean reaction time differences (ms) in self-other integration are displayed for four experimental conditions, reflecting the independent effects of autonomy (low vs. high) and influence (low vs. high). Error bars represent standard deviations.




**Note.** The two-way ANOVA revealed no significant main effects of influence, or autonomy, nor a significant interaction effect. Wide error bias indicates high variability within groups, contributing to the lack of significant findings.

## Discussion

The current study aimed to assess the impact of autonomy and influence on self-other integration in joint tasks. The results revealed that neither autonomy nor influence produced statistically significant main effects on self-other integration, and the interaction effect also failed to reach significance. There may be multiple explanations for these findings, which are elaborated below. One likely explanation relates to the lack of statistical power in the current study. A sample size insufficient to detect subtle effects can obscure meaningful trends, particularly when the effect sizes are small (Cohen, 1992). Given that the study relied on a medium effect size ($f$ = .25) for power calculations, minor deviations from this assumption could have significantly affected the outcomes (van der Weiden et al., 2021). These non-significant results may reflect insufficient statistical power due to a small sample size or variability within groups. For instance, high variability in the low influence – low autonomy ($SD$ = 21.2) and high influence – low autonomy ($SD$ = 25.7) conditions may have obscured any potential effects. This limitation highlights the importance of a larger sample size in future studies to enhance the robustness of findings. Additionally, variability within participant responses, as observed in the manipulation checks, might have contributed to reduced sensitivity in detecting expected patterns. These findings challenge initial hypotheses and highlight the complexity of power dynamics in joint contexts.

Task structure might also play a critical role in shaping the observed outcomes. Tasks emphasizing interdependence and shared goals are known to mitigate the distancing effects of power by fostering mutual accountability and shared responsibility (Bolt & Loehr, 2017): Ruys & Aarts, 2010). In the current task, the high-autonomy condition

emphasized individual performance through reward structures, which might have reduced the sense of shared agency critical for self-other integration. Conversely, a task framework designed to emphasize joint agency and collective outcomes might have encouraged greater attentiveness to co-actors, counteracting the potentially distancing effects of high power. This aligns with research demonstrating that structured interdependence in task design fosters integration by promoting shared objectives and collaboration focus (Sebanz et al., 2003; Bolt & Loehr, 2017).

While autonomy and influence are theoretically impactful on self-other integration, these effects may be contingent on specific contextual factors that were not adequately captured in this study. For instance, individual differences, such as participants' empathy levels or personality traits, might have overshadowed the experimental manipulations. Empathy, in particular, is known to impact attentiveness to other´s perspectives, potentially amplifying or mitigating the effects of power dynamics (Guinote, 2017; Lammers et al., 2016). Individuals with higher baseline empathy might naturally exhibit greater self-other integration, reducing the observed differences between conditions. Additionally, traits such as dominance orientation or agreeableness could impact how participants respond to autonomy or influence manipulations, further complicating the interpretation of results (Magee & Galinsky, 2008).

Although the findings do not confirm the expected effects, previous research suggests that power dynamics often reduce attentiveness to others' needs, diminish empathy, and encourage a focus on personal goals (Magee & Smith, 2013; Magee & Galinsky, 2008). For instance, high-power individuals often engage in approach-oriented behaviors that deprioritize attentiveness to social cues (Keltner, Gruenfeld, & Anderson,

2003). The design of the Joint Simon Task in this study, which emphasized individual performance in the high-autonomy condition, may not have sufficiently activated interdependence, reducing its sensitivity to these dynamics. Research also underscores the importance of shared task representations in fostering integration, suggesting that task explicitly designed to promote joint agency might yield different outcomes (Sebanz et al., 2003).

Task engagement further moderates the relationship between power dynamics and self-other integration. Participants focused on task completion might deprioritize social cues, reducing the effect of autonomy and power manipulations on integration. This is particularly relevant in tasks with low interdependence, where attentiveness to co-actors may not be essential for successful task performance (Bolt & Loehr, 2017). However, it remains unclear what the expected level of self-other integration should be under these conditions. The manipulation checks indicate some trends in the expected directions, even if the results were not statistically significant, suggesting that the manipulations might not have been strong enough to elicit meaningful behavioural changes.

Furthermore, social-cognitive mechanisms, such as perceived co-actor agency and intentionality, play a critical role in self-other integration (Atmaca et al., 2011). High-power individuals prioritize their agency, reducing responsiveness to perceived subordinates. However, without stronger operationalizations of power, such as granting decision-making authority or exclusive resources, it is challenging to determine the extent of this effect (Guinote, 2017). The results of the manipulation checks suggest that the financial incentives used in this study may not have been sufficient to evoke meaningful perceptions of authority or exclusivity, which are often critical for eliciting psychological

distancing effects.

For instance, incentives alone may not create a meaningful sense of authority or exclusivity necessary to elicit significant effects (Guinote, 2017). This aligns with existing evidence that reward power is most effective when tied to control over outcomes or symbolic authority (Vohs et al., 2006). The absence of these elements in the current study may partially explain the lack of significant effects, as participants may not have experienced the incentives as reflective of true power dynamics.

In summary, while this study did not confirm the hypothesized effect of autonomy and influence on self-other integration, it provides important insights into the complexity of power dynamics in joint tasks. The non-significant findings are likely affected by a combination of limited statistical power, task design emphasizing individual performance, and insufficient operationalization of power constructs. Future research should refine these elements, including more robust manipulations of autonomy and influence, to better capture the nuanced effects of power on self-other integration.

## Strengths and Limitations

This study provides important insights into the nuanced relationship between autonomy, influence, and self-other integration. However, several strengths and limitations warrant consideration to provide a balanced evaluation of the study´s contributions.

### *Strengths*

One of the key strengths of this research lies in its innovative design. The use of a 2x2 factorial framework to explore the main and interactive effects of autonomy and influence represents a novel approach to studying self-other integration. This design integrates two key

dimensions of power, which are often examined independently, into a single framework, providing a foundation for future research to further investigate their combined effects.

The behavioural measurement approach, utilizing the Joint Simon Task, adds robustness to the study. Unlike self-reported methods that may be prone to biases or inaccuracies, this method provides an objective measure of attentional and response mechanisms, enabling precise and quantifiable assessments of cognitive processes during joint tasks.

The study also holds ecological relevance due to its operationalization of autonomy and influence through performance-based financial incentives, which mirrors real-world scenarios where power dynamics are intertwined with tangible rewards and interdependencies. This design adds practical significance and enhances the study´s relevance to organizational and interpersonal contexts.

Lastly, by addressing a theoretical gap in the literature, this research contributes to a more nuanced understanding of how autonomy and influence interact to shape cognitive and social processes. The inclusion of well-established theoretical models (e.g., Guinote, 2017; Lammers et al., 2016) strengthens the study´s conceptual foundation and ensures that findings are situated within a broader framework.

***Limitations***

Despite its strengths, the study has notable limitations. The small sample size ($N = 34$) significantly limited the study´s statistical power, increasing the likelihood of Type II errors and reducing the ability to detect subtle variations in the effects of autonomy and influence. This limitation restricts the ability to draw robust conclusions about the observed effects and may have obscured potential trends in the data.

Another limitation lies in the homogeneity of the participant pool, as most participants were young adults from a single university setting. While this demographic homogeneity ensures consistency across participants, it raises concerns about the generalizability of findings to more diverse populations. The reliance on a narrow participant pool may limit the applicability of results to broader contexts where age, cultural background, and professional experiences vary.

The operationalization of autonomy and influence through financial incentives may not have fully captured the complex psychological dimensions of power. While financial incentives reflect tangible aspects of power, they may lack the symbolic or authoritative significance needed to evoke the distancing or integrative effects associated with autonomy and influence. For instance, prior studies suggest that manipulations involving task flexibility, resource control, or symbolic rewards (e.g., decision-making authority or recognition) (Craft & Simon, 1970) may more accurately reflect real-world power dynamics and elicit stronger psychological responses (Vohs et al., 2006; Guinote, 2017).

Although the recruitment and design choices ensured consistency, alternative strategies for recruitment – such as targeted outreach to diverse demographic groups – might have enhanced participant variability and broadened the study´s scope. Moreover, while this study demonstrated the utility of financial incentives for operationalizing autonomy and influence, stronger or alternative manipulations could provide clearer insights into the nuanced effects of these power dimensions.

Taken together, the strengths of this study underscore its innovative approach, rigorous methodology, and relevance to real-world power dynamics. However, the limitations, particularly the small sample size, demographic homogeneity, and operationalization of key

constructs, suggest caution when interpreting the findings. By addressing these limitations in future research, this work can serve as a stepping stone toward a more comprehensive understanding of the interplay between autonomy, influence, and self-other integration.

**Implications**

While the current study´s findings were not statistically significant, they offer a foundation for discussing potential implications based on prior literature and the patterns observed in the data. It is important to interpret implications cautiously, given the study´s limitations, particularly the low statistical power. Instead of definitive conclusions, these insights should be considered speculative interpretations that align with existing theoretical frameworks.

The results suggest that external factors, such as task engagement and the social context of the task, may play a role in shaping the effects of autonomy and influence on self-other integration. For example, task designs that emphasize shared goals and interdependence could potentially mitigate the distancing effects of power by fostering collaboration and attentiveness to others. This aligns with prior research suggesting that stable and cooperative environments encourage greater integration by reducing competitive or hierarchical tendencies (Guinote, 2017; Tost, 2015). However, these interpretations remain speculative and should be tested in future research.

**Future Directions**

This study highlights several avenues for future research to deepen our understanding of how autonomy and influence impact self-other integration within power-laden contexts. A crucial first step is to replicate the current study with a significantly larger and more diverse sample to address the limitations of statistical power. Replication with a larger participant pool

would enable the detection of subtler effects of autonomy and influence, providing a more robust foundation for understanding their interplay in shaping cognitive and social behaviours. Proper randomization and balanced experimental conditions would further enhance the reliability and generalizability of the findings.

Contextual factors, such as time pressure and situational stress, merit further exploration as moderators of the relationship between power dynamics and self-other integration. Under high time pressure, for instance, high-power individuals may deprioritize social cues, leading to reduced attentiveness and empathy, while low-power individuals may become more vigilant as they adapt to hierarchical constraints (Galinsky et al., 2015). Understanding these dynamics could clarify how temporal and stress-related factors interact with power, shaping attentional focus and collaborative behaviours in hierarchical contexts.

Cultural orientations are another critical area for future research. In collective cultures, the emphasis on group harmony and interdependence may buffer the distancing effects of high-power roles, fostering greater collaboration and self-other integration (Hofstede, 1984). Conversely, individualistic cultures may exacerbate autonomy-driven disconnection and reduce attentiveness to others (Guinote, 2017). Cross-cultural studies could provide valuable insights into how cultural norms impact the interplay between autonomy, influence, and collaborative outcomes, enhancing the ecological validity of power-related theories.

Personality traits, such as empathy and social sensitivity, may also moderate the effect of power on self-other integration. Individuals with high empathy may remain attentive and collaborative even in high-power roles, while those with low empathy may show reduced self-other integration regardless of their power levels (Guinote, 2017). Future studies could investigate how these individual differences interact with autonomy and influence to either

mitigate or exacerbate their effects on collaborative behaviours. Examining personality-based moderators would provide a nuanced understanding of how power dynamics manifest across different individuals.

Task design represents another promising direction for advancing this research. Structured interdependence and task-emphasizing joint agency over individual performance could mitigate the distancing effects of task-emphasizing power by fostering collaboration and mutual responsibility (Bolt & Loehr, 2017; Ruys & Aarts, 2010). Future studies should prioritize creating tasks that require shared decision-making and emphasize collective goals, enabling a richer exploration of how autonomy and influence shape integration in collaborative settings.

Expanding this research to non-hierarchical power dynamics offers another area of inquiry. Investigating how autonomy and influence operate in egalitarian or distributed power structures could shed light on their effect beyond traditional hierarchical settings. Additionally, future studies could assess whether operationalizations such as symbolic authority or relational impact capture the nuances of power dynamics more effectively than financial incentives.

Finally, longitudinal research could provide valuable insights into the long-term effect of power on self-other integration. Tracking individuals in sustained high-power roles over time may reveal cumulative effects on attentiveness, empathy, and social cognition (Masten et al., 2011; Sebanz et al., 2003). These findings could inform interventions aimed at reducing the negative impacts of prolonged power imbalances while fostering more equitable and collaborative dynamics in both organizational and social contexts. By addressing these directions, future research can build on the findings of the current study, offering deeper insight into mechanisms and moderators of power dynamics in collaborative and hierarchical settings.

This expanded understanding has the potential to inform theoretical models, improve task designs, and guide practical applications in diverse cultural and organizational environments.

## Conclusion

This study investigates the effects of autonomy and influence on self-other integration using the Joint Simon Task but found no significant impact on autonomy, influence, or their interaction. These results suggest that the relationship between power dynamics and self-other integration is more complex than initially hypothesized, likely affected by external factors such as task design and individual differences. While findings are inconclusive due to limitations such as a small sample size, the study´s methodology, and theoretical framework provided a promising foundation for future research- Refining the experimental design and achieving greater statistical power in subsequent studies could offer deeper insights into how power dynamics shape social and cognitive processes.

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# Appendices

## Appendix A

## Distribution of Dyads Across Conditions

The following table illustrates the distribution of the three dyads across the four different conditions used in this study. This distribution reflects the levels of autonomy and influence assigned to each condition.

**Table A1**

*Distribution of Dyads Across Conditions*

| Condition | Dyad | Influence | Autonomy |
|---|---|---|---|
| 1 | 1 | High | Low |
| 2 | 2 | Low | High |
| 3 | 3a | High | High |
| 4 | 3b | Low | Low |

## Appendix B

## Post-Simon Questionnaire

In the joint task you recently completed, you collaborated with another participant to focus on your designated shapes (either squares or diamonds) while disregarding the other shape. Please answer the following questions to help us better understand how individual differences influenced task performance.

**Note**: When answering, rely on your initial instincts and avoid overthinking.

1. To what extent did your interaction partner's performance affect you?
   *(Scale: 1 = Not at all, 9 = To a great extent)*
2. To what extent did you feel independent of your interaction partner's performance?
   *(Scale: 1 = Not at all, 9 = To a great extent)*
3. To what extent did you feel your performance influenced your interaction partner?
   *(Scale: 1 = Not at all, 9 = To a great extent)*
4. To what extent did you feel your interaction partner was independent of your performance?
   *(Scale: 1 = Not at all, 9 = To a great extent)*
5. During the task, did you feel like you were in a position of low or high power?
   *(Scale: 1 = Very low, 9 = Very high)*
6. How did you feel during the task overall?
   *(Scale: 1 = Bad, 9 = Good)*

**Additional Information**:

- Where were you seated? *(Left / Right)*
- What is your handedness? *(Left / Right / Ambidextrous)*
- What is your gender? *(Female / Male / Non-Binary / Prefer not to say)*
- What is your age? *(Please specify)*

**Final Comments**:
If you have any additional feedback, please share it here.

**Post-Completion**:
After filling out the questionnaire, kindly inform the experiment leader to finalize your payment details.

**Thank you for your participation!**

## Appendix C

### Assumption Checks in Results

Before conducting the ANOVA, it was essential to ensure that the assumptions of normality and homogeneity of variance were met. These assumptions are critical for the validity of the ANOVA results.

To test the normality of the dependent variable, self-other integration, we performed the Shapiro-Wilk normality test ($W = 0.984$, $p = 0.8768$). Since the p-value is greater than 0.05, we fail to reject the null hypothesis that the data are normally distributed. Therefore, the assumption of normality is satisfied.

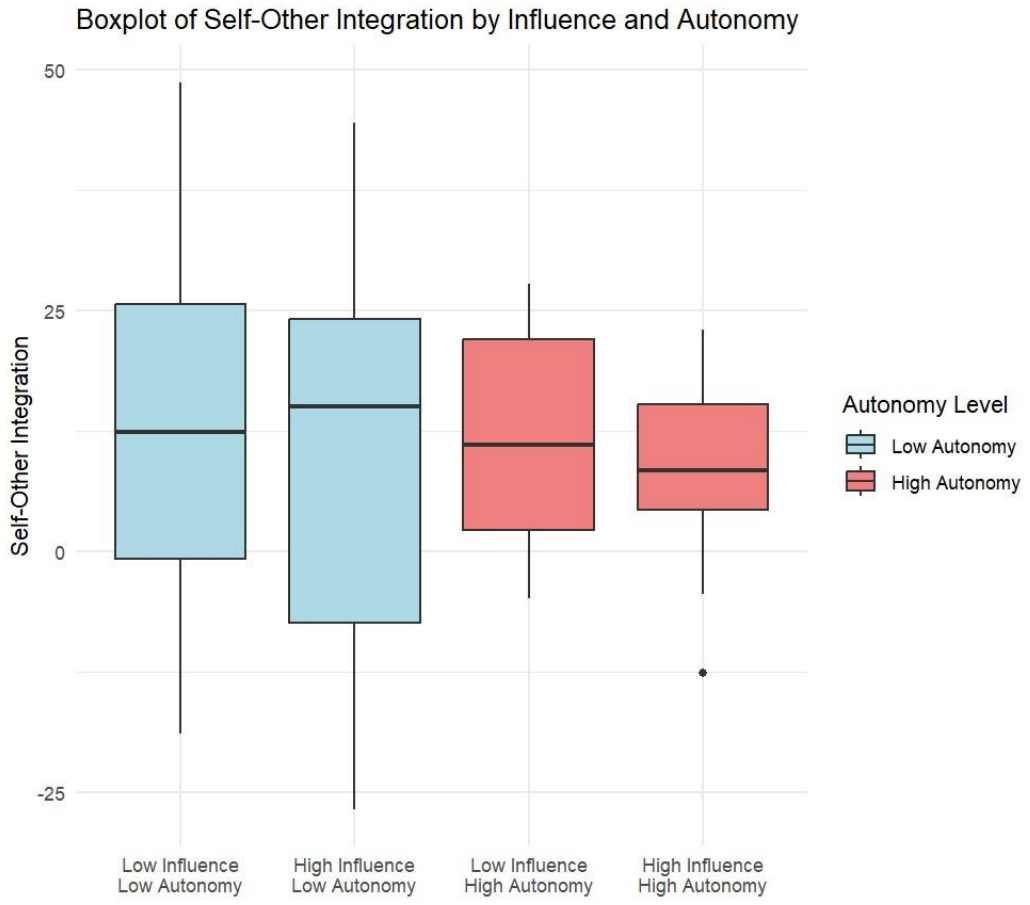
To check for homogeneity of variance, Levene's Test for Homogeneity of Variance was conducted ($F = 2.415$, $p = 0.086$). While the p-value is slightly above the conventional alpha level of 0.05, it is below the more lenient threshold of 0.10. This suggests that the variances may not be completely equal across groups, but the deviation is not substantial enough to strictly violate the homogeneity of variance assumption.

For further inspection, a boxplot of self-other integration by influence and autonomy was created (see Figure 1 below). This boxplot visually supports the results of the statistical tests, showing that the spread of self-other integration values across different groups does not indicate extreme deviations or significant outliers that could compromise the assumptions required for the ANOVA.

**Figure C1**

*Boxplot of Self-Other Integration by Autonomy and Influence Levels*

The distribution of self-other integration scores is shown for four experimental conditions: low influence – low autonomy, high influence – low autonomy, low influence – high autonomy, and high influence – high autonomy. Autonomy levels are color-coded (blue = low autonomy, red = high autonomy).




**Note.** The Sharpio-Wilk test confirmed normality ($W = .984$, $p = .8768$), and Levene´s test suggested no substantial violation of homogeneity of variance ($F = 2.415$, $p = .086$). The boxplot visually supports these findings, showing no extreme deviations or significant outliers that could compromise the ANOVA assumptions.