The Effect of Body-Posture-Primed Implicit Sense of Power on Fair Decision-Making: Post-print

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Abstract

Previous research has demonstrated that expansive body postures can prime individuals' sense of power. From an embodied cognition perspective, Experiment 1 examined the influence of body posture on monetary allocations made by proposers in a punishment-free game, while Experiments 2 and 3 investigated, respectively, the rejection rates of responders in the ultimatum game and punishment-free game for various allocation types under contractive and expansive postures. The results revealed that, compared to contractive postures, expansive postures increased individuals' tendency to make more self-serving unfair allocations when in the proposer role in the punishment-free game, and concurrently increased their tendency to reject unfair allocations in both the ultimatum game and the punishment-free game. This study provides evidence that the sense of power primed by expansive postures can influence individuals' fairness decision-making.

Full Text

The Influence of Body Posture-Primed Implicit Power on Fair Decision-Making

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Abstract

Previous research has demonstrated that expansive body postures can prime feelings of power. Grounded in an embodied cognition perspective, Experiment 1 examined how body posture influences monetary allocations when participants served as proposers in the Impunity Game. Experiments 2 and 3 investigated rejection rates for various allocation types when participants, in either contracted or expansive postures, served as responders in the Ultimatum Game and Impunity Game, respectively. Results indicated that, compared to contracted postures, expansive postures led individuals to make more self-serving unfair allocations when acting as proposers in the Impunity Game, while also increasing rejection rates of unfair offers in both the Ultimatum Game and Impunity Game. This study demonstrates that power primed through expansive postures can influence individuals' fair decision-making.

Keywords: embodied cognition; power metaphor; fair decision-making; ultimatum game; impunity game

Introduction

A series of social situational experiments have confirmed that expansive postures can increase individuals' sense of power (Carney, Cuddy, & Yap, 2015). Moreover, participants maintaining expansive postures make more high-risk, high-reward decisions than those in contracted postures; for instance, individuals in expansive postures are more willing to risk losing their principal to try to double it, rather than choosing low-risk decisions that would secure their principal while yielding half the amount (Carney, Cuddy, & Yap, 2010). This finding can be explained by the view that high-power individuals prefer high-risk decisions (Anderson & Galinsky, 2010). Some scholars argue that individuals in expansive postures choose high-risk, high-reward decisions because they have greater confidence in their decisions (Fischer, Fischer, Englich, Aydin & Frey, 2011). In economic negotiations, individuals with high power seek more profit for themselves (Kim, Pinkley & Fragale, 2005; Galinsky, Michael, & Magee, 2017). However, economic decision-making paradigms involving risk factors cannot distinguish whether individuals make high-risk, high-reward decisions to obtain greater benefits or to experience higher-risk stimulation. Consequently, research on how expansive postures influence economic decisions still contains significant gaps.

Most scholars contend that power leads individuals to act more selfishly because high-power individuals have stronger motivations to control resources than low-power individuals, enabling them to control low-power individuals through resource control (Fiske, 1993; Keltner, 2008). Other scholars propose that power activates individuals'approach systems, increasing sensitivity to reward and gain information, thereby prompting individuals to make self-serving allocations in decision-making (Salancik & Pfeffer, 1974). However, the selfish behavior of high-power individuals is also moderated by the level of power perception and

various situational factors (Jin, Li, Chen, & Guo, 2017). On the other hand, power primed by body postures operates at different consciousness levels than power primed in previous economic decision-making studies. Scholars generally agree that the process of power priming through expansive postures occurs at the subconscious level, and the priming effect is highly effective (Smith & Galinsky, 2010). Li, Galinsky, Gruenfeld, and Guillory (2011) compared power priming through body postures versus power role-playing through social situational experiments, finding that when both priming methods were manipulated as independent variables in the same experiment, only expansive postures successfully primed power, while high-power role-playing did not make participants perceive higher power. This suggests that power primed at the subconscious level is more effective than that primed at the conscious level. Only some expansive postures have cross-cultural effects on power priming (Park, Streamer, Huang, & Galinsky, 2013). Domestic research has also confirmed that expansive postures consistent with Chinese culture make individuals perceive higher power (Yang, Li, Guo, Fan, & He, 2017) and social status (Li, Du, & Ye, 2016). In summary, the mechanism by which power influences economic decisions is complex, involving both the diversity of power as a psychological state and the decision-making context.

Most psychological researchers use the Ultimatum Game paradigm and its variations to investigate the mechanisms influencing fair decision-making, examining questions such as when individuals might abandon rational pursuit of maximum benefit to reject profitable but unfair allocations (Nowak, Page, & Sigmund, 2000), and how internal factors like personality and genetic temperament affect fair decision-making (Wallace, Cesarini, Lichtenstein & Johannesson, 2007). When manipulating participants' power through explicit power manipulations, studies show that high-status responders in the Ultimatum Game have higher rejection rates for unfair allocations than low-status responders (Hu, Cao, Blue & Zhou, 2014; Hu et al., 2016). However, no research has investigated whether implicit power primed through expansive postures increases rejection rates of unfair allocations in the Ultimatum Game and its variations. Furthermore, no studies have examined whether implicit power primed through expansive postures leads individuals to make more self-serving monetary allocations in fair decision-making contexts. In summary, this study uses risk-free monetary allocation decision paradigms to investigate how body posture-primed implicit power influences individuals' fair decision-making.

Among various economic decision-making paradigms, the Ultimatum Game and its variations are widely and maturely applied in psychology. In the Ultimatum Game, a proposer suggests how to divide money with another player (the responder). When the responder accepts the proposal, both receive the amounts specified; when the responder rejects, both receive nothing. The Impunity Game is a similar task with two roles: proposer and responder. The key difference is that if the responder rejects the proposer' s allocation, the proposer still receives their allocated amount while the responder receives nothing. When individuals serve as proposers in the Impunity Game, they need not consider rejection risk,

focusing solely on monetary allocation and personal gain. Therefore, the proposer role in the Impunity Game can be used to investigate whether power primed through expansive postures leads individuals to make more self-serving allocations in risk-free monetary allocation contexts. Based on this, we propose Hypothesis 1: In risk-free monetary allocation decision contexts, power primed through expansive postures leads individuals to allocate more money to themselves.

Previous research shows that in the Ultimatum Game, most proposers allocate 40%-50% of the total amount to responders, while most responders reject allocations below 20% of the total. This phenomenon exists in both Western individualistic and Eastern collectivistic cultures (Camerer, 2004). When individuals serve as proposers in the Ultimatum Game, they must consider both the risk of rejection due to excessive unfairness and how to maximize their benefit (Rand, Tarnita, Ohtsuki, & Nowak, 2013). As previously noted, power can motivate individuals to seek profit and rewards, and also arouse motivation to control resources and others. The responder roles in both the Ultimatum Game and Impunity Game can investigate whether power influences fair decision-making by activating motivation to control resources or punish, or by activating motivation to gain profit. If power activates motivation to control resources or punish, participants will reject more unfair allocations; if power activates profit motivation, participants will accept more unfair allocations. Notably, responders in the Ultimatum Game can reduce the proposer' s gain to zero through rejection, meaning they can control resource allocation and the proposer's gain, potentially also rejecting due to aversion to unfairness. Research on the neural mechanisms of fair decision-making shows that unfair allocations activate negative emotion brain regions, with decision-making processes activating the anterior insula, anterior cingulate cortex, dorsolateral and medial prefrontal cortex, while profit outcomes relate to the brain' s reward system (Gabay, Radua, Kempton, & Mehta, 2014; Guo, Zheng, Cheng, Liu, & Li, 2017). Whether researchers manipulate social power through game tasks or subjective power through social and group roles (Hu et al., 2014; Hu et al., 2016), results consistently show that power increases rejection rates of unfair allocations among Ultimatum Game responders. Power and social status influence fair decision-making at early cognitive stages, with negative emotions from unfair allocations not interfering with how social context affects fair decision-making (Massi & Luhmann, 2015). Some scholars argue that power activates punishment motivation and motivation to control the proposer' s resources (Albrecht, Essen, Fliessbach, & Falk, 2013; Hu et al., 2016), while others propose that power reduces acceptance of unfairness that violates social expectations and increases aversion to unfairness, whereas low power makes individuals more sensitive to allocation information and more focused on actual gains (Boksem, Kostermans, Milivojevic, & De Cremer, 2012).

Overall, no unified view exists regarding the mechanism by which power influences responders' rejection of unfair allocations in the Ultimatum Game. However, it can be summarized that power increases responders' motivation to control resources or aversion to unfairness, thereby increasing rejection rates. No

research has used body posture-primed implicit power to observe its effect on rejection rates of unfair allocations among Ultimatum Game responders. Therefore, Hypothesis 2 proposes that implicit power primed through expansive postures increases rejection rates of unfair allocations among Ultimatum Game responders.

However, confirming Hypothesis 2 would only demonstrate that both implicit power primed through body postures and explicit power affect unfair allocation rejection rates, without clarifying whether power influences rejection through activating motivation to control the proposer' s resources or through resisting unfairness. In the Impunity Game, responders cannot punish proposers or control resource allocation through rejecting unfair allocations; their rejections are considered based solely on aversion to unfairness (Takagishi et al., 2009). No research has investigated whether implicit power primed through expansive postures increases rejection rates of unfair allocations in the Impunity Game. Only when individuals no longer have the possibility to punish proposers can we infer whether resistance to unfairness causes rejections. Previous research suggests that power increases aversion to unfairness. Based on this, Hypothesis 3 proposes that implicit power primed through expansive postures increases rejection rates of unfair allocations among Impunity Game responders.

In summary, this study aims to verify the influence of body posture-primed implicit power on fair decision-making. To eliminate risk factors from decision-making, we used responder roles in the Ultimatum Game and both proposer and responder roles in the Impunity Game. First, Experiment 1 examined whether implicit power primed through expansive postures leads individuals serving as Impunity Game proposers to allocate more money to themselves. Next, Experiment 2 investigated how body posture-primed implicit power affects rejection rates of unfair allocations when individuals serve as Ultimatum Game responders. Finally, Experiment 3 examined how body posture-primed implicit power affects rejection rates of unfair allocations when individuals serve as Impunity Game responders.

Experiment 1: The Effect of Posture-Primed Implicit Power on Self-Serving Allocations in the Impunity Game

2.1 Purpose

To investigate the effect of expansive posture-primed implicit power on monetary allocations when individuals serve as proposers in the Impunity Game.

2.2 Participants

Forty-three undergraduate students from a university participated in the experiment. Two participants were excluded due to input errors causing missing trials, and one participant was excluded for voluntarily changing posture during the experiment. The final sample consisted of 40 participants (18 male, 22 female;

23 science majors, 17 humanities majors) with a mean age of 20.15 ± 1.30 years. All participants were right-handed with normal or corrected-to-normal vision. They participated voluntarily and had no prior experience with similar experiments. After the experiment, participants received payment based on randomly selected trials.

2.3 Design

A single-factor two-level within-subjects design was employed, with body posture (contracted vs. expansive) as the independent variable. The contracted posture required participants to bend at the waist, place their hands together on their thighs, keep their legs together, and retract their calves backward. The expansive posture required participants to sit upright against the chair back, place their hands outward on the armrests, and extend their legs forward with feet apart. The dependent variable was the amount of money participants allocated to themselves. Mood was assessed using a 7-point Likert scale (1 = very unhappy to 7 = very happy) at three time points: before the game, after the contracted posture block, and after the expansive posture block (Hewig et al., 2011).

2.4 Experimental Scenario and Materials

Upon arrival at the experimental area consisting of three independent laboratories, participants were informed that the experiment was a two-player online monetary allocation game with another student waiting in an adjacent laboratory. In reality, all allocations were pre-programmed. Each participant completed the experiment alone in a soundproof, well-lit laboratory using a single computer positioned centrally. Chair position and distance from the monitor were standardized before each block.

The experimenter introduced the game rules, explaining that each trial had two roles: proposer and responder. Participants selected their role by pressing a number key on a blind selection screen. In Experiment 1, regardless of which key participants pressed, they were always assigned the pre-determined role. This role selection procedure was implemented to create a sense of randomness, prevent participants from guessing the experimental purpose, and enhance belief in the presence of an actual online partner. After role selection, the experimenter confirmed participants' understanding of the rules, followed by five practice trials.

2.5 Procedure

Step 1: The experimenter read the instructions: "Hello! Thank you for participating in our psychology experiment. This experiment is anonymous and results are for research purposes only. Please first complete this brief demographic questionnaire. Another student in the adjacent laboratory will participate with you.

This is a 30 RMB allocation game. Please review the game rules. Press any key when you understand."

The game rules were presented as follows: "There are two game formats, each with two roles: Proposer vs. Responder. We will randomly assign you and the other player to roles based on your selection. Please read the instructions carefully.

Game A: The proposer allocates 30 RMB. If the responder rejects the allocation, both receive 0 RMB. If the responder accepts, both receive the proposed amounts.

Game B: The proposer allocates 30 RMB. If the responder rejects the allocation, the responder receives 0 RMB while the proposer' s bonus is unaffected. If the responder accepts, both receive the proposed amounts."

Step 2: The screen displayed that the participant had been assigned as the proposer in Game B. The experimenter confirmed participants' understanding, followed by five practice trials. The program then randomly selected a posture image, which was displayed for one minute while participants maintained the posture. The experimenter ensured posture accuracy before leaving the laboratory.

Step 3: Each game trial involved a 30 RMB stake. Participants entered their allocation proposal ten times in a box at the bottom of the screen, with no time limit per entry. After each entry, participants received 2000 ms feedback displaying their proposed allocation. No information about whether the responder accepted or rejected was provided.

Step 4: After a break, the program again presented posture selection and required one minute of posture holding. The experimenter re-entered to ensure correct posture and seating distance before participants began the next posture block. The procedure for all three experiments was essentially identical (see Figure 1 [Figure 1: see original paper]).

2.6 Results and Discussion

A two-way (body posture × proposal round) repeated measures ANOVA revealed a significant main effect of body posture, $F(1, 39) = 8.79$, $p = 0.005$, ^{2} $= 0.18$. Participants allocated more money to themselves in the expansive posture condition (18.99 ± 0.71) than in the contracted posture condition (17.97 ± 0.70). Neither the main effect of proposal round nor the interaction between proposal round and body posture was significant, indicating no differences across the ten proposal rounds and no mutual influence between rounds and posture.

A repeated measures ANOVA on mood ratings (initial: 4.48 ± 0.94; contracted block: 4.56 ± 1.19; expansive block: 5.04 ± 1.56) showed no significant differences, $F(2, 80) = 1.65$, $p = 0.204$, suggesting no significant mood changes across the initial phase and the two posture blocks.

Overall, participants proposed more money for themselves in both posture conditions. In the expansive posture condition, the minimum mean self-allocation was 18.40 RMB in round 6, and the maximum was 19.55 RMB in round 9. In the contracted posture condition, the minimum was 17.15 RMB in round 3, and the maximum was 19.00 RMB in round 7. These results exceed previous findings where Ultimatum Game proposers typically allocated 40%-50% to themselves. Because Experiment 1 used the non-public Impunity Game where participants faced no rejection risk, even the contracted posture condition yielded average self-allocations exceeding 50%. These results align with previous findings that power leads to more self-serving behavior, demonstrating that implicit power primed through body postures activates individuals' approach motivation for profit in economic decision-making, similar to explicit power and social power.

Experiment 2: The Effect of Posture-Primed Implicit Power on Rejection Rates of Unfair Allocations in the Ultimatum Game

3.1 Purpose

To investigate whether expansive posture-primed implicit power, compared to contracted posture, affects rejection rates of unfair allocation proposals when participants serve as responders in the Ultimatum Game.

3.2 Participants

Forty-five university students participated (21 male, 24 female; 22 science majors, 23 humanities majors) with a mean age of 20.35 ± 1.43 years. All were right-handed with normal or corrected-to-normal vision. Participants received payment based on randomly selected trials after the experiment.

3.3 Design

A 2 (body posture: contracted vs. expansive) × 3 (allocation: extremely unfair vs. relatively unfair vs. fair) within-subjects design was employed. Posture requirements matched Experiment 1. The dependent variable was rejection rates for the three allocation types. Mood assessment was identical to Experiment 1.

3.4 Materials

3.4.1 Experimental Scenario Identical to Experiment 1.

3.4.2 Materials Stake and allocation proportions: Based on previous Ultimatum Game research and considering Chinese monetary values and consumption perspectives, the stake was set at 30 RMB. Previous research indicates that responders typically reject allocations below 20% of the total, with rejection rates decreasing when allocations exceed 30%. Accordingly, three allocation types (responder/proposer) were used:

- Extremely unfair: 1/29, 2/28, 3/27, 4/26, 5/25
- Relatively unfair: 10/20, 11/19, 12/18, 13/17, 14/16
- Fair: 15/15

3.5 Procedure

Step 1: Instructions were read and comprehension confirmed, identical to Experiment 1.

Step 2: The screen displayed assignment as the responder in Game A. Posture manipulation matched Experiment 1.

Step 3: Each block randomly presented five trials of each allocation type (30 trials total). Participants responded with 'G' or 'H' keys to accept or reject. Each trial remained on screen until response, followed by 2000 ms feedback. Posture order, response keys, and left/right positions of proposer/responder were counterbalanced across participants.

3.6 Results and Discussion

A 2 (posture: expansive vs. contracted) × 3 (allocation: extremely unfair vs. relatively unfair vs. fair) repeated measures ANOVA revealed significant main effects of posture, $F(1, 44) = 5.83$, $p = 0.020$, $^{2} = 0.12$, and allocation, $F(2, 88) = 165.62$, $p < 0.001$, $^{2} = 0.79$ (see Table 1 for means and standard deviations). No interaction existed between posture and allocation. Multiple comparisons showed significant differences between fair and relatively unfair allocations, $F(1, 44) = 62.29$, $p < 0.001$, $^{2} = 0.59$; between fair and extremely unfair allocations, $F(1, 44) = 401.98$, $p < 0.001$, $^{2} = 0.90$; and between relatively unfair and extremely unfair allocations, $F(1, 44) = 91.14$, $p < 0.001$, $^{2} = 0.67$.

Mood ratings (initial: 4.63 ± 1.11; contracted block: 4.76 ± 1.22; expansive block: 5.05 ± 1.53) showed no significant differences, $F(2, 88) = 0.79$, $p = 0.437$, indicating no significant mood changes across experimental phases.

Because Ultimatum Game responders possess some power to control resource allocation, even though rejection yields no profit, mean rejection rates for extremely unfair allocations exceeded 80% in both posture conditions. When unfairness decreased to relatively unfair levels, the expansive posture condition yielded a 44% rejection rate, while the contracted posture condition showed only 32%. These results suggest that implicit power primed through expansive postures likely strengthened responders' control over resource allocation and punishment of proposers, motivating rejection of both extremely and relatively unfair allocations rather than reducing rejection rates to obtain more profit. However, whether this effect stems from increased aversion to unfairness cannot be determined from Ultimatum Game behavioral studies. The Impunity Game responder role, based solely on aversion to unfairness, is required to address this question.

Experiment 3: The Effect of Posture-Primed Implicit Power on Rejection Rates of Unfair Allocations in the Impunity Game

4.1 Purpose

To investigate whether expansive posture-primed implicit power, compared to contracted posture, affects rejection rates of unfair allocation proposals when participants serve as responders in the Impunity Game.

4.2 Participants

Forty-one undergraduates participated, with one excluded for posture change during the experiment. The final sample of 40 participants (17 male, 23 female; 14 humanities majors, 16 science majors) had a mean age of 18.01 ± 1.45 years. All were right-handed with normal or corrected-to-normal vision and no prior experience with similar experiments. Participants received payment based on randomly selected trials after the experiment.

4.3 Design

A 2 (body posture: contracted vs. expansive) × 3 (allocation: extremely unfair vs. relatively unfair vs. fair) within-subjects design was employed. Posture requirements matched Experiment 1. The dependent variable was rejection rates for the three allocation types. Mood assessment was identical to Experiment 1.

4.4 Materials

4.4.1 Experimental Scenario Identical to Experiment 1.

4.4.2 Materials Identical to Experiment 2.

4.5 Procedure

Identical to Experiment 2.

4.6 Results and Discussion

A 2 (posture: expansive vs. contracted) × 3 (allocation: extremely unfair vs. relatively unfair vs. fair) repeated measures ANOVA revealed significant main effects of posture, $F(1, 39) = 6.10$, $p = 0.018$, $^2 = 0.14$, and allocation, $F(2, 78) = 41.64$, $p < 0.001$, $^2 = 0.52$. No interaction existed between posture and allocation. Multiple comparisons showed no significant difference between fair and relatively unfair allocations, $F(1, 39) = 5.37$, $p = 0.026$, $^2 = 0.12$; significant differences between fair and extremely unfair allocations, $F(1, 39) = 46.30$, $p < 0.001$, $^2 = 0.54$; and between relatively unfair and extremely unfair allocations, $F(1, 39) = 42.29$, $p < 0.001$, $^2 = 0.52$ (see Table 2 for means and standard deviations).

A repeated measures ANOVA on mood ratings (initial: 5.15 ± 1.19; contracted block: 4.15 ± 1.40; expansive block: 4.13 ± 1.22) showed a significant main effect of time point, $F(2, 78) = 15.69$, $p < 0.001$, $^{2} = 0.29$. Multiple comparisons revealed significant differences between initial mood and both contracted block, $F(1, 39) = 16.25$, $p < 0.001$, $^{2} = 0.29$, and expansive block, $F(1, 39) = 20.75$, $p < 0.001$, $^{2} = 0.35$. No difference existed between the two posture blocks, $F(1, 39) = 0.034$, $p = 0.855$. These results suggest that participants' lower mood ratings during the posture blocks compared to initial ratings may reflect frustration with the Impunity Game' s rules that prevent punishing proposers and result in unilateral loss. The absence of mood differences between posture blocks indicates that posture did not affect emotion.

Compared to the Ultimatum Game, the Impunity Game creates a status differential between proposers and responders. Even when responders reject unfair allocations, proposers still receive their proposed amounts. Responders' rejections can thus be interpreted as resulting from aversion to unfair treatment outweighing rational profit-seeking. The results suggest that implicit power primed through expansive postures strengthened aversion to unfair allocations, thereby increasing rejection rates.

To better compare Experiments 2 and 3, merged data were analyzed using a 2 (game type: Ultimatum Game vs. Impunity Game) × 2 (posture: expansive vs. contracted) × 3 (allocation: fair vs. relatively unfair vs. extremely unfair) repeated measures ANOVA, with game type as a between-subjects variable and posture and allocation as within-subjects variables. Results showed significant main effects of game type, $F(1, 83) = 28.45$, $p < 0.001$, $^{2} = 0.25$, with lower rejection rates in the Impunity Game (0.18 ± 0.03) than the Ultimatum Game (0.40 ± 0.03); posture, $F(1, 83) = 9.72$, $p = 0.003$, $^{2} = 0.11$, with higher rejection rates in expansive (0.32 ± 0.02) than contracted postures (0.27 ± 0.02); and allocation, $F(2, 166) = 175.63$, $p < 0.001$, $^{2} = 0.68$, with extremely unfair allocations receiving higher rejection rates (0.64 ± 0.04) than relatively unfair allocations (0.23 ± 0.03), and fair allocations receiving the lowest rejection rates (0.02 ± 0.01).

Multiple comparisons revealed significant differences between fair and relatively unfair allocations, $F(1, 83) = 60.76$, $p < 0.001$, $^{2} = 0.42$; between fair and extremely unfair allocations, $F(1, 83) = 291.98$, $p < 0.001$, $^{2} = 0.78$; and between relatively unfair and extremely unfair allocations, $F(1, 83) = 125.42$, $p < 0.001$, $^{2} = 0.60$. Significant interactions emerged between allocation type and game type, $F(2, 166) = 1.21$, $p < 0.001$, $^{2} = 0.19$, and between allocation type and posture, $F(2, 166) = 3.26$, $p = 0.045$, $^{2} = 0.04$. No significant interactions appeared between game type and posture, $F(1, 83) = 1.14$, $p = 0.29$, or among all three variables, $F(2, 166) = 0.65$, $p = 0.51$.

Simple effects analysis showed that for fair allocations, neither game type, $F(1, 83) = 0.73$, $p = 0.40$, nor posture, $F(1, 83) = 0.89$, $p = 0.35$, significantly affected rejection rates. For relatively unfair allocations, the Ultimatum Game yielded higher rejection rates than the Impunity Game, $F(1, 83) = 24.58$, $p < 0.001$,

^{2} = 0.23, and expansive posture yielded higher rejection rates than contracted posture, $F(1, 83) = 7.73$, $p = 0.007$, ^{2} = 0.09. For extremely unfair allocations, the Ultimatum Game again yielded higher rejection rates than the Impunity Game, $F(1, 83) = 26.86$, $p < 0.001$, ^{2} = 0.24, and expansive posture yielded higher rejection rates than contracted posture, $F(1, 83) = 3.90$, $p = 0.052$, ^{2} = 0.05. These results indicate that: (1) when considering game type differences, rejection rate differences primarily manifest for relatively and extremely unfair allocations, with game type and posture effects diminishing for fair allocations; (2) the absence of interaction between game type and posture indicates that posture effects on rejection rates are consistent across game types and unfairness levels, suggesting that expansive posture-primed implicit power may both increase aversion to unfairness and enhance motivation to punish proposers and control resources, thereby increasing rejection rates of unfair allocations.

General Discussion

This study' s theoretical foundation rests on the embodied effects of expansive postures and power, high-power individuals' approach tendencies toward self-serving behavior and resource control, and factors influencing fair decision-making in Ultimatum and Impunity Games. Using risk-free responder roles in the Ultimatum Game and both proposer and responder roles in the Impunity Game, results demonstrate that implicit power primed through expansive postures influences fair decision-making. Specifically, expansive postures led individuals to make more self-serving unfair allocations and increased rejection rates of unfair allocations among responders in both games. Previous research on power and fair decision-making used explicit power manipulations, whereas this study used body postures to prime implicit power, providing novel evidence for embodied decision-making and implicit power effects on fair decision-making. The findings show that implicit and explicit power produce consistent behavioral effects on fair decision-making: when allocating money, increased implicit power leads to more self-serving allocations; when serving as responders, implicit power increases motivation to punish or control resources, producing more rejections. Even when individuals cannot punish others or control resources, implicit power strengthens aversion to unfairness, leading to rejection of profitable offers.

5.1 The Effect of Body Posture-Primed Implicit Power on Proposers' Self-Serving Allocations in the Impunity Game

Most studies using Ultimatum Game variations to examine situational influences on fair decision-making have focused on responder roles. Recent research has begun examining brain activity in Ultimatum Game proposers as they weigh pros and cons and risks (Billeke et al., 2014). Ultimatum Game proposers must consider numerous factors, most critically the estimated risk of rejection, as well as responder identity and gender (Fabre, Causse, Pesciarelli & Cacciari, 2016). Compared to Ultimatum Game proposers, Impunity Game proposers need not balance profit and rejection risk, ensuring they receive their intended benefit.

No previous research has examined power effects on Impunity Game proposers' allocation decisions. Experiment 1 confirmed that when individuals experience high power, their approach motivation for profit is activated, leading them to pursue greater benefits. This aligns with previous findings that high-power individuals secure more profit in economic negotiations. The innovation of this study lies in priming power through posture control, demonstrating that embodied metaphorical effects generating implicit power lead individuals to allocate more benefits to themselves in risk-free economic decisions.

5.2 The Effect of Body Posture-Primed Implicit Power on Responders' Rejection Rates in the Ultimatum Game

Previous research has verified that social status and power affect Ultimatum Game responders' rejection of unfair allocations, with higher power leading to higher rejection rates. Additionally, whether responders and proposers belong to the same group influences rejection rates, with EEG data showing that group relationships affect fair decision-making at early cognitive stages (Wang et al., 2017). Numerous cognitive neuroscience studies demonstrate independent cognitive processing of fair decision-making across complex contexts. However, when multiple internal factors are involved, their effects on responders' decisions become difficult to disentangle. For example, testosterone' s effects on Ultimatum Game responders' decisions remain controversial. Correlational studies grouping participants by endogenous testosterone levels show that higher testosterone responders reject unfair allocations more than low testosterone responders (Zak et al., 2009). However, experimental studies comparing exogenous testosterone administration to placebo find that testosterone reduces rejection rates, with researchers suggesting that exogenous testosterone reduces anxiety and aggression during decision-making (Kopsida, Berrebi, Petrovic & Ingvar, 2016). Carney et al. (2010) demonstrated that expansive postures increase testosterone levels. However, testosterone may be more suitable as an indicator of male personality traits and risk tolerance than as an independent variable affecting fair decision-making.

Experiment 2' s results align with correlational studies using endogenous testosterone levels, showing that expansive postures increase testosterone and rejection rates of unfair allocations. However, Experiment 2 manipulated only sitting posture, with each participant responding to different allocation types across postures.

Previous Ultimatum Game research has manipulated explicit power through role-playing or rank assignment based on pre-task skill test performance. The essential difference from implicit power manipulation is whether participants consciously perceive power changes or status shifts during the experiment. This study manipulated power through body postures, with breaks and role selection procedures between posture blocks to distract attention from posture changes. Because this study used a within-subjects design for posture manipulation, subjective power measures could not be used to validate priming effectiveness with-

out revealing the experimental purpose. Combined with previous findings and our results, we can infer that expansive postures effectively primed implicit power. Experiment 2' s results suggest that expansive posture-primed implicit power motivated participants to punish proposers or express aversion to unfair, socially deviant behavior, with this motivation outweighing rational profit-seeking. Whether implicit power would still increase aversion to unfairness when punishment and resource control are impossible was addressed in Experiment 3.

5.3 The Effect of Body Posture-Primed Implicit Power on Responders' Rejection Rates in the Impunity Game

Most researchers consider Ultimatum Game responders as having resource allocation power because rejection can punish proposers (Feng, Luo, & Krueger, 2015). Others argue that responders reject to avoid accepting allocations that place them at a relative disadvantage (Yamagishi et al., 2012). In any case, Ultimatum Game responders are not optimal for examining the choice between aversion to unfairness and rational profit-seeking. Haruno, Kimura, and Frith (2014) found that responding to unfair allocations activated more brain regions in Ultimatum Game than Impunity Game responders, indicating different cognitive processes.

Few studies have examined Impunity Game responders, and none have investigated explicit or implicit power effects on their rejection rates. Experiment 3 therefore lacked direct comparisons. Its purpose was to determine whether implicit power strengthens aversion to unfairness, causing rejection even when proposers still profit. Results showed that expansive posture-primed implicit power increased rejection rates of unfair allocations. Combined with Experiment 2, this suggests that expansive posture-primed implicit power may both strengthen motivation to punish proposers and control resources, and increase aversion to unfairness. However, the merged analysis of Experiments 2 and 3 indicates that when facing identical unfair allocations, implicit power increases rejection rates far more in the Ultimatum Game than the Impunity Game, suggesting that the motivation to punish and control resources is substantially stronger.

5.4 Future Directions

The mechanism by which power influences fair decision-making remains unresolved. Most economic decision-making research interprets rejection of unfair allocations as high-power individuals controlling low-power individuals, while the opposite behavior—accepting unfair allocations—reflects profit approach motivation. In the Ultimatum Game, high-power individuals reject allocations to punish or control proposers' resources, a widely accepted explanation. However, neuroimaging studies show that rejecting unfair allocations activates negative emotion brain regions, leading many scholars to infer that power increases aversion to unfairness (Gabay, Radua, Kempton, & Mehta, 2014; Guo, Zheng,

Cheng, Liu, & Li, 2017). Furthermore, previous research has not distinguished between punishment motivation and resource control motivation, requiring more evidence to determine what motivates high-power individuals to reject unfair allocations rather than accept profit. This study provides new evidence that body posture-primed implicit power also increases rejection of unfair allocations, supplementing the literature on power and fair decision-making. Future research could investigate whether implicit and explicit power differ in their enhancement of punishment and resource control motivations, and whether brain activation patterns in negative emotion regions differ between implicit and explicit power states when facing unfair allocations. Thus, future studies could use EEG or fMRI to explore the cognitive neural mechanisms of posture-primed implicit power effects on fair decision-making. Additionally, personality variables, culture, and group characteristics represent future directions (Wang et al., 2017). Moreover, most research examines non-self-serving unfair allocations, with self-serving unfair allocation decisions understudied, offering another avenue for expanding unfairness research (Wang, Li, Li, Wei, & Li, 2016).

This study confirmed that, compared to contracted postures, expansive posture-primed implicit power leads Impunity Game proposers to make more self-serving allocations. Furthermore, expansive posture-primed implicit power strengthens responders' aversion to unfairness and motivation to punish proposers and control resources, making these motivations outweigh rational profit-seeking and increasing rejection rates of unfair allocations among Ultimatum Game responders. Simultaneously, expansive posture-primed implicit power strengthens aversion to unfairness, making it exceed rational profit-seeking and thereby increasing rejection rates of unfair allocations among Impunity Game responders.

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Note: Figure translations are in progress. See original paper for figures.