Research Article

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Fairness is What You Can Get Away With: Proposer and Responder Behaviour in a Collective Action Ultimatum Game

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Supplementary Materials: Data, Materials [see Index of Supplementary Materials]

Abstract

The collective action of subordinates has historically been the most important factor constraining exploitative behaviour of powerful individuals. However, subordinate collective action is often overlooked within the psychological literature examining the effect of power on decision making. Using a modified multiplayer version of the Ultimatum Game, we investigated how the ease of collective action affected the decision making of Proposers and Responders. Altogether 256 students took part in a 20-round Collective Action Ultimatum Game. They were divided into four conditions and into fixed groups of four (three Responders per group). The ease of collective action was operationalized as the contribution responders needed to make to a 'collective pot' to prevent the Proposer receiving their allocation. The mechanism that determined how total contributions could result in a successful rejection varied between the four conditions ('Easy', 'Medium', 'Hard' and 'Impossible'). The study found that Proposers in the Easy/Medium conditions divided resources more equally than those in the Hard/Impossible conditions from the start of the game. Results also showed that ease did not affect Responders' willingness to engage in collective action, but in the Hard condition they became more accepting of unequal offers as the game progressed. Results suggest that the ease of collective action (i) induces more egalitarian behaviour by individuals in a position of power, and (ii) makes subordinates less willing to accept inequality.

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Keywords

equality, fairness, power, coalitions, ultimatum game, collective action

Highlights

- The study used a modified Ultimatum Game to examine how the ease of collective action influences decision-making. Proposers offered fairer distributions when collective action was easier, while Responders were less willing to accept inequality.
- Proposers adjusted offers immediately upon learning about rejection, showing sensitivity to potential threats rather than learning from past rejections.
- When collective action was harder, Responders contributed more to rejection attempts but became more accepting of unfair offers over time.
- The findings highlight how power and fairness perceptions are shaped by the ease of collective action, with implications for those concepts across society.

"The strong do what they can, the weak endure what they must" – Thucydides (5.86)

Compared to other animals, humans are unique in our care for the welfare of others (Brosnan, 2011). In the laboratory, this manifests itself as an aversion to inequality (Dawes et al., 2007), which is evident from a very young age (Blake et al., 2015; but see Wynn et al., 2018). This concern extends to an aversion to advantageous inequality, where one receives more than others (Blake et al., 2015). Individuals express preferences to live in more (but not completely) equal societies (Starmans et al., 2017), egalitarian preference seems to motivate the punishment of unfair or unequal behaviour in the laboratory (Dawes et al., 2007), and anger over inequality is also a prime motivator for social change and protest (e.g., Kulkarni, 2023; van Zomeren et al., 2008). Some researchers consider this emotional response to inequality and unfairness seen across human societies as 'Strong Reciprocity', a fundamental concern for others rooted in our evolutionary history of living in small and interdependent groups (Gintis et al., 2019). Indeed, there is an argument that large-scale peaceful human cooperation is only possible because of this 'egalitarian instinct' (Gintis et al., 2019). At the same time, pro-social behaviour is influenced by a myriad of environmental and normative factors (for a wider discussion see, Manrique et al., 2021; Ostrom, 1990; Romano et al., 2021). Hence, despite an egalitarian instinct, our society does not appear to be constructed by an inequality averse species: less than 1% of the globe's population owns over 45% of its wealth (Suisse, 2019) and the distribution of wealth is drastically different from what many would consider fair (Starmans et al., 2017).

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Psychology of Power

One key determinant of social behaviour is power. Differences in power—the differential control over resources and their allocation—is also a fundamental part of human social life. Importantly, power influences thoughts and behaviour. Whether the result of variation in formidability or expertise (Cheng et al., 2013), having power allows individuals the freedom of action to pursue their own interests at the expense of others (Pike & Galinsky, 2020). Powerful individuals are less sensitive to social disapproval and social threats (Lammers et al., 2010) and pay less attention to others in the social environment (Dietze & Knowles, 2016). Powerful individuals tend to select self-serving norms of behaviour (Nikiforakis et al., 2012) and are in general more willing to engage in anti-social behaviour (Piff et al., 2012). Politically, powerful individuals are less likely to endorse redistributive economic policies and are more willing to endorse the use of force (Sell et al., 2009).

While the psychology of power has been heavily researched, the literature has tended to focus on the internal motivations and emotions activated by power, and how legitimacy and personality attenuate the former's expression. Such research is usually conducted with scenario or priming methods, or by assigning participants to a socially recognised role in a laboratory (see, Galinsky et al., 2015; Pike & Galinsky, 2020; Postmes & Smith, 2009). However, decisions in such studies often lack material or temporal consequences (Smith & Hofmann, 2016; see also Doliński, 2018). Equally, while power, as manipulated by the aforementioned methods, may result in a host of psychological changes (Pike & Galinsky, 2020), research has rarely examined the fact that power is not just a property of one's position, but of whether conspecifics can act to limit any control over resources that a 'powerful' position may in principle have.

Role of Subordinates

Over human evolutionary history, powerful individuals have rarely been challenged by a single subordinate, but instead by coalitions (Boehm, 2012). Coalitions are common in primates, and coalitional psychology is a core part of human social cognition (see, ecological dominance–social competition model, Flinn et al., 2005). Evidence suggests that very young children have an intuitive grasp of the dynamics of coalitional aggression (Pietraszewski & German, 2013; Pun et al., 2016), are sensitive to subtle cues of alliance (Bian & Baillargeon, 2022) and are adept at calculating the outcomes of such confrontations (Pietraszewski, 2016). Furthermore, in adults, the presence of social allies reduces how threatening opponents are seen to be (Fessler & Holbrook, 2013), affects the willingness to take revenge (McCullough et al., 2013) and generally moderates aggressive behaviour (Sell et al., 2015).

The constraints imposed by coalitions of subordinates can be readily observed in small-scale ('non-state') societies. Seen as the typical human society before the advent

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of agriculture (Marlowe, 2005), these societies are generally seen as highly egalitarian as there is little material inequality in resources, and decision making is collective (Boehm, 2012). Although leaders exist, they exert influence through persuasion rather than coercion and rarely benefit directly from their role (von Rueden & van Vugt, 2015; Wiessner, 2005). This is not by accident. Rather, such egalitarianism is continually enforced; any individual seen as excessive boasting, ordering others around, or refusing to share, is targeted by the community, initially with light collective ridicule but with the possible escalation to ostracism or physical punishment (Wiessner, 2005). This 'reverse dominance' (Boehm, 2012), or the suppression of the powerful by the collective action of the community, ensures that no single individual can completely dominate others and monopolise resources.

Collective Action Problem

However, where there is collective action there is the collective action problem (Hardin, 1968). While it would be beneficial for everyone to prevent the powerful from monopolising resources, it would be even more beneficial for an individual if everyone else did the preventing. This is especially so when powerful individuals can bestow rewards and protection on supporters (De Mesquita, 2005; Smith et al., 2004), can punish and harass challengers (Dorrough et al., 2016), or otherwise restrict access to resources (Powers et al., 2016; von Rueden, 2022). This might especially be true where there is engaged followership (see Birney et al., 2024, for a review), where a powerful individual or leader is seen as the representative of the group as a whole and a driver of its collective wellbeing or success (Haslam et al., 2023). In such circumstances, individuals might wish to challenge the behaviour of the powerful individual but fear punishment by other subordinates for appearing to harm the in-group, whether this occurs spontaneously (i.e., black sheep effect, Marques & Yzerbyt, 1988) or due to cues from the person in power (Haslam et al., 2023). These examples represent a potential cost to a subordinate challenging the monopolisation of resources by the powerful and thus make free-riding beneficial.

Nevertheless, modelling suggests that a lower cost of coalitional aggression can allow coalitions to successfully suppress powerful individuals (Gavrilets, 2012), and factors exist that can lower the risks. For example, in smaller scale societies, the closeness of the communities means information about past behaviour is easily available and coordination is relatively simple (Guala, 2012; Wiessner, 2005). Equally, researchers have suggested that weapon technology may have also played a role in the emergence of egalitarian cultural practices as physical strength means far less when facing several armed foes (Boehm, 2012). Advancements in communication technology has long been linked to social change (e.g., Lin, 2014), and in the last decades the advent and accessibility social media has greatly expanded the scope and ease of coordination (Greijdanus et al., 2020).

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While changes to the natural and technological environment affect the material cost of collective action, such changes also affect the *perceived* costs of collective action. The Social Identity Model of Collective Action (SIMCA, van Zomeren et al., 2008), interprets the effect of external costs as primarily acting through a change in perceived efficacy (van Zomeren, 2013). While the model itself considers social identity to bridge the different motives for collective action, it does suggest that efficacy is a key mechanism, with external factors affecting how individuals perceive the likely outcome of any action (van Zomeren et al., 2008). Thus, the ecological ease of collective action affects both the material and subjective barriers to challenging the decisions of the powerful.

Ultimatum Bargaining

One method used as a proxy for asymmetries in power is the Ultimatum Game (Galinsky et al., 2015; Nowak et al., 2000). In a standard Ultimatum Game, one participant (the Proposer) can divide an allocation of resources (to make an 'Offer'), and the participant receiving the offer (the Responder) can accept or reject it; if the offer is rejected neither participant receives any resources. The Proposer role is deemed to have greater power as they set the terms of the exchange (Galinsky et al., 2015). Typically, Proposers split the resources equally and Responders rarely accept less than 40% of the total amount, though cross-cultural variation exists (see Henrich et al., 2005).

However, Proposer and Responder behaviour is conditional, as evident by how the inclusion of multiple Responders can change this dynamic: if the Proposer's offer is awarded to the first Responder willing to accept it, with the other Responders receiving nothing, then Proposer decisions are far less generous than those seen in the standard two-player version of the Ultimatum Game (Camerer & Fehr, 2006; Grosskopf, 2003). Conversely, simulation studies have shown that in cases when a rejection of the Proposer offer can occur if only one of the many Responders chooses to 'reject', Proposers should make fair/equal offers that ensure Proposers and Responders receive the same amount of resources (Santos et al., 2015). Using a 'Collective Action Ultimatum Game', a modified Ultimatum Game with multiple Responders (CAUG, see *Method*), the current study investigated the impact of the ease of collective action amongst Responders on Proposer and Responder behaviour.

Predictions

We predicted that Proposers would offer a more equal division of the available resources when it was easy for the Responders to collectively oppose the Proposer, and that this would be influenced by the experience of past successful rejections (see, Burton-Chellew & Guérin, 2021; Grosskopf, 2003). For Responders, we predicted that the ease of collective action would affect the resource division that Responders would be willing to accept, with greater ease of collective action resulting in more rejection of unequal offers. Thus,

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for both power-roles we predicted that behaviour would be sensitive to the probability of success/failure of rejections and would change through repeated interactions.

While the primary aim of the current study was to investigate behavioural change, participants were also given a post-experiment survey that assessed their perception of the Responder and Proposer roles in terms of power and importance, and their motivation for their behaviour. We predicted that answers would be affected by both in-game role and the ease of collective action.

Open Practices Statement

The data and materials for this study are publicly accessible at the OSF Project site for this study (see Gordon, 2023). There is not a pre-registration for this study.

Method

Participants and Procedure

A convenience sample of 256 students were recruited through the paid-participant recruitment database at the University of Jyväskylä, Finland (145 females; M^{age} = 26.10, *SD* = 6.29). Sample size reflects the resources available to the researchers and data collection was concluded before any analysis took place.

Sixteen experimental sessions (4 for each condition) were conducted with between 12 and 20 participants in each session. Each participant was seated in a visually isolated experimental cubicle that contained a computer terminal. Groups of four anonymous participants were formed in the experimental software; thus, the participants did not know who the other group members were. Basic instructions were read verbally, and more detailed instructions were given on the computer screen as the game progressed. Participants were asked to raise their hand if there was anything they did not understand. To avoid any end-round effect, participants were not told how many rounds would be played. The total points accumulated by each participant was converted to Euros at a ratio of €1.50 points. Including the €5 attendance incentive, the mean payment received by participants was €14.10. Following the game session, participants completed a brief post-game survey. The grip-strength of participants was also measured using a portable grip-strength meter: grip-strength has been associated with aggressive and non-cooperative behaviour (Gallup et al., 2010) and the measurement was taken opportunistically. There were no significant associations between grip-strength and any behavioural or self-report measures ($p > .05$; raw data on grip strength is included in the online supporting materials). Participants were paid in private following completion of the study. Mean duration of the sessions was 53 minutes.

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Collective Action Ultimatum Game

For the current study we created a novel multiplayer version of the Ultimatum Game dubbed the Collective Action Ultimatum Game (CAUG). The Ultimatum Game represents a simple example of a constraint that can be imposed on a more powerful group member (i.e., one who has control over resource distribution). In a standard Ultimatum Game, one participant (the Proposer) can divide an allocation of resources (to make an 'Offer'), and the participant receiving the offer (the Responder) can accept or reject the offer; if the offer is rejected, neither participant receives any resources.

The CAUG modifies this approach by turning the ability to reject a Proposer's offer into a collective action problem.Rather than give simple accept/reject decisions, Responders have to decide how much to invest into a collective pot in order to reject the offer, with the probability of success being a function of the collective investment (see Figure 1 and *Experimental Design*). Furthermore, investments to the collective action were always lost, regardless of the success of the effort.

The CAUG further deviates from a typical ultimatum bargaining situation by allowing Responders to keep the resources they received (and did not invest to collective action) regardless of the success of collective action. This creates a free-riding incentive typical to collective action dilemmas: An individual Responder always has a direct benefit from withholding personal investments to collective action, but the Responder also benefits from investments of other Responders if they succeed in changing the Proposer behaviour to be more generous in the future. The necessity of Responders keeping their resource division regardless of whether the Proposer offer was rejected meant the mechanism of the CAUG was closer to the "cost-free rejection game" mechanism of Ding et al. (2017). In that adaptation of the UG, a single Responder could reject an offer and keep their division. As with Ding et al. (2017), we refer to dispossessing the Proposer of their resources as a 'rejection' of the Proposer offer.

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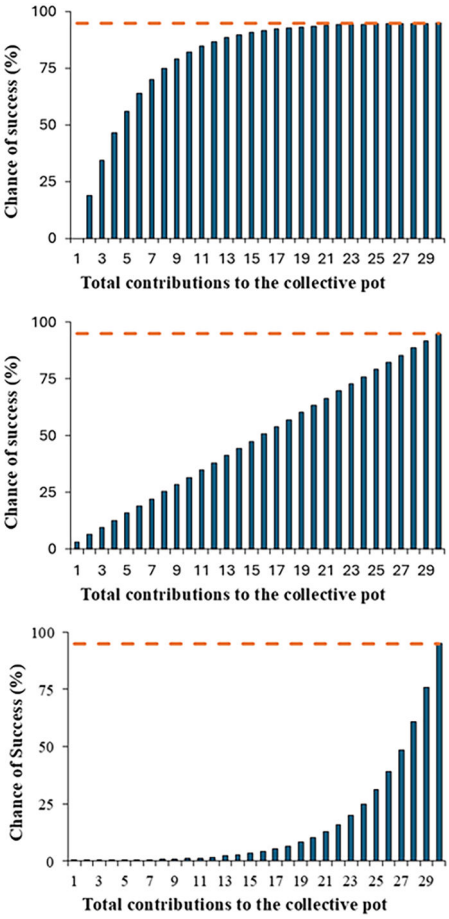
Figure 1

Graphic Representation Shown to Participants of the Relationship Between Responder Contributions to the Collective Pot and the Chance of a Successful Rejection



Note. Top = Easy condition, Middle = Medium condition, Bottom = Hard condition. Dotted line indicates 95% chance of a rejection occurring. Original labelling was in Finnish.

Experimental Design

Participants took part in 20 rounds of the CAUG. Participants were randomly assigned to groups of four, and to the role of Responder or Proposer, referred to as Type A and Type B roles respectively in the instructions. Each group contained 1 Proposer and 3 Responders; see Table 1 for the number of groups in each condition. Participants knew groups were fixed for the duration of the session. In each round, the Proposer divided an allocation of 100 points between themselves and the Responders, with each Responder

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receiving a minimum of 10 points. Thus, the Proposer could choose to keep anything from 0 to 70 points, with the rest being divided equally amongst the Responders. This restriction was enforced to ensure that the Responders were always able to attempt to reject the Proposer offer (except in the condition 'Impossible', where collective action was not possible, see below).

In Round 1, participants were presented with a basic overview of the session. They were told they had been divided into groups of one Proposer and three Responders, and that the Proposer had the ability to divide an allocation of 100 points between group members. Participants then answered a series of questions to ensure they understood the game mechanics. Following this, the first allocation was automatically divided; with 70 points for the Proposer and 10 for each of the Responders (all participants were aware that this division was automatic). In Round 2, the Proposer was given the opportunity to decide on the division of the allocation, or what amount they would keep for themselves (as described in the instructions). Responders were then alerted to the outcome of the decision, and the Proposer was informed of how many points each Responder received.

In Round 3, prior to the decision of the Proposer, all participants were introduced to the collective action round, described to participants as an opportunity for the Responders to prevent the Proposer from receiving points in that round. The Responders could each contribute between 0-10 points to a collective pot. The total value of the collective pot determined the chance of successfully preventing the Proposer from keeping points from the current round. Responder contributions were added together, and a function was used to derive a number between 0 and .95 based on that total. A successful rejection occurred when a random number drawn from a uniform distribution was smaller than the result of the function (see *Experimental Conditions* and Figure 1). Participants were informed in the accompanying text that there was a maximum 95% chance of success. It was made clear to participants that the Proposer's points would not be redistributed to the Responders and that Responders would not lose any points they had received—and had not spent on collective action—if the rejection was successful. Participants then answered questions on this mechanism to ensure they understood it.

Round 3 then continued with the Proposer making a division decision, followed by the Responders making their own contribution decision. Neither the Proposer nor the Responders could see how much each Responder contributed to the collective pot; they could only see whether the rejection was successful or not; a feedback mechanism similar to Grosskopf (2003), where neither Proposers nor Responders saw how many of the multiple Responders gave a 'reject' decision. The outcome screen displayed how many points the participant had earned in that round (only their own earnings) and their total points in the session so far. All subsequent rounds had the following progression: a screen reminding participants of their role, followed by a Proposer decision round, a Responders contribution round and, finally, an outcome and earnings screen.

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Table 1

Descriptive Statistics by Condition

				Proposer		Responder			Initial division of resources		"fair amount to keep"[a]	
Condition	# of groups	# of rejections	Mean losses per round	Offers	Earnings	Rejected Offer	Contribution	Earnings	Kept by Proposer	Received per Responder	Proposer	Responder
Impossible	16	—	—	51.18	50.14	—	—	16.63	48.82	17.06	44.93	32.23
				(17.62)	(11.64)			(5.43)	(17.62)	(5.87)	(20.20)	(9.05)
Hard	16	5	8.38	52.37	47.98	46.00	8.24	14.83	47.63	17.46	37.81	34.41
			(5.37)	(16.08)	(15.00)	(16.40)	(2.66)	(5.96)	(16.08)	(5.36)	(18.35)	(10.64)
Medium	12	51	14.94	62.63	32.18	53.86	7.28	18.55	37.38	20.88	30.00	35.50
			(12.53)	(14.48)	(11.55)	(16.49)	(2.98)	(5.49)	(14.48)	(4.83)	(13.31)	(16.81)
Easy	20	120	20.00	65.82	22.49	57.66	3.82	19.85	34.18	21.94	29.70	29.98
			(17.73)	(13.08)	(11.61)	(20.95)	(2.12)	(4.71)	(13.08)	(4.36)	(10.67)	(11.02)

Note. Standard Deviation in parentheses

[a]post-experiment questionnaire

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Experimental Conditions

Participants played in one of four conditions: 'Easy', with a convex relationship between the collective pot and the probability of successful dispossession of the Proposer, 'Medium', where the relationship was linear, and 'Hard', where the relationship was concave (see Figure 1, and S.I. for the function used in each condition). In the condition "Impossible", Responders could not respond to Proposer decisions and could not contribute to a collective pot. In the other conditions, participants were informed of the ease of rejection via a graph displayed prominently to the left half of the screen (see Figure 1). This visually demonstrated the relationship between the value of the collective pot and the probability of successfully dispossessing the Proposer. From Round 3 onwards, the graph was displayed when the Proposers and Responders made their respective decisions.

Thus, the conditions varied the risk of collective action for the Responders, (i.e., the extent to which individuals had to rely on other group members to reject the Proposer offer). In the 'Easy' condition, participants did not need to invest a great deal of points to have a good chance of rejection and did not need to rely on other participants also contributing. However, in the 'Hard' condition, rejection was only likely to succeed if all Responders contributed the maximum amount. Importantly, the experimental set-up varied the environment under which Proposer decisions were made without affecting the stability of their position or, strictly speaking, their power: they always had control over resource distribution. This scenario is analogous to the real world. For instance, the overturning of a presidential decision does not replace the president, nor does rejecting the demands of a skilled hunter make that hunter any less skilled.

Post-Experiment Questionnaire

Following the study, participants were presented with a survey that asked a series of questions about their experience with the game: participants were asked to indicate what a fair split of resources would have been (0–100), the extent to which they agreed with the statement about how powerful each role was (e.g., "Proposer [Responder] role was a position of power") from 1 (completely disagree) to 7 (completely agree), and whether they considered it their role to ensure fairness in the game, (e.g., "my role was to ensure fairness"), also from 1 (completely disagree) to 7 (completely agree).

Analysis

As the rules of the experiment were introduced over a period of three rounds, unless otherwise stated, all analyses used data from rounds 3–20 only. Analyses of participant behaviour was conducted using a Generalized Linear Mixed-Model, with AIC used to find the best-fit for the distribution models within each analysis (Burnham & Anderson, 2004). All analyses were limited to two-way interactions. For the analysis of Responder behaviour, 'group' was included as a random effect in the analysis. The Impossible

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condition was removed from all Responder analyses as the Responders remained passive in that condition.

An ANOVA examined whether participants' earnings differed between roles and between conditions. ANOVA was also used to explore any condition and role effects on participant responses to the post-experiment questionnaire. However, in these analyses, post-hoc power analyses (alpha = .05 and power = .8; Erdfelder et al., 1996) suggest there was an insufficient sample size to detect small or medium effects. All stated pairwise comparisons are those whose significance remained after a Bonferroni adjustment for multiple comparisons. All analyses were conducted using SPSS 26.

Results

Results Summary

The ease of collective action affected Proposer behaviour, Responder behaviour, and the earnings of both roles. As predicted, Proposers' offers were more generous when collective action against the Proposer was easier, but this occurred immediately rather than through learning with Proposers being insensitive to actual rejections when making their decisions. Conversely, Responder behaviour was more nuanced; ease of collective action did not affect whether a rejection was attempted (whether a non-zero amount was contributed) but did affect the amount contributed, with Responders in the harder conditions contributing more to rejection attempts.

The offer amount that triggered a rejection attempt ('Rejected Offer') was also affected by ease of collective action; Responders in the Hard condition accepting smaller offers as the round progressed, whereas in the easier conditions, Responders were more consistent in the size of offer that triggered the rejection attempt.

The ease of collective action also affected earnings, with greater equality in earnings shown in the conditions with easier collective action. Equally, the post-experiment perception of what constituted a fair division of resources was consistent across conditions and roles, but the ease of collective action did affect the perceived power of each role and the importance of upholding 'fairness' to participants.

Descriptive statistics for Proposer and Responder behaviour and group-level outcomes can be found in Table 1. Given the group structure of the CAUG (i.e., three Responders), for clarity and for easy comparison to other ultimatum game results, the "Initial division of resources" columns in Table 1 contain information on the number of points Proposers kept for themselves and the number of points received by each of the three responders.

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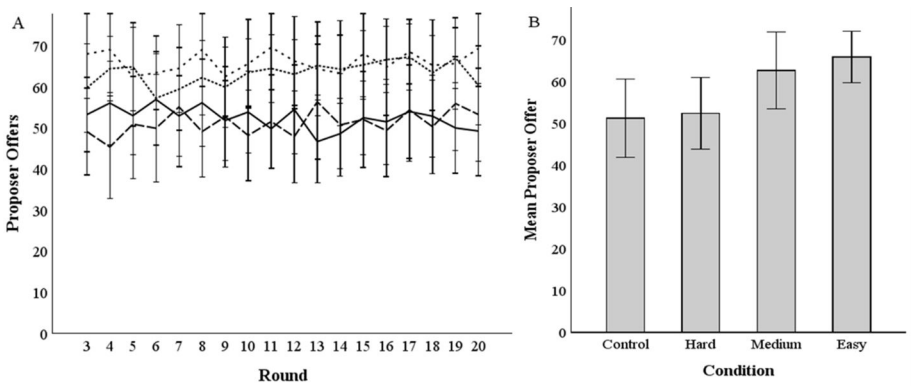
Proposer Behaviour

The Proposer 'offer' is the amount they chose not to keep for themselves. To test whether Proposer behaviour was affected by the ease of collective action, Condition, Round, and whether a rejection occurred in the previous round were entered into the model (Table 2). Proposers were not aware of the amount contributed to the collective pot, only whether their offer was successfully rejected or not by Responders. Such success was closely associated with condition: in the Easy condition there were 120 successful rejections, representing 38% of possible opportunities (i.e., rounds where rejection was possible); in the Medium condition there were 51 successful rejections, representing 16% of possible opportunities; and in the Hard condition there were 5 successful rejections, representing 2% of possible opportunities.

As shown in Figure 2A, Proposer offer was not affected by an interaction between Round and Condition, nor did offers change as the game progressed. Offers were significantly affected by condition; compared to the Impossible control treatments Proposers in the Easy and Medium conditions made higher offers. Further exploring this data, a one-way ANOVA found a significant difference in mean offers between conditions, $F(3,60) = 3.87$, $p = .013$, $\eta_p^2 = .16$, with a significant difference in mean offers between the Easy and Impossible conditions ($p = .006$, Figure 2B).

Figure 2

Proposer Offers in the CAUG



Note. A: Proposer offers over the 20 rounds. Solid line = Impossible condition, Dashed line = Hard condition, dense dotted line = Medium condition, sparse dotted line = Easy condition. Error bars = 95% CI. B: Overall mean Proposer offers. Error bars = 95% CI.

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Table 2

Summary of GZLMMs for Proposer and Responder Data

		Proposer Offers				Attempted rejection				Contributions				Rejected offer			
		f	***df***	**B**	**S.E.**	***f***	***df***	**B**	**S.E.**	***f***	***df***	**B**	**S.E.**	***f***	***df***	**B**	**S.E.**
Intercept		**3.56*****	**10, 1141**	**3.87**	**0.13**	**5.74*****	**8, 2583**	-0.15	0.68	**8.80*****	**8, 762**	**1.99*****	**0.11**	**6.55*****	**8, 762**	**3.80*****	**0.12**
Condition:		**3.57***	**3, 1141**			0.47	2, 2583			**8.54*****	**2, 762**			2.51	8, 762		
	Easy			**0.30***	**0.15**			0.66	0.78			**-0.57*****	**0.16**			0.21	0.14
	Medium			0.21	0.15			0.79	0.80			-0.18	0.14			-0.001	0.15
	Hard			0.10	0.09			—	—			—	—			—	—
Round		0.11	1, 1141	0.01	0.01	**39.70*****	**1, 2583**	**0.06*****	**0.02**	0.54	1, 762	0.01	0.01	2.49	1, 762	**-0.01***	**0.003**
Condition* Round:		0.48	3, 1141			0.05	2, 2583			2.18	2, 762			**4.88*****	**2, 762**		
	Easy			-0.004	0.01			0.00	0.02			-0.02	0.01			0.01	0.01
	Medium			-0.002	0.01			-0.01	0.02			0.002	0.01			**0.02****	**0.01**
	Hard			-0.01	0.01			—	—			—	—			—	—
Rejection in previous round		0.47	1, 1141	0.02	0.11	**4.23***	**1, 2583**	0.74	0.58	2.67	1, 762	0.01	0.09	**10.64****	**1, 762**	0.085	0.105
Condition* prev. rejection:		0.02	3, 1141			0.34	2, 2583			0.35	2, 762			0.99	2, 762		
	Easy			0.01	0.12			-0.49	0.61			0.09	0.11			0.03	0.11
	Medium			0.02	0.12			-0.42	0.61			0.06	0.10			0.10	0.11
	Hard			—	—			—	—			—	—			—	—
Random effects (group)							$p = .03$				$p = .02$				$p < .001$		

$^{*}p < .05$. $^{**}p < .01$. $^{***}p < .001$.

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To further demonstrate the change in behaviour occurred immediately after the rejection mechanism was known, the following analyses were conducted. In Round 2, i.e., before participants were aware that rejecting the Proposer offer was a possibility, there was no significant difference in offers between conditions, $F(3,66) = .70$, $p = .56$, $\eta_p^2 = .03$; Impossible, $M = 46.32$, $SD = 20.81$; Easy, $M = 56.0$, $SD = 23.14$; Medium, $M = 54.69$, $SD = 17.65$; Hard, $M = 50.63$, $SD = 21.44$. However, at Round 3 there was a significant difference in offers between conditions, $F(3,63) = 2.90$, $p = .042$, $\eta_p^2 = .13$; Impossible, $M = 49.06$., $SD = 19.9$; Easy, $M = 67.35$, $SD = 20.81$; Medium, $M = 57.91$, $SD = 17.86$; Hard, $M = 57.64$, $SD = 20.21$, with corrected pairwise comparisons showing a significant difference between the Impossible and Easy conditions ($p = .04$)

In sum, and as shown in Figure 2A&B, Proposers adjusted their behaviour to the ease of collective action without experiencing any rejection and seemed insensitive to their occurrence.

Responder Behaviour

The study recorded direct decisions by Responders to Proposer offers (as opposed to the Strategy Method where participants indicate their rejection threshold before any offer has been made). While the direct method is arguably more ecologically valid (see Aina et al., 2020; Chen & Schonger, 2024; Lamba & Mace, 2013; but see Brandts & Charness, 2011), it does mean the Responder data was inherently contingent on the behaviour of the Proposers, which varied significantly by condition. Though Proposers in each condition did cover the full range of possible offers, this confound needs to be considered with any interpretation of Responder willingness to reject offers.

To provide a complete image of Responder behaviour in the context of the above, two approaches were taken. First, a hurdle model was implemented to a) investigate whether condition (the ease of collective action) affected non-zero contributions to the collective pot, and b) investigate whether condition affected the size of the non-zero contributions. Second, we analysed whether condition affected sensitivity to the offers being given, i.e., the Proposer offers that trigged non-zero contributions to the collective pot.

Responder Contributions

First the frequency of attempted rejection decisions was assessed, that is, whether any non-zero contribution to the collective pot was made. Condition did not affect the frequency of attempted rejection, with between $^1/_3$ and $^1/_4$ of participants attempting to reject the offer made by Proposers (Easy = 28%, Medium = 26%, Hard = 27%, $\chi^2_2 = 1.00$, $p = .61$).

Table 2 shows the results of the zero-hurdle step. As shown in Table 2, Round predicted rejection attempts, with a lower chance of rejection attempts as the game progressed (Odds Ratio [*OR*] = 1.06, 95% CI [1.03, 1.09]). Whether there was a successful rejection in

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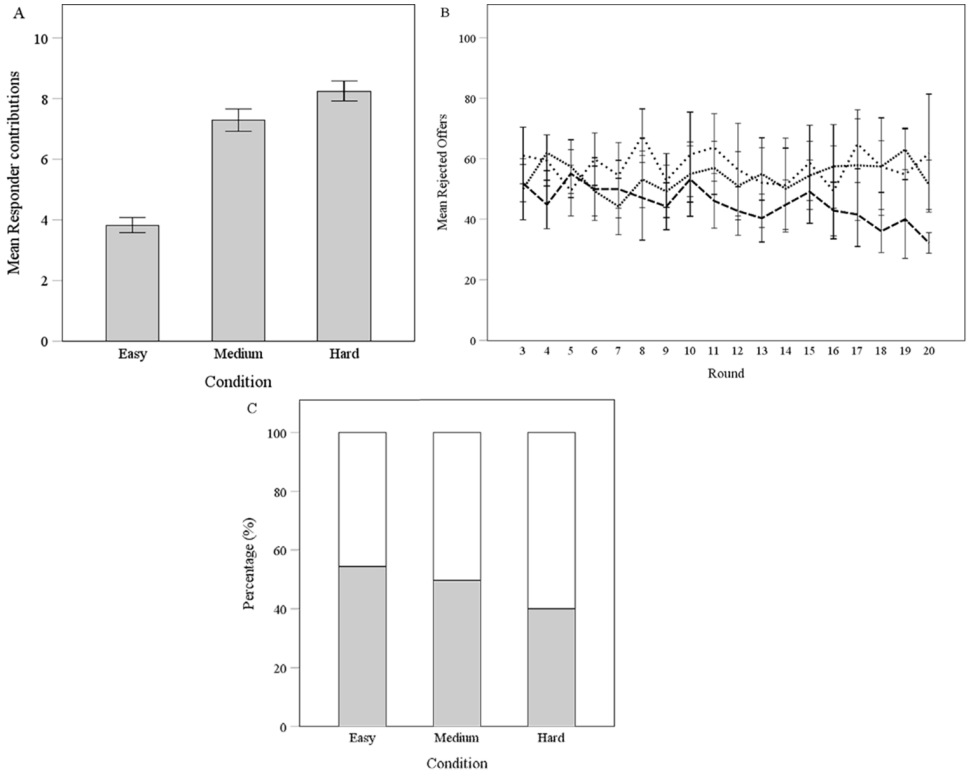
the previous round was also a significant predictor of rejection attempts, with rejection attempts being less likely if a successful rejection did not occur in the previous round (*OR* = 2.10, 95% CI [0.67, 6.53]).

Table 2 shows the results of the non-zero contributions step. As shown in Table 2 and Figure 3A, there was a significant effect of condition on Responder contributions, with those in the Easy condition contributing significantly less than those in the Hard condition, and no significant difference between the Medium and Hard conditions. There was no significant effect of round number, nor was contribution affected by whether a successful rejection occurred in the previous round (Table 2).

Figure 3

Responder Behaviour in the CAUG



Note. A: Mean contributions to collective pot between conditions. Error Bars = 95% CI. B: Mean Rejected Offers between conditions across rounds. Dashed line = Hard condition; dense dotted line = Medium condition; sparse dotted line = Easy condition. Error Bars = 95% CI. C: Frequency of 'Greedy' Proposer Offer that were accepted (light) or rejected (dark) between conditions.

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Responder Sensitivity

Rejected Offer was then calculated to probe Responder sensitivity to offers. Rejected Offer represents a Proposer decision that a Responder attempted to reject, e.g., if the Proposer made an offer of 30 points (i.e., 10 points per Responder), and a Responder contributed any points to the rejection pot, then '30' would be recorded as that Responder's Rejected Offer for that round. As such, only values from attempted rejections contributed to the analysis.

Table 2 shows the results of Rejected Offer. As shown in Table 2, Rejected Offer was affected by an interaction between Round and Condition. This change in Rejected Offer over the course of the experiment can be seen in Figure 3B, with participants in the Hard condition showing a greater change in the offers that elicited rejection. Whether there was a successful rejection in the previous round did impact Rejected Offer, with Responders lowering their Rejected Offer following a successful rejection.

To further disentangle Responder decisions from Proposer behaviour, a subset of responses to specific offer amounts were selected: 30–40 represented a 'greedy offer' (including the lowest possible offer, 30), and 70–80 represented Equal offers (75 would be indicative of an equal distribution to all participants). For frequencies, see Table 3. A logistic regression was conducted for each category, with Condition as the predictor variable and attempted rejection as the outcome. Due to the exploratory nature, a Bonferroni correction was applied to each result. Condition did affect whether a Responder attempted to reject a Greedy Offer above the null model (Wald $\chi^2_2 = 9.425$, $p = .027$, Figure 3C), with those in the Easy condition being 78% more likely to reject a such an offer compared to the Hard condition ($B = .578$, $SE = .200$, Wald $\chi^2_1 = 8.286$, $p = .016$, $OR = 1.78$). Condition did not significantly predict whether Responders would reject an Equal Offer (Wald $\chi^2_2 = 6.532$, $p = .11$).

Table 3

Frequency of Proposer Offer Categories, and Rejection of Those Offers by Responders

		Greedy offer (30–40)			Equal offer (70–80)		
Range of offers made		**#Offers[a]**	**Reject[b]**	**Accept**	**#Offers[a]**	**Reject[b]**	**Accept**
Easy	30–100	49	80	67	136	90	318
		17%	54%	46%	39%	22%	78%
Medium	30–100	49	73	74	158	54	420
		17%	50%	53%	46%	11%	89%
Hard	30–92	108	130	194	80	37	209
		38%	40%	59%	21%	15%	85%

[a]'percentage' indicates the percentage of offers by proposers in that condition that fell within the stated range.
[b]'Reject' indicates whether the Responder invested any non-zero amount in the group rejection pot. Percentage indicates the rejection rate within the stated range.

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In sum, the effect of the ease of collective action on Responder behaviour was nuanced. Firstly, most participants were willing to accept whatever offer was given, and the likelihood of attempting to reject an offer declined as the game progressed regardless of Condition.

Conversely, when examining the data of Responders who did try to reject an offer, the ease of collective action did affect their behaviour. Responders in the Medium and Hard condition contributed more to the collective pot than those in the Easy condition. Equally, the sensitivity data suggested that those in the Hard condition seemed willing to accept lower offers compared to other conditions.

Earnings

For Proposers, earnings represent the number of points they kept for themselves minus any losses due to rejection. For Responders, earnings represent the points per round they received from the Proposer minus any expenditure spent on rejecting the Proposer offer. To compare Proposers and Responders, in subsequent analyses the group-level mean was calculated for the latter.

A 4*2 ANOVA found that participant earnings were significantly affected by an interaction between Condition and Role ($F(3,120) = 19.17$, $p < .001$, $\eta_p^2 = .34$), with main effects for both Role ($F(1,120) = 79.00$, $p < .001$, $\eta_p^2 = .40$) and Condition ($F(3,120) = 10.51$, $p < .001$, $\eta_p^2 = .21$). As shown in Figure 4, there was a large difference in earning between roles in the Control and Hard conditions, but less so in the Medium and Easy conditions. Adjusting the p-values for multiple comparisons, follow-up analyses showed that in both the Easy and Medium conditions there was not a significant difference in total earnings between Proposers and Responders (Easy, $t(38) = -0.61$, $p = 1.0$, $r = .10$; Medium, $t(22) = 2.53$, $p = .08$, $r = .47$; Hard, $t(30) = 7.42$, $p < .001$, $r = .80$; Impossible, $t(30) = 6.84$, $p < .001$, $r = .78$).

Questionnaire Data

Following the experimental session, participants were presented with a questionnaire to explore their thoughts about their roles. As with earnings data, the Responder data represents a mean of the three responders in each group.

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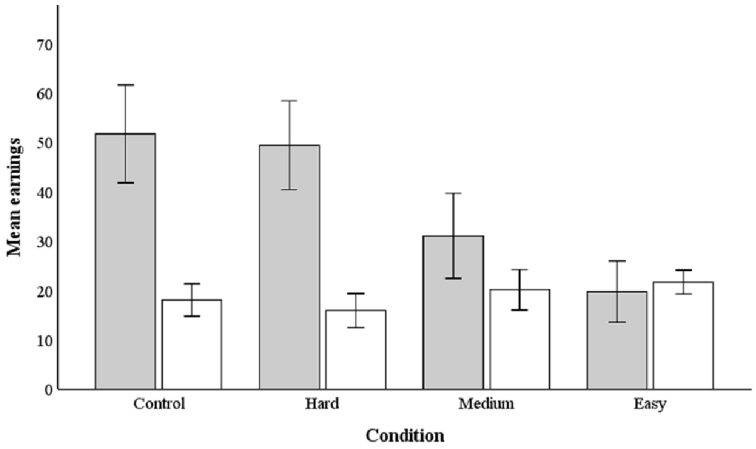
Figure 4

Mean Overall Earnings of Proposers (Filled Bars) and Responders (Empty Bars).



Note. Error Bars = 95% CI.

Fairness

All participants were asked what they considered to be a fair allocation of points by the Proposer in their condition (see Table 1; Figure 5A). A 2*4 ANOVA found that opinion of the fair number of points for the Proposer to keep was not significantly affected by an interaction between Condition and Role ($F(3,120) = 2.20$, $p = .09$, $\eta_p^2 = .05$), nor were there main effects for Role ($F(1,120) = 1.04$, $p = .31$, $\eta_p^2 = .01$) and Condition ($F(3,120) = 2.61$, $p = .055$, $\eta_p^2 = .06$). The lack of any significant differences might be due to a lack of statistical power, as the sample was below that sufficient to detect a small or medium effect (it was below $N = 158$, alpha = .05, beta = .8; Erdfelder et al., 1996). Figure 5 also places the actual decisions by Proposer's alongside the indication of a 'fair' amount; paired-sample *t*-tests found no significant differences between actual Proposer behaviour and their opinion of fair behaviour.

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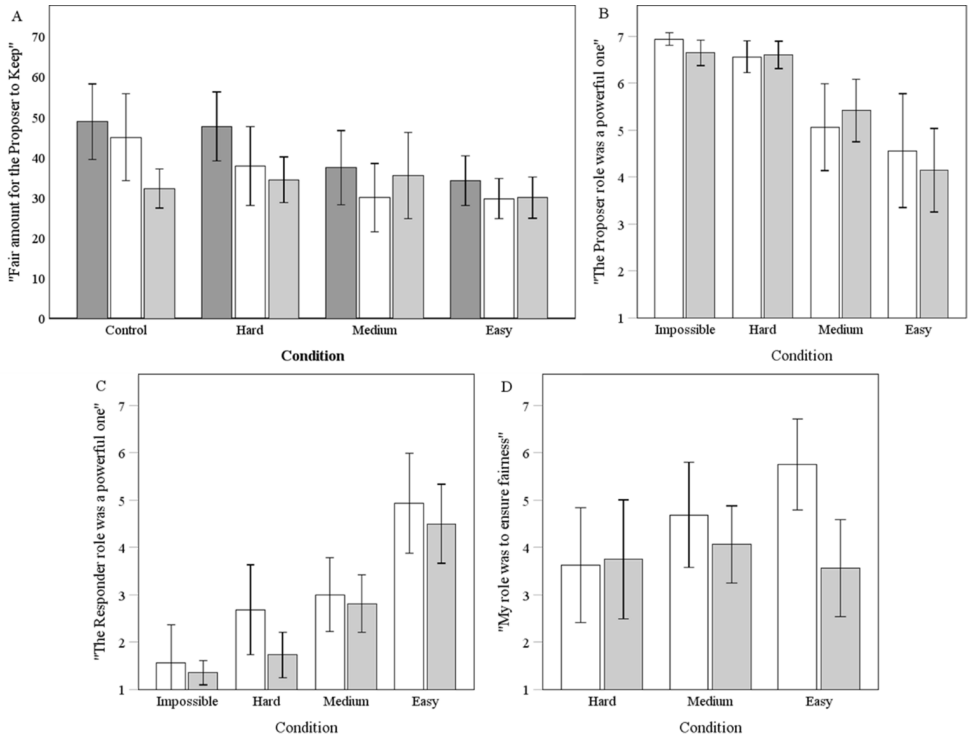
Figure 5

Responses to Post Survey Questionnaires



Note. A: Agreement to the question "what would be a fair amount for the Proposer to keep?" B: Agreement to the question "The Proposer role is a powerful one". C: Agreement to the question "The Responder role is a powerful one". D: Agreement to the question "My role was to ensure fairness". All graphs: Empty bar = Proposer response, Light grey bar = Responder response; Dark grey bar = Mean Proposer behaviour (5A only). Error bars = 95% CI.

View of Roles Within the CAUG

Participants were then asked whether they perceived the Proposer role to be a position of power. A 2*4 ANOVA found that condition affected whether the Proposer role was viewed as a position of power ($F(3,120) = 25.08$, $p < .001$, $\eta_p^2 = .39$; Figure 5B). After controlling for multiple comparisons, there were significant differences in how powerful the Proposer was viewed between the Impossible condition and the Medium ($p < .001$) and Easy ($p < .001$) conditions, between the Hard condition and Medium ($p < .001$) and Easy ($p < .001$) conditions, and between the Medium and Easy conditions ($p = .045$). There was no effect of Role ($F(1,120) = .12$, $p = .74$, $\eta_p^2 = .001$) or of an interaction between Role and Condition ($F(3,120) = .57$, $p = .64$, $\eta_p^2 = .014$).

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Participants were then asked whether they perceived the Responder role to be a position of power. A 2*4 ANOVA found that condition also affected whether the Responder role was viewed as a position of power ($F(3,120) = 30.31$, $p < .001$, $\eta_p^2 = .43$; Figure 5C). After controlling for multiple comparisons, there were significant differences in how powerful the Responder role was viewed to be between the Impossible condition and the Easy ($p < .001$) and Medium ($p < .001$) conditions, between the Hard and Easy conditions ($p < .001$), and between the Medium and Easy conditions ($p < .001$). There was no effect of Role ($F(1,120) = 3.15$, $p = .08$, $\eta_p^2 = .026$) or of an interaction between Role and Condition ($F(3,120) = .51$, $p = .68$, $\eta_p^2 = .012$).

Finally, participants were asked to indicate the degree to which they believed it was their role to ensure fairness. The Impossible condition was removed from this analysis as the Responders in this condition were not asked this question. A 2*3 ANOVA found condition affected whether participants agreed with this statement ($F(2,90) = 4.33$, $p = .016$, $\eta_p^2 = .09$; Figure 5D). After controlling for multiple comparisons, there was a significant difference between the Hard and Easy conditions ($p = .013$). There was no effect of Role ($F(1,90) = 3.67$, $p = .06$, $\eta_p^2 = .038$) or of an interaction between Role and Condition ($F(2,90) = 2.23$, $p = .11$, $\eta_p^2 = .05$). Figure 5D does suggest the Condition result was driven by changes in Proposer responses, and the null interaction result might be due to the lack of statistical power.

Discussion

The threat of collective action is one of the key ecological limits on the wielding of power (Boehm, 2012). However, it is relatively neglected from the experimental psychological work on the topic. Using a novel multi-responder variant of the Ultimatum Game (the CAUG), the current study found evidence that those with greater power over allocation of resources (Proposers) distributed them more equally when there was some expectation of successful collective action. However, the response of those with less power (Responder) to the ease of collective action was more nuanced; the frequency of attempted rejection by Responders was not affected by the ease of collective action, but there was evidence that Responders in the Hard condition were more willing to accept unfair offers overall and as rounds progressed. Analyses also found that the ease of collective action led to more equality in earning between Proposers and Responders, and the post-study survey suggested that ease of collective action affected the perception of the 'power' of the Proposer/Responder role and whether fairness concerns were deemed to be part of the role.

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Proposer Behaviour

We expected Proposer behaviour to change over time as participants became familiar with the game (Burton-Chellew et al., 2016). But the differences in behaviour between conditions were apparent from the moment rejection was possible, suggesting they were responding to the threat of collective action. In the two-player version of the Ultimatum Game the proposal is usually around 50/50 (Bahry & Wilson, 2006; Henrich et al., 2005) and while Proposers in Hard and Impossible conditions offered this, that 50 was split three ways, meaning that the relative amount received by each Responder was closer to that seen in a Dictator Game (Engel, 2011). Given the behaviour of Proposers facing a higher risk of collective actions (and the on-screen reminders), it is unlikely that Proposers facing less (or no) risk did not realise their offer would be divided up to this extent. Indeed, the allocation decisions of Proposers conforms to recent evidence suggesting that the larger the pool of subordinates, the more selfishly individuals behave (Alós-Ferrer et al., 2022). Equally, rejection in the Ultimatum Game can be seen as implicit communication between Proposer and Responder as to the dissatisfaction of the latter, with such communication resulting in higher offers (e.g., Brunner & Ostermaier, 2018). However, in the current study, Proposers seemed insensitive to rejection. As the change in Proposers' offers between conditions was immediate upon the introduction of the rejection mechanism, it seems that Proposer behaviour was driven by sensitivity to the threat posed by a coalition of subordinates (Bian & Baillargeon, 2022; Pietraszewski & German, 2013; Sell et al., 2015). Because Proposers had adjusted their behaviour in anticipation of rejection, they were less sensitive to its occurrence.

The sensitivity to the ease of collective action is also reflected in the questionnaire data. While the Proposer is deemed to have greater power as they set the terms of the exchange (Galinsky et al., 2015), the perception of power in both roles was affected by Condition with a greater ease of collective action increasing the perception of Responder power and decreasing the perception of Proposer power. That Proposer fairness concerns also increased with the ease of collective action is also worth noting, and can be explained by powerful individuals selecting self-serving norms in response to ecological constraints and by how constraints affect the perception of their own power (Gintis et al., 2019; Nikiforakis et al., 2012; van Zomeren, 2013). When collective action was easy (and unfair behaviour therefore risky), Proposers and Responders perceived the former's role as one of *Noblesse Oblige* whereas those with greater freedom of action did not.

Responder Behaviour

The response of Responders to the ease of collective action was more nuanced. Contrary to predictions, the rate of rejection attempts did not vary across conditions, with most of the Responder decisions being to accept the Proposer offer. This finding contradicts what would be expected from an inequality averse species (Dawes et al., 2007; Gintis et al.,

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2019) as we would expect more attempted rejections in conditions where Proposer offers were lower. However, the rejection rate corresponds to the finding of some two-player UG studies using the Strategy method (e.g., Lamba & Mace, 2013) where Responders are willing to accept lower offers than the corresponding Proposers expect. It might suggest that within the game environment, that is, repeated interactions with a minimum guaranteed earning per round, most participants were adopting a fitness maximising strategy (e.g., Bahry & Wilson, 2006; Roth et al., 1991) and free-riding on the efforts of the few participants adopting fairness norms (Bahry & Wilson, 2006). Possible evidence for responder concern about free-riding can be seen in the success of rejection in the previous round increasing the occurrence of rejection attempts: communication aids coordination (Koch et al., 2021) and the only information available on the intentions of other Responders was whether a rejection was successful. However, if free-riding was a concern, one would expect an interaction of contributions with Condition, and this was not evident.

Conversely, while this is speculative in the context of our data, the lack of an effect of condition on rejection frequency could be explained by shared identity among Responders. Placing participants in a subordinate role in a setting with an overt power imbalance might have created a group identity that may have reduced the perceived risks of free-riding in the game context across all conditions (van Zomeren, 2013; van Zomeren et al., 2008). Equally, that the ease of collective action did not affect rejection attempts might be explained by a combination of the impact of ease of collective action on Proposer behaviour and perceived Responder efficacy (van Zomeren et al., 2008): Responders in the easier conditions had less reason to reject offers, whereas those in harder conditions felt less willing to reject, with the relationship between Condition and perception of power(lessness) being evident in the questionnaire data.

The ease of collective action did affect the contributions of Responders willing to attempt a rejection. Responders in the Medium and Hard conditions contributed more per rejection attempt than the Easy condition, the contributions in the former also rose compared to the latter as the game progressed. This does suggest that when the decision to attempt rejection was made, a) Responders were willing to expend resources to ensure that outcome and b) adjusted their contributions to the ease of collective action: once the decision to attempt a rejection was made in the harder conditions (see Figure 1) anything other than a high contribution would guarantee a lack of success, an "all or nothing" decision. This result is compatible with the suggestion that humans have an egalitarian preference and are willing to endure costs to ensure fairness (Bahry & Wilson, 2006; Dawes et al., 2007; Gintis et al., 2019); indeed, research using public goods games with punishment mechanisms suggest 'pro-social' punishment of unfair behaviour is insensitive to resource cost (Egas & Riedl, 2008). However, this is contrary to our suggestion that the cost of collective action is an impediment to its occurrence (Gavrilets, 2012; Powers et al., 2016; van Zomeren et al., 2008). Instead, Responders

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adjusted their contributions as appropriate for the rejection mechanism to maximise the chances of success, even if success was unlikely.

However, the sensitivity of Responders who attempted rejection (Rejected Offer) was affected by the ease of collective action and round progression. As noted above, collective action often comes with the risk of free-riding (Hardin, 1968). So, while Responders in the Hard condition did seem to disregard this when deciding the contribution amount, they were not consistently trying to reject lower offers. While the Rejected Offer data was contingent on Proposer behaviour as Responders could only respond to what was offered, this differed significantly by condition (see Table 1 and Table 3), a pattern that was also evident when the analysis focused specifically on 'greedy' offers by Proposers. This supports our suggestion that the ease of collective action, i.e., the ecological constraints on it, can affect the willingness to accept unfairness from those with power (Boehm, 2012; Fessler & Holbrook, 2013; Guala, 2012; van Zomeren et al., 2008). The Rejected Offer data suggests that the potential costs involved in collective action changed the level of unfairness required to trigger attempted rejection, even if once triggered an all or nothing approach was taken. Nevertheless, an important caveat to the above is that by using a direct as opposed to strategy method of recording Responder behaviour, Responder sensitivity to offers cannot be disentangled from Proposer behaviour so the results above are more tentative than the Responder contribution results.

Overall Impact of the Ease of Collective Action

The outcome of greater ease of collective action was more equality in behaviour and earning across the roles. Behaviourally, this was primarily due to Proposers offering a larger share of resources to Responders when collective action was easier and Proposer losses due to successful rejections in the Easy and Medium conditions. Ease of collective action also shifted the perceptions of each role with a) the Proposer and Responder roles being seen as more equal in power when collective action was easy and b) ease of collective action affecting the perceived importance of 'fairness' in each role.

Overall, the results support findings from experiments and modelling (Gavrilets, 2012; Santos et al., 2015), anthropological studies (Boehm, 2012; Powers et al., 2016; Wiessner, 2005) and contemporary labour markets (Lombardi et al., 2023) showing that egalitarian outcomes are a result of the ease of collective action. The results suggest that despite experimental games showing the desire to diminish inequality to be the primary driver behind 'rejections' (Casal et al., 2019), and humans cross-culturally showing an aversion to inequality and a desire to live in more equal societies (Blake et al., 2015; Starmans et al., 2017; van Zomeren et al., 2008), whether such an environment emerges is very much dependent on the ease at which collective action against the powerful is possible.

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Limitations and Future Directions

The current study is not the first to include multiple responders in an Ultimatum Game design, nor to show that Proposers adjust their offers in response. When one of many Responders can accept an offer, Proposers tend to lower their offers (Camerer & Fehr, 2006; Grosskopf, 2003), and when any one Responder can reject, Proposers tend to raise them (Santos et al., 2015). However, the study is the first to use responder behaviour to operationalise collective action by turning the rejection process into a collective action problem. While this study has focused on modelling the ecological constraints on collective action, the experimental design has the potential to advance research of the internal psychological processes around power and collective social actions (see van Zomeren et al., 2008). Research has highlighted the importance of social identity (Balliet et al., 2014), intergroup competition (Puurtinen & Mappes, 2009), and the ability to punish non-cooperation (Gordon & Puurtinen, 2021; Sääksvuori et al., 2011) for increasing group-beneficial behaviour, and these could be transferred to the CAUG design. For example, whether a common identity among Responders encourages continued investment in rejection even when the chances of success are low, or whether the effect of (in)congruence in identity between Proposers and Responders affects the behaviour of both (e.g., Haslam et al., 2023). Equally, how a competitive scenario dependent on group-level efficiency might affect Proposer and Responder(s) behaviour would be an interesting approach to investigating how external threats interact with power and bargaining.

While acknowledged in social identity models of collective action (van Zomeren et al., 2008), ecological constraints are nevertheless downplayed in favour of *perceived* constraints and wider social identity concerns, despite research suggesting the importance of the former (see Boehm, 2012; Gintis et al., 2019; Powers et al., 2016), especially as subjective belief will be a downstream effect of actual constraints and failures. This is not to dismiss the role of social identity in collective action (van Zomeren, 2013), but to suggest material constraints are undervalued as well as experimentally understudied (Smith & Hofmann, 2016; see also Doliński, 2018). This is noteworthy as, outside of the laboratory, adding friction to collective action is an effective suppression mechanism (e.g., Fieldhouse et al., 2021; Lombardi et al., 2023). More importantly, identity models offer little perspective on how the powerful respond to antagonistic collective action. From the perspective of more powerful individuals or institutions, physical or legal constraints on collective action are viable means of maintaining their own freedom of action without having to consider the in-group dynamics of the less powerful. Equally, while the emotions and mental states activated by power have been heavily studied in experimental social psychology (Galinsky et al., 2015), how external constraints such as coalitional aggression curtail their behaviour has not. Thus, the results of the current study, and the future use and adaption of the CAUG, might help integrate the ecological and economic theoretical traditions more thoroughly into the prevailing social psycho-

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logical theories of power and collective action (e.g., Pike & Galinsky, 2020; van Zomeren, 2013).

Nevertheless, with any laboratory experiment the goal is to operationalise certain aspects of the world rather than fully simulate the world. Restrictions on participant action can potentially produce artificial behaviours (e.g., Guala, 2012), and this is a caveat to any interpretation of results beyond the game setting. Here, we manipulated the ease of collective action through the relationship between contributions and probability of a rejection, but we did not necessitate a minimum number of contributors required for rejection to occur (Santos et al., 2015). Collective action, from signing petitions to joining picket lines, requires many individuals to engage in at least a minimal way to be effective, yet our experimental environment had no such mechanism. Instead, our mechanism meant that, in the Easy condition, a single individual could reject the offer. In similar bargaining games, a minority of participants show "hyper fairness" norms (Bahry & Wilson, 2006), so the level of rejection in this condition might have been inflated. Indeed, that there was significant variation between Responder groups suggests that the presence of such individuals in a group may have been a factor. However, as there were few statistical differences in Proposer or Responder behaviour between the Easy and Medium conditions, this issue does not detract from the overall findings that even a moderate threat of collective action changed Proposer behaviour. Additionally, other multiplayer Ultimatum games have been designed to increase competition between responders, by awarding offers solely to the first responder willing to accept it (Grosskopf, 2003). This results in lower offers than seen in the standard Ultimatum Game, and models a different risk of collective action, that of potential defection. Furthermore, our design included 'cost-free rejection' as rejection dispossessed Proposers but Responders kept their un-contributed allocation (see Ding et al., 2017). This may have differentially impacted conditions, for example, by inflating rejections in the Easy condition as they had more to lose and less to gain compared to other conditions with 'greedier' Proposers.

Finally, the study did not assess other psychological aspects that have been shown to influence power and action. For example, beliefs about the fairness of resource division can depend on whether an individual is deemed to have earned it (Starmans et al., 2017), the role of social identity (van Zomeren, 2013), or the numerous personality traits that have been shown to impact how individuals wield power once it is given to them (Galinsky et al., 2015). These factors would likely impact both Proposer and Responder behaviour within the CAUG, but we would posit that the practical constraints on collective action would be a greater predictor of Proposer and Responder behaviour than psychological phenomena such as identity. In sum, future studies implementing the CAUG could incorporate some or all the above to provide more nuanced experimental data on how different 'risks' of collective action affect behaviour.

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Conclusion

Much of the research on power has focused on the psychological moderators of power (Galinsky et al., 2015; Pike & Galinsky, 2020). We argue that such focus has been to the detriment of research on ecological constraints. Specifically, throughout human history the behaviour of powerful individuals has been contained by the ease with which those with less power can engage in collective action (Boehm, 2012; Gintis et al., 2019; Powers et al., 2016; Wiessner, 2005). Using a novel Collective Action Ultimatum Game, the current study attempted to operationalise such "ease" and demonstrated that when collective action is moderately or substantially easy, Proposers gave more generous offers to Responders, Responders were less willing to accept low offers, and both perceived 'fairness' to be a key part of their position. Interestingly, Responders increased their contributions to collective action in response to its difficulty. The findings suggest that the ecology of power, specifically the circumstances in which it can be exercised relative to the ease of collective action from subordinates, is important when understanding the human response to power. As well as suggesting avenues for the future study of human social systems and coalitional psychology, the results suggest that we should take notice when there are changes to the ease of collective action at various levels of society: as the results suggest, for the powerful, fairness is what you can get away with.

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Author Contributions: *David Gordon*—Conceptualization | Methodology | Software | Formal analysis | Investigation | Data curation | Writing – original draft | Visualization. *Mikael Puurtinen*—Methodology | Investigation | Resources | Writing – review & editing | Visualization | Supervision | Project administration | Funding acquisition.

Ethics Statement: Ethical approval for the study was granted by the Ethics Panel of University of Jyväskylä, FI. All participants were over the age of 18 and gave informed consent.

Data Availability: The data and materials for this study are publicly accessible at the OSF Project site for this study (see Gordon, 2023).

Supplementary Materials

For this article, data and materials are available (see Gordon, 2023).

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Index of Supplementary Materials

Gordon, D. (2023). *Fairness is what you can get away with: proposer and responder behaviour in a Collective Action Ultimatum Game* [Data, materials]. OSF. https://osf.io/bgwqu

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