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Strength-is-Weakness: The (ir)relevant relation between resources and payoffs in coalition formation

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Abstract

A key observation in coalition formation is that bargainers who control many resources are often excluded from coalitions by bargainers who control few resources, the Strength-is-Weakness effect. We argue that this effect is contingent on whether resources provide a legitimate claim to be included in a coalition. Across three incentivized coalition experiments (n = 2745; 915 triads), three participants (player A had four resources, player B had three resources, player C had two resources) negotiated about a payoff of 90 monetary units. Depending on condition, these resources were obtained randomly, earned, or earned and proportionally linked to the payoff. Results showed player As were less included when resources were obtained randomly and more often included in coalitions when resources were earned and/or proportionally linked to the payoff. This provides evidence that the Strength-is-Weakness is contingent on the legitimacy of the resources.

KEYWORDS
accountability theory, coalition formation, effort, equity theory, Strength-is-Weakness

1 | INTRODUCTION

Often individuals or groups lack the resources to attain an outcome by themselves. In these situations, they need to pool their resources; they need to form a coalition. Gamson (1964, p. 85) defines a coalition as 'the joint use of resources to determine the outcome of a decision in a mixed-motive situation involving more than two units'. For example, in multi-party government systems the individual political parties generally lack the seats to form a majority government and thus form coalitions to determine how the country's budget is allocated. Consider the stylized situation in which three political parties need to decide how to allocate a budget of 90 million. After the elections, Party A controls 44% of the votes, party B controls 33% of the votes, and party C controls 22% of the votes. What will happen? Will party A form a coalition with party B or with party C? Or will party A be excluded and will party B and C form a coalition instead? And how will the members of the coalition allocate the budget?

Such questions—or more formally the question of what coalition is formed and how available payoffs are allocated among coalition members—are the questions that coalition scholars seek to answer. According to classical coalition formation theories such as minimal resource theory (Gamson, 1961, 1964) and bargaining theory (Komorita & Chertkoff, 1973), a key predictor is how many resources an individual or party has. Based on the idea that 'a person ought to get from an agreement an amount proportional to what he brings into it' (Gamson, 1964, p. 88), these theories predict that individuals aim to form the smallest possible coalition as this maximizes their personal outcome. A difference between the two theories is that minimum

resource theory assumes that all bargainers will base their allocation solely on resources whereas bargaining theory allows for bargainers shifting between an allocation based on resources and an equal division, depending on what would benefit them the most.

In our opening example, both theories would predict that each of the three parties would use their resources (i.e., the number of votes they represent) to estimate what they could get in each of the possible coalitions. Based on self-interest they would then try to form the coalition that maximizes their outcomes. Party A would thus prefer to form a coalition with party C because party A assumes that this will result in a better outcome than forming a coalition with party B. By the same logic, both party B and C would then prefer to form a BC-coalition instead of forming a coalition with party A. Moreover, although both minimum resource and bargaining theory predict that the BC-coalition would form, they differ in how the available payoff of a coalition will be allocated among its members. Minimum resource theory would predict 60% for B and 40% for C. Bargaining theory—which has received more empirical support (Komorita, 1984)—would predict that B and C would split the difference between a proportional demand of B and an equal demand of C, such that B would end up with 55% and C with 45% of the payoffs.

1.1 | Strength-is-Weakness effect

A key prediction of leading coalition theories is thus that coalition bargainers use resource differentials to estimate what people want, and in turn use this information to form a coalition that would provide them the largest share of the available payoffs. The consequence—see for instance our opening example—is that this may lead to the exclusion of the party that controls the most resources. This pervasive effect in coalition formation is called the Strength-is-Weakness effect (Caplow, 1956; Chaney & Vinacke, 1960; Gamson, 1964; Kelley & Arrowood, 1960; Murnighan, 1978; van Beest et al., 2011, 2004a; Vinacke & Arkoff, 1957; Wissink et al., 2022).[1]

The Strength-is-Weakness effect has been observed in lab experiments, field studies on coalition formation in West-European democracies (Bäck & Dumont, 2008; Warwick, 1996; Warwick & Druckman, 2006) and even in chimpanzee colonies (De Waal, 2000). However, Strength-is-Weakness is not a given; in both lab experiments and real life, there is of course variance in findings, showing that sometimes 'strong players' are included in coalitions.[2] The current research aimed to specify which conditions are conducive for the Strength-is-Weakness effect. We sought to test whether we can moderate the Strength-is-Weakness effect as this would provide further insight on why it occurs, but also provide further insights into the two basic questions of coalition formation: who forms a coalition with whom and how are the available payoffs of a coalition allocated among its members?

To understand the occurrence of the Strength-is-Weakness effect, we point to two features of the situation in which it is observed. The first feature is that it may not always be clear how or why people had a resource advantage in the first place. For example, in lab experiments participants are often assigned to a specific bargaining position without providing a reason why bargainers control different amounts of resources. The second feature is that the Strength-is-Weakness effect is typically observed in coalition settings where resources do not have a direct bearing on payoffs. More specifically, the effect is typically observed in so-called simply weighted majority games where each possible coalition yields the same payoff. A good illustration of such a setting is our opening example in which each possible coalition (AB, AC, BC) is associated with an available payoff of 90 units. The Strength-is-Weakness effect is typically not observed in multi-valued games where each possible coalition generates a different payoff (e.g., AB generates a payoff of 120, AC a payoff of 100, BC a payoff of 80). In these multi-valued games having a strength is not defined in terms of resources but in terms of how much payoff a specific coalition yields (see Komorita, 1984 for a more detailed overview of coalition settings).

Following insights from accountability theory (Konow, 1996, 2000), and equity theory (Adams, 1965; Walster et al., 1973), we reason that both the reason underlying the acquisition of resources and the impact of resources on the payoff of a coalition might contribute to the occurrence of the Strength-is-Weakness effect. After all, if resources are assigned without justification and have no bearing on the size of the available payoffs, resources may not be perceived by all coalition bargainers as a legitimate basis to be included in a coalition. We therefore propose that the claim of a strong player to participate in a coalition and to obtain the lion's share of the payoffs will only materialize if the weaker players agree that it is legitimate. We base this assumption on the social utility model of coalition formation (Van Beest & Van Dijk, 2007), which posits that coalition bargainers are motivated not only by self-interest but also by a concern for the others and specifically whether all people get what they deserve. Thus, if a party controls the most resources for a valid reason or has contributed the most to the available payoffs, excluding that party from a coalition would be considered unfair. However, when strong and weaker parties disagree about the legitimacy of resources (e.g., if resources were indeed allocated unfairly or randomly and/or when the available payoff of a coalition has no bearing on resources) it is likely that the strong player ends up excluded.

1.2 | Resources and effort

A first factor we expect to increase the perceived legitimacy of resources is a clear link between resource acquisition and effort. This resonates with accountability theory (Konow, 1996, 2000), which postulates that a fair allocation is one in which payoffs vary in relation to variables under one's control. In other words, we propose that bargainers are entitled to an equitable share of payoffs when they have worked for their resources, but less so when resources are assigned randomly. Support for this notion comes from, for example, research

[1] Note that we focus on simple situations in which payoffs do not vary between coalitions. See Komorita (1984) for an overview of different coalition formation settings.

[2] Note that the terms strong and weak bargainers are misnomers, as they are not reflective of true bargaining power. However, for the sake of continuity with previous literature, we retain these terms.

on allocators in ultimatum bargaining games or dictator games. In these games, allocators make more self-serving offers when they have exerted effort to earn their position rather than being endowed with their position without justification (Cherry, 2001; Hoffman & Spitzer, 1985; Hoffman et al., 1996). Importantly, these unequal allocations are more likely to be accepted by parties that do not benefit from them, indicating that recipients are willing to forgo money in order to give the allocator what they feel allocators are entitled to (Frohlich et al., 2004; Lee & Shahriar, 2016; Oxoby & Spraggon, 2008; Ruffle, 1998).

Although scarce, there is also some support for our reasoning in prior experiments on coalition formation. Miller and Wong (1986), for example, allegedly informed participants that they had earned their bargaining position based on their performance on a business test. In this condition, strong players obtained a higher payoff share than in a control condition where positions were obtained without justification. However, Miller and Wong (1986) relied on a multi-valued game in which coalitions that control more resources also yield more payoffs than coalitions that control fewer resources. This finding leaves unanswered whether earning resources would also benefit a strong player in situations where each coalition yields the same payoffs, that is, the simple weighted majority setting that is the focus of the current investigation.

A more direct test of the relation between earning resources and the Strength-is-Weakness effect in the context of simple weighted majority games is provided by contributions by Wilke and Pruyn (1981) and Messe et al. (1975). In Wilke and Pruyn (1981) strong players obtained more resources than others because they scored higher on an intelligence test. Although strong players were more often included when their position was based on intelligence than when there was no justification for their position, it is debatable whether all players truly felt that the strong player deserved to be in a coalition. The reason is that the participants were also informed that there would be a subsequent task that would require intelligence. Hence, it can be argued that participants included the subsequent task in their estimation of the available payoffs, turning this 'simple game' into a multi-valued game in which coalitions with more intelligent players provide a higher chance to win a subsequent task. Like the study by Miller and Wong (1986), this may thus not be the clearest test of showing that a Strength-is-Weakness effect can be moderated in the context of a simple game.

In Messe et al. (1975) strong players obtained more resources than the other players because they had to work longer on an unrelated task. In line with the idea that effort counteracts the Strength-is-Weakness effect, strong players who worked longer to attain their bargaining position were included in six out of six coalitions, whereas only two out of six strong bargainers were included in formed coalitions when resources were assigned without justification. However, since participants did not decide themselves how long they worked on the initial task that led to them having more resources, the exerted effort was arguably not seen under the control of these participants, who merely followed orders of the experimenter. According to the accountability principle (Konow, 1996, 2000), this implies that the participants cannot be held accountable for the fact that they had more or fewer resources. Moreover, according to Leventhal and Michaels (1969) individuals evaluate the legitimacy of effort by considering what people have done given the time that is available. In Messe et al. (1975), participants only had information on how long people worked on a task, they did not know what was achieved during the allotted time. Taken together, it is thus unclear if the observed effect of Messe et al. (1975) is perhaps based on a false positive (e.g., small number of observations) and, more crucially, whether it used the most appropriate method to have people earn resources in the first place.

1.3 | Resources and payoffs

A second factor which we propose should increase the perceived legitimacy of resources is to highlight the relation between resources and available payoffs of a coalition. A basic assumption of equity theory (Adams, 1965; Walster et al., 1973) and coalition theories, such as minimum resource theory (Gamson, 1961, 1964) and bargaining theory (Komorita & Chertkoff, 1973), is the existence of an implicit or explicit relationship between how many resources a party holds and which share of the outcomes it is entitled to. In the latter two theories, this relationship between in- and output is assumed to be the driving force behind coalition bargaining; participants seek out coalition partners because they infer preferences on how to allocate the payoffs from the number of resources these bargainers hold.

In coalition settings that resemble simple weighted majority games, however, this relationship is far from explicit. Often, participants are informed that there is a payoff, without an explanation where the payoff came from or how the resources bargainers hold relate to this payoff. If bargainers with more resources are not responsible for creating a larger share of the payoffs, it is likely that their resources will not be seen as relevant input and that their (expected) proportional claims are seen as illegitimate. If, however, it would be clear that those with more resources were also responsible for generating a larger part of the available payoffs, resources might be viewed as relevant. In turn, this might enhance the perception that strong bargainers deserve a larger part of the payoffs and hence deserve to be included.

In dyadic settings, there is some evidence for the notion that when one's input directly determines the payoffs, these payoffs will be allocated more equitably than when payoffs are fixed (Cherry, 2001; Frohlich et al., 2004; Konow, 2000; Lee & Shahriar, 2016; Oxoby & Spraggon, 2008; Ruffle, 1998). For example, when recipients increased the available payoff by correcting spelling errors, dictators allocated more money to the recipient than when the payoffs were fixed (Frohlich et al., 2004).

To our knowledge, multivalued games are the only coalition games in which bargainers differentially contribute to the payoffs that are associated with a coalition. The problem, however, is that they do this by varying the payoff of every possible coalition (e.g., the AB-coalition would yield a payoff of 110, the AC-coalition would yield a payoff of 100, the BC-coalition would yield a payoff of 90 monetary units). As a result, it is impossible to distinguish whether players are included in a winning coalition because they contributed more to the value of a

specific coalition, or because the value of a specific coalition is higher than other possible coalitions.

In contrast, no research investigating the relation between resources and payoffs in simple weighted games exists, a gap in the literature the present studies seek to fill. To highlight the relation between resources and payoffs without changing the payoffs of every possible coalition, we informed participants that every player of the game would be responsible for the final payoffs of all possible coalitions. Specifically, we indicated that participants had to work to generate payoffs and that those who worked hardest would obtain the most resources and also would contribute the most to the available payoffs. To use the opening example in which every coalition could allocate 90 million, we informed participants that this budget was available because party A contributed 40 million to the country's budget, party B contributed 30 million, and party C contributed 20 million.

1.4 | Overview of the present research and key hypotheses

In sum, we propose that Strength-is-Weakness is driven by disagreement among coalition bargainers whether strong players have a legitimate claim on payoffs and whether they thus deserve to be included in a coalition. We argue that (1) having participants earn their resources through effort and (2) creating a direct relationship between resources and payoffs, should create a shared perception of resources as a legitimate basis to be part of a coalition, which in turn should moderate the occurrence of the Strength-is-Weakness effect. To test this, we conducted three experiments that either focused more on the how resources are attained (Study 1), or more on how resources are related to the overall payoff of each possible coalition (Study 2 and Study 3).

In all the experiments, we used the cover story of a political setting to introduce the dynamics of what is formally called a 5(4–3–2) simple weighted majority game with a fixed payoff of 90 monetary units. The reader may note that this is indeed akin to the opening example where we described this game in terms of percentages. The key questions are thus whether player As (the 'strong' individual who controls four resourses) will be included in coalitions less often (i.e., a strength-weakness effect), equally included, or perhaps even more included than player Bs (the individual who controls three resources) or Cs (the individual who controls two resources). Following a social utility approach to coalition formation (Van Beest & Van Dijk, 2007), assuming that coalition bargainers are motivated by self-interest but also by concern for others, we predict that weak bargainers (i.e., B and C) are more likely to approach strong players (i.e., player A) as a potential coalition partner when resources are earned and/or directly related to the available payoffs than when they are not (*Hypothesis 1*).

In addition to partner selection, we also assess how the payoffs are allocated among coalition members. According to the accountability principle (Konow, 2000) bargainers should be more likely to adhere to a parity norm (Gamson, 1964)—which is rooted in equity theory (Adams, 1965; Walster et al., 1973)—the more resources are perceived to provide a legitimate claim on payoffs. Specifically, we predict (a) that player As should claim more in their opening offers than player Bs, who in turn should claim more than player Cs, and that (b) this difference should be more pronounced when resources are earned and/or directly related to payoffs than when they are not (*Hypothesis 2*).

Finally, we also assess if such preferences in partner selection and payoff allocation translate to final outcomes. We thus predicted that the strong bargainers would be more often included in the final coalition when resources are earned and/or directly related to the available payoffs then when they are less (*Hypothesis 3*). We did not have a clear prediction on how the payoffs would be divided in the final coalition. The reason is that we were unsure to what extend deservingness (player A should get the most) but also self-interest (I want to the most) would interact over the course of the negotiation.

1.5 | Open practices and power analyses

All studies were pre-registered and for all studies, an a priori power analysis was conducted. The focal hypotheses were tested with a *z*-test for independent proportions (two-tailed for Study 1; one-tailed for Study 2 and Study 3), for which we aimed to achieve a statistical power of $(1-\beta) = 0.80$. Power analyses were conducted using GPower (Faul et al., 2007). For Study 1, we estimated that 35% of strong bargainers would be included in the winning coalitions in the Control condition (see Wissink et al., 2021, 2022) and at least 50% in the Resource condition. To detect this effect with the specified parameters, at least 170 triads per condition were needed. These estimates were adjusted for Studies 2–3 based on the findings of Study 1, leading to a target sample size of at least 142 triads per condition for both experiments. For details on the power analyses, see the pre-registrations (Study 1: https://aspredicted.org/ye592.pdf; Study 2: https://aspredicted.org/au94u.pdf, Study 3: https://aspredicted.org/e443d.pdf).

For all studies, a data package including (meta) data, analysis scripts, stimulus materials, is available at dataverse.nl: https://doi.org/10.34894/FCLGKP. Moreover, for all studies we report manipulations, measures and—where applicable—exclusion criteria. Results on the secondary dependent variables are reported in supplemental materials.

Participants in all three experiments were recruited via MTurk. To increase the data quality (for a discussion see: e.g., Griffin et al., 2021; Van Quaquebeke et al., 2022) we approached workers via the turkprime toolkit (https://www.cloudresearch.com/products/turkprime-mturk-toolkit/). Using this toolkit, we prevented suspicious IP addresses and suspicious geolocations from participating. Moreover, we prevented participants from enrolling in the same experiment again and prevented participants of Study 1 from enrolling in Study 2.

All reported analysis followed these pre-registrations, with the following exception: in addition to reporting analyses with the full sample (in the main text) and only those participants who correctly answered the comprehension check (in footnotes), whenever the interpretations differed substantially, we also report analyses on only participants who correctly responded to the manipulation check.

2 | STUDY 1

Study 1 assessed whether having participants work for their resources would reduce the Strength-is-Weakness effect. In the *Control* condition, we randomly assigned participants to their bargaining position. In the *Resource* condition, participants earned their number of seats based on their relative performance on a real-effort slider task. Based on the idea that effort increases the perceived legitimacy of claiming payoffs in coalition formation, we expected that the Strength-is-Weakness effect would be weaker or absent in the *Resource* condition.

2.1 | Method

2.1.1 | Participants and design

$n = 1023$ Amazon Mechanical Turk workers ($M_{age} = 35.88$ years, age range 18–72, 425 females, 591 males, two other), grouped into 341 triads, participated in this study. Participants received $1.80 for completing the task and another $0.05 cents per $1 million they attained in the bargaining scenario, leading to a payout of between $1.80 and $6.30.

Participants were randomly assigned to a *Control* condition in which participants' resources were randomly assigned ($n = 510 = 170$ triads) or a *Resource* condition in which participant received their resources based on effort ($n = 513 = 171$ triads).

2.1.2 | Procedure

Participants read that they would take on the role of a bargainer for a political party, with the goal of being included in the municipal government and thereby obtaining a share of the budget to spend. Participants then received information on how their party obtained their seats. Participants in the *Control* condition read that parties received their number of seats based on a random draw. Participants in the *Resource* condition read that the number of seats would be determined by how many citizens of the municipality voted for the party. Crucially, participants learned that they could influence the number of votes by campaigning for their party and that this would be simulated by a slider task. Participants learned that participants who performed better during the slider task would earn more seats for their party than participants who performed worse.

Next, participants read how they would negotiate with each other. Following a procedure introduced by Komorita and Meek (1978) and recently adapted to an online version (Wissink et al., 2022) using the open source software oTree (Chen et al., 2016), participants learned that bargaining would be done in rounds and that each round contained three distinct phases. In phase 1, each participant had to formulate a coalition offer in which they stated with whom they wanted to form a coalition and how they wanted to allocate the budget between themselves and their coalition partner. In phase 2, all offers were shown, and each participant selected one offer they wanted to execute. Participants could only select an offer if it was made by themselves or directed at them. In phase 3, each participant would see who selected what offer. This was the moment participants learned if all relevant bargainers of an offer selected an offer and whether a coalition was thus formed. If no coalition was formed, participants would go to the next round, formulate an offer, etc., until a coalition would be formed.

After explaining the bargaining procedure, participants in the Control condition were matched into triads and randomly assigned to the role of Party A (with four seats), Party B (with three seats), and Party C (with two seats). Participants in the Resource condition first completed a slider task and were assigned to these positions based on their performance on this task. Next, all participants learned how many seats were needed to form a winning coalition (i.e., five seats), and that each winning coalition (i.e., AB, AC, BC) could allocate $90 million among its members. Finally, all participants were informed that they would obtain a real bonus of $0.05 for every $1 million obtained during the negotiation.

Before the actual negotiation started, all participants first completed a series of comprehension checks. If participants answered wrong on the comprehension check, they were provided the correct answer. After bargaining was completed, participants completed two process variables and one manipulation check.

2.1.3 | Slider task

To simulate campaign efforts, we adapted the real-effort slider task developed by Gill and Prowse (2019). In each of three rounds, participants saw 21 sliders on one screen and had 30 seconds to position as many sliders as possible in the middle. After three rounds, participants who correctly positioned the most sliders were assigned to Party A (four seats), participants who came in second were assigned to Party B (three resources), and participants who performed worst were assigned to Party C (two resources).[3]

2.1.4 | Comprehension checks

Before the bargaining started, we checked whether participants understood the instructions. Participants completed a multiple-choice quiz (correct answers in *italics*) asking for the size of the budget to be allocated (*€90 million*/This depends on the size of the coalition), what the outcomes would be of the party not included in the coalition (This depends on the offer that was accepted/*This party doesn't receive any money*), and which coalitions could be formed (AB & AC/AB & BC/AC & BC/*AB, AC, & BC*). If participants made a mistake, they received a

[3] In the three studies, participants assigned to position A (Study 1: $M = 34.43$, $SD = 8.08$; Study 2: $M = 32.26$, $SD = 8.66$, Study 3: $M = 26.84$, $SD = 12.47$) had clearly completed more sliders, than participants assigned to positions B (Study 1: $M = 25.22$, $SD = 7.09$; Study 2: $M = 22.00$, $SD = 7.60$, Study 3: $M = 20.66$, $SD = 10.84$) which had completed more than C (Study 1: $M = 15.81$, $SD = 8.79$; Study 2: $M = 12.53$, $SD = 8.86$, Study 3: $M = 15.89$, $SD = 13.84$), showing that an actual difference in effort led to their assigned positions.

TABLE 1 Frequency of proposed coalitions and associated payoff allocation in Study 1

Control							
Position	**Coalition**	***n***	**(%)**	M_A	M_B	M_C	**(*SD*)**
A (4 seats)	AB	101	59.4	52.33	37.67	–	(9.84)
	AC	69	40.6	56.45	–	33.55	(9.00)
B (3 seats)	AB	90	52.9	45.23	44.77	–	(8.51)
	BC	80	47.1	–	51.89	38.11	(8.78)
C (2 seats)	AC	86	50.6	50.14	–	39.86	(12.14)
	BC	84	49.4	–	49.15	40.85	(9.43)
Resource							
Position	**Coalition**	***n***	**(%)**	M_A	M_B	M_C	**(*SD*)**
A (4 seats)	AB	103	60.2	49.81	40.19	–	(5.89)
	AC	68	39.8	56.96	–	33.04	(9.85)
B (3 seats)	AB	106	62.0	45.67	44.33	–	(9.41)
	BC	65	38.0	–	52.31	37.69	(10.03)
C (2 seats)	AC	102	59.6	49.43	–	40.57	(14.39)
	BC	69	40.4	–	48.87	41.13	(12.21)

Note: Each coalition allocated $90 million between the coalition members.

message that gave them the correct answer and were presented with the question again until they answered correctly.

2.1.5 | Manipulation check

After the final coalition was formed, participants answered a manipulation check, assessing whether they had obtained their seats through performance on a slider task or randomly.

2.1.6 | Additional variables

Participants also rated whether they felt they had control over the number of resources they obtained (1 = No control, 7 = Full control), and whether they agreed that parties with more seats deserved to be in the coalition more than parties with fewer seats (1 = Strongly disagree, 7 = Strongly agree). The outcome of these analyses showed that both perceptions of control and deservingness predicted which coalition participants wanted to form. Full analyses are provided in the supplemental materials.

2.2 | Results

2.2.1 | Comprehension check

Of all participants, 62.3% responded correctly to all questions of the comprehension check. Only 7% made more than one mistake.

2.2.2 | Manipulation check

Most participants correctly reported how they obtained their seats: 93% in the Control condition and 97% in the Resource condition.

2.2.3 | First offers

The frequency of coalitions and associated payoff allocations of the first offers of Study 1 are provided in Table 1.

Target of first offer

A two-tailed exact z-test of independent proportions showed that bargainers B and C made more offers to bargainer A in the Resource condition (n = 208, 60.8%) than in the Control condition (n = 176, 51.8%), z = 2.38, p = .02, OR = 1.45. Subsequent binominal tests revealed that player A was less included than would be expected by chance (i.e., less than 66%) in both the Control condition, $p < .001$, OR = 1.07, and the Resource condition, p = .03, OR = 1.55. This supports our first hypothesis that strong bargainers are more included in offers if resources are acquired by effort (relative to obtained randomly).

Proposed allocation

A 3(Bargaining position: A vs. B vs. C) × 2(Condition: Control vs. Resource) ANOVA on payoff to self, yielded a main effect of bargaining position, $F(2, 1017) = 72.37, p < .001, \eta^2 = .11$. Tukey HSD tests showed that bargainer A (M = 53.33, SD = 9.11) claimed more than bargainer B did (M = 47.74, SD = 9.85), $p < .001$, d = 0.59, who in turn claimed

TABLE 2 Frequency of formed coalitions and associated payoff allocations in Study 1

Control						
Coalition	***n***	**(%)**	M_A	M_B	M_C	**(*SD*)**
AB	50	29.4	48.56	41.44	–	(4.46)
AC	48	28.2	51.46	–	38.54	(7.36)
BC	72	42.4	–	47.49	42.51	(5.95)
Resource						
Coalition	***n***	**(%)**	M_A	M_B	M_C	**(*SD*)**
AB	58	33.9	47.38	42.63	–	(4.80)
AC	57	33.3	54.30	–	35.70	(9.84)
BC	56	32.7	–	50.41	39.59	(9.55)

Note: Each coalition allocated $90 million between the coalition members.

more than bargainer C did ($M = 40.57$, $SD = 12.25$), $p < .001$, $d = 0.64$. The analysis did not yield a main effect of condition, $F(1, 1017) = 1.39$, $p = .24$, $d = 0.05$, or an interaction effect of condition and bargaining position, $F(2, 1017) = 0.64$, $p = .53$, $\eta 2 < .01$. This analysis supports the view that strong players claim more than the other players. It does not support our second hypothesis that opening claims of strong players are moderated by condition.

2.2.4 | Final outcomes

The frequency of formed coalitions and payoff allocations of Study 1 are provided in Table 2.

Formed coalitions

To test whether our manipulation affected final outcomes, we first tested for the existence of a Strength-is-Weakness effect within the two conditions (see Table 2). In the Control condition, we observed a Strength-is-Weakness effect: A was included in 57.6% of all coalitions, which is significantly lower than the two-thirds we would observe when all coalitions were formed equally often, $p = .01$, $OR = 0.68$.[4] In the Resource condition, we did not observe a Strength-is-Weakness effect: bargainer A was included in 67.3% of all coalitions, which does not significantly differ from equal formation of coalitions, $p = .94$, $OR = 1.03$. Against H3, our preregistered *two-tailed z*-test for independent proportions did not reveal a statistically significant difference (i.e., at our preregistered $p < .05$) between the two proportions, $z = 1.83$, $p = .07$, $OR = 1.51$.

Allocation in formed coalitions

To explore whether our manipulation influenced the received payoffs for bargainers included in a coalition (see Table 2), we conducted a 2(Condition: Control vs. Resource) × 3(Bargaining position: A vs. B vs. C) ANOVA on obtained payoffs. We obviously found no main effect of condition, $F(1, 676) = 0.60$, $p = .44$, $d = 0.00$, as the size of the budget is identical in the two conditions. We did find a main effect of bargaining position, $F(2, 676) = 36.59$, $p < .001$, $\eta^2 = .08$. When included, bargainer A ($M = 50.43$, $SD = 7.48$) obtained a higher share of the outcomes than bargainer B ($M = 45.70$, $SD = 7.37$), $p < .001$, $d = 0.64$, who in turn obtained more than bargainer C ($M = 39.33$, $SD = 8.56$), $p < .001$, $d = 0.80$.

TABLE 3 Share of payoff when included in coalition by player in the two conditions (Study 1)

Condition	Position	*M*	(*SD*)
Control	A (4 seats)	49.98[a]	(6.20)
	B (3 seats)	45.01[b]	(6.15)
	C (2 seats)	40.93[c]	(6.81)
Resource	A (4 seats)	50.81[a]	(8.43)
	B (3 seats)	46.45[b]	(8.44)
	C (2 seats)	37.63[d]	(9.85)

Note: Different superscripted letters indicated significant differences (Tukey HSD, all *p*s < .05).

We also found an interaction effect (see Table 3), $F(2, 676) = 6.35$, $p = .002$, $\eta 2 = .01$.[5] Tukey HSD tests revealed that in both conditions bargainer A obtained a higher payoff share than bargainer B, who obtained a higher share than bargainer C. Moreover, both bargainer A and B seem to obtain a similar share in the Control than in the Resource condition. Bargainer C, however, obtains a lower share in the Resource than the Control condition.

2.3 | Discussion

In Study 1, we provide evidence that acquiring resources through effort has the potential to increase the inclusion of strong bargainers. When coalition bargainers had acquired their resources through effort (rather than through random assignment) (a) both strong and

[4] This effect became non-significant when only including participants who passed all comprehension checks, $p = .08$, $OR = 1.11$. Note that this analysis was conducted on only 38 participants.

[5] This interaction effect became non-significant when only including participants who passed all comprehension checks, $F(2,433) = 1.74$, $p = .18$, $\eta 2 = .01$.

weak bargainers were more likely to think strong parties deserve to be included and (b) strong bargainers actually received more first offers. We also found some evidence that these preferences materialized into final outcomes. That is, we found a Strength-is-Weakness effect in the Control condition, but not in the Resource condition, although we acknowledge that the two-sided test of proportions comparing the two conditions yielded a *p*-value of .07. Finally, regardless of condition, we observed that player As wanted and obtained more than player Bs, who wanted and obtained more than player Cs. In short, the crucial difference between the two conditions is not that player A's adapt how much they want in their opening offers, nor does it affect how much player A's obtain if they are a member of the final coalition. Instead, the crucial difference between the two conditions is that strong bargainers deserve to be included more often when resources are earned, are thus more often selected as a potential partner, and end up more often in a coalition than when resources are provided randomly.

3 | STUDY 2

Results from Study 1 provide evidence that strength becomes less of a weakness when resources are earned through effort. Study 1 did not provide evidence that strength may become a strength. After all, in the resource condition we did not find that player As were more often included than the other players. Instead, player As were included equally often as the other players. In Study 2, we investigated whether our second manipulation of input relevance—an explicit link between resource and payoff—would further increase the inclusion of strong bargainers, testing whether a strength in resources may also become a strength in terms of inclusion.

3.1 | Method

3.1.1 | Participants and design

Our final sample consisted of 858 Amazon Mechanical Turk workers (M_{age} = 35.71 years, age range 18–78, 351 females, 495 males, two other, 10 did not provide data) which were grouped into 286 triads. Participants received $2.64 for completing the task and another $0.05 per $1 million they attained in the scenario, leading to a payout of between $2.64 and $7.14.

Participants were randomly assigned to a *Resource* condition in which the municipality's budget was a fixed $90 million ($n = 426 = 142$ triads) or a *Payoff* condition in which Parties A, B, and C ostensibly contributed $40 million, $30 million, and $20 million respectively ($n = 432 = 144$ triads).

3.1.2 | Procedure

The Resource condition was a direct replication of the Study 1. The Payoff condition followed the same procedure with the exception that participants were informed that the more they exerted effort in the slider task (a) the more seats they would secure for their political party and (b) that this in turn would also increase the available budget of the municipality. After the slider task was completed, all participants were informed how many seats they but also the other two participants secured and how much each contributed to the available budget of the municipality. Participants learned that party A secured four seats and contributed 40 million to the available budget, party B secured three seats and contributed 30 million to the available budget, and party C secured two seats and contributed 20 million to the available budget. It was explicitly stated that the total budget was thus 90 million.

Before bargaining, participants completed the same comprehension checks as Study 1. Participants could only continue to the bargaining phase when they provided a correct answer. To check whether our manipulation was successful, we asked participants to indicate how participants contributed to the available budget of the municipality. This question had two answer options ('Parties with more seats contributed more' and 'They did not contribute to it at all. The budget was fixed').

As in Study 1, we assessed perceptions of control, and perceptions that stronger players are more deserving of inclusion in a coalition. Unlike Study 1, perceptions of control were now targeted at having control over the total budget generated. In addition, we assessed motivations that pertained more directly to allocations. Full details of these analyses are presented in the supplementals. Replicating Study 1, we observed that feelings of deservingness predicted whether stronger players were approached in an opening offer. Perceptions of control over the budget size did not predict whether stronger players were approached more often in opening offers.

3.2 | Results

3.2.1 | Comprehension check

Of all participants, 55.4% correctly answered all questions (3.3% made more than one mistake).

3.2.2 | Manipulation check

In the Resource condition, 66.2% correctly indicated that budget was fixed. In the Payoff condition, 77.9% correctly indicated that those with more seats had contributed more. This high failure rate inspired additional exploratory analyses selecting those who understood the manipulation. Below, we report results on this subset only when its interpretations differ from results based on the entire sample.

3.2.3 | First offers

See Table 4 for frequency of proposed coalitions and payoffs in Study 2.

TABLE 4 Frequency of proposed coalitions and associated payoff allocations in Study 2

Resource							
Position	**Coalition**	***n***	**(%)**	M_A	M_B	M_C	**(*SD*)**
A (4 seats)	AB	85	59.8	51.25	38.75	–	(7.71)
	AC	57	40.1	57.04	–	32.96	(11.00)
B (3 seats)	AB	93	65.5	46.14	43.86	–	(7.79)
	BC	49	34.5	–	52.41	37.59	(10.00)
C (2 seats)	AC	97	68.3	52.02	–	38.98	(15.25)
	BC	45	31.7	–	47.40	42.60	(13.97)
Payoff							
Position	**Coalition**	***n***	**(%)**	M_A	M_B	M_C	**(*SD*)**
A (4 seats)	AB	113	78.5	52.00	38.00	–	(8.32)
	AC	31	21.5	55.65	–	34.35	(8.04)
B (3 seats)	AB	108	75.0	45.54	44.46	–	(8.17)
	BC	36	25.0	–	52.03	37.97	(7.35)
C (2 seats)	AC	102	70.8	51.01	–	38.99	(9.49)
	BC	42	29.2	–	46.76	43.24	(12.22)

Note: Each coalition allocated $90 million between the coalition members.

Target of first offer

We first tested if our manipulation affected who people selected as a potential coalition partner. In the Payoff condition, 210(72.9%) first offers were made to A, compared to 190 (66.9%) offers in the Resource condition, $z = 1.57$, $p = .06$, $OR = 1.33$. Subsequent binominal tests revealed that player As were more often included than chance in the Payoff condition, $p = .02$, OR = 2.69, but not more or less than chance in the Resource condition, $p = .95$, OR = 2.01.[6]

The subset analysis on participants who correctly indicated what condition they participated in showed that this reduction between first offers to strong bargainers in the Payoff Condition ($n = 167$, 75.2%) and in the Resource condition ($n = 102$, 59.0%) was now statistically significant, $z = 3.44$, $p < .001$, $OR = 2.11$. Subsequent binominal tests revealed that player As were more often included than chance in the Payoff condition, $p = .006$, OR = 2.98, and that player As were less included than chance in the Resource condition, $p = .04$, OR = 1.44.

Taken together, this supports our first hypothesis that adding legitimacy to resources by linking it more clearly to payoffs increases offers made to strong bargainers. In fact, it even provides some evidence for a Strength-is-Strength effect.

Proposed allocation

Next, we assessed how much player demanded in their opening offers. A 3(Bargaining position: A vs. B vs. C) × 2(Condition: Resource vs. Payoff) ANOVA on payoff to self, yielded a main effect of bargaining position, $F(2, 852) = 58.59$, $p < .001$, $\eta 2 = .12$. Tukey HSD tests showed that player A ($M = 53.17$, $SD = 8.98$) claimed more than player B ($M = 46.58$, $SD = 9.05$), $p < .001$, $d = 0.73$, whom in turn claimed more than player C ($M = 40.18$, $SD = 12.85$), $p < .001$, $d = 0.58$. There was no interaction between bargaining position and condition, $F(2, 852) = 0.13$, $p = .88$, $\eta^2 < .001$, nor a main effect of condition, $F(1, 852) = 0.40$, $p = .53$, $d = 0.03$. Replicating Study 1, we find that player As claim more than the others, but not that this is moderated by condition.

3.2.4 | Final outcomes

See Table 5 for frequency of formed coalitions and associated payoffs in Study 2.

Formed coalitions

First, we conducted two exact binomial tests comparing the actual proportion that bargainer A is included to the expected inclusion of A if all coalitions were formed equally often (as A is a member of two of the possible three coalitions, this is two-thirds). These analyses did not provide evidence for a Strength-is-Weakness effect or Strength-is-Strength effect in the Resource condition (62.7% inclusion rate), $p = .33$, $OR = 1.68$,[7] and the Payoff condition (68.1% inclusion rate), $p = .79$, $OR = 2.13$. Moreover, against H3, there is no significant difference in formed coalitions between the Resource and Payoff condition, one-tailed $z = 0.87$, $p = .19$, $OR = 1.27$.[8]

[6] When excluding participants with comprehension check errors, the inclusion rates of A do not differ between Payoff (62.2%) and Resource condition (57.4%), $z = 0.83$, $p = .20$, OR = 1.22.

[7] Only including those without comprehension check errors, we find a Strength-is-Weakness effect in the Resource condition: bargainer A was included in 13 coalitions (39.4%), $p = .01$, OR = 0.65. Do note that this analysis was conducted on only 33 triads.

[8] Only including those without comprehension check errors, we find a significantly higher inclusion rate of bargainer A in the Payoff (70.6%) than in the Resource condition (39.4%), $z = 2.09$, $p = .02$, OR = 3.69.

TABLE 5 Frequency of formed coalitions and associated payoff allocations in Study 2

Resource						
Coalition	***n***	**(%)**	M_A	M_B	M_C	**(*SD*)**
AB	49	34.5	48.49	41.51	–	(7.64)
AC	40	28.2	53.05	–	36.95	(11.12)
BC	53	37.3	–	49.85	40.15	(4.93)
Payoff						
Coalition	***n***	**(%)**	M_A	M_B	M_C	**(*SD*)**
AB	51	35.4	48.73	41.27	–	(6.00)
AC	47	32.6	54.04	–	35.96	(6.97)
BC	46	31.9	–	50.07	39.93	(6.46)

Note: Each coalition allocated $90 million between the coalition members.

Conducting the analysis on those who passed the manipulation check, we do find support for H3 that strong players are more included in the Payoff condition (strong included 50 times, 75,8%) than in the Resource condition (strong included 20 times, 48,8%), $z = 2.85$, $p = .002$, $OR = 3.28$. Moreover, we observe that these inclusion rates are different from chance in the Resource condition ($p = .02$, $OR = 0.95$) but not in the Payoff condition ($p = .12$, $OR = 3.13$).

Allocation in formed coalitions

To assess whether the presence or absence of a direct link between resources and outcomes influenced received payoffs for bargainers included in a coalition (see Table 5), we conducted a 2(Condition: Resource vs. Payoff) × 3(Bargaining position: A vs. B vs. C) ANOVA on obtained payoffs. As the size of the budget was identical in the two conditions, we did not find a main effect of condition, $F(1, 566) = 0.41$, $p = .52$, $d = 0.00$. We did find a main effect of bargaining position, $F(2, 566) = 69.02$, $p < .001$, $\eta^2 = .17$. When included player A ($M = 50.92$, $SD = 8.30$) obtained a higher share of the outcomes than player B ($M = 45.65$, $SD = 7.59$), $p < .001$, $d = 0.66$, who in turn obtained more than player C ($M = 38.35$, $SD = 7.65$), $p < .001$, $d = 0.96$. We did not find an interaction effect, $F(2, 566) = 0.50$, $p = .60$, $\eta^2 = .001$.

3.3 | Discussion

At first glance, the analyses of the full sample of Study 2 appear not to provide the strongest support that increasing the legitimacy of resources by linking them to payoffs adds much relative to having resources only earned. That is, an analysis on the full sample of participants did not reveal statistically significant differences (i.e., at the preregistered one-tailed $p < .05$) between the payoff condition and the resource condition in terms of coalition preferences ($p = .06$) or final coalitions ($p = .19$). However, the analysis on the manipulation check revealed that a considerable number of participants failed to correctly recall what condition they belonged to. This failure is potentially problematic because it increases random measurement error and may have caused some participants to behave under the impression of being in another condition than they were assigned to. To address this, we conducted a subset analysis focusing on participants who correctly recalled the condition they were assigned to. These analyses did find statistically significant differences in coalition preferences ($p < .001$) and formed coalitions ($p = .002$) between the two conditions.

Notwithstanding these qualifications, we argue that Study 2 provides support for the main hypotheses. When resources are earned and explicitly linked to payoffs, strong bargainers receive more first offers (H1) and are included more often in final coalitions (H3), compared to when resources are only earned. When we consider the percentages of inclusion it even appeared that strong players were more included than chance, pointing towards a possible Strength-is-Strength effect. Moreover, replicating the pattern of Study 1, we find that payoffs made within offers are less affected by condition, suggesting that the occurrence of the Strength-Weakness-Effect is more driven by who is selected in an offer than by how the payoffs are allocated within an offer.

4 | STUDY 3

Study 3 aimed to address potential limitations observed in Studies 1 and 2. First, in Study 1 we used a control condition that did not include a slider task and compared this to a resource condition that did include a slider task. This leads to a difference in cognitive effort exerted before the coalition game, which potentially confounded our manipulation and thus the interpretation of the results. Second, in Study 2 we observed that the difference between the two conditions was most profound when we focused on the participants who indicated that they understood the manipulation. Third, in hindsight, we admit that Study 2 was quite ambitious in its goal as it compared two conditions that both provide a reason why strong players have a legitimate claim on more payoffs than weaker players.

To address these shortcomings, we conducted a third experiment. In this third experiment we focused on the condition that did not provide any reason why resources provide a legitimate claim on payoffs (the control condition of Study 1 in which resources are determined

randomly) and the condition that offered reasons why resources provide a legitimate claim on payoffs (the payoff condition of Study 2). Moreover, we ensured that both the participants in the control condition and the participants in the payoff condition had to complete a slider task before the coalition game. Would this comparison provide further evidence about the legitimacy of resources, and thus provide more concrete evidence that a Strength-is-Weakness effect can be moderated, and as observed in Study 2, possibly turn into a Strength-is-Strength?

4.1 | Method

As Study 3 is based on the experimental conditions from Studies 1 and 2, we only mention the differences.

4.1.1 | Participants and design

Our final sample consisted of 864 Amazon Mechanical Turk workers (M_{age} = 35.71 years, age range 26–74, 369 females, 478 males, three other, 14 missing data) which were grouped into 288 triads. Participants received $2.64 for completing the task and another $0.05 per $1 million they attained in the scenario, leading to a payout of between $2.64 and $7.14.

Participants were randomly assigned to a *Control* condition in which in which participants' resources were randomly assigned (n = 420 = 140 triads) or *Payoff* condition in which Parties A, B, and C ostensibly contributed $40 million, $30 million, and $20 million respectively (n = 444 = 148 triads).

4.1.2 | Materials and procedure

Instructions were similar to the Control condition in Study 1 and Payoff condition in Study 2, respectively. The main difference was that the Slider task was introduced in the Control condition to equate the cognitive load in both conditions and that we made some small textual changes to increase the readability of the instructions. Moreover, as a manipulations check, participants completed the manipulation check questions of Study 1 and Study 2. We combined the answers into one score that ranged from (0 both questions wrong to 2 both questions right). Following our preregistration, we did a subset analysis on those who had both questions correct and report this analysis only when the results differ.

We again assessed additional measures (i.e., control, deservingness, motivations). Unlike the Study 1 and Study 2, we included two perceptions of control. One perception of control pertained to control over seats acquired (i.e., the control measure of Study 1), the other pertained to control over the budget size of a coalition (i.e., the control measure of Study 2). Key findings are that both control over budget size and deservingness predicted offers made to stronger players. Control over seats acquired and allocations motivations (e.g., maximize own outcomes, minimize harm) did not. A full description of the analyses is given in the supplementals.

4.2 | Results

4.2.1 | Comprehension check

64.9% of participants correctly answered the comprehension checks. Only 3% made more than one mistake. As in Study 1 and 2 participants were informed about the correct answer before they continued to the actual negotiation.

4.2.2 | Manipulation check

In the Control condition, 71.5% correctly indicated that seats were randomly assigned and the budget was fixed. In the Payoff condition, 90.4% correctly indicated that their performance on a slider task determined the number of seats, and those with more seats had contributed more to the overall budget. Following the preregistration of Study 3 we report below both an analysis on the whole sample and the subset when the interpretation would suggest a different conclusion.

4.2.3 | First offers

See Table 6 for proposed coalitions and payoffs of Study 3.

Target of first offer

We first tested whether more first offers were made to bargainer A by bargainers B and C in the Payoff than in the Control condition, using a one-tailed exact z-test of independent proportions. In the Payoff condition, 217 (73.3%) first offers were made to A, compared to 157 (56.1%) offers in the Control condition. Supporting H1, this difference, was significant, z = 4.33, p < .001, OR = 2.15 (See Table 6). Subsequent binominal tests revealed that player As were less often included than chance in the Control condition, p < .001, OR = 1.28, and more than chance in the Payoff condition, p = .008 .01, OR = 2.75.[9]

Proposed allocation

Next, we assessed how much each bargainer demanded in his/her opening offer (see Table 6). A 3(Bargaining position: A vs. B vs. C) × 2(Condition: Control vs. Payoff) ANOVA on payoff to self, yielded a main effect of bargaining position, $F(2, 858) = 44.06$, $p < .001$, $\eta 2 = .08$. Tukey HSD tests showed that bargainer A (M = 52.42, SD = 9.23) claimed more than bargainer B (M = 44.25, SD = 9.56), p < .001, d = 0.87, who in turn claimed more than bargainer C (M = 40.46, SD = 11.07), p < .001, d = 0.37. There was no interaction between bargaining position and condition, $F(2, 858) = 1.36$, $p = .26$, $\eta^2 < .01$, nor a main effect of condition, $F(1, 858) = 1.93$, $p = .53$, $d = -0.02$. As in Studies 1 and 2, we find that player As claim more than the others, but not that this is moderated by condition.

[9] Only including those without comprehension check errors, we did not find a significantly higher inclusion rate of bargainer A than chance in the Payoff condition (71%), p = .25, OR = 2.44.

TABLE 6 Frequency of proposed coalitions and associated payoff allocation in Study 3

Control condition							
Position	**Coalition**	***n***	**(%)**	M_A	M_B	M_C	**(*SD*)**
A (4 seats)	AB	87	62.1	52.20	37.80	–	(11.80)
	AC	53	37.9.1	55.02	–	34.98	(9.13)
B (3 seats)	AB	86	61.4	50.09	39.91	–	(11.37)
	BC	54	38.6	–	51.24	38.76	(7.32)
C (2 seats)	AC	71	50.7	49.99	–	40.01	(13.29)
	BC	69	49.3	–	50.22	39.78	(6.60)
Payoff condition							
Position	**Coalition**	***n***	**(%)**	M_A	M_B	M_C	**(*SD*)**
A (4 seats)	AB	105	70.9	49.91	40.09	–	(6.30)
	AC	43	29.1	55.81	–	34.19	(7.66)
B (3 seats)	AB	117	79.1	47.00	43.00	–	(7.05)
	BC	31	20.9	–	48.87	41.88	(7.12)
C (2 seats)	AC	100	67.6	48.12	–	41.88	(11.50)
	BC	48	32.4	–	50.83	39.17	(11.68)

Note: Each coalition allocated $90 million between the coalition members.

TABLE 7 Frequency of formed coalitions and associated payoff allocations in Study 3

Control condition						
Coalition	***n***	**(%)**	M_A	M_B	M_C	**(*SD*)**
AB	49	35.0	51.39	38.61	–	(11.23)
AC	44	31.4	54.20	–	35.79	(8.82)
BC	47	33.6	–	49.38	40.61	(4.14)
Payoff condition						
Coalition	***N***	**(%)**	M_A	M_B	M_C	**(*SD*)**
AB	58	39.2	48.07	41.93	–	(7.47)
AC	51	34.4	53.25	–	36.74	(8.47)
BC	39	26.3	–	51.90	38.10	(9.31)

Note: Each coalition allocated $90 million between the coalition members.

4.2.4 | Final outcomes

See Table 7 for formed coalitions and payoffs of Study 3.

Formed coalitions

Unexpectedly, the exact binomial tests did not provide evidence for the occurrence of a Strength-is-Weakness effects in the Control condition (66.4%), $p = 1$, $OR = 1.97$. Expectedly, it also did not in the Payoff condition (73.6%), $p = .08$, $OR = 2.79$. Moreover, against H3, there was no significant difference in formed coalitions between the Control and Payoff condition, $z = -1.34$, $p = .09$, $OR = 1.41$.

However, conducting an analysis on those who correctly answered the manipulation check, we do find support for H3 that strong players are more often included in the Payoff than in the Control condition, $z = 3.07$, $p < .001$, $OR = 3.69$. Moreover, we observe that the inclusion rate of strong bargainers is lower than chance in the Control condition (strong included 16 times, 47%), $p = .03$, $OR = 0.88$, and not lower (but also not higher) in the Payoff condition (strong included 59 times, 76.6%), $p = .07$, $OR = 3.28$ (See Table 7).

Allocation in formed coalitions

We conducted an ANOVA to explore whether the presence or absence of a direct link between resources and outcomes influenced received payoffs for bargainers included in a coalition. We found a main effect of bargaining position, $F(2, 570) = 52.44$, $p < .001$, $\eta^2 = .13$. If players managed to become a member of a winning coalition, bargainer A ($M = 51.52$, $SD = 9.29$) obtained a higher share of the outcomes than bargainer B ($M = 44.92$, $SD = 9.85$), $p < .001$, $d = 0.69$, who in

turn obtained more than bargainer C ($M = 37.81$, $SD = 8.04$), $p < .001$, $d = 0.79$. We did not find a main effect of condition $F(1, 570) = 3.01$, $p = .06$, $\eta^2 < .01$, or an interaction $F(2, 570) = 2.85$, $p = .08$, $\eta^2 < .01$ (See Table 7).

4.3 | Discussion

In Study 3 we compared our most extreme conditions (from Studies 1 and 2) to provide further evidence that the perceived legitimacy of resources can moderate the Strength-is-Weakness effect. As in Study 1 and Study 2, we again provide evidence that the Strength-is-Weakness effect can be moderated. Specifically, we find that strong bargainers were significantly more included when resources were earned and there was an explicit relationship between resources and payoffs, than when resources were randomly obtained and there was no such relationship, in both proposed (H1) and formed coalitions (H3). Mimicking the results of Study 2, pointing towards a Strength-is-Strength effect, we again observed that player As were more included than chance if resources were clearly linked to payoffs. Finally, and this speaks to H2, as in Study 1 and 2 we observed that the payoffs within opening offers or formed coalitions were not moderated by condition. This highlights that the Strength-is-Weakness effect appears to be driven by whether people are selected in an offer, and less by how much is offered in an offer.

5 | GENERAL DISCUSSION

In this article, we tested the proposition that the inclusion of strong bargainers in coalitions is partly determined by whether their resources are perceived to provide a legitimate claim on inclusion and payoffs. Across three studies, we provide evidence that increasing the legitimacy of resources moderates the Strength-is-Weakness effect. In Study 1, we observed that strong bargainers obtained more first offers (support for Hypothesis 1) and were more included in final coalitions (support for Hypothesis 3) when resources were obtained by effort than when resources were obtained randomly. In Study 2 and Study 3 we linked resources to effort and to payoffs. In both studies we observe that this increased the number of offers to strong bargainers. In both studies we even observed that strong bargainers were included more than chance when effort was explicitly linked to both resources and payoffs. Note that this effectively turned a Strength-is-Weakness effect into a Strength-is-Strength effect. Admittingly, our results were stronger on the level of first offers and weaker on the level of final outcomes. Moreover, we observed the clearest support for our hypotheses when we focused on participants who understood the manipulation.

In none of our studies we provided evidence that linking resources to effort and/or payoffs did also moderate the magnitude of offers made (failure to support Hypothesis 2). Indeed, in all three studies we observed that—regardless of condition—the strong bargainers claimed more than the weaker bargainer, who in turn claimed more than the weakest bargainer. This suggest that the moderation of the Strength-is-Weakness effect is thus not driven by a combination of changes in partner selection (whom do people select as a potential coalition partner) *and* changes in the magnitude of an offer (how much do people offer to a potential partner), but instead *only* by changes in partner selection. Put differently, this suggests that the inclusion of strong bargainers does not depend on the magnitude of the demands of the strong bargainers, but more on whether weak bargainers agree that the demand is justified.

Our studies also provide a more general insight into the role of resources in coalition formation. An ongoing debate in research on simple weighted majority games is whether resources or underlying bargaining power are more predictive of which coalitions are formed. Whereas theories based on resources (e.g., Gamson, 1961; Komorita & Chertkoff, 1973) predict the existence of a Strength-is-Weakness effect, theories based on bargaining power—such as pivotal power theory (Shapley & Shubick, 1954) and minimum power theory (Gamson, 1964)—propose that resources should only influence formed coalitions and payoffs when they lead to differences in bargaining power. In the case of the 5(4–3–2) game, resource theories would predict the formation of the BC-coalition, whereas power theories would acknowledge that players in this game are equally powerful as all players have an equal number of opportunities to form a coalition, and thus predict that each possible two-player coalition is equally likely and that payoffs within the coalition should then be equally shared. Overall, our findings provide more support for resource-based theories than power-based theories. After all, counter to predictions from power theories, we find that payoffs were strongly determined by resources in all conditions. Moreover, and again counter to predictions form power theories, we find that player As were less often included in the control conditions and more often included in the payoff conditions. An important realization is thus that coalition bargaining is strongly influenced by the number of resources bargainers hold, even when differences in resources do not translate into differences in bargaining power.

Another insight provided by our data is that participants seem to read more into differences in resources than seems to be there. Taking a closer look at the manipulation check from Study 2, we find that more errors occurred in the Resource condition than in the Payoff condition. This suggests that a substantial proportion of participants in the Resource condition seem to assume that resources and payoffs are related in situations in which they are not. This is compatible with previous literature on the Strength-is-Weakness effect which emphasizes that a large part of coalition formation is the process of participants making sense about what kind of situation they are in and acting upon these (possibly incorrect) perceptions (Psathas & Stryker, 1965). Besides providing theoretical insights, the notion that participants misattribute certain qualities to resources also has practical relevance: in addition to using salient instructions, researchers should make sure appropriate manipulation checks are in place, and maybe even more stringent comprehension checks to filter out participants who hold erroneous views of the bargaining situation.

5.1 | The magnitude of the Strength-is-Weakness effect

A surprising finding in the current investigation was that we observed a relatively small Strength-is-Weakness effect in the control conditions of Study 1 and Study 3. Based on prior research, we anticipated that strong bargainers would be included in about 35% of the formed coalitions. Instead, we observed that strong bargainers were included in 57.6% of the formed coalitions in Study 1 and in 47% of the formed coalitions in Study 3. One reason that comes to mind is that the current research was based on an online sample. However, we do not believe that this is a likely explanation as our estimate was based on research that tested the 5(4–3–2) game in both a physical lab setting and online (Wissink et al., 2022). Indeed, the results of Wissink et al. (2022) revealed that 33% of the strong bargainers were included when participants were approached and tested in a physical lab at a university and 35% when participants were approached online via MTurk.

We offer two more likely reasons why our effect was smaller than anticipated in the control conditions. First, we speculate that the reason may be how resources were operationalized in our study compared to the study that we used to estimate our effect. Wissink et al. (2022) assessed Strength-is-Weakness in a landowner paradigm (see also van Beest et al., 2004b) where participants take on the role of landowners who are interested in selling their parcels. Participants learn that they do not have enough land to meet the demands of a buyer and thus need to form a coalition to sell their individual parcel. Resources in this paradigm are thus operationalized by the relative size of a parcel. The strong player controls a parcel of 4 acres, the weaker players either control a parcel of 3 or of 2 acres. We speculate that people might already have the perception that those who have a large electorate are naturally more deserving of inclusion than those who simply control a larger parcel of land. After all, in a political convention paradigm, participants who represent a large party may infer that a lot of people supported their party and thus perceive that they are more entitled to run the country, a perception that might thus also be shared by those who represent a smaller political party. This fits with the convention that, in many countries with a multi-party system, the largest party is often given the leading role as the party starting negotiations, which increases the probability that they are included (Bäck & Dumont, 2008; Warwick, 1996). Future research could compare the two settings to investigate whether inclusion of strong bargainers indeed differs between them.

A second possible reason why we observed a relatively small Strength-is-Weakness-effect in the control conditions might be due to the way we explained how resources were obtained. In the Control conditions, we made it clear that resources were received because of a random draw. In the Resource and Payoff conditions we made it clear that resources were earned and related to payoffs because of the effort that participants exerted during a slider task. In the research of Wissink et al. (2022), the source of differences in resources was not related to effort, and in fact was also more ambiguous than stating that it was based on a random draw. That is, participants were simply assigned to a position without being given a justification why. It is thus possible that our explicit mentioning of the source of resources led to a higher shared perception about input relevance—and hence less disagreement—whereas there may be more room for self-serving interpretations when the source of resources is more ambiguous, leading to more disagreement and thus a stronger Strength-is-Weakness effect. Future research could compare settings in which it is made clear that differences in resources are due to effort, due to randomness, or in which the sources are more ambiguous. Our prediction is that the Strength-is-Weakness effect would then be largest in the ambiguous condition, smaller in the random condition and—replicating the current work—absent in the effort conditions.

Regardless of these two reasons, we also want to point out that we used the 5(4–3–2) simple weighted majority game to test our hypotheses. We did this because we did not want to increase the complexity of the current investigation by also testing a multitude of different resources configurations. However, we hasten to say that we do not believe our findings are specific to this configuration of resources. We could, for example, also have used the 4(3–2–2) simple weighted majority game to test our hypotheses. Recent research by Wissink et al. (2022) revealed that the obtained Strength-is-Weakness effect of this 4(3–2–2) game resembled the obtained Strength-is-Weakness effect of the 5(4–3–2) game by Wissink et al. (2022). That is, strong bargainers were included in 32% of the formed coalitions. We would thus predict that the current manipulations that sought to increase the legitimacy of a strong bargainers' claim on payoffs would ultimately also increase the inclusion of strong bargainers in this configuration of resources (or any other configuration of resources for that matter) but admit that this is ultimately an empirical question that can be addressed in future research.

CONFLICT OF INTEREST

The authors have no conflicts of interest to disclose.

DATA AVAILABILITY STATEMENT

The data and stimulus materials of the current three studies are made available via the Dutch national centre of expertise and repository for research data (DANS), dataverse.nl, and can be downloaded using the following link: https://doi.org/10.34894/FCLGKP

ETHICS STATEMENT

We confirm that participants in all studies gave informed consent. The authors comply with APA ethical publication standards and our studies are approved by the Ethics Review Board of Tilburg University.

TRANSPARENCY STATEMENT

Following university regulations data and materials of all studies are available via DataverseNL network: https://doi.org/10.34894/FCLGKP.

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