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# From ideals to deals - the effect of arbitration experience on stakeholder behavior

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## Abstract

In this paper, we study a two-party pie-sharing problem in the presence of asymmetries in the stakeholders' private endowments. Both the two stakeholders and third-party arbitrators may influence the outcome. We consider Nash-demand negotiations where the two stakeholders place demands and share the pie accordingly if demands are compatible, and elicit dictatorial allocations from the stakeholders and the arbitrators. The Nash demands by stakeholders are strategic; the dictatorial allocations by stakeholders and arbitrators are non-strategic. We are interested in the influence of the past arbitrator experience on stakeholder allocations and demands and the past negotiator experience on third-party arbitration allocations. We find that the ex-arbitrators' stakeholder allocations differ more from the impartial ideal than the stakeholder allocations by those without arbitration experience. In contrast with previous findings, the arbitration outcomes do not depend on the asymmetries in the previous negotiator roles.

**JEL Classification:** C91, D74

**Keywords:** bargaining, arbitration, fairness, self-serving bias, cognitive dissonance

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# 1 Introduction

Historical precedents such as needs, abilities, sunk inputs, bequests or endowments generate asymmetries in bargaining, negotiations, and conflict situations. When parties attempt reconciling a deal that neither would reject these differences may turn detrimental [Gächter and Riedl, 2005, 2006]. The parties might not share views about what really matters for fairness [Cappelen et al., 2007, Luhan et al., 2013]. Negotiation parties' views on focal determinants of a fair deal might drastically depend on which side of the table one sits [Konow, 2000, Babcock and Lowenstein, 1997]. Such profound and potentially self-serving differences in fairness ideals may generate conflict and inefficiencies; the capacity of putting oneself into the shoes of the other may help to promote favorable outcomes in such situations. This capacity may crucially depend on past experiences in the various roles in analogous situations.

From a societal perspective, it seems crucial to understand the influence of the parties' past experiences on negotiation outcomes. In wage negotiations between unions and in settlement negotiations in legal disputes, for instance, it is professional negotiators who act on behalf of their clients and who have variant degrees of experience from the various roles around the negotiation table in similar situations. It is of interest to understand which kind of an experience profile is likely to deliver a favorable negotiation outcome both for the interest of an individual client and from the societal perspective of efficiency or allocative fairness.

In this paper, following the footsteps of Konow [2000], we ask how past experiences in two alternative stakeholder roles influence the impartiality of arbitrator decisions. We also ask, and this is our main contribution, how past experiences in an impartial arbitrator role influence stakeholder behavior in the stakeholder role. In our lab-experimental setup there are initial asymmetries in the exogenously assigned endowments between the stakeholders who engage in negotiating a division of an additional windfall profit without an option for side payments. Thus if parties wish to redress for the asymmetries in initial endowments, they must share the wind-fall profit unevenly. The negotiations are carried out in a standard Nash demand game fashion. The novel feature is that there are also two arbitrators present each of whom proposes how the wind-fall profit should be shared between the negotiators. A random lottery decides ex-post whether it is the stakeholders' negotiation choices or one of the third-party allocations that determine the ultimate payoffs of the negotiators. Neither the negotiators nor the arbitrators can influence the third party payoffs.

There are two competing fairness ideals in this situation: (i) either share the windfall profit equally or (ii) share the sum of the windfall profit and the endowments equally implying that windfall profit

itself must be shared asymmetrically. The fairness ideal one endorses might depend on which side of the negotiation table one sits. The one with the smaller endowment might be more willing to compensate for the differences in endowments and thus favor the split-all fairness ideal; the other with a larger endowment might have a stronger tendency for the split-the-windfall ideal [Babcock and Lowenstein, 1997, Konow, 2000]. Past experience may influence the fairness perceptions. On the one hand, the impartial arbitration decisions might be biased towards the ideal favorable to one's past negotiator role [Konow, 2000]. On the other hand, a past history in the role of an impartial arbitrator might influence the behavior as a negotiator. Experience from the arbitrator role could advance the capacity for understanding the positions on each side of the table. Bargaining outcomes might thus be more efficient or at least differ from the outcomes reached otherwise.

We utilize the theoretical framework put forward by Konow [2000]: when making decisions that influence the sharing of the pie between two parties, a stakeholder has three components in her utility function that she is trading off. A stakeholder aims to maximize own monetary earnings, to ensure that one's own share of the pie comes as close to what one beliefs to be a fair entitlement, and not to overly deceive oneself by tinkering oneself to believe that one's own entitlement is larger than it actually is. Konow theoretically shows that a stakeholder who gets to dictatorially decide how to share a pie between the two, generally tends to choose a share larger than what one beliefs to be her fair entitlement and chooses to believe that her fair entitlement is greater than is generally thought by independent third parties. In an experiment where endogenous variation in real effort by the two parties and exogenous variation in reward schemes are used to generate variation in the pie-size and the entitlements, Konow finds patterns complying with these theoretical predictions. Faced with this variation, dictators in a dictator game are randomly assigned either a stakeholder role or a third-party role. When participants that are initially assigned to a stakeholder role, are suddenly given the opportunity to act as third-parties after their initial stakeholder choice, their third party allocation choices are biased towards their stakeholder allocations, which for their part are biased towards their private monetary benefit. Konow did not study how third party arbitrator experience influences stakeholder choices, i.e. he did not let initial third-parties suddenly choose as stakeholders. This is the novel question addressed in this paper.<sup>1</sup>

We find that arbitrator experience drastically influences stakeholder behavior. The distance between the stakeholder allocations and the third-party allocations provides a measure of the gap between stakeholders' (revealed) preferred deals and the unbiased ideals of impartial arbitrators. This gap is

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<sup>1</sup> There are several other smaller differences between the experimental designs in the present paper and that of Konow.

larger when stakeholders have arbitration experience. Arbitration experience thus impacts the stakeholder behavior in an asymmetric and self-serving manner. This is surprising as the theory predicts the opposite: experience from the impartial arbitration role should render the beliefs about fair entitlements more concordant and, since decision makers wish to avoid cognitive dissonance and maintain a consistent self-image, their dictatorial allocations should also lie closer to each other.

In addition to dictatorial allocations by shareholders (as in Konow [2000], Cappelen et al. [2007, 2011], Ubeda [2013], Aguiar et al. [2013]), we also allow them to place Nash demands to negotiate a deal. We find that rich stakeholders with arbitrator background place lower Nash-demands than rich stakeholders without arbitration experience. The Nash-demands of the poor stakeholders with arbitration experience are not significantly different from those of the poor stakeholders without arbitration experience.

We also conclude with another somewhat surprising finding. The arbitrator decisions of ex-negotiators, for their part, are not self-servingly biased. To justify the negotiation behavior, to reduce cognitive dissonance between one's behavior and one's ideals, it is conceivable that arbitration decisions would be biased towards the ideals in the interest of the past negotiator role as in Konow [2000]. We find no evidence of such bias; ex-negotiators allocations of the surplus are independent of the past negotiator role, and this evidence is in line with Cappelen et al. [2007, 2011]. In fact, the differences between our finding and that of Konow, may not be that drastic since Konow found less evidence of self-serving biases in treatments where there was only exogenously generated variation in the entitlements (as in our paper). In that case participants were more concordant that inequality, which parties cannot control and influence and thus cannot be held responsible for, should be redressed in dictatorial allocations such that the weaker party will be compensated for the disadvantageous exogenously generated inequality. In our experiment, we have only treatments where there is such exogenous inequality and thus indeed third-party allocations should be expected to compensate for it independently of previous stakeholder experience.

That average third party allocations do not depend on the previous role, hides the fact that there is a lot of individual variation in the third party allocations and that these allocations exhibit the expected multiplicity of fairness ideals observed also in the previous literature, [Cappelen et al., 2007, Ubeda, 2013, Becker and Miller, 2009]. Experimental literature has pointed out that people vastly differ in their views about which fairness ideal should be endorsed [Frolich et al., 2004, Cappelen et al., 2007]. The closest papers to the present one among these studies are perhaps Konow [2000], Becker and Miller [2009], Cappelen et al. [2011]. Konow studies non-strategic allocation choices by stakeholders and third-parties and finds evidence that the stakeholder role biases allocations in a manner promoting

self-interest, but previous experience in the third-party role reduces the bias. The interest of Becker and Miller [2009] lies in non-strategic and dictatorial divisions in front and behind a veil of ignorance about the asymmetries in initial endowment. Behind the veil of ignorance people differ in terms of how much they are willing to compensate for the asymmetries: some do not redistribute at all, some others compensate fully to make parties ex-post payoffs equal, and yet some others choose something in between. These differences are also reflected in the decisions made in front of the veil, yet to a minor extent.

Cappelen et al. [2011] illustrate that an appeal for moral reflection impacts the non-strategic and dictatorial redress of differences in productive activities by stakeholders when the joint returns to those activities are shared. They find more redress for the asymmetries in productive inputs when subjects are instructed to engage in moral reflection. In our case, we do not directly ask the subjects to engage in moral reflection - in fact the entire experimental design is not cast to any specific context or frame, apart from bargaining. Yet, it is likely that moral judgment matters in arbitrator choices when dividing the windfall profit between the negotiators. Thus the fact that negotiation strategies and outcomes are influenced by prior experience from the arbitrator role can be seen as a result parallel to the effect of explicit requests of moral reflection: prior moral reflections can function as coordination cues and/or impact the strength of cognitive dissonance if the previously used fairness ideal is transgressed in the ensuing negotiation game [Konow, 2000]. Ubeda [2013] relatedly studies decision makers' fairness judgments in dictatorial stakeholder allocation choices over a large number of independent interactions and finds evidence of self-serving biases: stakeholders switch the ideal choosing the one which gives the stakeholder the highest payoff. All the choices in Ubeda's case are stakeholder decisions; in our paper there is variation in whether one adopts a stakeholder or an arbitrator role in the negotiation table.

In line with Konow [2000], Cappelen et al. [2007, 2011], Becker and Miller [2009], we study non-strategic dictatorial divisions by stakeholders and third parties. In addition to the studies above, the focus on third-party allocations is reminiscent to Aguiar et al. [2013] who examine two orthogonal characteristics that impact the degree of impartiality in arbitrator decisions. They find that both a higher payoff- and a higher information-independence induce more redress and thus more ex-post egalitarian outcomes.

In addition, we contrast non-strategic and dictatorial allocations with the strategic negotiation choices by the stakeholders. Our focus on stakeholder negotiation choices is reminiscent to the design of Gächter and Riedl [2005, 2006]. In those papers the need for redress in negotiations springs from differences in prior endogenous inputs to the generation of the surplus to be negotiated. In our case,

need for redress arises from differences in exogenous endowments. Moreover, in our case the need for negotiation is not implied by a sudden exogenous shrinking of the surplus. Our interest in fairness ideals in a bargaining context also bears a connection to Luhan et al. [2013] who study the role of self-serving biases in bilateral Nash-bargaining.

The paper is organized as follows. The experimental design and procedures are explained in detail Section 2. The theory, the hypotheses, and the power tests to determine the sample size are explained in Section 3. In Section 4, we present the results. The final section briefly concludes.

## 2 Experimental design

The experimental sessions were conducted in September 2014 and April-May 2015 at the PCRC laboratory at the University of Turku, Finland. Subjects were recruited using ORSEE software [Greiner, 2015] and the experiment was programmed and conducted using the z-Tree software [Fischbacher, 2007].

We checked the identity of the subjects and randomly allocated each a visually isolated cubicle in the laboratory. The participants received a hard-copy of the instructions, written in Finnish (Supplementary Material). The instructions were read out loud by the experimenter once the participants had read the instructions privately and quietly. Thereafter the experiment was started. The participants first answered three control questions (Supplementary Material) regarding the four player interaction. They could proceed to the actual experiment only once all three questions were answered correctly. Once all decisions were finished subjects were paid individually according to their choices. The currency for final payments was euros.

There were altogether 10 sessions which took place in a 20 seat dedicated laboratory. There were 16 participants in one of the sessions, 18 in another one, and 20 participants in the remaining eight sessions. The participants were randomly allocated one of the three player-roles: a rich negotiator, a poor negotiator, or an arbitrator. In each session, half of the subjects started off as arbitrators and half as negotiators, and again half of the negotiators started in the rich negotiator role and the other half in the poor negotiator role.<sup>2</sup>

The one-shot game played in each period was as follows. There were four players in the game: one rich negotiator (player A), one poor negotiator (player B), and two arbitrators (players C and D). The

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<sup>2</sup> In the session with 18 participants, there were 10 participants starting out as negotiators and 8 starting as arbitrators.

poor negotiator had a low endowment of 0 euros and the rich negotiator had a high endowment of 6 euros. Each arbitrator had an endowment of 6 euros. The task of the two negotiators (A and B) was to divide an additional 12 euros between themselves. There were five alternative mechanisms to decide how to divide the additional 12 euros.

The first mechanism was the negotiation game by the stakeholders: the rich and the poor negotiator. They bargained how to allocate an additional 12 euros between themselves. We used a Nash demand game to model this bargaining game: the two players simultaneously made demands and each player received a pay-off corresponding to her demand (in addition to her endowment) if the demands were jointly feasible. If the demands were jointly infeasible (summing up to more than 12) then all payoffs were zero, and even the endowments of all parties were destroyed.

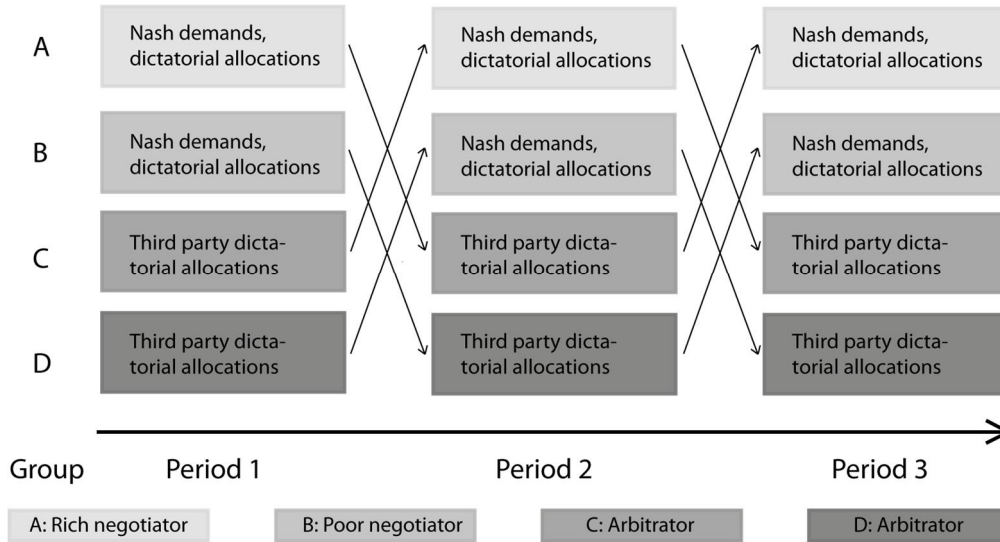
The second and the third mechanism was to let the arbitrator C or the arbitrator D to decide how to divide the 12 euros between A and B, respectively. This is the dictatorial allocation by a non-stakeholder third party. The task of each arbitrator was to allocate a share of the 12 euros to the poor negotiator and to assign the residual share of the 12 euros to the rich negotiator. The assignment was carried out without knowing the actions of the negotiators or the other arbitrator.

The fourth and the fifth mechanism granted the dictatorial decision of how to split the 12 euros to negotiator A or to negotiator B, respectively. This is the dictatorial allocation by a stakeholder.

In the end, an electronic dice-roll by the computer determined which of the five mechanisms became payoff-relevant. The first mechanism was chosen with a  $1/3$  probability and each of the other four mechanisms with a  $1/6$  probability.

The four-player interaction was repeated three times with random re-matching under the restriction that the roles had to be switched from a negotiator to an arbitrator role and vice versa in each round. Moreover a rich negotiator in round 1, after turning into an arbitrator in round 2, became a rich negotiator also in round 3. Similarly, a poor negotiator in round 1, after turning into an arbitrator in round 2, became a poor negotiator again in round 3. The timeline and role-switching is illustrated in Figure 1. The role of each participant was announced at the beginning of each round – the switching structure illustrated in Figure 1 was not known to the participants at any stage.





**Figure 1: Decisions, timing, and role-switching**

Once the game had been played for three rounds, each participant was asked to give her/his best guess regarding (i) the negotiation choice of a randomly chosen rich negotiator in a randomly chosen round, (i) the negotiation choice of a randomly chosen poor negotiator in a randomly chosen round, (iii) the arbitration choice of a randomly chosen arbitrator in a randomly chosen round. The participant was rewarded with one euro for each correct guess. After the elicitation of the beliefs, we used the standard incentivized Holt-Laury (2002) procedure to elicit the participants' risk preferences.

The participants learned nothing about the outcome of each round between the rounds. A random draw by the computer determined which of the three periods was payoff relevant. Each period had an equal 1/3 chance of being chosen. The payoff-relevant round and choice, the outcome of the game, the correctness of the payoff-relevant guess regarding the beliefs, and the remuneration from the Holt-Laury procedure were revealed in the very end of the experiment.<sup>3</sup> Finally the subjects filled out a post-experimental questionnaire and then each was compensated individually and privately in cash.

### 3 Hypotheses

The main scope of the experiment is to study whether previous experience in the impartial arbitrator role alters negotiator behavior, or stakeholder behavior in general. Secondly, we are interested in whether the differential experience in the two alternative negotiator roles influences arbitration

<sup>3</sup> This feature excludes learning and repeated game effects.

decisions. In this section, we present a number of key empirical results in our specific context and design, and briefly introduce some theory to organize our thoughts regarding the upcoming main hypotheses. We also present some power calculations based on initial results which ultimately determined our sample size.

### 3.1 Preliminary hypotheses

These hypotheses are based on existing and published experimental results in contexts similar to ours. They touch upon issues like fairness concerns [Fehr and Schmidt, 2006], self-interest, and multiple fairness ideals [Cappelen et al., 2007, 2011].

In our lab-experimental setup there are initial asymmetries in the exogenously assigned endowments between the stakeholders who engage in negotiating a division of an additional windfall profit without an option for side payments. Thus if parties wish to redress for the asymmetries in initial endowments, they must share the wind-fall profit unevenly. There are thus two competing fairness ideals in this situation: (i) either share the windfall profit equally or (ii) share the sum of the windfall profit and the endowments equally implying that windfall profit itself must be shared asymmetrically. Which way of dividing the pie you prefer depends on how you wish to keep account of the endowments and the windfall and bracket your choice, separately or together.<sup>4</sup>

The stakeholders have two choices which potentially influence the sharing of the windfall between them: (i) the demand in the Nash-demand game (the first mechanism, see Section 2), (ii) the allocation decision in the dictator game (the fourth and the fifth mechanism, see Section 2). Our pre-hypothesis 1 claims that when making these respective choices, the stakeholders are interested in fairness either in a broad or in a narrow sense. This would result in a bimodal distribution of third-party arbitration decisions:

*PRE-HYPOTHESIS 1 (mental accounting and two fairness ideals): The arbitration allocations peak at (6 / 6) and (3 / 9), i.e. these allocations are the two most popular allocations (in addition to the selfish allocation).*

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<sup>4</sup> For experimental evidence, see Read et al. [1999], for instance, and for an application to a field experiment in a fairness context, see Kube et al. [2013].

If stakeholders have fairness ideals and use broad brackets, then they wish to ensure some degree of equality in the total payoffs between the two parties and thus the rich are entitled to a smaller share of the windfall pie than the poor. This should also be reflected in the average choices:

*PRE-HYPOTHESIS 2: Rich negotiators demand a smaller share of the pie than poor negotiators.*

*PRE-HYPOTHESIS 3: Self-assigned share is smaller among rich negotiators than among poor negotiators.*

Our fourth hypothesis claims that while stakeholders may have fairness concerns, they are not entirely without self-interest either. Thus even if a rich negotiator may allocate a positive share to the poor in her dictator choice, this allocated share is still smaller than the share that a poor stakeholder allocates to herself on average.

*PRE-HYPOTHESIS 4: (Self-interest): A rich negotiator allocates a smaller share to the poor negotiator than a poor negotiator allocates to herself.*

The last pre-hypothesis concerns the relationship between the stakeholder's preferred allocation and the strategic incentives in the Nash demand game. Abstracting from context-dependent (game-form-dependent) social norms, procedural fairness issues and the like, the dictatorial allocation reveals in a clean manner the preferred allocation of each stakeholder. According to the simplest of other-regarding theories (outcome-based ones), the allocation that maximizes the stakeholder's utility in the Nash demand game should coincide with the allocation revealed in the dictatorial choice. Yet, since a higher demand also runs a higher risk of leading to the destruction of the pie, strategic incentives call for shading the Nash demands downwards from the preferred allocation.

*PRE-HYPOTHESIS 5: (strategic considerations): Each negotiator type's Nash-demand is smaller than her dictator allocation to herself.*

### 3.2 Theory

Konow (2000) presents a theory of fairness and cognitive dissonance. Applied to our context, stakeholder behavior is motivated by self-interest and fairness and the avoidance of cognitive dissonance. Applying Konow's theory, the stakeholder's maximization problem when choosing how much to allocate to oneself in the dictatorial allocation decision can be written as<sup>5</sup>

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<sup>5</sup> Konow [2000] presents a version with more general functional forms but for our purposes the quadratic formulation serves our illustrative purposes. The results generalize in a straightforward manner.

$$\max_{\phi, y} \left\{ (1 - \alpha_i)(1 - \beta_i)y - \frac{\alpha_i}{2}(y - \phi)^2 - \frac{\beta_i}{2}(\phi - \eta)^2 \right\} \quad (1)$$

where  $y$  is the amount allocated to oneself,  $\phi$  is the belief regarding the fair entitlement, and  $\eta$  is the average impartial observer view of a fair entitlement,  $\alpha_i$  and  $\beta_i$  are individual preference parameters capturing sensitivities to fairness and conformity, respectively. The utility function exhibits conflicting goals between bringing about outcomes that are favorable to oneself (self-interest) and outcomes that are fair. This conflict implicates a tension which is the scope of the “cognitive dissonance” literature in social psychology [Festinger, 1957] and modelled and studied by economists such as Akerlof and Dickens [1982], Oxoby [2003]. The agent strives to reduce this tension by either reducing self-interested behavior or by engaging in self-serving management of one's own beliefs about what is fair (which may well be taking place somewhat unconsciously). This latter option is modelled as a rational choice of one's own view of what is fair,  $\phi$ . Yet, there will be dissonance also if that view differs drastically from the impartial view denoted by  $\eta$ .

A third party arbitrator faces a different problem where she has no own stake in the problem and thus the maximization problem is written as

$$\max_{\phi, y} \left\{ -\frac{\alpha_i}{2}(y - \phi)^2 - \frac{\beta_i}{2}(\phi - \eta)^2 \right\},$$

where  $y$  is now the share allocated by the third party to the stakeholder in the role corresponding to the decision maker in (1). The impartial arbitrators who do not have any personal stake, choose optimally  $y^* = \phi^* = \eta$ .

Stakeholders' decisions depend on their personal parameters. In general, they trade off the marginal material benefit against moral costs of unfairness and self-deception. The optimal interior solution satisfies  $y^{**} = \frac{(1-\alpha_i)(1-\beta_i)}{\alpha_i} + \phi$  and  $\phi^{**} = \frac{\alpha_i y + \beta_i \eta}{\alpha_i + \beta_i}$  and thus

$$y^{**} = \frac{(1 - \beta_i)(1 - \alpha_i)(\alpha_i + \beta_i)}{\alpha_i \beta_i} + \eta$$

$$\phi^{**} = \frac{(1 - \alpha_i)(1 - \beta_i)}{\beta_i} + \eta$$

which are both larger than  $\eta$ . Thus, the stakeholder optimally deceives herself and self-servingly inflates her perception about her fair entitlement which allows her to grab an even larger share at the same time keeping check of the moral cost of unfairness.

### 3.3 Main hypotheses

In line with Konow (2000), we predict the arbitration choices of the ex-stakeholders in the second period to be biased towards the self-assigned shares of the stakeholder dictatorial allocations from the first period: the choice of  $\phi$  is fixed in the first round to serve the purpose of allowing to grab a larger share of the pie without having too much bad conscience about it; at the second round the  $\phi$  chosen in the first round influences the perception of how much the poor should be allocated. Thus ex-rich stakeholders who become arbitrators are expected to assign a lower share to the poor than the ex-poor arbitrators. This self-serving bias should drive a wedge between the arbitration decisions in the second period. Yet, in the first period, there should be no difference in the arbitration decisions of the arbitrators in the C and the D roles.

Previous evidence regarding the existence of self-serving biases in the presence of multiple fairness ideals is mixed. Cappelen et al. [2007, 2011] find little or no evidence for self-serving biases in their setting without negotiations, the experimental evidence in Konow [2000] is favorable towards the prevalence of self-serving biases and Babcock and Lowenstein [1997] review supportive evidence in negotiation contexts. Finally the experimental evidence of Gächter and Riedl [2005], Luhan et al. [2013], Brekke et al. (2015) find supportive evidence in negotiation contexts. Our design studies both negotiation behavior and dictatorial allocations and, in particular, brings into the limelight the question of how past own experiences influence these biases.

In our setting, self-serving biases would imply that (i) the poor are more inclined to consider both the wind-fall pie and the endowments when evaluating fairness, and (ii) the rich are more inclined to consider the wind-fall pie only when evaluating fairness (see Section 3.1). Thus previous experience from a given negotiator role is hypothesized to shift arbitrator decisions to the direction of the bias. This yields our hypotheses concerning third party dictatorial allocation decisions:

*HYPOTHESIS 1: Arbitrators with stakeholder experience choose dictatorial allocations that are further away from the average impartial fairness ideal (i.e. the average dictatorial allocation of the arbitrators without stakeholder experience).*

*HYPOTHESIS 1a: Stakeholder experience influences arbitration decisions. An arbitrator with experience from the rich negotiator role allocates less to the poor negotiator than an arbitrator with experience from the poor negotiator role.*

Our design allows us to address a feature not studied in Konow (2000): how does arbitration experience influence stakeholder decisions? The arbitrators form opinions,  $\phi$ , about fair entitlements

in the first period and the theory predicts these to coincide with the average impartial views of the fair entitlement,  $\eta$ . Due to the cognitive dissonance argument, self-deception should be more costly in the second period when the third-party participants become stakeholders. Thus, the self-assigned shares in the dictatorial allocation decisions of the ex-arbitrator stakeholders should be less apart than the dictatorial allocation decisions of the poor and rich who start off as stakeholders. This yields out main Hypothesis 2 (see also Section 3.3).

In the case of stakeholders, self-serving biases would imply that previous third party arbitrator experience should debias negotiators and shift stakeholder behavior towards the preferred ideal of the opposing side. This yields our hypotheses concerning stakeholder dictatorial allocation decisions:

*HYPOTHESIS 2: Arbitration experience influences stakeholder decisions (stakeholder dictatorial allocations). Stakeholders with arbitration experience choose dictatorial allocations that are closer to the average impartial fairness ideal (i.e. the average dictatorial allocation of the first-round arbitrators) than stakeholders without arbitration experience.*

*HYPOTHESIS2a: Arbitration experience influences stakeholder decisions (allocation decision of the rich). Stakeholders in the rich negotiator role with arbitration experience take a lower share of the pie than stakeholders in the rich negotiator role without arbitration experience.*

*HYPOTHESIS2b: Arbitration experience influences stakeholder decisions (allocation decision of the poor). Stakeholders in the poor negotiator role with arbitration experience take a lower share of the pie than stakeholders in the poor negotiator and without arbitration experience.*

Up to now, we have considered the effect of arbitration experience on dictatorial stakeholder decisions. Obviously, similar effects should apply for the Nash-demands. The following three hypotheses articulate such predicted effects:

*HYPOTHESIS 3: Arbitration experience influences stakeholder decisions (stakeholder negotiation decisions). Stakeholders with arbitration experience choose Nash-demands that are closer to the average impartial fairness ideal (i.e. the average dictatorial allocation of the first-round arbitrators) than stakeholders without arbitration experience.*

*HYPOTHESIS 3a: Arbitration experience influences stakeholder decisions (negotiation decision of the rich). Negotiators in the rich negotiator role with arbitration experience place a lower Nash-demand than negotiators in the rich negotiator role without arbitration experience.*

*HYPOTHESIS3b: Arbitration experience influences stakeholder decisions (negotiation decision of the poor). Negotiators in the poor negotiator role with arbitration experience place a lower Nash-demand than negotiators in the poor negotiator role without arbitration experience.*

When it comes to Hypothesis 1, the outcome variable we study is  $|\phi_{i,t} - \bar{\eta}_1|$  where  $\phi_{i,t}$  is the individual  $i$  arbitrator allocation to the poor in period  $t$  and  $\bar{\eta}_1$  is the allocation of an average arbitrator in the first period (6.94 in our sample,  $N = 98$ ). The absolute value is taken since the rich and the poor bias their allocation to the poor in opposite directions. In Hypothesis 2, the outcome variable we study is  $|y_{i,t} - \bar{\eta}_1|$  where  $y_{i,t}$  is the stakeholder's allocation to the poor. In Hypothesis 3, the outcome variable we study is  $|d_{i,t} - \bar{\eta}_1|$  where  $d_{i,t}$  is the stakeholder Nash demand allocation to the poor (in the case of rich negotiators  $d_{i,t} = 12 - x_{i,t}$  where  $x_{i,t}$  is how much the rich negotiator demands for herself; in the case of poor negotiators  $d_{i,t} = x_{i,t}$ )

### 3.4 Power tests and priors

The experiments were carried out in two phases. After the first phase in September 2014, when 60 participants had taken part, we investigated the data and studied the observed effects of role switch. Our main hypothesis is that having experience from the third party arbitration role provides a common benchmark for fairness ideals and thus the share assigned to the poor by the rich and poor stakeholders in the second period will be closer to each other and less biased towards the direction of self-interest. Surprisingly, our initial sample of 60 participants showed quite the opposite patterns - the dictatorial allocation decisions of the rich and the poor were more apart when the stakeholders had previous stakeholder experience. The average third party allocation to the poor was 6.97 in the first period. The rich stakeholders without arbitration experience allocated on average 5.44 euros to the poor in the first period but those with arbitration experience allocated on average only 4.79 euros to the poor. Thus the allocations shift away from the impartial ideal by about 0.65 euros - not towards it. The poor stakeholders without arbitration experience, for their part, allocated on average 8.07 euros to themselves in the first period. The poor stakeholders with arbitration experience allocated on average 7.92 euros to themselves. Thus, the arbitration experience does not seem to shift the allocations towards the impartial position on this side of the bargaining table either. In conclusion, if cognitive dissonance plays a role, the stakeholder allocations with arbitration experience should be closer to the impartial allocation than the stakeholder allocations without arbitration experience. We observe the opposite in the initial sample and strive to test for this opposite hypothesis.

We wish to estimate the sample size to have a power of 90% in this one-sided test. Due to the multiple fairness ideals, the allocations to the poor are not normally distributed. Thus we will resort to a Wilcoxon Mann-Whitney U test. We assume that the fractions of allocations observed in the initial sample correspond to those in the true underlying distributions and use Monte Carlo simulations to estimate the sample size. The calculations show that with a sample size of 200 (100 observations without arbitration experience and 100 observations with arbitration experience) yields a power of a bit more than 90%.

## 4 Results

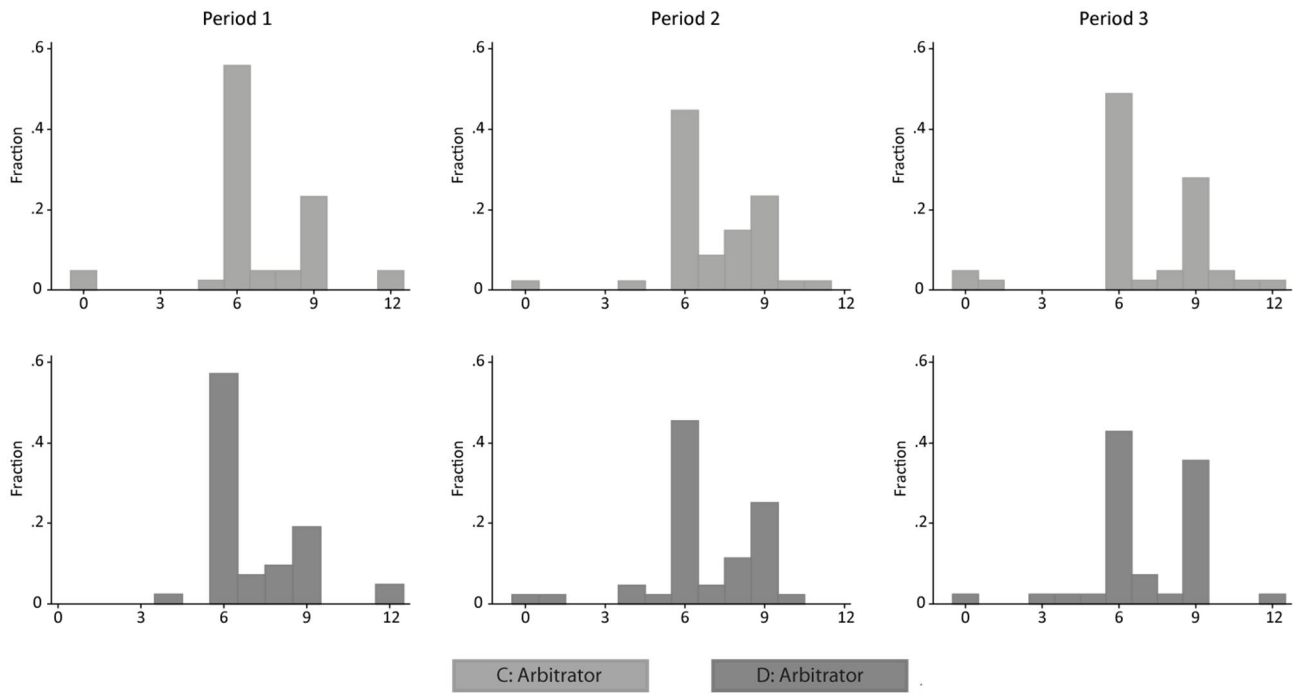
### 4.1 Preliminary hypotheses

Before tackling our main hypotheses, we will first look at empirical tests of the preliminary hypotheses (Section 3.1) that constitute the basis of our study. We use first period data to test these basic hypotheses. Later down we test how the behavioral relationships will be influenced by having experience from acting in another role.

The histograms in Figure 2 describe the dictatorial allocations of the arbitrators, in particular the number of euros out of 12 euros that they allocate to the poor stakeholder. Clearly, we can observe two dominant fairness ideals: allocating 6 euros leading to an equal split of the windfall but to unequal total payoffs to the stakeholders, and (ii) allocating 9 euros to the poor stakeholder leading to an unequal split of the pie but equal total payoffs for the stakeholders.

*SUPPORT FOR PRE-HYPOTHESIS 1: The arbitration allocations peak at (6 / 6) and (3 / 9), i.e. these allocations are the two most popular allocations.*





**Figure 2:** The distributions of the shares (out of 12 euro) the arbitrators' allocated to the poor stakeholder.

**Table 1:** The average Nash-demands and dictatorial allocations by negotiation roles and past experience (standard errors in the parenthesis).

Role	Action	Period 1		Period 2		Period 3
Poor negotiator	Nash-demand	6.07 (1.21)	r o	6.31 (1.51)	r o	6.27 (1.23)
Rich negotiator	Nash-demand	5.40 (1.30)	l e	4.72 (1.53)	l e	4.81 (1.17)
Poor negotiator	Allocation to poor / self	7.43 (2.27)		8.26 (2.60)		8.14 (2.44)
Rich negotiator	Allocation to poor	5.13 (2.29)	s w	5.24 (3.10)	s w	5.21 (2.67)
	Allocation to self	6.87 (2.29)	i t	6.77 (3.10)	i t	6.79 (2.67)
Arbitrator (ex-poor at 2nd & 3rd)	Allocation to poor	7.07 (1.70)	c h	6.75 (2.06)	c h	7.05 (2.11)
Arbitrator (ex-rich at 2nd & 3rd)	Allocation to poor	6.81 (2.27)		7.11 (1.83)		7.00 (2.51)

Our second and third pre-hypothesis concerned the redress for the asymmetries in the endowments. Our findings suggest that there is surprisingly little redress and concern for the worse-off in the negotiation decisions of the rich negotiators. Both fairness concerns per se and strategic foresight should impact the incentives of the rich and induce the Nash-demands of the rich to be lower than those of the poor (Table 1). Yet empirically, even if the Nash-demands of the rich are smaller, this difference is significant only at the 10 percent level, or at 5 percent level with specific statistical distributional assumptions (t-test). The periodic averages of the stakeholder conditional on the negotiator role are illustrated in Figure 3, Panel A.

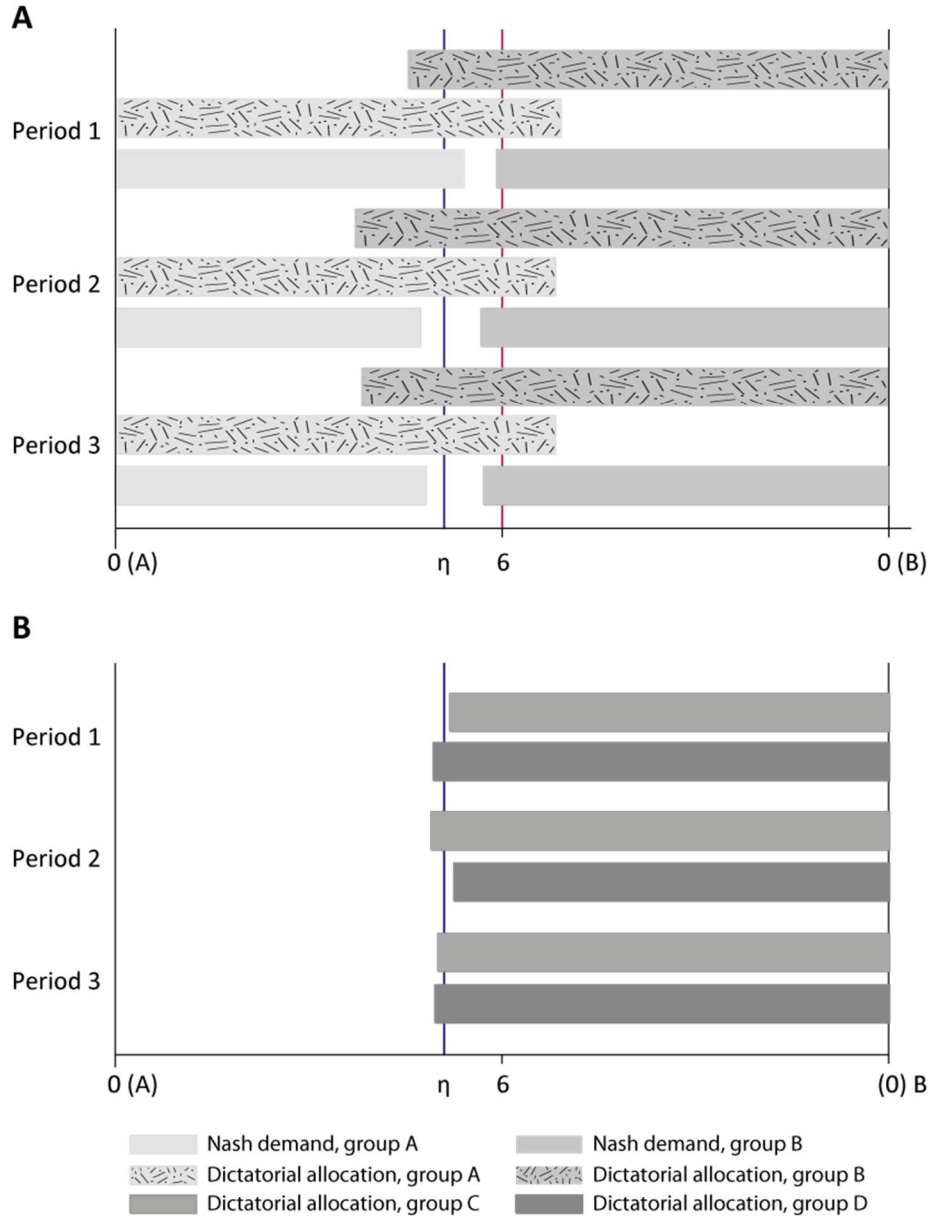
*WEAK SUPPORT FOR PRE-HYPOTHESIS 2: Rich negotiators demand a smaller share of the pie than poor negotiators. ( $p=0.067$ , MW-U;  $p=0.013$ , t-test; one-sided)*

There may be some sign of redress in the strategic negotiation behavior of the rich but once strategic considerations are lifted, there is no difference in how much stakeholders on each side of the table grab to themselves (dictator allocations). Now the rich with high endowments take precisely as much as the poor with low endowments (Pre-hypothesis 3, not significant even at 10% level, MW-U). There could be at least two explanations for these patterns: either fairness does not matter and all stakeholder dictatorial allocations are extremely selfish, or mental accounting is so strong that all of the participants only consider the narrowly fair-minded equal splitting of the windfall. Yet, both of these explanations conflict with the fact that we do find support for Pre-hypothesis 1: the dictatorial allocations do peak both at 6/6 (splitting the windfall equally) and at 3/9 (splitting the total earnings equally between the negotiators), corresponding to the two fairness ideals. These findings open up an interesting additional research question related to the main hypotheses 2 and 3: whether the (non)difference in behavior of the rich and the poor will be impacted by arbitration experience. We return to these questions in the following subsection.

While differences in endowments do not seem to have a drastic influence on stakeholder behavior and thus self-servingly biased fairness considerations are somewhat mute, we do find strong evidence for self-interest (Pre-hypothesis 4). We also find support for self-interest being reflected through the understanding of the strategic nature of the negotiations in that strategic bids tend to be lower than dictatorial allocations by the stakeholders (Pre-hypothesis 5). There is no strategic risk in the dictatorial decision but strategic risk is present and strategic considerations must be taken in account in the negotiation decisions since too high a Nash demand may result in the pie and the endowments being destroyed. This seems to be well understood by the stakeholders and it suggest that the no-self-serving-bias finding is not due to lack of understanding the strategic underpinnings of the interaction.

*SUPPORT FOR PRE-HYPOTHESIS 4: A rich negotiators allocates a smaller share to the poor negotiator than a poor negotiators allocates to herself (significant at 1% level, MW-U).*

*SUPPORT FOR PRE-HYPOTHESIS 5: Each negotiator type's Nash-demand is smaller than her dictator allocation to herself (significant at 1% level).*



**Figure 3: Panel A** Stakeholder demands and their dictatorial allocations to self. **Panel B** Arbitrators' dictatorial allocations

## 4.2 Main hypotheses

With the empirical tests of the pre-hypotheses at hand, we can proceed and analyze whether and to which extent our main hypotheses are supported by experimental evidence. Notice that given our design with role-switching, our results are between-subjects comparisons.

Let us begin with the third-party arbitration decisions. The periodic averages of the third-party arbitration decisions of agents in roles C and D are illustrated in Figure 3, Panel B. These bars are very consistently of equal width at each period (average across periods 6.53) – this average arbitrator allocation in the first period gives the empirical proxy for  $\eta$ , the impartial fairness ideal in equation (1). Thus, we find no support whatsoever for the hypotheses that the third party arbitration decisions would be impacted in a self-serving manner by previous negotiator experience. This is also confirmed by statistical tests (Hypothesis 1 and 1a, not significant even at 10% level, MW-U). Such evidence would result if participants behaved somewhat selfishly in the negotiator role and desired their impartial arbitration decisions to be consistent with their stakeholder behavior.

Let's then consider the stakeholder decisions each at a time, first the dictatorial allocation decisions and thereafter the negotiation behavior. Regarding the dictatorial choices, we did not find support for the pre-hypothesis 2 of smaller difference in the dictatorial allocation decisions in each side of the bargaining table. In fact we find evidence of the opposite: dictatorial allocations diverge away from the impartial fairness ideals when stakeholders have previous arbitration experience.

*THE OPPOSITE OF HYPOTHESIS 2 HOLDS TRUE: Stakeholders with arbitration experience choose dictatorial allocations that are further away from the average impartial fairness ideal (i.e. the dictatorial allocations of the first-round arbitrators) than stakeholders without arbitration experience (p-value equals 0.026 with a two-sided MW-U test).*

We do not find any evidence of a difference triggered by role-switching from arbitrator to stakeholder on either side of the bargaining table - studying each side separately (Hypothesis 2a and 2b, not significant even at 10% level, MW-U). The no-result of impact of arbitration on the dictator choices holds both for the rich and the poor.

When it comes to the Nash demands, we do not observe that Nash demands of the ex-arbitrators would be closer to the average impartial fairness ideal (Hypothesis 3, not significant even at 10% level, MW-U). Yet, arbitration experience does impact the negotiation choices of the rich which are lower, and thus closer to the impartial entitlement, among those who have arbitration experience. Yet

the Nash-demands of the poor are not impacted by arbitration experience (Hypothesis 3b, not significant even at 10% level, MW-U).

*SUPPORT FOR HYPOTHESIS 3a: Arbitration experience influences stakeholder decisions (negotiation decision of the rich). Negotiators in the rich negotiator role with arbitration experience demand a lower share of the pie than negotiators in the rich negotiator role without arbitration experience. ( $p=0.013$ , MW-U;  $0.024$  t-test)*

Although the Nash-demands of the poor are higher, we found only weak support for the pre-hypothesis 1 of a difference in the Nash-demands of the rich and poor. Moreover we found no significant difference in the self-assigned share of the rich and the poor when it comes to the dictatorial stakeholder allocations. As noted in the end of section 4.1, this raises the question of whether the difference in the self-assigned shares, on the one hand, and Nash-demands, on the other hand, might turn significant once stakeholders have arbitration experience. Indeed, after role-switching these differences turn highly significant.

*ADDITIONAL RESULT 4a: Arbitration experience influences the difference in stakeholder dictatorial allocations across the roles. A rich negotiator without arbitration experience takes as much as a poor negotiator without arbitration experience (p-value of two-side test of difference yields  $p=0.16$ , MW-U). Yet, the allocations of the poor and the rich negotiators differ when considering negotiators with arbitration experience ( $p=0.019$  in period 2 and  $p=0.006$  in period 3, MW-U).*

*ADDITIONAL RESULT 4b: Arbitration experience influences the difference in stakeholder negotiator Nash demands across the roles. A rich negotiator without arbitration experience demands as much as a poor negotiator without arbitration experience (p-value of two-side test of difference yields  $p=0.067$ , MW-U). Yet, the demands of the poor and the rich negotiators differ when considering negotiators with arbitration experience ( $p<0.0001$ , MW-U).*

We can complement Result 4 by conducting a difference-in-differences test. We run a linear regression where arbitration experience is interacted with role when explaining allocation decision and the Nash-demands, respectively (Supplementary Material, Table S1). This reveals that the change in the difference in the Nash- demands (4b) of the rich and the poor is significant at 5% level such that the gap in the demands of the poor and the rich gets wider when the negotiators have arbitration experience. The gap in the self-assigned share also increases (4a), but this change is not statistically significant.

### 4.3 Supportive evidence and regressions

In Table 2 below, we regress the Nash demand decisions of the negotiators on (i) the negotiator role, (ii) their guesses or beliefs about other party's behavior, (iii) and on the individual risk aversion measure. Regression models 1-3 regress the negotiation behavior of the respective period. Thus the first model studies negotiators without arbitration experience, the second model examines those with arbitration experience, and the last column has the data from the same participants as in the first model, but now when they have played the interaction once in the role of the negotiator and once in the role of the arbitrator.

**Table 2:** Linear regression models on stakeholders' Nash-demands in periods one, two and three

VARIABLES	(1) Nash-demand	(2) Nash-demand	(3) Nash-demand
Role B (poor)	-1.072 (1.285)	3.432* (1.851)	0.0684 (1.388)
Guess a	0.357*** (0.091)	0.618*** (0.180)	0.454*** (0.098)
Role B $\times$ Guess a	-0.471*** (0.150)	-0.865*** (0.213)	-0.628*** (0.162)
Guess b	-0.189** (0.093)	-0.0710 (0.145)	-0.434*** (0.101)
Role B $\times$ Guess b	0.653*** (0.135)	0.403** (0.176)	0.719*** (0.146)
H&L-score	-0.0984* (0.055)	-0.0670 (0.0734)	-0.0888 (0.059)
Constant	5.442*** (1.030)	2.357 (1.779)	5.848*** (1.112)
Observations	78	74	78
R-squared	0.498	0.513	0.625

Standard errors in parentheses, \*\*\*  $p < 0.01$ , \*\*  $p < 0.05$ , \*  $p < 0.1$

There is no difference in the Nash-demands of the two negotiating parties in the first period, not even when controlling for risk-aversion and beliefs. In the second period, the ex-arbitrators ending up in the role of the poor negotiator make a higher demand and the demand is correlated with what the Bs believe other participants in the same role are doing (the interaction between Role B and Guess b). Since we do not have independent exogenous (experimental) variation in beliefs, one cannot say

whether this is evidence that conformism matters. Alternatively, a positive association between own behavior and beliefs about others' behavior in a similar situation could be brought about by consensus bias in beliefs (Blanco et al., 2014; Ross et al. 1977), for instance, i.e. a potentially false belief that others' behavior is more similar to one's own behavior than it actually is. Notice also that there is a similar positive association between the beliefs and the behavior of As (variable Guess a). The beliefs regarding the behavior of the opponents is negatively associated with the Nash demands (variable Guess b and the interaction between Role B and Guess a ). This is in line with strategic best-response behavior. Yet similar words of caution apply here: the direction of the causal effect cannot be identified due to the lack of exogenous variation. Also the role of risk-aversion is line with the theoretical prediction: Nash demands of the risk-averse are smaller in the first period. Yet the effect is insignificant at the latter two periods.

**Table 3:** Linear regression models on arbitrators' dictatorial allocations in period one

(1)	
VARIABLES	Dictatorial allocation
Role D	-0.953 (2.631)
Guess a	-0.302 (0.205)
Role D $\times$ Guess a	0.385 (0.256)
Guess b	0.331 (0.225)
Role D $\times$ Guess b	-0.138 (0.273)
Constant	6.190*** (2.244)
Observations	85
R-squared	0.114
Standard errors in parentheses, *** p<0.01, ** p<0.05, * p<0.1	

Let us then turn to a regression analysis of the arbitration decisions by the third parties. In Table 3 we show that there is little difference in the arbitration decisions between the Cs and the Ds in the first

period. This is merely a check that there are no labelling effects in the arbitration decisions and that the randomization of the participants to different roles has been successful.

Linear regression models 1 and 2 in Table 4 study how the arbitration decisions of the arbitrators in the C and D role, respectively, are impacted by negotiation experience. Consider first Model 1. In Period 2, the rich negotiators become arbitrators. Now that we control for beliefs, the upward shift from period 1 to 2 in the amount assigned to the poor is not significant. In fact, none of the explanatory variables has a significant impact on the share of the poor negotiator.

**Table 4:** Linear regression models on arbitrators' dictatorial allocations in the first two periods

	(1)	(2)
VARIABLES	Dictatorial allocation	Dictatorial allocation
Ex-rich / ex-poor	1.670 (2.884)	6.680*** (1.887)
Guess a	-0.302 (0.205)	0.083 (0.134)
Ex-rich / ex-poor $\times$ Guess a	-0.0118 (0.267)	-0.940*** (0.235)
Guess b	0.331 (0.226)	0.193 (0.136)
Ex-rich / ex-poor $\times$ Guess b	-0.189 (0.289)	-0.236 (0.206)
Constant	6.190*** (2.251)	5.238*** (1.208)
Observations	90	86
R-squared	0.114	0.227

Standard errors in parentheses, \*\*\* p<0.01, \*\* p<0.05, \* p<0.1

Among the ex-poor (Model 2 in Table 4) in the second period, the arbitrators' beliefs regarding how much a rich negotiator demands in the negotiations (variable Guess a) are negatively associated with the amount assigned to poor. There is no such effect in the first period. Again the causal effect in the second period is unclear - this is merely an association. This could indicate, for instance, that an arbitrator's fairness ideal regarding the fair share to A is positively correlated with her guess regarding



As' demands (which should be the case if the ex-poor negotiators think it at all likely that fairness at all influences As' demands) and likewise negatively correlated with how much the arbitrator gives to a poor negotiator (which should be the case if fairness matters at all to the arbitrator in question). The median arbitrator in the D role (ex-poor) estimates the demand of As at 6 (half the pie) in the second period. Therefore, a D-arbitrator with a median guess about As' demands will assign 6.3 euros to the poor while a D-arbitrator with a guess at the 2nd decile at 5, will assign 7.24 euros to the poor negotiator.

The effect of the second period (negotiation experience) is highly significant among the arbitrators who were poor negotiators in the preceding round. The linear regression coefficient of 6.68 applies to those who guess that As and Bs ask for nothing. These constitute very extreme beliefs; so one may wish to calculate the implied predicted marginal effect of negotiation experience when beliefs are average beliefs. Holding beliefs constant at the average beliefs, the marginal effect of negotiation experience in the poor negotiator role alone is negative at -0.44 euros and insignificantly different from zero but, indeed, the ex-poor arbitrators who guess the rich negotiators to assign a low share to the poor also assign a lower share to the poor (significant interaction 2.period x Guess a).

## 5 Discussion

In this paper, we study bilateral pie-sharing in the presence of asymmetries and a plurality of fairness ideals where not only stakeholders but also arbitrators actively influence the outcome. The stakeholders take two types of choices; Nash-demands in the negotiations are strategic and dictatorial allocations are non-strategic. The arbitrator choices by third parties are non-strategic and dictatorial. We are interested in the influence of third-party experience on stakeholder choices and the differential influence of stakeholder experience on arbitration choices.

In line with the theoretical predictions, based on the theory and experiments of Konow [2000], we expected to observe self-serving biases in stakeholder choices and that these biases would be of smaller extent among stakeholders with arbitration experience. Likewise, we expected to replicate the finding of Konow in a fairly similar experimental setup, that previous stakeholder experience would bias arbitrator choices to the direction of one's stakeholder choices. Our evidence fails to support these hypotheses. In fact regarding the former, our evidence supports the opposite prediction that experience from an impartial arbitration role makes the dictatorial allocations more biased to the direction that benefits the allocating stakeholder.

Although our setup has more similarities than differences with Konow, the experimental designs differ in a number of aspects. Most importantly, we do not have treatments where the pie to be shared would be generated in a real-effort task. Such a design might generate a stronger tendency for a conflict in fairness ideals regarding how the pie should be shared.<sup>6</sup> Indeed, Konow did not find any conflict in those treatments where pie size and the investments were exogenous- thus in that respect both papers report similar findings. Despite the lack of asymmetries across the ex-rich and the ex-poor in allocation choices, we do observe two modal fairness ideals both among the ex-rich and the ex-poor. Yet as indicated above, the distributions are not significantly different, so there is no evidence of a self-serving bias.

Another key difference between the designs is that we have a decision screen where all choice problems of all the influential parties are presented simultaneously and the dice roll that determines the payoff-relevant one among all the actions is very vividly illustrated. Thus the design has features akin to the hybrid design of Levati et al. [2011] (see the decision screen in the Supplementary Material). The dice roll implements the widely applied randomized incentive protocol to pick up one payoff-relevant action among the many that each decision maker takes. This is done in order to rule out income effects and the like. In all such experimental designs, there is an implicit Archimedian assumption (independence of irrelevant alternatives) made which ensures that the preferred choice of the agent is independent of the probability of the payoff-relevance of the particular choice task. Due to the structure of our decision screen where the dice roll is very explicit, the probabilistic payoff-relevance is highly salient and may thus account for the fact that our choice patterns look rather different. To provide an example: a rich stakeholder may over-shade her bid downwards thus benefitting the poor stakeholder, and this may justify the choice of not compensating the poor in the dictatorial allocation - over-shading suffices to increase the expected balance between the two stakeholder's payoffs (a suitably crafted other-regarding preference model that combines of efficiency concerns [Charness and Rabin, 2002, Engelmann and Strobel, 2004] and procedural fairness [Krawczyk, 2011, Trautmann, 2009] would predict such patterns). Thus, although only one of the stakeholder's two actions may be payoff relevant at a time, the rich stakeholder may not treat her two actions as independent.

Notice that our effect of arbitration experience on stakeholder allocations is reminiscent to the findings of Cappelen et al. [2011] who find that an appeal for moral reflection impacts the non-strategic and dictatorial redress of differences in productive activities by stakeholders when the joint

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<sup>6</sup> See Cherry [2001] for evidence that this may matters a great deal.

returns to those activities are shared. As in Cappelen et al. [2011], the sample consists of Nordic university students. In our case there is no explicit appeal but it is imaginable that the negotiators with arbitrator experience did engage in moral reflection when acting as third-party arbitrators. The puzzling feature is that this effect seems more pronounced among the ex-arbitrators who end up in the poor stakeholder role. It is obviously more in their self-interest to redress more for the asymmetries. We do not observe similar change in the behavior of the rich stakeholders.

How should we think about our contribution affecting our posteriors regarding the effect of arbitration experience on stakeholder behavior? The question is new but related to earlier research on the effect of stakeholder experience on fairness ideals. How should those earlier contributions influence our priors? We ourselves started with strong priors well above 50%, but given the earlier mixed results concerning the prevalence and existence of self-serving biases driven by cognitive dissonance and contextual inertia of fairness ideals [Maniadis et al., 2014]? Given the earlier mixed evidence of self-serving biases [Babcock and Lowenstein, 1997, Cappelen et al., 2007, 2011, Konow, 2000, Luhan et al., 2013] in the literature, we consider a range of prior probabilities (from 30% to 90%) that the stakeholder allocations of the rich and the poor would be closer together when they have arbitration experience from the impartial arbitrator position. The post-study probability of each of our hypotheses [Maniadis et al., 2014] falls to 4,3% with a prior of 30% and to 48,6% with a prior of 90% given the power of 90% and the significance of 5%.<sup>7</sup>

Though related studies exists and existing theories suggest theoretical predictions, we are not aware of previous experimental research studying the effects of past arbitrator experiences on negotiation and outcomes. The question is novel and interesting. In wage negotiations between unions and in settlement negotiations in legal disputes, for instance, it is professional negotiators who act on behalf their clients and who have variant degrees of experience from the various roles around the negotiation table in similar situations. It is of interest to understand which kind of a negotiator experience prove is likely to deliver a favorable negotiation outcome both from the perspective of an individual client and from the societal perspective of efficiency or allocative fairness. In this paper we have taken the first modest steps towards a better understanding of some of these factors. To gain a better confidence and wider understanding of such effects, further and complementary field and laboratory behavioral data and surveys are needed.

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<sup>7</sup> Evidence confirming our hypothesis would have updated a prior of 30% up to 88,5% and a prior of 90% to 99,3%.

## References

- Fernando Aguiar, Alice Becker, and Luis M. Miller. Whose impartiality? An experimental study of veiled stakeholders, impartial spectators and ideal observers. *Economics and Philosophy*, 2013.
- George A. Akerlof and William T. Dickens. The economic consequences of cognitive dissonance. *American Economic Review*, 72:307–19, 1982.
- Linda Babcock and George Lowenstein. Explaining bargaining impasse: The role of self-serving biases. *Journal of Economic Perspectives*, 11:109–26, 1997.
- Alice Becker and Luis M. Miller. Promoting justice by treating people unequally: an experimental study. *Experimental Economics*, 12:437–449, 2009.
- Blanco, Mariana, Dirk Engelmann, Alexander K. Koch, and Hans-Theo Normann. Preferences and beliefs in a sequential social dilemma: a within-subjects analysis. *Games and Economic Behavior*, 87: 122-135, 2014.
- Kjell A. Brekke, Alice Ciccone, Tom.-R. Heggedal, and Leif Helland. Reference points in sequential bargaining: theory and experiment, 2015.
- Alexander Cappelen, Astrid Drange Hole, Erik O. Sorensen, and Bertil Tungodden. The pluralism of fairness ideals. *American Economic Review*, 97, 2007.
- Alexander Cappelen, Erik O. Sorensen, and Bertil Tungodden. The importance of moral reflection and self-reported data in a dictator game with production. *Social Choice and Welfare*, 2011.
- Gary Charness and Matthew Rabin. Understanding social preferences with simple tests. *Quarterly Journal of Economics*, 117:817–869, 2002.
- T. Cherry. Mental accounting and other-regarding behavior: Evidence from the laboratory. *Journal of Economic Psychology*, 22:605–615, 2001.
- D. Engelmann and M. Strobel. Inequality aversion, efficiency, and maximin preferences in simple distribution experiments. *American Economic Review*, 94:857–869, 2004.
- E. Fehr and K. Schmidt. *Handbook of the Economics of Giving, Altruism and Reciprocity*, volume 1, chapter The Economics of Fairness, Reciprocity and Altruism - Experimental Evidence and New Theories, pages 615–691. 2006.
- Leon Festinger. *A Theory of Cognitive Dissonance*. Row and Peterson, Evanston, IL., 1957.
- Urs Fischbacher. Z-tree, Zurich toolbox for ready-made economic experiments. *Experimental Economics*, 10:171–8, 2007.
- Normann Frolich, Joe Oppenheimer, and Anja Kurki. Modeling other-regarding preferences and an experimental test. *Public Choice*, 119:91–117, 2004.
- Simon Gächter and Arno Riedl. Moral property rights in bargaining with infeasible claims. *Management Science*, 2005.
- Simon Gächter and Arno Riedl. Dividing justly in bargaining problems with claims. *Social Choice and Welfare*, 2006.
- Ben Greiner. Subject Pool Recruitment Procedures: Organizing Experiments with ORSEE. *Journal of the Economic Science Association*, 1: 114-125, 2015.

- James Konow. Fair shares and cognitive dissonance in allocation decisions. *American Economic Review*, 90:1072–1091, 2000.
- Michał Wiktor Krawczyk. A model of procedural and distributive fairness. *Theory and decision*, 70:111–128, 2011.
- S. Kube, M. A. Marechal, and C. Puppe. Do wage cuts damage work morale? Evidence from a natural field experiment. *Journal of the European Economic Association*, 11:853–870, 2013.
- Wolfgang Luhan & Odile Poulsen & Michael Roos. Unstructured Bargaining over an Endogenously Produced Surplus and Fairness Ideals: An Experiment. *Working Paper series, University of East Anglia, Centre for Behavioural and Experimental Social Science (CBESS)* 13-10, 2013.
- Levati. M.-V., T. Miettinen, and B. Rai. Context and interpretation in laboratory experiments: The case of reciprocity. *Journal of Economic Psychology*, 32:846–856, 2011.
- Z. Maniadis, F. Tufano, and J. A. List. One swallow doesn't make a summer: New evidence on anchoring effects. *American Economic Review*, 104:277–290, 2014.
- R. J. Oxoby. Attitudes and allocations: Status, cognitive dissonance, and the manipulation of preferences. *Journal of Economic Behavior and Organization*, 52:365–85, 2003.
- D. Read, G. Lowenstein, and M. Rabin. Choice bracketing. *Journal of Risk and Uncertainty*, 19:171–197, 1999.
- Ross, Lee, David Greene, and Pamela House. The “false consensus effect”: An egocentric bias in social perception and attribution processes. *Journal of experimental social psychology* 13: 279-301, 1977.
- Stefan T. Trautmann. A tractable model of process fairness under risk. *Journal of Economic Psychology*, 30:803–813, 2009.
- Paloma Ubeda. The consistency of fairness rules: An experimental study. *Journal of Economic Psychology*, 2013.

# Electronic Supplementary Material for From ideals to deals - the effect of arbitration experience on stakeholder behavior

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## 1. Difference-in-differences Tests

**Table S1:** Linear regression models on stakeholder' Nash-demands and dictatorial allocations in the first two periods

	(1)	(2)
VARIABLES	Nash-demand	Dictatorial allocation
Poor	0.664** (0.291)	2.304*** (0.541)
Arbitration experience	-0.683** (0.293)	0.105 (0.544)
Poor $\times$ Arbitration experience	0.925** (0.419)	0.725 (0.778)
Constant	5.404*** (0.203)	5.128*** (0.376)
Observations	176	176
R-squared	0.165	0.221

Standard errors in parentheses, \*\*\*  $p < 0.01$ , \*\*  $p < 0.05$ , \*  $p < 0.1$

## 2. Experimental Instructions (translated from Finnish)

### General instructions

Many thanks for taking part to this experiment. You will receive 3.50 euros for showing up on time. You can earn even more but this will depend on your choices, those of other participants, and to some extent, on random events. Your responses will be strictly confidential, meaning that your name will never be associated with your test results.

Please, read through the instructions carefully. All participants have received identical instructions. Shut down your mobile phone. Notice that you are not allowed to talk to other participants during the experiment. If you have any questions, please, raise your hand. We will answer your question personally.

## Description of the experiment

You are in a decision making situation with three other participants, but you will not learn the identity of the other three (the others will not learn your identity either). Two of the four participants, A and B, are assigned the role of a negotiator, and the two others, C and D, are assigned the role of an arbitrator. The experiment consists of three rounds. At the beginning of each round, each participant will be in one of the four roles. In each round the negotiators and the arbitrators are altered, and both the negotiators and the arbitrators are randomly re-matched. As a negotiator, you will never be matched with the same negotiator twice.

**During each round, you will make several decisions: the number of decisions will depend on your role during the round in question.**

(1) The task of the Negotiators A and B is share 12 euros between themselves. Simultaneously each of the Negotiators, A and B, states a demand without observing the demand of the Negotiator in the opposing role or the actions of the Arbitrators C and D. A demand is an integer amount between 0 and 12 euro. The payments of the Negotiators and Arbitrators depend on the Negotiators' decision as follows:

**Case 1:** The demands of A and B are not compatible in the sense that they sum up to more than 12 euros, the amount to be shared. In this case, the sharing is automatically rejected. In the case of such automatic rejection, all parties (A, B, C and D) receive 0 euro.

**Case 2:** The demands of A and B are compatible in the sense that they sum up to 12 or less. In this case, each participant receives the share she/he demanded. If the demands sum up to less than 12 euros, the residual will not be paid to either participant. If the negotiators reach an agreement, each party gets a *contract bonus*. The sizes of the contract bonuses will appear on the computer screen during the experiment.

(2) In addition to the demands of the Negotiators A and B, both the Negotiators A and B and the Arbitrators C and D will make so called *sharing decision*. In the sharing decision, all parties propose a division of 12 euro between A and B. The Negotiators and the Arbitrators do not know each other's sharing decisions, or the demands of A and B.

**In the end of each round, the payments of the round are determined by throwing dice:**

- If the result is 1 (with probability  $1/6$ ), *the sharing decision* of the Negotiator A is used to divide 12 euros, in addition, all parties get their contract bonuses.
- If the result is 2 (with probability  $1/6$ ), *the sharing decision* of the Negotiator B is used to divide 12 euros, in addition, all parties get their contract bonuses.
- If the result is 3 or 4 (with probability  $1/3$ ), *the negotiation decision* of the Negotiators A and B is used as follows:



**Case 1:** The demands of A and B are not compatible in the sense that they sum up to more than 12 euros, the amount to be shared. In this case, the sharing is automatically rejected. In the case of such automatic rejection, all parties (A, B, C and D) receive 0 Euros.

**Case 2:** The demands of A and B are compatible in the sense that they sum up to 12 or less. In this case, each participant receives the share she/he demanded. If the demands sum up to less than 12 euros, the residual will not be paid to either participant. If the Negotiators reach an agreement, each party gets *a contract bonus*. The sizes of the contract bonuses will appear on the computer screen during the experiment.

- If the result is 5 (with probability 1/6), *the sharing decision* of the Arbitrator C is used to divide 12 euros, in addition, all parties get their contract bonuses.
- If the result is 6 (with probability 1/6), *the sharing decision* of the Arbitrator D is used to divide 12 euros, in addition, all parties get their contract bonuses.

### **Your payoff**

In the end of the experiment (all rounds), the computer chooses randomly *one* round for actual payment, each round with equal likelihood. The outcome of that randomly chosen round determines your payment. In addition, you will receive 3.50 euros for showing up.

*Please be patient. We are waiting until all participants have read the instructions.*

### 3. Decision Screen

A dice roll determines which decision(s) determine your reward.

Dice roll 6: Arbitrator D sharing decision.

**Neuvotteluroolisi on B.**

**Nopanheitto määrää mikä tai mitkä ao. päätöksistä vaikuttavat palkkioosi.**

**Contract Bonus Information:**

**SOPIMUSBONUS TIEDOT:**

Neuvottelija A:n sopimusbonus on	6
Neuvottelija B:n (sinä) sopimusbonus on	0
Välittäjä C:n sopimusbonus on	6
Välittäjä D:n sopimusbonus on	6

**SILMÄLUKU 5: Välittäjän C jakopäätös.**

Välittäjä C päättää, miten jakaa 12 euroa neuvottelijoiden A ja B (sinä) kesken.  
Lisäksi kaikki osapuolet saavat sopimusbonusensa.

**SILMÄLUKU 6: Välittäjän D jakopäätös.**

Välittäjä D päättää, miten jakaa 12 euroa neuvottelijoiden A ja B (sinä) kesken.  
Lisäksi kaikki osapuolet saavat sopimusbonusensa.

**SILMÄLUVUT 3 ja 4: Neuvottelut**

Neuvottelija A ja sinä (neuvottelija B) vaaditte kumpikin tahoillanne osuuden 12 eurosta. Sinä ja neuvottelija A saatte vaatimanne osuudet ja kaikki osapuolet sopimusbonusensa, jos sinun ja neuvottelija A:n vaatimien osuuksien summa ei ylitä 12 euroa.  
Jos vaatimusten summa on yli 12 euroa, kukaan ei saa sopimusbonusiaan.

**VAADI OSUUTTA 12 EUROSTA.**

Ehdotan itselleni osuutta:

**SILMÄLUKU 1: Toisen neuvottelijan (A) jakopäätös**

Neuvottelija A päättää, miten jakaa 12 euroa itsensä (A) ja sinun (B) kesken.  
Lisäksi kaikki osapuolet saavat sopimusbonusensa.

**SILMÄLUKU 2: Oma jakopäätöksesi**

Jaa 12 euroa itsesi (B) ja neuvottelijan A kesken:

Annan neuvottelijalle A osan

Näin ollen saan itse osan

Lisäksi kaikki osapuolet saavat sopimusbonusensa.

**OK**

Dice roll 3 and 4: Negotiations.

Dice roll 2: Your sharing decision.

**Figure 4:** Main decision screen for a player in role B.

#### 4. Control Questions (translated from Finnish)

Q1: Let us assume that

- B demands 7 euros
- A demands 5 euros
- C assigns 4 euros to negotiator A and 8 euros to negotiator B
- D assigns 8 euros to negotiator A and 4 euros to negotiator B

The contract bonus for each party is 3.

What is the monetary remuneration for player A, if the decision of C is randomly chosen to determine the remuneration?

Q2: Let us assume that

- B demands 7 euros
- A demands 5 euros
- C assigns 4 euros to negotiator A and 8 euros to negotiator B
- D assigns 8 euros to negotiator A and 4 euros to negotiator B

The contract bonus for each party is 3.

What is the monetary remuneration for player A, if the negotiation outcome is randomly chosen to determine the remuneration?

Q3: Let us assume that

- B demands 7 euros
- A demands 6 euros
- C assigns 4 euros to negotiator A and 8 euros to negotiator B
- D assigns 8 euros to negotiator A and 4 euros to negotiator B

The contract bonus for each party is 3.

What is the monetary remuneration for player A, if the negotiation outcome is randomly chosen to determine the remuneration?