Agency, Gender, and Endowments Effects in the Efficiency and Equity of Team Allocation Decisions*

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Abstract

We conduct a novel lab experiment in which pairs of subjects make separable decisions about allocative efficiency and equity in different agency structures. In terms of equity, subjects appropriate all surplus when they can, and share equally when they have to negotiate. They achieve high efficiency in general, albeit less so when the allocation of surplus is negotiated and negotiations fail. Allocative efficiency is reduced by input and output endowment effects, particularly in negotiated allocation games where subjects seek to create a sense of entitlement over joint surplus so as to achieve a more equitable income distribution. We find few differences across gender or gender pairings. Subjects are then given a choice between negotiating, paying to decide alone, or be paid to let their assigned partner decide. We find that demand for agency or delegation is sensitive to the price of agency, irrespective of gender. But female subjects are more likely to delegate to their partner if it is a male. We also find that a large fraction of both male and female subjects show a preference for negotiating that appears intrinsically motivated.

JEL Codes: D13, D91, J16

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1 Introduction

There is a large and influential literature in behavioral and experimental economics on dictator, ultimatum and trust games (e.g., Bolton et al. 1998a, Tonin and Vlassopoulos 2013, Forsythe et al. 1994, Roth et al. 1991, Cherry et al. Shogren 2002, Fehr and Fischbacher 2004, Berg et al. 1995, Bartling et al. 2018, Castilla 2015, Costa-Gomes et al. 2014, Eckel and Grossman 1996). For comparison purposes, these games have typically been run using the same design, and they have been mostly used to measure social preferences and trust. Dictator and reverse dictator games have also been used to document endowment effects in preferences over the distribution of outcomes (e.g., Bardsley 2008, Korenok et al. 2014, Cappelen et al. 2013, Bolton et al. 1998). Efficiency losses have been found in ultimatum games (i.e., rejections) and in trust games (i.e., transferring less than the entire endowment). For this reason, these games have been used as an abstract way of measuring welfare losses resulting from mismatched expectations or lack of trust between subjects.

We revisit this literature using a richer design that allows for a deeper exploration of endowment effects and welfare losses due to lack of trust, mismatched social norms, and preference for symmetrical outcomes. This is achieved by setting up an experimental design that combines, within an identical framework: single-player decision making; dictator, ultimatum, and trust games; and a sequential negotiation game that allows communication. We also test subjects' preferences for negotiation, power, or delegation. The experiment is run with an equal number of male and female subjects randomly matched with each other over a sequence of games. Subjects never play twice with each other to eliminate repeated game effects. There is no public information about past play so as to eliminate reputational concerns.

Each of the games played by subjects in our experiment shares the same basic features that are common to many situations arising between siblings, spouses, flat mates, and team workers: individuals have input endowments (e.g., money, time, skills, equipment, assets) that can be used to engage in productive activities (e.g., wage work, self-employment, domestic chores), the output or income of which then gets divided between members of the team. Even when individuals do not redistribute inputs between them directly, they often do so indirectly. For instance, the fact that one spouse contributes more to chores frees time for the other to work outside the home. Similar issues arise in teamwork and partnerships – including in academic collaborations.

Our core game captures the common elements of these situations while exploring the effect of agency structure and gender mix on efficiency and equity. At the start of each game, an input is allocated between two activities to generate two individually assigned incomes. In the first period one player can reallocate inputs across the two production activities. Reallocation affects the income from each activity as well as total income. Each game has a single input allocation that maximizes joint income. Input endowments and production parameters vary in each game. Sometimes the optimal allocation is to invest all the input into a single activity; other games have an interior optimum. Sometimes the optimum input allocation is close to initial endowments, other times it is not.

In the single-player game, selecting an input allocation between the two activities is the only decision made. Income from both activities goes to the decision maker. All subjects play three of these games at the beginning of the experiment to get acquainted with the interactive template and learn how to obtain the highest income.

All other games involve two players, each of whom is ascribed an input endowment and income from one of the two activities. One player is then selected at random to make the input allocation decision. This is followed by a second decision to divide joint income between the two players so as to determine individual payoffs. Four different types of games are played by subjects. They differ on how choices are made. In some games, one subject has full control over one or both allocation choices. In others, the other subjects can veto the decision or negotiate. All subjects play three of each of these four games, each time with a different partner whose identity is kept secret except for their gender. The gender compositions of pairs is varied across the experiment to identify differences across genders or across gender pairings. In particular, we investigate whether homogeneous teams perform better in terms of efficiency (e.g., Marx et al. 2021, Calder-Wang et al. 2021, Dahl et al. 2021).

In the single-player game, we find that after one round of play, nearly all subjects, both male and female, select an input allocation that maximizes the combined income from both activities. This demonstrates a good understanding of the core game template – and thus a good grasp of which input allocation maximizes efficiency. All other games result in a statistically significant loss of efficiency. The largest loss is when the non-deciding player can reject the choices made by the deciding player, as in an ultimatum game. The input allocation choice is more efficient when a single player makes all the decisions, as in a dictator game, but the distribution of income is a lot more unequal. The distribution of income is similarly unequal when one player chooses the input allocation and the other distributes the joint income between players. But production is less efficient because the first chooser distorts the input allocation, perhaps in the hope of creating an entitlement effect. Allowing pairs of subjects to negotiate yields a much more egalitarian distribution of income, but also significant deviations from efficiency as players insist on capturing gains from their input endowment or from their output activity.

We find evidence of input endowment effects in all games except in the single player game. Subjects tend to distort input allocation decisions in the direction of their initial input endowments, as in Udry (1996). There is, however, strong evidence that they put more weight on the efficient input allocation. The distribution of joint income between players depends heavily on the agency structure: when all the income distribution power rests in one player, income distribution tends to be unequal, with the decision maker appropriating most of the joint income. This stands in contrast with standard dictator games where equal distribution in commonly found.

When one player can reject the choices made by the other, income distribution offers tend to be more equal, and rejection is concentrated on offers that give the non-deciding player substantially less than half of the income. In rejection cases, both subjects receive a zero payoff, which singularly reduces their combined welfare. In other words, miscalculation in offers leads to a loss of income for both subjects. This is largely corrected when multiple rounds of offers and counter-offers are allowed: subjects tend to reject initial offers that give them less than half of the income, as in an ultimatum game; but this leads to a sequence of offers and counteroffers that, little by little, converge towards a fairly equal distribution of income with few rejections. There is some evidence, however, that a few subjects keep bargaining for longer, insisting on receiving more, and this often leads to failed negotiations. We find little evidence that subjects play any of these games differently depending on their gender or the gender of their assigned partner.

At the end of the experiment subjects play three rounds of a game in which they choose between three possible agency structures: deciding everything; negotiating; or delegating everything to the other player. Subjects either negotiate, pay a price p to decide, or receive a price p for delegating. The price varies over the three games. We find a strong response to the price among all subjects, irrespective of gender: a large fraction of subjects choose to pay to decide when the price is low, and choose to delegate when the reward for doing so is high. But a substantial fraction of players appears motivated by preferences over the process itself, irrespective of material payoff considerations.

We also find a systematic difference in the choice of agency structure among female subjects, depending on whether they are matched with a male or female partner. When matched with a female partner, their choices of agency structure are identical to those of men; but when a female subject is matched with a male partner, she is less likely to pay to decide and more likely to delegate. This difference is observed irrespective of whether the price is high or low. This finding suggests that, while male and female subjects have similar preferences over how to play each of the four two-player games, they have somewhat different preferences regarding the process by which decisions are made, and this difference in preferences relates only to situations where a female subject is matched with a male subject.

This paper contributes to several literatures. First, we complement the large body of work on dictator, ultimatum, and trust games. We show that the symmetry of shares that characterizes many dictator and reverse dictator game outcomes is an artifact of the sparse and symmetrical structure of the game. By framing initial input allocations as endowments, we are able to distort income distribution in various directions, thereby offering a substantial generalization of existing studies documenting different outcomes in dictator and reverse dictator games – and attributing the difference to an endowment effect (e.g., Boltonet al. 1998a, Tonin and Vlassopoulos 2013, Forsythe et al. 1994 Bardsley 2008, Korenok et al. 2014). Our results also generalize findings from trust games, in which sender subjects are typically found willing to incur a sizable loss of efficiency to guarantee themselves a minimum payoff. Here too we find a loss of efficiency operating through an endowment effect: subjects distort the allocation of inputs to stake a claim on some of the team's income. In the context of the ultimatum game, however, our findings are similar to what has been discussed in the literature: many subjects are willing to incur a cost to reject on outcome they find inequitable. This arises even though, in our experimental setting, subjects are unable to reap any reputational reward from acting tough.

Second, our findings add to the existing literature on bargaining games, and does so in a setting that allows comparison with simple agency structures that have been well studied, such as the dictator, ultimatum, and trust games. Bargaining games are known to theoretically and empirically converge to an equitable distribution of income (e.g., Rubinstein 1982, 1985). We confirm these earlier findings but complement them by showing that subjects seek to move income distribution to their advantage by manipulating the distribution of inputs and outputs so as to stake a bigger claim on joint output. By doing so, they reduce aggregate welfare.

Third, this paper is one of few papers that examine the demand for agency structures in teams (e.g., Harju et al. 2021). We find that many subjects are willing to pay to change the agency structure to their advantage, and to be paid to delegate power to their assigned partner – even when doing so will dramatically reduce their payoff. This suggests that average preference over process responds to material incentives, but also that many subjects are relatively unresponsive to material payoff considerations.

Finally, we contribute to a large literature exploring gender differences in the lab (e.g., Saccardo et al. 2017, Andersen et al. 2013, Croson and Gneezy 2009, Eckel and Grossman 1996, Solnick 2001, Heinz et al. 2012). While this literature has generally found female lab subjects to be more risk averse and less confrontational with men (Charness and Gneezy 2012, Buser et al. 2014, Niederle and Vesterlund 2007, 2010, Cooper et al. 1989, Rieger et al. 2015, Flory et al. 2015, Exley et al. Vesterlund 2016, Falk et al. 2022), we find little evidence that these already documented gender differences translate into different outcomes in any of our simple games, including the negotiation game. In terms of team gender mix, the literature has found that mixed-gender teams generally perform better and are more efficient (Cooper and Kagel 2016). We find some evidence in the same direction, but the difference is not large. We do, however, observe that female subjects are more willing to delegate and less willing to decide, but only when matched with a male partner. This indicates the existence of a systematic difference in the preference for agency structure by women when they are in a team with a male subject. This echoes experimental results suggesting that female lab subjects are less confrontational when matched with a male team partner, as well as recent lab and field experiments indicating that women are more willing to delegate to a male partner than the opposite (e.g., Afzal et al. 2022; Bahktiar et al. 2022).

The rest of this paper is organized as follows. In Section 2 we present the details of the experimental design. Section 3 introduces our testing strategy. Empirical results are presented in Sections 4 – for general results – and 5 – for results on gender. Section 6 concludes

2 Experimental design

The object of our experiment is to study allocative efficiency and equity in small teams, as a function of the distribution of externally allocated power in that team. In order to maximize the external validity of our findings, we choose to use an explicit frame that mimics the type of everyday situations that arise between siblings, spouses, flat mates, and team workers.

Each subject is endowed with an initial allocation of a productive resource that they must allocate between themselves and their partner. The resulting incomes of the pair of players must then be divided between them. This simple design resembles situations that arise in humans from an early age. To play together, children must typically share a resource over which they have some claim (e.g., a toy) in order to achieve competing goals, the fruits of which must then be shared (e.g., who gets to play with the toy for how long). Similar issues arise between flat mates (e.g., who bought the groceries and who gets to consume them) and between family members (e.g., who volunteers time for a chore and who benefits from it, or who pays a utility bill and who has extra cash to spend on personal consumption). They also arise in a professional context, as when workers (e.g., builders, lawyers, consultants, researchers) or other economic agents (e.g., construction firms in a large project, buyer and producer of a bespoke good) team up on a task, the income from which must then be shared. Because cooperation between humans nearly always combine these two attributes – who contributes and who reaps the benefits – we expect human subjects to have a good intuitive understanding of it. To trigger these heuristics we rely on a simple frame: how to divide fertilizer between two fields, and how to divide the income from these two fields. While our subjects are not involved in farming themselves, this contextualization of the game is easy to grasp and visualize.

The main intended contribution of the study is not to identify these behavioral patterns per se. Rather we seek to investigate how choices respond to different agency structures and to different input endowments, and how this affects allocative efficiency and equity. The agency structures we introduce in our design all mimic well known games: dictator, ultimatum, and trust games; and sequential negotiation with structured communication. This is done for comparative purposes, given that behavior in each of these abstract games has been studied extensively, usually in a non-contextualized, abstract setting.[1] By giving these well-known games a more concrete frame, we seek to trigger relevant heuristics in cooperative situations, so as to add valuable insights to the literature about the applicability of results from lab games to more realistic situations.

At the end of the experimental session, we also allow subjects to choose, at a cost, between different agency structures. Since subjects have already experienced how agency structure affects their payoff, we expect their choice of agency structure to reflect not only the material gain they expect from different structures, but also their intrinsic demand for having or delegating power.

2.1 Visuals

The novelty of our experimental design is made possible by the carefully crafted main screen where all decisions are made. Understanding the design of the experiment therefore requires a full grasp of the structure of this interactive screen, which is programmed in z-Tree (Fischbacher

[1]See the references already cited in the introduction. In a cross-cultural setting, see for instance Heinrich et al. (2005) and Falk et al. (2020).

2007) and contains colors, sliders, and visual cues responding instantaneously to players' choices. One screen shot is presented in Figure 1. Other screen shots are provided in the Online Appendix A.

Unlike other z-Tree experiments, our design relies heavily on interactive visuals: subjects make decisions by moving two sliders on a screen that remains similar across all games. As they move one slider, all the changes introduced by the move are displayed visually on a colored screen. No calculation is required as all the consequences of an action are instantaneously displayed in a graphically intuitive way: if one quantity increase, a bar grows and the amount that the bar represents is displayed in real time; if an allocation is shifted between participants, the color of a horizontal bar changes to represent it. Participants are free to experiment with the sliders as much as they want before finalizing their decision. This allows them to explore the consequences of their actions in an intuitive and fast way, without the need for any calculation or other cognitive effort.

More specifically, the bottom part of the screen is dedicated to input decisions; the upper part of the screen is dedicated to income sharing decisions. Items that are ascribed to the subject are shown on the left; those ascribed to the second mover (or passive player, depending on the game) are shown to the right. The bottom panel of the screen shows two vertical bars, one on the left and another on the right. These bars represent the quantity of input assigned to the production activity of the subject and the partner, respectively.

Input allocation is decided by moving the horizontal slider shown at the bottom of Figure 1. This slider appears when the subject has the option to change the input allocation between plots. As the player moves this slider, the colors of the fat horizontal bar (marked 'Fertilizer') shift to show the chosen fertilizer allocation. For instance, if the subject moves the slider to the right, the orange section of the Fertilizer bar grows and the green section shrinks to match the slider's position. At the same time, the input quantities in each of the *vertical* bars (marked 'Your income' and 'Your partner's income') move accordingly, the income from each activity is shown by the height of the bars, and the total income is shown in the box 'Joint income'. All this happens in real time and the subject is free to experiment with the slider at will before finalizing their decision. Below the fat input allocation slider is a thin horizontal bar showing the initial input endowment of each player. This bar does not change during the game and is there to remind the player of how inputs were initially allocated between subjects. It serves as visual representation of the input endowment of each player.

A similar horizontal slider appears in the upper half of Figure 1 when the subject has the option to change the income allocation between self and the assigned partner. This is achieved by moving the slider to the right or to the left to determine the allocation of joint income between the two players. Income to self is displayed in orange, and income to the partner is shown in green.

Unlike the *width* of the Fertilizer horizontal bar, which is preassigned, the width of the fat Income bar increases or decreases to reflect the value in the 'Joint income' box – which is itself determined by the input allocation selected in the lower panel. As joint income increases (decreases), the fat Income bar widens (shrinks) symmetrically on either side. The advantage of this approach is that, as subjects change the position of the input slider, they instantaneously visualize how input allocation affects total income as well as the incomes earmarked for each player.

Below the 'Income' horizontal bar at the top of the screen are two thin horizontal bars. The bottom thin bar does not change during the game. It shows the income to self (in orange) and to the partner (in green) with their initial fertilizer endowment. This serves as visual representation of the income earmarked to each player if they had kept their initial fertilizer endowment. The middle thin bar reflects the values of 'Your income' and 'Your partner's income' that results from the chosen input allocation. Like the fat horizontal bar labelled 'Income', its total width is determined by the value of joint income while the respective sizes of the orange and green sections mirror those of the vertical bars labeled 'Your income' and 'Your partner's income', respectively. All these bars change instantaneously as the player moves the Fertilizer allocation slider, thereby providing an immediate visual representation of all the information relevant to the players. It follows that when subjects move the Income slider to the right, they immediately see how much of the income earmarked to their partner they are, de facto, appropriating. This serves to provide a visual representation of income entitlements based on the chosen allocation of inputs.

To summarize, subjects can only move the two sliders. Everything else in the screen changes instantaneously to depict all the consequences of moving the sliders. No calculation is ever required of subjects. This makes the experiment much easier for the subject than many commonly used experiments,[2] leaving subjects free to concentrate on the efficiency and distributive consequences of their actions.

The structure of this screen remains unchanged throughout the experiment. What changes is the initial input allocation and the production functions for each of the two players. Each production function is a two coefficients second order polynomial in input share. Some production functions are linear, implying that the marginal return to the input is constant; others are concave, implying decreasing marginal returns. The parameter vectors used in the experiment are presented in Table A1 in Online Appendix A, together with the corresponding optimal allocation of inputs. In some cases, it is best to invest all the inputs in a single activity; in other cases, it is best to combine both activities. Input endowment vectors also vary from game to game. The values used in the experiment are shown in Table A2 in Appendix A. In some cases, endowments are distributed equally, but in most cases one subject starts with more than their partner. The total input endowment always remains the same, however, and is normalized to 100.

[2]E.g., a Holt-Laury choice list, a BDM elicitation, compound lotteries, or belief updating.

2.2 Game assignment

After receiving a detailed tutorial on the visual display and a set of instructions relative to all the games, subjects play six sets of three games. The top part of the screen describes the type of game that is being played. The games are sequenced as follows.

Game 1

All subjects start by playing three *single subject* games, Game 1. In these games, all income goes to the subject. They serve as learning tool. They also allow use to ascertain whether the subjects understand the screen and to investigate whether they choose an efficient fertilizer allocation.[3] Each subject plays Game 1 three times, with different initial input endowments and production functions for the two plots. This familiarizes subjects with the interactive screen and the different changes that moving the Fertilizer slider generates on the screen.

Games 2, 3 and 4

Subjects then play three blocks of three games 2, 3, and 4, each of which has a distinct but simple agency structure. To cancel out possible order effects, we vary the order in which subjects play these three blocks of games in such a way that an equal proportion of subjects play them in the different possible orders. Table A3 in Appendix shows the proportion of subjects assigned to the different game sequences.

Game 2 resembles a dictator game in the sense that the subject chooses not only the fertilizer allocation (as in Game 1), but also the allocation of joint income between self and the partner. In practice, this means that both sliders are available to the subject at the same time. Since there is no interaction between players in Game 2, each subject independently makes a full decision about inputs and incomes without seeing what the other player is doing.[4] We then select one of the two players at random and implement their choices. The purpose of Game 2 is to test whether choices made by the subject are affected by endowment effects, either in inputs or outputs. In the absence of endowment effects, we expect subjects to choose the optimal allocation of fertilizer and to divide joint income in a fair manner, e.g., close to 50-50. Endowment effects in fertilizer would manifest themselves as a deviation from efficient allocation in the direction of the initial input split. Endowment effects in income allocation would manifest themselves as a deviation from equal sharing in the direction of realized incomes from production – i.e., players are given a larger share of joint income when their output is larger.

Games 3 and 4 are interactive: one subject is chosen at random to be the first mover while

[3] In this game, the screen is slightly different (see Online Appendix A for an illustration). The labels 'Your income' and 'Your partner's income' are replaced by 'Income from plot A' and 'Income from plot B', respectively, and the label 'Joint income' is replaced by 'Your income'. The top panel of the screen provides a horizontal representation of the income from both plots. There is no income allocation slider since in this game all income goes to the subject.

[4] The reason for this approach is to double the number of observations for that game, while ensuring that each dictator acts in ignorance of the other to avoid reciprocity/non-independence of decisions.

the other is the second mover. Game 3 starts like Game 2 for the first mover. But after the first mover has selected the allocation of fertilizer and the distribution of joint income, a dialog box opens for the second mover to either accept or reject the first mover's choice. This design is reminiscent of an ultimatum game, adapted to our design. One purpose of this game is to investigate whether fertilizer or income endowments affect the offered division of income, possibly signaling the recognition of an entitlement by the first mover. The other is to examine the extent to which the second mover uses his/her veto to reject those offers that deviate from an equitable income split or those that deviate from fertilizer and income endowments.

Game 4 is more akin to a trust game. The first mover allocates fertilizer using the slider at the bottom of the screen. When this move is completed, the second mover distributes the resulting joint income using the slider at the top of the screen. Both decisions are final and are observed by both players. The purpose of this game is to ascertain whether second movers reciprocate for receiving a larger input endowment by sharing their higher income equitably, or whether they opt to keep 'their' income, suggesting an entitlement effect. If the income division by second movers shows evidence of an income endowment effect, we investigate whether first movers anticipate this by deviating from the efficient fertilizer allocation in order to increase their own income endowment and reduce that of their partner.

Game 5

Subjects then play a sequential negotiation game. It is placed after Games 2, 3 and 4 because it is more complex and we want subjects to be completely familiar with the game screen and features before entering the negotiation process. In this Game 5, subjects take turns in offering a complete allocation of inputs and incomes. A dialog box also opens that allows them to write little short messages that subjects typically use to justify their choices to the other player. After receiving an offer, each subject can either accept it – in which case the game ends – or make an alternative offer of fertilizer allocation and income division. The game ends either when an offer is accepted, or after 3 offers and counter-offers. This means that the last allowable counter-offer is final – like in Game 2.

Game 6

We end the session with an agency structure selection game in which subjects decide either to dictate their choice to the other player, delegate all the decisions to the other player, or negotiate.

In Game 6, each subject is first presented with a separate screen that invites this subject to choose between Game 2 acting as decider, Game 2 acting as passive subject, or Game 5. If the subject chooses Game 2 as decider, an amount p is deducted from their show-up fee. This is the price of being the sole decision maker. Conversely, if the subject chooses Game 2 as passive player, an amount p is added to their show-up fee. If the subject decides to negotiate, no payment is made. All subjects play Game 6 with three different values of $p = \{25, 50, 75\}$

points.

After each subject has made a choice between playing Game 2 as decider, Game 5, or Game 2 as a passive subject, one of the two subjects is selected at random and their choice of game is implemented. If the selected player had chosen Game 2, the next screen is the Game 2 screen, which the subject sees either as first mover or passive subject, depending on the decision made. If the selected subject had selected the negotiation game, we randomize who moves first, and the subjects play Game 5 as normal. Game 6 is played last since it requires previous familiarity with the negotiation game in order to make an informed choice.

The object of this game is to investigate the extent to which subjects are willing to pay to decide, and the gain (or loss) they derive from making that choice. Similarly, we examine whether subjects are willing to be paid a fixed transfer to delegate decision power to the other player. We expect subjects to be more willing to pay to decide when p is small and to be paid to delegate when p is large.

2.3 Gender

As noted in the introduction, the experimental literature on gender has emphasized some reluctance among female subjects to compete with others, especially men (e.g., Charness and Gneezy 2012, Buser et al. 2014, Niederle and Vesterlund 2007, 2010, Cooper et al. 1989, Rieger et al. 2015). On the other hand, Cooper and Kagel (2016) have found that teams that combine individuals of both sexes often do better on cooperative tasks while Kuhn and Villeval (2015) have found that women are more attracted to cooperation than men. Our games contain elements of both: cooperation to achieve an efficient outcome, but competition over the division of the ensuing surplus. It is therefore a priori unclear how these previously documented gender tendencies would affect outcomes in our games.

Our experiment is also designed to be conversant with the literature on intrahousehold bargaining, which emphasizes the role of power – either devolved by law and custom or secured by the threat of domestic violence. The same issues arise in work teams. The four games that we test capture in a stylized manner agency structures that are discussed in the female empowerment literature: Game 2 epitomizes the situation in which one team member has all the power; Game 3 is one in which the other team member has a veto; Game 4 is when one team member must trust the other to return a favor; and Game 5 allows for more or less equal bargaining power.

The experiment is also chosen so as to introduce the type of endowment effects that have been discussed, in one way or another, in the intrahousehold literature. Udry (1996) provides compelling evidence that input endowments affects intrahousehold efficiency. Endowment effects have also been shown on intrahousehold equity. In particular, it has been documented that earned income affects the distribution of material welfare between spouses (e.g., Browning et al. 1994) and that who in the household receives a government transfer changes the allocation of consumption (e.g., Lundberg et al. 1997; Armand 2020; Harris-Fry et al. 2021).[5] Similarly, Deere and Doss (2006) have found a correlation between assets brought to marriage and the subsequent division of welfare between spouses. These findings are obtained even though, in most of these legal contexts, household assets are owned jointly by both spouses, thereby ruling out legally binding endowment effects. We take this as suggestive evidence that endowment effects influence intrahousehold efficiency and equity even when, by law or custom, they do not formally affect bargaining weights. For this reason, we suspect that similar endowment effects may arise in any collaborative teams. What is unclear is whether endowment effects are different for men and women, and whether they affect team operation. Our games are specifically designed to throw light on the emergence of endowment effects in collaborative teams.

As indicated earlier, the behavioral economics literature has provided some evidence that gender differences exist in the way subjects play games with different agency structures – e.g., in terms of risk aversion, competition, or assertiveness. More recent evidence has focused on gender differences in the choice of agency structure itself. In some contexts, women have been shown to be willing to delegate consumption decisions to men (e.g., Afzal et a. 2022, Bakhtiar et al. 2022) while in others the opposite has been found (e.g., Almås et al. 2018). We revisit all these issues by varying agency structures and endowments across games and subjects, and by allowing subjects to choose – for a price – a different agency structure.

Our experimental design allows us to disentangle several sources of behavioral differences across genders or gender pairings. First, we can test whether subjects of one gender are more altruistic or whether subjects care more for other members of their own gender by comparing income allocation decisions in Games 2 and 4. Second, we can investigate differences in assertiveness between genders and gender pairings by examining their negotiation style in Games 3 and 5 – e.g., are female subjects less likely to reject an offer, or an offer from a man, in Game 3; and are men more likely to over-negotiate in Game 5, leading to a higher incidence of breakdown in negotiations. Third, we can test whether subjects of different gender are more or less inclined to seek to create endowment effects by distorting the input allocation, e.g., in Games 3, 4, and 5. Finally, we can test whether the gender of a subject predicts differences in the choice of agency structure in Game 6 – and particularly the decision to pay to decide, or to be compensated for delegating.

2.4 Implementation

As explained earlier, in Game 2 each subject is invited to make choices independently and the choice of one of the two subjects is subsequently selected at random. For Games 3, 4 and 5, we randomly assign one of the two players to be first mover. In Game 6, we similarly select one subject to choose which game to play, after which we follow the script described earlier.

The pairing of subjects by gender is implemented as follows. Each session includes an

[5] See, however, Somville et al. (2020) for different findings in India.

identical number of male and female participants, namely, eight men and eight women.[6] Given this, there are 15 feasible pairings satisfying the requirement that each subject plays once and only once with each of the other subjects – 8 of these pairings are with a person of the opposite sex, and 7 with a person of the same sex. The 15 possible pairings are shown in Table A3a. Since no pairing is required in Game 1 because subjects play individually, this enables us to play five sets of three games (i.e., games 2 to 6) while ensuring that each subject never plays twice with the same partner.

The order of pairings used in the experiment is shown in Table A3b. As is shown in the Table, gender pairings change with each game – except of course for single subject games which, by definition, do not require a pairing. The gender of the player they are paired with is always revealed to subjects. Subjects also know that their gender is revealed to the other player. No other information is revealed about subjects during or after the experiment. But subjects are told that they never play twice with the same partner.

The experiment was implemented at the economics behavioral laboratory of the University of East Anglia (UEA), Norwich, United Kingdom. The UEA is well known for its work in behavioral economics, and its experimental lab has been used for numerous publications in economics. This guarantees that our study population is similar to that of other lab-based articles.

Ten sessions with 16 subjects each were run between 23 and 27 April 2018. Subjects were given a participation fee of GBP 5 (approximately $US 7 at the going exchange rate) plus a payoff determined by selecting 3 games at random and assigning them their payoff for that game.[7] The exchange between GBP and points, the unit of currency used within the experiment, was 1 GBP for 50 points. Subjects were also paid an additional GBP 2 for properly completing a questionnaire at the end of game. Subjects on average received GBP 13 for their participation in the experiment, which is commensurate with what is typically earned by subjects at the University of East Anglia laboratory.

3 Testing strategy and conceptual framework

We articulate our testing strategy around two key concepts: efficiency, which depends uniquely on the choice of input allocation; and equity in material outcomes, which is determined uniquely by the choice of output allocation. In what follows, the words 'total output', 'joint surplus' and 'total income' are equivalent since output is measured in monetary units.

[6]Even though, by the nature of this experiment, subjects who decline to provide a gender identity cannot be invited to participate, we did not encounter such a case after registration.

[7]We could have made the final payoff depend on a single game. In principle, this would have ensured adequate incentives while avoiding the introduction of an incentive to diversify. We chose instead to make the final payment depend on three games out of 18, instead of a single one. This reduces the potential risk that subjects regard each game as too unlikely to be selected to be taken seriously. Selecting 3 games out of 18 is a compromise between ensuring proper incentivization, maintaining interest, and minimizing the risk of incentivizing diversification.

3.1 Individual efficiency

We start by testing whether subjects can allocate inputs efficiently on their own. This also serves as a test of understanding of the decision structure of the game. Let x_i denote the share of inputs that the decision maker assigns to his earmarked activity i; by definition, $x_j = 1 - x_i$. Further let x_i^* denote the input allocation share that maximizes efficiency, that is, that yields the largest payoff for the decision maker. The deviation from an efficient input allocation is simply $r_i \equiv |x_i - x_i^*|$. We plot the cumulative distribution of r_i to visualize what proportion of subjects deviate significantly from an efficient allocation. To check for learning effects, we do so separately for each of the first three games that each subject plays individually.

We also estimate a model of the following form, using only data from game 1:

$$x_{it} = a_x + b_x x_{it}^* + c_x m_{it} + d_x \widetilde{x}_{it} + u_{it} \tag{1}$$

where $t = \{1, 2, 3\}$ denotes the round, the input initially assigned to activity i is denoted m_i, and where $\widetilde{x}_i$ is defined as the input allocation that maximizes the output of activity i. Efficiency implies $a_x = c_x = d_x = 0$, and $b_x = 1$. Coefficient c_x captures a possible endowment or inertia effect: the subject assigns more to activity i if the game starts with a larger input share assigned to it. Coefficient d_x captures a possible output or activity endowment effect: the subject assigns to activity i the share of input that maximizes the output of the activity earmarked to decision maker i. We expect no endowment effect if subjects understand the nature of the decision and act rationally.

We also compare total output/income y to the maximum y^* that is achievable in a particular game. The output gap $l \equiv \frac{y^*-y}{y^*}$; it is positive and less than one by construction. To check for learning effects, we plot the cumulative distribution of l, allowing us to determine the efficiency loss that subjects incur after one, two, or three games.

3.2 Input allocation choice

We now turn to games involving two players. We start by noting that if subjects are purely consequentialist and behave accordingly, our experimental design is such that the decisions to allocate inputs and divide income are separable. Indeed, nothing in the game formally ties the allocation of final output to input endowments or production technology. Hence there is no reason for subjects *not* to maximize joint surplus since doing so maximizes individual payoffs, whatever their social preferences are.

To show this formally, let m_i and m_j denote the input endowments of players i and j, respectively. By construction, $m_i + m_j = 1$ always. Let x_i and x_j denote the share of total inputs allocated to the activities of i and j, respectively. By construction, $x_i + x_j = 1$ always. Outputs are $q_i(x_i)$ and $q_j(x_j)$, respectively. The production functions are indexed by i and j because they differ: $q_i(.) \neq q_j(.)$. Joint surplus is total output defined as $y = q_i(x_i) + q_j(x_j)$.

Efficiency is achieved by maximizing joint surplus:

$$\max_{0\leq x_i\leq 1} y = q_i(x_i) + q_j(1-x_i) \tag{2}$$

which leads to a system of Kuhn-Tucker first-order conditions. For interior solutions, we have $\frac{\partial q_i(x_i)}{\partial x_i} = \frac{\partial q_j(1-x_i)}{\partial x_i}$. Let x_i^* be the solution to the above maximization problem, and y^* the corresponding joint surplus. We immediately see that x_i^* and y^* do not depend on the distribution of initial endowments m_i and m_j. If m_i affects decision-making, it must be through some kind of input endowment effect – as when a decision maker i assigned a larger input share m_i at the beginning of the game feels entitled to assign more input to his/her activity i.

Both x_i^* and y^* depend on the underlying parameter vectors β_i and β_j of $q_i(.)$ and $q_j(.)$, respectively. These parameter vectors vary across games. To capture this dependence, let x_{ik}^* and y_k^* denote the optimal input allocation and associated joint surplus that correspond to joint parameter vector k. The structure of decision problem (2) implies that x_{ik}^* depends on β_i and β_j only through x_{ik}^* and y_k^*; it does not depend on other characteristics of the production functions. In particular, it does not depend on what i could achieve in isolation. To formalize this idea, let $\widetilde{x}_{ik}$ denotes the input level that maximize output i in game k, i.e.:

$$\widetilde{x}_{ik} = \arg\max_{0\leq x_i\leq 1} q_{ik}(x_i)$$

While $\widetilde{x}_{ik}$ varies with $\{\beta_{ik}\ ,\ \beta_{jk}\}$, it does not by itself enter the maximization problem (2) and thus should not affect the input choice and total surplus once we control for x_{ik}^* and y_k^* directly. If it does, it signals a kind of output endowment effect, i.e., decision maker i identifies with activity i when choosing an input allocation.

Putting all this together, we test whether the input allocation choice in game k coincide with x_{ik}^* by estimating a regression model of the form:

$$x_{ik} = a_x + b_x x_{ik}^* + c_x m_{ik} + d_x \widetilde{x}_{ik} + u_{ik} \tag{3}$$

where i is the subject selecting the input allocation and m_{ik} is the (relative) input endowment of decision maker i in game k. If subjects are perfectly efficient, we should observe $a_x = 0$, $b_x = 1$, $c_x = 0$, $d_x = 0$ and $var(u_{ik}) = 0$.[8] Coefficient $c_x > 0$ implies an input endowment effect: subjects hesitate to deviate from the initial distribution of inputs across the two subjects. Similarly, if $d_x > 0$ it means that subjects maximize the output of their own activity instead of maximizing joint output.

To look at joint surplus y_k^* we start by plotting the cumulative distribution of the output gap $l_k \equiv \frac{y_k^* - y_k}{y_k^*}$, which is a positive number between 0 and 1 by construction. Normalization serves to control for variation in the magnitude of y_k^* across games – and thus for variation in the possible range of y_k. This approach gives the proportion of observations for which the loss of

[8] Alternatively we can plot the cumulative distribution of the absolute deviation from the efficient allocation $r_{ik} \equiv |x_{ik} - x_{ik}^*|$ to visulalize the extent of deviation from efficient allocation.

efficiency is less than a given proportion α. The higher α is for a given cumulative probability p, the more inefficient subjects are. We use this approach to compare efficiency across treatments.

We also estimate a regression model of the form:

$$y_k = a_y + b_y y_k^* + c_y y_{ik}^m + d_y y_k^q + v_k \tag{4}$$

where $y_{ik}^m \equiv q_i(m_{ik}) + q_j(1 - m_{ik})$ is the income resulting from setting the input allocation equal to initial endowments, and $y_k^q = q_{ik}(\widetilde{x}_{ik}) + q_{jk}(1 - \widetilde{x}_{ik})$ is the total income achieved if the decision maker maximizes the output of his/her own activity i. If the decision maker is purely consequentialist, we should observe $a_y = 0$, $b_y = 1$, $c_y = 0$, $d_y = 0$, and $var(v_k) = 0$. If the decision maker suffers from an input endowment effect, $c_y > 0$ and $b_y < 1$ while $d_y = 0$. If the decision maker suffers from an output endowment effect and consequently maximizes his/her own output, we have $d_y > 0$ and $b_y < 1$ while $c_y = 0$. Separate identification of coefficients b_y, c_y and d_y relies on exogenous variation in $\{\beta_{ik}\ , \beta_{jk}\}$ and $\{m_{ik}, m_{jk}\}$ across games and subjects.

Regressions (3) and (4) are estimated on pooled observations from all games, adding game dummies to identify average treatment effects while controlling for differences in production functions and related endowment effects across games. We then interact game dummies with regressors to test whether endowment effects depend on agency structure.

In some games, the payoff that players receive is different from what is offered: in the ultimatum game, the second player can refuse it, in which case the realized payoff is zero for both subjects in that game; in the negotiation game, the second player can refuse the initial offer and initiate a sequence of offers and counter-offers that affect input allocation and incomes. Unless otherwise specified, in the empirical analysis y_k refers to the final, realized income – which can be zero if the (last) offer is rejected.

3.3 Division of joint surplus

We now turn to the allocation of joint surplus y_k among subjects. Let i be the subject selecting a division of the joint surplus – either as final decision (Games 2 and 4) or as an offer made to the other player (Games 3 and 5). Let this division of surplus be denoted as $\{y_i, y_j\}$ with $y_j = y - y_i$. By definition, consequentialist players make decisions purely based on material outcomes. This means that their preferences can be represented by a welfare function of the form $u_i(y_i, y_j)$. This encompasses many possibilities including: selfish preferences ($u_i(y_i, y_j) = u_i(y_i)$); altruistic preferences ($u_i(y_i, y_j) = u_i(y_i) + \omega u_j(y_j)$); paternalistic preferences ($u_i(y_i, y_j) = u_i(y_i) + \omega v_i(y_j)$); as well as inequality aversion (e.g., Fehr and Schmidt 1999) and rival preferences (e.g., Blanchflower and Oswald 2004). The decision maker solves a maximization problem of the form:

$$\max_{0 \le y_i \le y} u_i(y_i, y - y_i) \tag{5}$$

Let the solution z_i^* be normalized by y so as to express it in relative terms as a fraction of total surplus y. This offers the advantage of abstracting from differences in the level of y across observations, which include a strong element of endogeneity.[9] Special cases include $z_i^* = 1$ (selfish or rival preferences); $z_i^* = 1/2$ (strong altruistic preferences, paternalism, or inequality aversion); and $z_i^* > 1/2$ (weak altruism, paternalism, or inequality aversion). The object of our experiment is not, however, to disentangle other-regarding preferences. Instead, we are interested in identifying entitlement effects coming from (input and output) endowments and from the agency structure built into the different games. Let us first concentrate on endowments.

If subjects are consequentialist, the choice of z_i^* depends only on $y^*$and preferences; it does not depend on endowments. To capture input endowment effects, we define $z_i^m \equiv \frac{q_i(m_i)}{y}$; it is the share of realized surplus that the decision maker could have achieved with his/her initial endowment. A decision maker that derives a mental entitlement effect from a large initial endowment would chose a z_i level that increases in z_i^m. To capture output endowment effects, we similarly define $z_i^q \equiv q_i(x_i)$; it is the share of realized output that comes from the activity assigned to the decision maker. We estimate a model of the form:

$$z_{ik} = a_z + b_z z_i^* + c_z z_{ik}^m + d_z z_{ik}^q + v_k \tag{6}$$

where subscript k as before denotes the game played, and z_i^* is not directly observed and has to be inferred from observed behavior. If male and female subjects have systematically different other-regarding preferences, they would have a different z_k^*, for instance. We revisit this point below. Input endowment effects manifest themselves as $c_z > 0$ while output endowment effects are captured as $d_z > 0$.

The maximization model (5), and its generalization (6) to allow for endowment effects, are good for games in which the subject makes a final decision about the division of surplus – i.e., Games 2 and 4. In power sharing games, the other player has an opportunity to respond to the offer made – either by rejecting it (Game 3), in which case i receives nothing, or by making a counter-offer (Game 5), which may be aggressive or even destructive if i's offer is viewed as insufficient or perhaps insulting. To capture this idea, we expand maximization model (5) to include a social acceptability term:

$$\max_{0 \le z_i \le 1} u_i(z_i, 1 - z_i) - \lambda \left(z_i - \overline{z}_i\right)_{z_i > \overline{z}_i} \tag{7}$$

where λ denotes a penalty that is associated with an offer z_i that exceeds an acceptable level $\overline{z}_i$. The lower this acceptable level is, the higher the penalty associated with any offer z_i, and the lower the optimally chosen offer z_i^*. What is of particular interest to this paper is whether offers made by i are lower if player j can claim a higher input or output endowment effect.

[9] This assumption is satisfied exactly if subjects have a welfare function of the form $\log y_i + \omega \log y_j$, which yields first order condition

$$\frac{1}{y_i} = \frac{\omega}{y - y_i}$$

with $\frac{y_i^*}{y} \equiv z_i^* = \frac{1}{1+\omega}$. The reader should regard our estimation model as an approximation centered on the above model.

This is equivalent to assuming that the acceptable offer $\overline{z}_i$ falls with z^m_{jk} and z^q_{jk}: the larger the entitlement effect that player j derives from either endowment, the lower the optimal offer that i makes to avoid rejection or confrontation. This approach can be further refined in the renegotiation game to allow for negotiation round effects and the tightening of the negotiation window.

As we did for regressions (3) and (4), regression model (6) is estimated on pooled observations with game dummies to identify average treatment effects. Next, we interact game dummies with regressors to test whether endowment effects depend on agency structure. We also estimate a subject fixed-effect version to capture the unobserved but subject-invariant variable z^*_i.

3.4 Negotiation

In Games 3 and 5, we also observe whether the offers made by the decision maker are accepted by the other player. Let dummy $a_{jt} = \{0, 1\}$ denote whether subject j receiving an offer z_{jt} at time t accepts the offer or not. In Game 3, this only happens once. In Game 5, there can be up to 6 offers made sequentially, each of which can specify a different input allocation and income sharing offer. We examine this data separately, focusing directly on self-interest, endowment effect, as well as efficiency and equity considerations.

Four regressors are considered: the income share z_{it} offered to subject i – this capture self-interest motives on the part of the recipient; the difference between z_{it} and z^m_{ik}, i.e., the income share based on initial endowments – this captures the endowment effect; the absolute difference between chosen input allocation and the optimal input shares – the larger the gap, the less efficient the offer is; and the absolute difference from equal sharing – the larger the gap, the less equitable the division of surplus is on a priori grounds. We do this analysis separately for Game 3 and for each of the offers made in Game 5.

3.5 Choice of agency structure

In Game 6, we ask subjects to choose between three options: pay price p to decide (i.e, play Game 2 as first mover); receive price p to defer to their team partner (i.e. play Game 2 as passive subject); or negotiating (i.e., play Game 5). In case Game 5 is selected, the order of play is randomized.

It is relatively easy to characterize players' actions when $p = 0$. In this case, we expect consequentialist subjects to pick the first option since it is the one that allows them to pursue their preferred social welfare function and achieves their personal optimum. Choosing the negotiated outcome suggests a preference for negotiation, i.e., a preference for the bargaining process by which an outcome is selected. This could be because subjects find a negotiated outcome more acceptable in general, or perhaps because they are unsure of the other player's preferences or views and use the negotiations to gain better information about their partner's views. For players to select that option, it would have to be the case that even when they have full control over the division of surplus, their maximization problem includes a social acceptability term but they have some uncertainty regarding what $\overline{z}_i$ is. Since communication is allowed in the negotiation game, players can gain a better understanding of what $\overline{z}_i$ is for their partner – including whether it includes an input or output endowment effect. Finally, when $p = 0$, we would not normally expect subjects to defer the choice to their opponent – except perhaps if the act of dividing the surplus entails a pure utility cost K, e.g., if their maximization problem is of the form:

$$\max_{0 \leq z_i \leq 1} u_i(z_i, 1 - z_i) - \lambda \left(z_i - \overline{z}_i\right)_{z_i > \overline{z}_i} - K$$

with or without social acceptability term. This could happen for instance because subjects find the input choice cognitively difficult – something we will be able to test indirectly. Alternatively, it could arise because the division of surplus creates conflicting emotions between self-gratification and social acceptability, and subjects prefer to avoid the emotional cost of this moral dilemma.

When subjects have to pay a price $p > 0$ to decide, this introduces a trade-off for individual i between the cost of deciding p and the expected material gain G_i^e from deciding relative to negotiating. It follows that, for consequentialist selfish-rational subjects, the probability of paying p to decide is given by:

$$Pr(i \text{ chooses to decide}|p) = Pr(G_i^e > p)$$

By the same reasoning:

$$Pr(i \text{ chooses to defer}|p) = Pr(L_i^e < p)$$

where L_i^e is the expected loss from deferring relative to negotiating. It follows that, if subjects are consequentialists and selfish-rational,[10] the probability of deciding falls with p and the probability of deferral increases with it. While we do not observe expectations G_i^e and L_i^e directly, we observe the information – i.e., past play – on which individual subjects can base these expectations, and thus we can control for it. Consequentialists should be more responsive to the information contained in their past play with others in the experiment. If, on the other hand, subjects have pure preferences about process, e.g., they prefer to decide – or defer, or negotiate – irrespective of losses and gains, we should observe no responsiveness of their decisions to the price level p and to past play information entering G_i^e and L_i^e. These observations form the basis for our analysis of Game 6.

3.6 Gender effects

To investigate how gender interacts with agency structure, we create four dummies g_{ij}, one for each of the four gender configurations for subjects i and j, i.e., male-male, male-female, female-male, and female-female. As before, i refers to the decision maker. We compare the coefficient of these gender pair dummies across the four games of the experiment.

[10] If subjects are paternalistically altrustic, they may pay to implement their view of what constitutes a fair division of income.

We do not have strong a priori expectations regarding gender effects on distributive justice, a topic for which the literature has failed to find strong gender differences. We do, however, expect teams with a gender mix to achieve higher efficiency, especially in Game 5 where communication is possible.

This testing strategy is implemented by estimating versions of regression models (3), (4) and (6) in which we interact game dummies with gender pair dummies. We follow a similar strategy to investigate whether endowment effects vary by gender pairings, i.e., we interact endowment effects with gender pair dummies in (3), (4) and (6). Results from these pairwise comparisons are summarized in Tables of marginal effects and their corresponding whisker bar charts.

Stronger predictions can be made regarding gendered behavior in Game 6 on the basis of the existing evidence that female subjects are less competitive or assertive, especially when matched to a male subject. The application of these predictions to our setting leads us to expect female subjects to be less willing to decide and more willing to defer in Game 6, either on average or when assigned a male partner. We test this as well.

4 Empirical results on choices made

4.1 Efficiency, equity, and learning

We start by reporting key indicators of performance in each of the games, split by playing round – to recall, each game is played three times in sequence by each subject. Since the focus is on learning how to play, we omit Game 6 from our analysis since it always occurs at the end of the experimental session and leads to subjects playing games they have already played before.

Table 1 displays the value of the input gap, output gap, and equality gap at the 50%, 80%, 90% and 95% percentiles, respectively. The input gap is defined as $|x_{it} - x^*_{it}|$ expressed in percentage terms – it represents the percentage deviation from the optimal allocation of inputs. The output gap is $l \equiv \frac{y^*-y}{y^*}$ as defined earlier. The equity gap is defined simply as $|z_{it} - 0.5|$; a value of 0 means income shares are equal, a value of 1 means they are fully unequal (i.e., either the decision maker has taken all income or given all income to the other player).

The first panel shows the input and output gaps for Game 1. There is no equality gap since this game only affects the payoff to a single player. We see that even in the very first round of the experiment, the median player chooses the optimum input and output, meaning that at least half of all subjects achieves an efficient outcome in the first round. There are some laggards, as shown by the large input gap at the 80% percentile and above. But by rounds 2 and 3, even these subjects have caught up and the output efficiency gap is between 6% and 8% at the 95% percentile, indicating that the overwhelming majority of subjects understand the game and are quickly capable of figuring out what is in their best interest. In other results not shown here, we find no difference in performance between male and female subjects in Game 1. This provides reassurance that our gender analysis in Section 5 relates to strategic play, not gender differences in their understanding of the game.

The next panel shows similar figures for Game 2. There is a fatter tail of subjects not achieving efficiency: by round 3, the input and output gaps are still 31% and 19% for the player at the 90th percentile. But 80% of subjects achieve a near-perfect level of output efficiency by rounds 2 and 3. In terms of equity, the overwhelming majority of subjects realize that they have all the power, and they take advantage of it to appropriate most of the output: the median player appropriates all of the joint income. There is however a sizable tail of players who share output more equally. The average share kept by the decision maker is 80%. The histogram reveals no mode at 50%, as is common in simple dictator games. Here the mode is keeping 100%.

Things are better for efficiency in Game 3, where by round 3 subjects have achieved the same input and output gap as in the single player Game 1. The division of surplus is also more equitable than in Game 2, with a median and average retained share of 60%. Clearly, the power to reject the offer has a significant effect on the decision maker's ability to extract all the surplus. We see some variation around the median on both sides, which explains that a sizable equality gap remains for most players. There is, however, a darker side to Game 3, namely the efficiency loss arising from offer rejections. When we factor this loss in, we find that the average income gap in round 3 is 16%, compared to 4.2% in Game 2 and 1.4% in Game 1. In fact, if anything the average income gap increases over rounds in Game 3, as more players start rejecting offers. We get back to this later when we look at offer acceptances.

In terms of equality, Game 4 resembles closely Game 2: the player with the power to divide income tends to keep most of it, the median share kept is 100%, and the average share kept is 80%. The two games do however differ in terms of efficiency, which is much lower in Game 4 and hardly improves across rounds. This suggests that the subject who allocates the input either seeks to reduce the size of the surplus that the other player can appropriate, or attempts to create a feeling of entitlement by allocating more input to his or her activity. We revisit these ideas below.

Of the four two-player games, Game 5 is the most egalitarian in terms of the division of surplus. The median equality gap in offers is 0, indicating that at least half of the negotiation games result in an equal division of surplus. Even at the 80% and 90% percentiles, the equality gap remains small – 7% and 16% respectively. Game 5 also does reasonably well in terms of efficiency, with 80th and 90th percentile levels of efficiency comparable to those achieved in Game 2. There is however a small upper tail of inefficiency driven by a small number rejected offers. Game 3 occupies an intermediate position, much more egalitarian than Games 2 and 4, but not as egalitarian as Game 5 where the second player has much more bargaining power.

4.2 Input allocation choice

We now examine in detail the input allocation choices made by subjects. The first regression model that we estimate is (3), which we repeat here. Results are presented in Table 2 for each of the 5 games – and for the pooled data in the last column. The Games 2 and 5 played as part of Game 6 are included in the analysis, but a Game 6 dummy is included in the regression. Standard errors are clustered by subject.

$$x_{ik} = a_x + b_x x^*_{ik} + c_x m_{ik} + d_x \widetilde{x}_{ik} + u_{ik}$$

We see that, as anticipated, the coefficient b_x is large and significant in all regressions: when efficiency requires allocating more input to activity i, the decision maker does so. The estimated coefficient, however, falls far short of 1, which would be required for full efficiency. It is largest for the single player Game 1 and, to a lesser extent, for Game 2. For all the other games, b_x is less than 0.5, indicating that efficiency in input allocation becomes a less dominant concern when the other player has more power.

We find a significant input endowment effect – i.e., c_x is significantly positive – in all games except Game 3. The effect is largest in Game 5. This indicates that, in that game, the allocation of input is more likely to respect initial input endowments – perhaps because doing so enables subject to claim a larger share of the total income. We also find a small input endowment effect in Game 1, suggesting that part of the effect may be due to inertia rather than an attempt to stake a claim on joint income.

We also see that in Games 2 and 3, d_x is positive and significant. This means that subjects allocate more input to their earmarked activity when it is more productive and is capable of achieving more output. This effect, which is totally absent from Game 1 and is strongest in Game 3, can be interpreted as an attempt to create a claim on joint surplus, in the sense that a player who 'contributes more' by producing more of the joint output feels entitled to appropriate more of it.

$$y_k = a_y + b_y y^*_k + c_y y^m_{ik} + d_y y^q_k + v_k$$

Next, we turn to aggregate efficiency by estimating model (4), reproduced above. Results are shown in Table 3. The results from Table 2 are by and large confirmed. Realized output y_k is strongly increasing in maximum potential output y^*_k. This is true in all games, although less so Game 5 where average output is higher on average (large positive constant term) but less sensitive to y^*_k. Sensitivity to initial input endowment remains in Games 1 and 2, suggesting some kind of inertia or anchoring on initial input values. The input endowment effect is much larger in Game 5. Subjects seem to partially anchor their proposed input allocation on initial input endowment when negotiating a share of the surplus – and incur an efficiency loss as a result. We also find a significant d_y coefficient in Games 2 and 3, indicating that decision makers assign more inputs to their own activity when it is productive – even though this may reduce total surplus. This confirms the presence of an activity endowment effect in these two games.

4.3 Division of surplus

We now examine how subjects divide surplus in each of the two-player games. The dependent variable z_{ik} is the share of total surplus that the offer maker assigns to himself/herself. The estimated model is regression (6), reproduced below. As noted earlier, z_i^* is not observed but can be captured by the inclusion of an individual fixed effect. Results are reported in Table 4 in two forms: OLS without z_i^* and fixed effects at the decision maker level. In both cases standard errors are clustered at the individual level. In Game 5, the final offer made and accepted is used as dependent variable.

$$z_{ik} = a_z + b_z z_i^* + c_z z_{ik}^m + d_z z_{ik}^q + v_k$$

The findings are contrasted across games. In the two games where the second player has bargaining power – namely Games 2 and 4, we see that final offers are an increasing function of z_{ik}^m, the output from own activity with the initial input allocation. It is as if players are relying on an endowment effect to justify their offer. Indeed, this effect is largest in Game 5 where z_{ik} is the last of a sequence of bargaining offers. This confirms our earlier findings and their interpretation: subjects use endowments to anchor their surplus division offers.

We also find that offers are strongly increasing in z_{ik}^q, the share of output produced by the offer maker's own activity. This indicates another type of endowment effect, grounded not in input but activity 'ownership': subjects assign themselves a larger share of output if it is produced by their assigned activity – even though the income from that activity is achieved by freely allocating inputs across them. This effect is again strongest in Games 3 and 5 where the second player has some power to reject offers and, presumably, offers must appear more 'justified'. This is indeed what is suggested by the chatting exchanges recorded in Game 5. In contrast, this effect is totally absent in Game 4 where the offer is made by the second player, that is, not by the player who decided the input allocation. This is as if the offer maker deliberately ignores his/her own output share – which could have been manipulated by the other player to be quite small.

Other earlier results are confirmed, notably the fact that, by default, the offer maker ascribes a much larger share on surplus to himself/herself than in the two power sharing games.

4.4 Acceptance of offers

We now examine the factors that predict the acceptance of offers. In Game 3, there is a single take-it-or-leave-it offer from the first player. In Game 5, there is a sequence of up to six alternating offers of which each odd-numbered offer comes from the first mover subject. Note that counter-offers are allowed to change the allocation of inputs as well, which evolves from offer to offer. In practice, we only observe twelve fourth round offers in Game 5 and thus stop after that.

Regression results on acceptance a_{ik} are presented in Table 5. Each regression is a linear probability model with standard errors clustered by subject. The first regressor is the surplus share offered to the decision maker; it captures self-interest – the higher the coefficient, the stronger is self-interest. The second regressor is the share of output coming from the offer recipient's activity (minus the offered share); it captures the output endowment effect discussed earlier. The other two regressors are absolute differences relative to an ideal: (1) how far the input allocation x_{ik} is from the optimal allocation x^*_{ik}; and how far is the offered share z_{ik} from equal splitting, that is, 50%. These regressors are included to capture the idea that the offer may be rejected to punish the offer-maker for making an inefficient or unequal choice.

We find that larger offers are more likely to be accepted. This is particularly true of offers made by first movers in Game 5, while counter-offers are not. This suggests that some first movers continue to regard themselves as final decision makers and treat counter-offers as pure bargaining move. We find evidence of an output endowment effect in Game 3 but not in Game 5. We find no robust evidence that inefficient input allocation is punished by offer refusal.[11] In contrast, the further away from equal sharing an offer is, the less likely it is accepted. This effect is distinct from the offer itself, which is controlled for separately. The estimated coefficient is quite large, especially for the first two offers of Game 5. This suggests that equality of treatment – regardless of efficiency or endowments – is a crucial determinant of offer acceptance, an observation that tallies with our earlier finding that surplus is divided more equally in Game 3 and especially in Game 5.

4.5 Choice of agency structure

In game 6 we ask subjects to choose whether they wish to replay a negotiation game, play a dictator game as decision maker, or play a dictator game in which they defer all choices to the second player. Both players make a selection, but the selection of only one player is implemented. The game then continues as before. If the negotiation game is selected, the first mover is selected at random.

Choices made are depicted in Figure 2a. We see that the choices to decide or delegate depend heavily on the price p, while the choice to negotiate is relatively constant across values of p – either by chance, or possibly because a fraction of subjects prefer that agency structure irrespective of its material benefits.

Next, we investigate whether observed decisions match what we know of G_i^e and L_i^e, the expected material gain from deciding and the expected material loss from delegating. In Game 5, subjects earn, on average, 66 points. In contrast, in Game 2 they earn on average 97 points as decider and 25 points as passive player. Hence, across all subjects, the expected gain from deciding is 31 points while the expected loss from delegating is 41 points. In the first bar or Figure 2, when $p = 25$ points, paying to decide yields an average gain of 31-25=6 points while receiving 25 points for delegating yields an average loss of 41-25=16 points relative to negotiating. Based on this, we expect all selfish-rational players to pay to decide. Since only 56% of subjects choose that action, this puts an upper limit on the proportion of selfish-rational

[11] There is a significant coefficient for the fourth offer, but it is based on only 12 observations.

players in our experiment. We also note that 16% of subjects choose to delegate when it is against their material interest suggests that these subjects have an intrinsic preference for that agency structure.[12]

In contrast, when $p = 50$, paying to decide yields an expected loss of 50-31=19 points while being paid for delegating yields an expected material gain of 50-41=9 points. Given this, we expect all selfish-rational players to delegate. In practice, only 39% of subjects do so – and 29% still pay to decide, suggesting that they have an intrinsic (i.e., non-instrumental) demand for exercising decision power. When $p = 75$, the loss from deciding and the gain from delegating are even larger, and we still find 4% of subjects paying to decide. But 74% of subjects now choose to take the 75 points and delegate power to their assigned partner.

To confirm these findings, we examine whether they change when we also control for the average payoff that individual subjects earned in Game 5 and in Game 2 – either as decider or as passive player. We then regress the three choices made by individual subjects on these three averages in addition to the value of p. Results, presented in Table 6, show that both the decision to pay to decide and the decision to be paid to delegate do not depend on past play. But they depend strongly on price p (p-values=0.000 in both cases). In contrast, the choice to negotiate is insensitive to p but mildly increasing (p-value=0.066) in the average payoff that the subject received in the three rounds of Game 5. The difference in average payoff in Game 5 between those who negotiate in Game 6 and those who do not is very small in magnitude, however (0.02 GBP), indicating that this effect is small in practice. Taken together, these findings indicate that, while some subject do respond strongly to the price of agency, others have intrinsic preferences over process, in particular towards negotiating.

5 Results on gender pairings

We now turn to the results on gender pairings. In the first set of regressions, we re-estimate the regressions presented in Tables 2, 3 and 4 with the addition of dummies for male-female, female-male, and female-female pairings. In Game 1, since subjects play on their own, we only introduce a female dummy. Detailed results are presented in Online Appendix B.

5.1 Differences in decisions

We first look at x_{ik}, the share of inputs allocated to the decision maker's assigned activity. The purpose is to test the hypothesis that women may feel they have more control and entitlement over their own activity. The results, available in Appendix Table B1, uncover no evidence of gender pairing effects in any of the paired games. We only find a weakly significant 2.3

[12] Another possibility is that subjects who defer when they could be dictator hope that their partner will reciprocate by allocating them a larger share of surplus. To investigate this possibility, we included a Game 6 dummy in the first column of Table 4: if reciprocation is present, the decision maker in Game 2 should take a smaller share in surplus when Game 2 is played as part of Game 6. We find the opposite: if anything, the coefficient of the Game 6 dummy is positive, implying that the self-appointed share is even larger. Reciprocation cannot, therefore, explain our finding.

percentage point increase in x_i associated with the female dummy in the single player game. Of the other 15 estimated coefficients (three for each game plus three for the pooled data), we only get one coefficient significant at the 5% level, which could easily occur by chance. From this we conclude that there is no evidence that gender pairings bias the allocation of inputs to own activity. Perhaps this is not surprising given that mechanically allocating more inputs to one's own activity yields no immediate benefit.

Next, we consider gender-pairing effects on total output y_k, controlling for all the regressors already in Table 3 (see Appendix Table B2). We find absolutely no evidence that gender or gender pairings are associated with systematic differences in aggregate efficiency – none of the estimated coefficients is statistically significant even at the 10% level.

Finally, we repeat the surplus offer regressions of Table 4 (see Appendix Table B3). Here too we find no evidence of gender pairing effects: out of 15 estimated coefficients, only one is significant at the 10% level. Furthermore, the magnitude of the coefficients themselves is small and unstable across games. From this we conclude that there is no evidence that gender pairings affect average performance in our games.

We do, however, find a systematic gender difference in the choices made in Game 6. This is shown in Figure 3, which replicates Figure 2 but breaks it down by gender pairings.[13] We see that male subjects make similar choices of agency structure irrespective of the gender of their assigned partner. We also observe that the choices made by female subjects assigned a female partner are indistinguishable from those of male subjects assigned a male partner. But there is a large difference in behavior between the choices made by female subjects assigned a male partner, and all the other pairings: in mixed-gender pairings, female subjects are much less likely to pay to decide, and much more likely to either negotiate (when $p = 25$) or to delegate decisions to their partner (when $p = 50$). These differences are strongly statistically significant: in mixed-gender pairings, male subjects pay to decide in 63% of the cases when $p = 25$, compared to 38% of female subjects (p-value=0.046). When p=50, the difference is smaller – 35% vs. 23% - but it is still significant at the 10% level (p-value=0.082). Only when the price of agency is highest is the difference no longer statistically significant, given that only a small fraction of subjects pays to decide in this case.

5.2 Differences in determinants of choices

In the final part of our analysis, we re-estimate regression models (3), (4), and (6) separately for each gender pairing. Detailed results are available in Online Appendix B. The dominant finding is the relative similarity in the decisions made irrespective of gender pairing, which is why we have not included these detailed results in the body of the paper. The few statistical differences that we observe are generally differences in magnitude, not in sign.

The only striking pattern is the observation that female subjects play somewhat differently

[13] Game 6 with p= 50 was not played with same-gender pairs. This is because, by nature, the number of distinct mixed-gender pairings exceeds the number of same-gender pairings that are feasible in a session.

when matched with a man or a woman. They are more accommodating when matched with a man, and this often results in more emphasis being put on efficiency; and they are equally or more competitive when matched with another woman. These results echo some of the literature discussed earlier and they confirm our findings regarding the choice of agency structure in Game 6.

6 Conclusions

In this paper we have conducted a novel experiment that combines separable decisions about efficiency and equity with different gender pairings. The object of the game is to allocate an input between two activities and then to divide the joint income from these two activities between players. Subjects play different versions of this game in which we vary the agency structure to mimic well-known games such as the dictator, ultimatum, and trust games. Subjects also play a alternating-offer negotiation game with communication and a game in which subjects decide the agency structure – as well as a single-player version. All games share the same contextualization through a carefully designed visual interface, making them easy to comprehend. Pairs of players never play each other twice.

We find that, in general, subjects quickly learn how to pick an efficient input allocation on their own, and they achieve a high level of output efficiency in all games. Some efficiency loss is nonetheless noticeable in the two games that allow the rejection of offers, namely, Games 3 and 5 – suggesting that a breakdown in negotiations can result in large losses. This outcome arises even though, by design, there are no reputation effects in our setting. In terms of equity, we find that games giving all the income allocative power to a single player lead to a highly unequal division of surplus: in both Games 2 and 4, the median share allocated to self is 100%. In contrast, when subjects have more equal power, as in Games 3 and 5, income tends to be allocated more equally – with equal sharing being the median outcome in Game 5.

Results regarding efficiency are confirmed using regression analysis. We also find that input allocation is subject to an input endowment effect: subjects who are allocated more input in a game tend to use more of it on their activity. This effect is strongest in Game 5, suggesting that subjects use endowments to anchor their surplus division offers and counter-offers. This interpretation is confirmed by regression analysis of the division of surplus. We also find an activity endowment effect, in the sense that subjects allocate more input to their earmarked activity in an attempt to create a claim on joint surplus. This strategy seems to pay off in the sense that a higher own output predicts receiving a higher share of income. Both types of endowment effects reduce aggregate efficiency, especially in Game 5 where subjects seek to establish claims on team surplus. Furthermore, in Games 3 and 5, we find no robust evidence that inefficient input allocation leads to an offer being refused. In contrast, an offer is less likely to be accepted if it is far from equal sharing, controlling for the size of the offer itself. This suggests that equality of treatment is a crucial determinant of offer acceptance, which consistent with the earlier finding of more equal sharing in games with negotiation over surplus.

In Game 6, subjects are given a choice between different agency structures. We find that the choice of agency structure is sensitive to the average material gains and losses associated with different agency structures. Put differently, subjects can be bribed to assert or relinquish power. But there is also a large fraction of subjects who choose an agency structure that is not in their material interest, suggesting that demand for power or delegation is at least partly driven by non-instrumental considerations. Such findings align well those of Afzal et al. (2022) and Bakhtiar et al. (2022), who also find that demand for agency or delegation is only partially sensitive to the price of agency.

The results on gender pairings are less contrasted than we had perhaps expected: differences between gender pairs in terms of efficiency or equity are generally small in magnitude and not always significant. First, we find no variation in input entitlement effect by gender and no gender-pair effect on the efficiency of input allocation. We also find no systematic variation in income sharing offers by gender.

In contrast, we find systematic gender differences in the decisions made when subjects can choose their agency structure: in mixed-gender pairings, female subjects are much less likely to pay to decide, and much more likely to either negotiate or to delegate decisions to their partner. In contrast, the choices made by males and females in same-gender pairings are indistinguishable, and male subjects make similar choices whether matched with a man or a woman. These findings indicate that female subjects in our experiment have an intrinsic, non-instrumental preference against making all the decisions. This interpretation is confirmed by a finer analysis of input and output endowment effects across genders and gender pairings.

As is clear from the above summary, the experimental design we have developed offers the advantage of combining, within a single intuitive setting, allocative efficiency and equity decisions in a separable way, while allowing for commonly studied agency structures. We find that subjects are quite good at making efficient decisions, except when negotiation breaks down over the division of surplus, something that occurs when the proposed division is too unequal. When they have full power to appropriate the joint surplus, subjects overwhelmingly do so – unlike in more commonly studied settings such as the simple dictator and trust games. We believe this is an important result in the sense that it casts doubt on the validity of claims made on the basis of simple, uncontextualized games. Our findings also confirm a number of earlier findings on gender – e.g., that mixed-gender teams work better together (e.g., Croson and Gneezy 2009; Cooper and Nagel 2016) and that women are less competitive when playing against men (e.g., Niederle and Vesterlund 2007, 2010). By combining decisions on allocative efficiency and equity separately within different power settings, our results go further than earlier findings in showing that gender differences are less important than gender pairings.

It would be interesting to ascertain whether gender pairing effects remain when subjects are allowed to select their partner, as in a marriage market. Indeed, we would expect that, on average, assortative matching would enhance cooperation. To this effect, it would be informative to repeat this experiment with married couples and compare their performance with that of randomly matched individuals from the same population.

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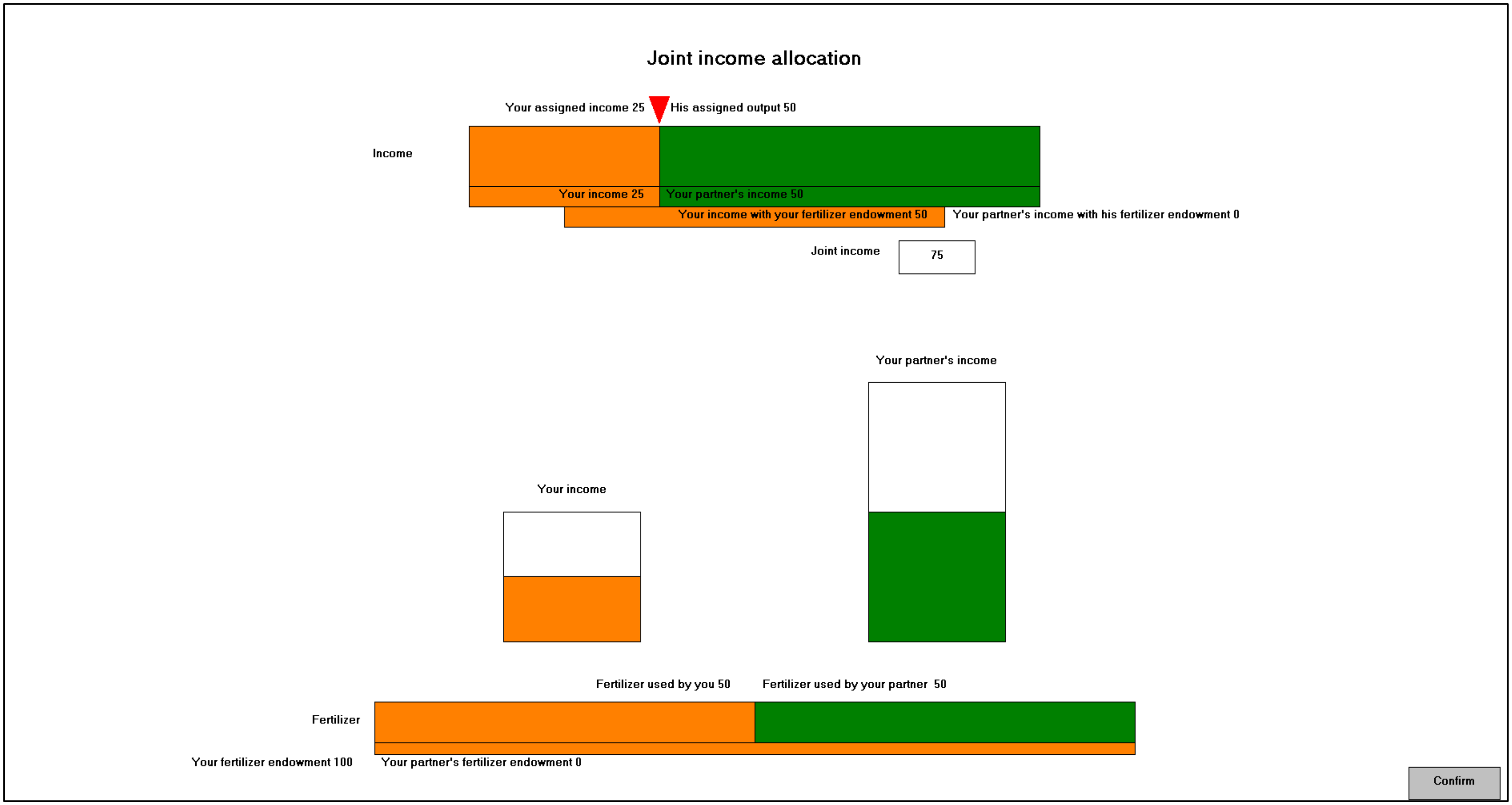
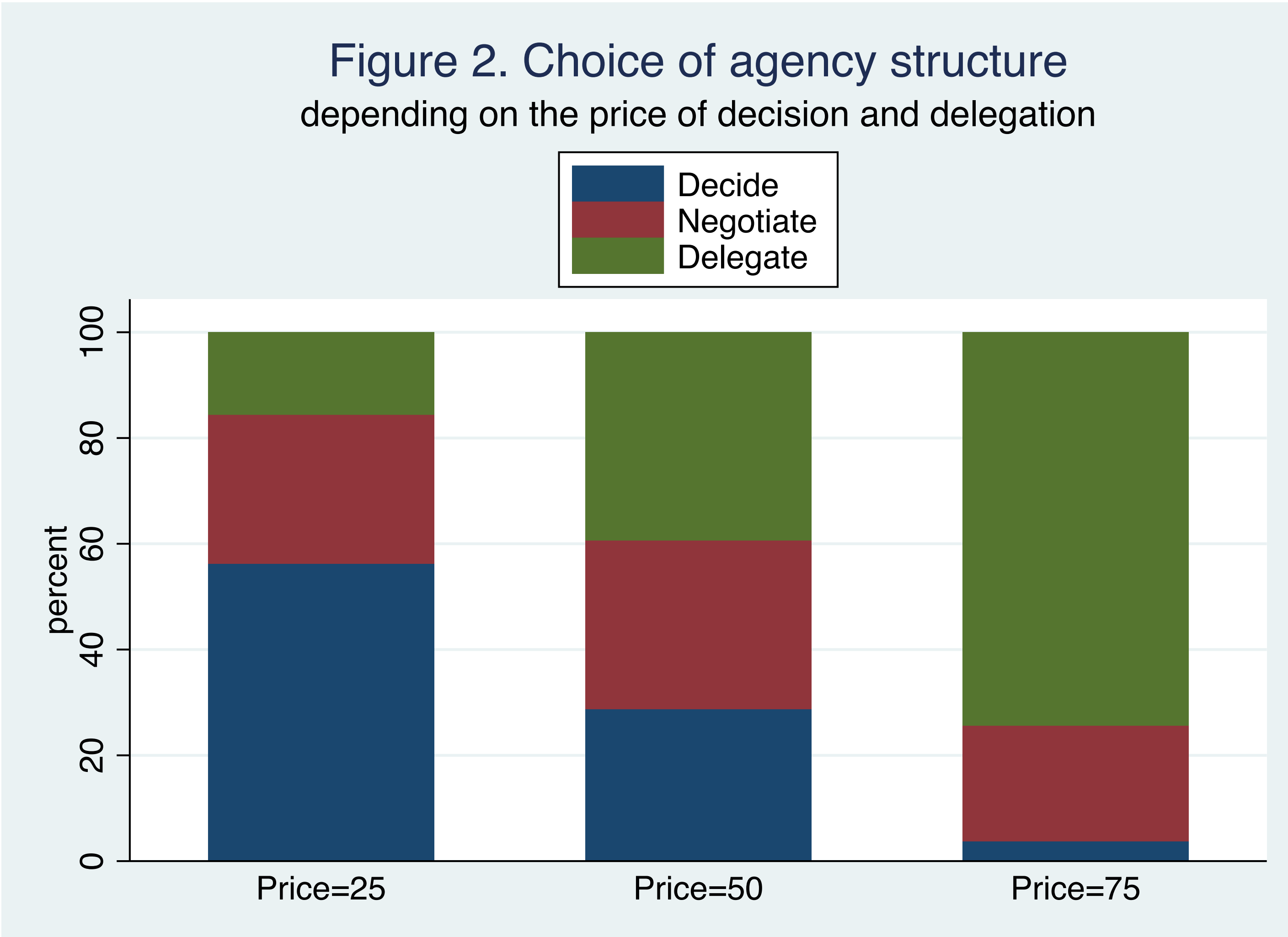
Figure 1: Screen shot of a two-player game – cursor is on income allocation decision



Notes: This is the screen seen by a subject who is second mover in Game 4. As shown in the bottom of the screen, the first mover has reallocated half of the fertilizer to his/her own field, and the rest to the second mover subject's field: the subject's fertilizer endowment is shown in orange in the bottom horizontal bar; the fertilizer allocated to the subject is shown in the second horizontal bar starting from the bottom of the screen. The two vertical bars show the output from the subject's field (orange) and the first mover's field (green). The joint income generated from this input allocation is 75 points, which is larger than the joint income of 50 that would have been produced by allocating all the fertilizer to the second mover's field. This is illustrated by comparing the first two horizontal bars in the top panel: the width of the bottom one, in orange, marks the total income with initial input endowments; the width of the second bar marks the total income with the input allocation decided by the first mover. The second mover can now move the red triangular cursor to distribute this joint income between himself/herself (orange) and the first mover (green). Moving this cursor to the right, for instance, will increase the size of the orange part of the top horizontal bar, and proportionally reduce that of the green part. When the subject has completed his/her choice, he/she clicks on the Confirm button at the bottom right of the screen.

To summarize: the bottom horizontal bar in the bottom panel offers a visual representation of the subject's input endowment; the bottom horizontal bar in the top panel is a visual representation of the subject's income generated by his/her fertilizer endowment; the middle horizontal bar in the top panel is a visual representation of the subject's income generated by the fertilizer allocation decided by the first mover; the color difference between the two top horizontal bars illustrates how much income the subject is reallocating from his/her output to the other player and vice versa.



Notes: The figure shows a frequency breakdown of the choices of agency structure made in Game 6. 'Decide' means paying price p to be the decider in Game 2; 'Delegate' means choose to receive price p to be the passive player in Game 2; and 'Negotiate' means choosing to play Game 5 with the first mover being randomized.

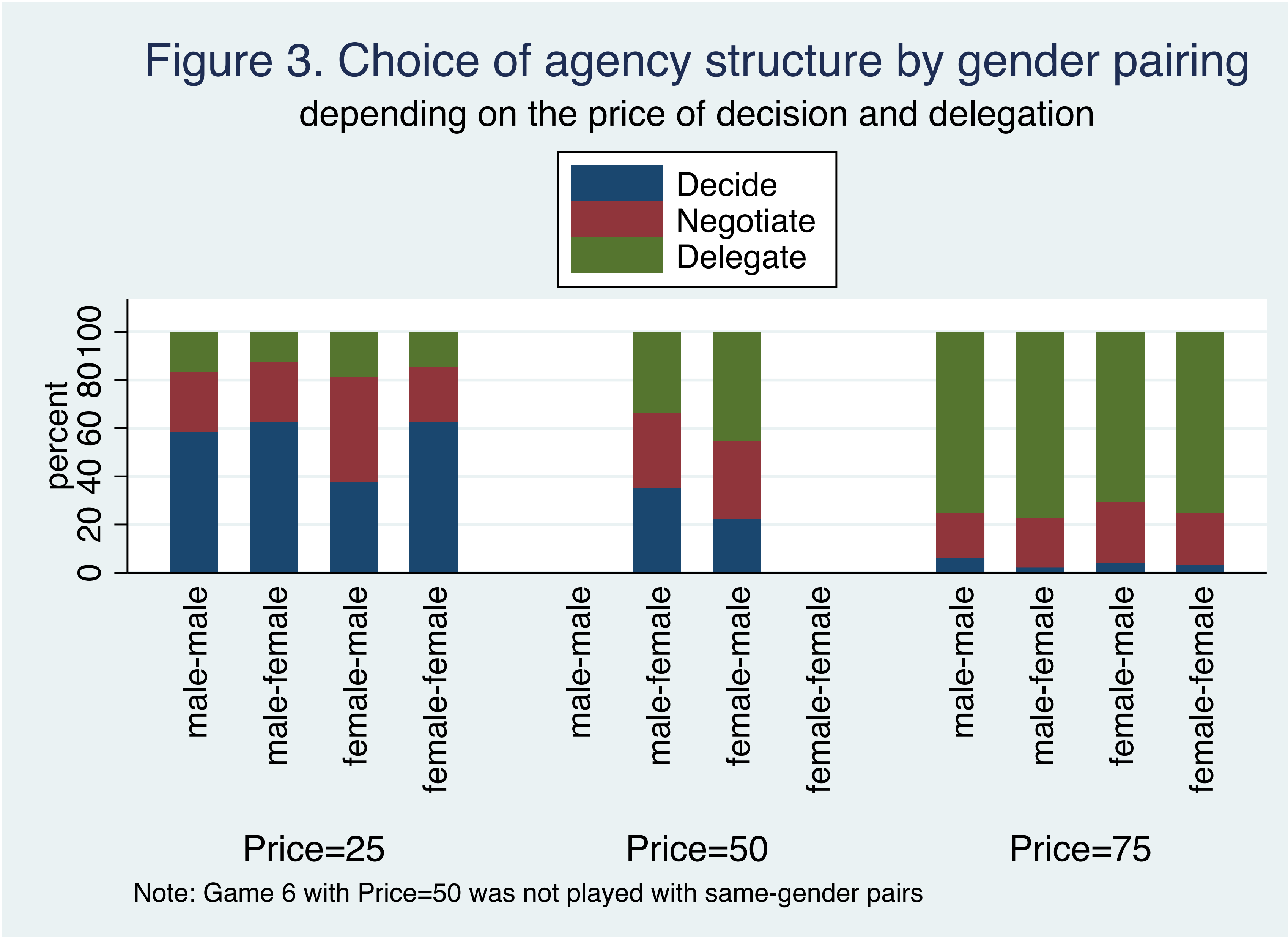


Figure 3. Choice of agency structure by gender pairing

depending on the price of decision and delegation

Note: Game 6 with Price=50 was not played with same-gender pairs

Table 1. Learning across rounds for each game: magnitude of the gap relative to the efficient or equitable choice

		Input gap			Output gap			Equality gap		
Game 1	**Percentile:**	**round 1**	**round 2**	**round 3**	**round 1**	**round 2**	**round 3**	**round 1**	**round 2**	**round 3**
single subject game	50%	0%	2%	2%	0%	0%	0%			
	80%	33%	3%	5%	17%	0%	1%			
	90%	50%	3%	11%	25%	0%	2%			
	95%	63%	12%	20%	31%	6%	8%			
Game 2										
one subject allocates	50%	4%	4%	4%	0%	0%	0%	31%	47%	49%
inputs and income,	80%	32%	12%	11%	20%	3%	3%	50%	50%	50%
other subject is	90%	50%	24%	31%	32%	12%	19%	50%	50%	50%
passive	95%	69%	33%	37%	37%	25%	26%	50%	50%	50%
Game 3										
one subject decides,	50%	3%	3%	3%	0%	0%	0%	9%	8%	13%
other subject can	80%	23%	8%	6%	11%	2%	1%	25%	17%	22%
reject	90%	40%	16%	15%	20%	4%	5%	38%	22%	26%
	95%	67%	45%	18%	33%	27%	7%	49%	25%	41%
Game 4										
one subject allocates	50%	3%	4%	4%	0%	0%	0%	20%	35%	48%
inputs, other subject	80%	18%	16%	17%	8%	5%	6%	50%	50%	50%
allocates income	90%	49%	31%	34%	25%	18%	26%	50%	50%	50%
	95%	67%	48%	52%	33%	33%	44%	50%	50%	50%
Game 5										
subjects make offers	50%	4%	5%	5%	0%	0%	0%	0%	1%	0%
and counter-offers	80%	9%	20%	12%	2%	7%	3%	11%	9%	7%
on input and income	90%	24%	29%	38%	10%	16%	25%	16%	16%	16%
allocation	95%	33%	38%	62%	15%	30%	69%	24%	25%	50%

Notes: For input and output, we report the efficiency gap; for income sharing, we report the equity gap. More precisely, the input gap is the absolute difference between the optimum input allocation and chosen input allocation, expressed in percentage of the optimum allocation. The output gap is the difference between the maximum achievable output and the chosen output, expressed as a percentage of the maximum output. The equality gap is the absolute difference between equal sharing of joint income and the chosen sharing, expressed as a share of joint income.

Table 2. Input allocation choice						
	Game 1	**Game 2**	**Game 3**	**Game 4**	**Game 5**	**All**
x* (optimal input allocation)	0.728***	0.640***	0.461***	0.477***	0.457***	0.647***
	(0.0359)	(0.0539)	(0.0884)	(0.122)	(0.0805)	(0.0315)
m (initial input endowment)	0.0443**	0.0369*	0.00478	0.0671**	0.121***	0.0526***
	(0.0171)	(0.0190)	(0.0228)	(0.0268)	(0.0325)	(0.0113)
x~ (input allocation maximizing own output)	-0.00140	0.168***	0.194***	0.114	0.0831	0.0864***
	(0.0380)	(0.0465)	(0.0566)	(0.0931)	(0.0644)	(0.0225)
Dummy if game order =2						4.278***
						(1.085)
Dummy if game order =3						2.551**
						(1.082)
Dummy if game order =4						1.767
						(1.150)
Dummy if game order =5						0.671
						(1.106)
Dummy if game 6		-2.137			-3.042	-1.498
		(1.902)			(2.849)	(1.497)
Dummy if round=2		-2.728	0.411	-1.322	4.067**	0.936
		(1.691)	(2.388)	(2.890)	(1.992)	(1.064)
Dummy if round=3	4.431**	-4.967***	-1.557	-0.777	1.197	-0.156
	(2.165)	(1.515)	(1.875)	(2.770)	(2.341)	(0.986)
Constant	11.25***	10.49***	15.18***	17.60***	14.36***	8.907***
	(3.059)	(2.338)	(2.981)	(3.925)	(5.228)	(1.735)
Observations	480	649	240	240	311	1,920
R-squared	0.732	0.530	0.526	0.359	0.276	0.529

Notes: The dependent variable is the quantity of input allocated by the decider to his/her own activity. Each column corresponds to a separate regression, estimated using all available observations for a particular game. Single corresponds to the single player game G1; there are two observations per player pair since the game is played individually, and three rounds, hence a total number of observations of 160x3=480. The ultimatum and trust games are all played in pairs over three rounds, for a total of 240 observations. In the dictator game played on its own, both players make a selection, producing 480 observations. To these are added the dictator games that are played as part of Game 6. In this case, only one player makes a selection, hence the odd number of additional observations. The number of observations for the negotiation game similarly combines 240 observations of Game 5 played on its own, and 71 as a result of Game 6. For the dictator and negotiation games, we include a Game 6 dummy to capture possible differences due to game self-selection. Similar results are obtained if observations from Game 6 are omitted. Robust standard errors are reported in parentheses *** p<0.01, ** p<0.05, * p<0.1

Game 1: single subject game. Game 2: one subject allocates inputs and income, other subject is passive. Game 3: one subject allocates inputs and income, other subject can reject or accept. Game 4: one subject allocates inputs, other subject distributes income. Game 5: subjects take turns making offers and counter-offers on input allocation and income division until an offer is accepted, or N=6.

Table 3. Joint surplus decision						
	Game 1	**Game 2**	**Game 3**	**Game 4**	**Game 5**	**All**
Joint surplus with:						
optimal intput allocation	1.145***	0.917***	1.063***	1.134***	0.686***	1.023***
	(0.0461)	(0.0500)	(0.0308)	(0.0815)	(0.211)	(0.0249)
initial input endowment	0.0315***	0.0473**	-0.0164	-0.00969	0.113***	0.0318***
	(0.00990)	(0.0200)	(0.0102)	(0.0266)	(0.0408)	(0.0107)
maximizing own output	-0.00624	0.146***	0.0896*	-0.0139	-0.188	0.0657***
	(0.0366)	(0.0396)	(0.0504)	(0.0819)	(0.114)	(0.0229)
Dummy if game order =2						-5.118***
						(0.920)
Dummy if game order =3						-2.503***
						(0.859)
Dummy if game order =4						-6.588***
						(1.613)
Dummy if game order =5						-6.216***
						(1.316)
Dummy if game 6		1.107			-0.723	2.268**
		(1.242)			(2.284)	(0.942)
Dummy if round=2	6.216***	1.966*	2.569	-2.410	-2.593	1.304*
	(1.653)	(1.047)	(1.616)	(2.828)	(2.167)	(0.731)
Dummy if round=3		1.046	3.529***	-5.764*	-2.676	0.114
		(1.064)	(1.191)	(3.041)	(2.075)	(0.744)
Constant	-23.26***	-16.27***	-22.11***	-20.33*	47.93	-14.53***
	(3.804)	(6.171)	(6.009)	(10.79)	(38.78)	(2.909)
Observations	480	649	240	240	311	1,920
R-squared	0.763	0.590	0.825	0.354	0.199	0.615

Notes: The dependent variable is the joint surplus resulting of the input allocation chosen by the decision maker. Each column corresponds to a separate regression, estimated using all available observations for a particular game. Single corresponds to the single player game G1; there are two observations per player pair since the game is played individually, and three rounds, hence a total number of observations of 160x3=480. The ultimatum and trust games are all played in pairs over three rounds, for a total of 240 observations. In the dictator game played on its own, both players make a selection, producing 480 observations. To these are added the dictator games that are played as part of Game 6. In this case, only one player makes a selection, hence the odd number of additional observations. The number of observations for the negotiation game similarly combines 240 observations of Game 5 played on its own, and 71 as a result of Game 6. Similar results are obtained if observations from Game 6 are omitted. Robust standard errors are reported in parentheses ***

Game 1: single subject game. Game 2: one subject allocates inputs and income, other subject is passive. Game 3: one subject allocates inputs and income, other subject can reject or accept. Game 4: one subject allocates inputs, other subject distributes income. Game 5: subjects take turns making offers and counter-offers on input allocation and income division until an offer is accepted, or N=6.

Table 4. Division of joint surplus						
	Game 2	**Game 3**	**Game 4**	**Game 5**	**All**	**All with FE**
Share of output						
with initial input endowment	-0.0412*	0.0458*	0.0566	0.0678***	0.0163	0.0227
	(0.0231)	(0.0256)	(0.0511)	(0.0228)	(0.0152)	(0.0149)
from own realized output	0.147***	0.327***	0.0825	0.395***	0.192***	0.200***
	(0.0427)	(0.0696)	(0.0869)	(0.0712)	(0.0330)	(0.0305)
Dummy if game order =3					-0.200***	-0.200***
					(0.0157)	(0.0153)
Dummy if game order =4					-0.0136	-0.0227
					(0.0180)	(0.0166)
Dummy if game order =5					-0.291***	-0.291***
					(0.0157)	(0.0153)
Dummy if game 6	0.118***			0.00406	0.0797***	0.0768***
	(0.0178)			(0.0175)	(0.0140)	(0.0137)
Dummy if round=2	0.0221	0.0105	0.0447	-0.0127	0.0146	0.0136
	(0.0148)	(0.0183)	(0.0325)	(0.0127)	(0.00918)	(0.00977)
Dummy if round=3	0.0315**	0.0323*	0.0613*	0.0123	0.0335***	0.0344***
	(0.0158)	(0.0189)	(0.0354)	(0.0166)	(0.0100)	(0.00982)
Constant	0.711***	0.388***	0.668***	0.283***	0.670***	0.665***
	(0.0341)	(0.0381)	(0.0521)	(0.0415)	(0.0267)	(0.0203)
Observations	649	240	239	311	1,439	1,439
R-squared	0.078	0.219	0.027	0.369	0.336	0.426
Number of subjects						160

Notes: The dependent variable is the share of the joint surplus assigned to himself/herself by the decision maker. Each column corresponds to a separate regression, estimated using all available observations for a particular game. Single corresponds to the single player game G1; there are two observations per player pair since the game is played individually, and three rounds, hence a total number of observations of 160x3=480. The ultimatum and trust games are all played in pairs over three rounds, for a total of 240 observations. In the dictator game played on its own, both players make a selection, producing 480 observations. To these are added the dictator games that are played as part of Game 6. In this case, only one player makes a selection, hence the odd number of additional observations. The number of observations for the negotiation game similarly combines 240 observations of Game 5 played on its own, and 71 as a result of Game 6. Similar results are obtained if observations from Game 6 are omitted. Robust standard errors are reported in parentheses ***

Game 2: one subject allocates inputs and income, other subject is passive. Game 3: one subject allocates inputs and income, other subject can reject or accept. Game 4: one subject allocates inputs, other subject distributes income. Game 5: subjects take turns making offers and counter-offers on input allocation and income division until an offer is accepted, or N=6.

Table 5. Acceptance of offers in games with veto power or negotiation

	Game 3	Game 5			
		First offer	Second offer	Third offer	Fourth offer
Income share assigned to	0.415***	0.901**	0.312	0.963**	-26.85
the player receiving the offer	(0.0845)	(0.376)	(0.528)	(0.424)	(116.6)
Outputof offer recipient as share of joint	0.114**	0.119	0.141	-0.135	-0.241
income, minus offered income share	(0.0553)	(0.0784)	(0.147)	(0.261)	(0.939)
Absolute difference from optimal	0.0581	-0.189	0.281	-0.718	-3.633*
input allocation	(0.0840)	(0.240)	(0.357)	(0.710)	(1.900)
Absolute difference from equal	-0.691***	-1.194***	-1.600***	0.268	-26.03
input shares	(0.129)	(0.404)	(0.573)	(0.587)	(117.4)
Dummy for round==2	-0.112***	-0.0700	0.141	-0.180	-0.819**
	(0.0401)	(0.0547)	(0.134)	(0.193)	(0.327)
Dummy for round==3	-0.0916**	-0.101*	0.199	-0.0976	-0.280
	(0.0420)	(0.0592)	(0.126)	(0.219)	(0.493)
Constant	0.879***	0.452**	0.395	0.441	14.63
	(0.0417)	(0.194)	(0.298)	(0.293)	(58.98)
Observations	240	285	87	36	12
R-squared	0.228	0.277	0.205	0.182	0.495

Notes: Each column is a different linear probability model estimated using OLS. In the ultimatum game, the dependent variable is 1 if the second mover accepts the income share offered by the first mover. In the negotiation games, there are up to 6 rounds of offers and counter-offers -- only four of which have enough observations to estimate a regression. For each round, the dependent variable is 1 if the offer made is accepted by the other player, and 0 otherwise. Robust standard errors are reported in parentheses *** p<0.01, ** p<0.05, * p<0.1 Game 3: one subject allocates inputs and income, other subject can reject or accept. Game 5: subjects take turns making offers and counter-offers on input allocation and income division until an offer is accepted, or N=6.

Table 6. Choice of agency structure in Game 6

	Subject chooses to:		
	Pay to decide	**Negotiate**	**Be paid to delegate**
Price p	-0.525***	-0.0625	0.587***
	(0.0450)	(0.0498)	(0.0486)
Subject's average self-assigned payoff in Game 2	0.0480	-0.0289	-0.0191
	(0.0570)	(0.0631)	(0.0616)
Subject's average payoff received from assigned partner in Game 2	-0.0350	0.00627	0.0288
	(0.0678)	(0.0750)	(0.0732)
Subject's average payoff in Game 5	-0.143	0.232*	-0.0885
	(0.114)	(0.126)	(0.123)
Constant	0.935***	0.0813	-0.0164
	(0.206)	(0.227)	(0.222)
Observations	480	480	480
R-squared	0.231	0.011	0.238

Notes: Each column is a different linear probability model estimated using OLS. 'Pay to decide' means choosing to pay price p in order to be the decision maker in Game 2. 'Be paid to delegate' means choosing to receive price p in order to be the passive player in Game 2. 'Negotiate' means choosing to play Game 5 with a randomly assigned first mover. The subject's average payoffs are calculated over the three games that the subject played in previous rounds of the same session. As explained in the text, each subject plays

Online Appendix

Appendix A. Details of the experimental design

Production function parameters and input endowments

In Table A1 we show the different parameter sets used for the production functions of individuals i and j. We use both linear and quadratic production functions. With linear production function, the efficient input allocation is a corner solution; with a quadratic production function, the efficient input allocation is an interior solution.

Formally, let I_i and I_j be the income from plots i and j, respectively. Similarly let F_i and F_j be the fertilizer amounts used on plots i and j, respectively. The two linear production functions on plots i and j are of the simple form $I_k = \beta_k F_k$ for $k = \{i, j\}$. If $\beta_i > \beta_j$ the marginal productivity on plot i is higher than on j and all the fertilizer should be used on plot i. Two parameter sets, named PF1 and PF2 in Table A1, define the linear production functions used in the experiment: (i) $\beta_i = 0.5$ and $\beta_j = 1$; (ii) $\beta_i = 1$ and $\beta_j = 0.5$. The quadratic production functions are of the form $I_k = \beta_{1k} F_k + \beta_{2k} F_k^2$ for $k = \{i, j\}$. Decreasing marginal returns requires $\beta_{2k} < 0$ for $k = \{i, j\}$. We use 15 different parameter sets, numbered PF3 to PF17, with quadratic production functions for both i and j.

We normalize the total input endowment to be 100 units in all games. The input share m_i initially assigned to player i takes five possible values: 0, 20, 50, 80 and 100. The input share m_j assigned to player j is simply $100 - m_i$. The cross-combination of 5 input endowments and 17 parameter sets define 85 possible parameter vectors, shown in Table A2. All 85 combinations are used in the experiment, randomized across sessions, games, and player pairs.

Game sequencing and randomization

Each of the six possible games is played three times by each subject. Game 1 is a single decision player game and is played three times by each subject individually at the beginning of the session. This serves to ensure that all subjects understand the general structure of the player interface, and the consequence of their choices on their own payoff. Games 5 (negotiation game) and 6 (choice game) are always played in fifth and sixth position, respectively. The order of the three other games 2, 3 and 4 is block randomized across sessions.

In Game 2, each subject plays the dictator version of the game and we pick one of them at random to determine final payoffs. In Games 3 to 6, one subjects plays first and the other follows. For instance, in Game 3 (ultimatum) the first player allocates all inputs and output and the second player can accept or reject; in Game 4 (trust game), the first player allocations all inputs and the second player allocates incomes; in Game 5 (negotiation), the first player proposes first and the second player either accepts or rejects; if the second player rejects, he/she then makes a counter-offer that the fist player can then accept or reject; and so on until the number of allowed negotiation rounds is reached. In Game 6, the first player selects the type of decision-making environment (self-dictator, other-dictator, or negotiation game). The second player then adjusts to the choice made by the first player. For instance, if the first player opts for self-dictator, the second player does nothing; if the first player opts for other-dictator, the second player takes the role of dictator; if the first player chooses to play the negotiation game, the identity of the first mover is randomly drawn and the two subjects play negotiation game 5.

Each subject plays each of the six games three times in a row, each time with a different partner. As shown in Table A3, we vary the gender pairings for games 2 to 6 between same-sex pairings (denoted SS) and other-sex pairings (denoted OS). For a given number of subjects in a session, there is by definition one more feasible other-sex pairing than the number of feasible same-sex pairings. The distribution of games OS and SS for each player in a session is:

	SS	OS
G2	1	2
G3	2	1
G4	1	2
G5	2	1
G6	1	2
All	7	8

To summarize, in each session each subject plays 18 rounds, three rounds for each game, three of these played alone and the others matched with another subject of the same (SS) or opposite (OS). The order of same-sex and other-sex pairings is randomized across sessions. Table A4 shows the game sequence and sex pairings for all the sessions of the experiment.

Tables for Online Appendix A

Table A1. Parameter sets of the production function used in the experiment

Parameter set	β_{1i}	β_{2i}	β_{1j}	β_{2j}
PF1	0.5	0	1	0
PF2	1	0	0.5	0
PF3	2	-0.02	2	-0.02
PF4	2	-0.01	2	-0.02
PF5	2	-0.02	2	-0.01
PF6	2	-0.01	2	-0.019
PF7	2	-0.019	2	-0.01
PF8	2.1	-0.01	2	-0.02
PF9	2	-0.02	2.1	-0.01
PF10	2.1	-0.02	2	-0.01
PF11	2	-0.01	2.1	-0.02
PF12	1.9	-0.01	2	-0.01
PF13	2	-0.01	1.9	-0.01
PF14	1.9	-0.015	2	-0.01
PF15	2	-0.01	1.9	-0.015
PF16	1.35	-0.001	1.2	-0.001
PF17	1.2	-0.001	1.35	-0.001

Notes: PF stands for 'Production Function'. We use 17 different production functions in the experiment. The first two are linear, the other 15 are quadratic. The first two parameters define the production function for the activity assigned to individual i while the last two columns give the parameters of the production function assigned to individual j.

Table A2. Combinations of endowment vectors and parameter sets used in the experiment

Type of production function	Parameter set of the production function	Input endowment				
		0	**20**	**50**	**80**	**100**
linear	**PF1**	PF1(0)	PF1(20)	PF1(50)	PF1(80)	PF1(100)
linear	**PF2**	PF2(0)	PF2(20)	PF2(50)	PF2(80)	PF2(100)
quadratic	**PF3**	PF3(0)	PF3(20)	PF3(50)	PF3(80)	PF3(100)
quadratic	**PF4**	PF4(0)	PF4(20)	PF4(50)	PF4(80)	PF4(100)
quadratic	**PF5**	PF5(0)	PF5(20)	PF5(50)	PF5(80)	PF5(100)
quadratic	**PF6**	PF6(0)	PF6(20)	PF6(50)	PF6(80)	PF6(100)
quadratic	**PF7**	PF7(0)	PF7(20)	PF7(50)	PF7(80)	PF7(100)
quadratic	**PF8**	PF8(0)	PF8(20)	PF8(50)	PF8(80)	PF8(100)
quadratic	**PF9**	PF9(0)	PF9(20)	PF9(50)	PF9(80)	PF9(100)
quadratic	**PF10**	PF10(0)	PF10(20)	PF10(50)	PF10(80)	PF10(100)
quadratic	**PF11**	PF11(0)	PF11(20)	PF11(50)	PF11(80)	PF11(100)
quadratic	**PF12**	PF12(0)	PF12(20)	PF12(50)	PF12(80)	PF12(100)
quadratic	**PF13**	PF13(0)	PF13(20)	PF13(50)	PF13(80)	PF13(100)
quadratic	**PF14**	PF14(0)	PF14(20)	PF14(50)	PF14(80)	PF14(100)
quadratic	**PF15**	PF15(0)	PF15(20)	PF15(50)	PF15(80)	PF15(100)
quadratic	**PF16**	PF16(0)	PF16(20)	PF16(50)	PF16(80)	PF16(100)
quadratic	**PF17**	PF17(0)	PF17(20)	PF17(50)	PF17(80)	PF17(100)

Notes: PF stands for the parameter vector of the production functions defined in Table A1. The reported input endowment is the initial endowment of player i in pair ij. The initial endowment of player j is 100 minus the initial endowment of player i.

Table A3. Gender pairings used in the experiment

Sample composition:		8 males								8 females								Pairing
		group of 4				group of 4				group of 4				group of 4				type
	Number assigned to subject	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	
Pairing #	Permutation with:																	
1	with second next group of 4	1	9	2	10	3	11	4	12	5	13	6	14	7	15	8	16	OS
2	within own group	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	SS
3	with second next group of 4	1	10	2	9	3	12	4	11	5	14	6	13	7	16	8	15	OS
4	within own group	1	3	2	4	5	7	6	8	9	11	10	12	13	15	14	16	SS
5	with second next group of 4	1	11	2	12	3	9	4	10	5	15	6	16	7	13	8	14	OS
6	within own group	1	4	2	3	5	8	6	7	9	12	10	11	13	16	14	15	SS
7	with second next group of 4	1	12	2	11	3	10	4	9	5	16	6	15	7	14	8	13	OS
8	with next group of 4	1	5	2	6	3	7	4	8	9	13	10	14	11	15	12	16	SS
9	with third group of four	1	13	2	14	3	15	4	16	5	9	6	10	7	11	8	12	OS
10	with next group of 4	1	6	2	5	3	8	4	7	9	14	10	13	11	16	12	15	SS
11	with third group of four	1	14	2	13	3	16	4	15	5	10	6	9	7	12	8	11	OS
12	with next group of 4	1	7	2	8	3	5	4	6	9	15	10	16	11	13	12	14	SS
13	with third group of four	1	15	2	16	3	13	4	14	5	11	6	12	7	9	8	10	OS
14	with next group of 4	1	8	2	7	3	6	4	5	9	16	10	15	11	14	12	13	SS
15	with third group of four	1	16	2	15	3	14	4	13	5	12	6	11	7	10	8	9	OS

Note: This Table shows the 15 different pairings of subjects used in each session -- e.g., in the first pairing, subject 1 is assigned subject 9 as partner, subject 2 is assigned subject 10, etc. Given that each session has 8 male and 8 female subjects, there exist exactly 15 pairings satisfying the requirement that each subject is matched exactly once with each of the other subjects. Of these 15 possible pairings, 8 are with a person of the other sex (OS) and 7 with a person of the same sex (SS). The order in which these pairings are played vary in each session, as shown in Table A4.

Table A4. Game sequencing used in each of the sessions

Game sequence	Session 1		Session 2		Session 3		Session 4		Session 5		Session 6		Session 7		Session 8		Session 9		Session 10	
	Game	*Pair*	*Game*	*Pair*	Game	*Pair*	Game	*Pair*	Game	*Pair*	Game	*Pair*	Game	*Pair*	Game	*Pair*	Game	*Pair*	Game	*Pair*
1	G1	.	G1	.	G1	.	G1	.	G1	.	G1	.	G1	.	G1	.	G1	.	G1	.
2	G1	.	G1	.	G1	.	G1	.	G1	.	G1	.	G1	.	G1	.	G1	.	G1	.
3	G1	.	G1	.	G1	.	G1	.	G1	.	G1	.	G1	.	G1	.	G1	.	G1	.
4	G2	SS	G3	SS	G4	SS	G2	SS	G3	SS	G4	SS	G2	OS	G3	OS	G4	OS	G2	OS
5	G2	OS	G3	SS	G4	OS	G2	OS	G3	SS	G4	OS	G2	OS	G3	SS	G4	OS	G2	OS
6	G2	OS	G3	OS	G4	OS	G2	OS	G3	OS	G4	OS	G2	SS	G3	SS	G4	SS	G2	SS
7	G3	SS	G4	SS	G2	SS	G4	SS	G2	SS	G3	SS	G3	OS	G4	OS	G2	OS	G4	OS
8	G3	SS	G4	OS	G2	OS	G4	OS	G2	OS	G3	SS	G3	SS	G4	OS	G2	OS	G4	OS
9	G3	OS	G4	OS	G2	OS	G4	OS	G2	OS	G3	OS	G3	SS	G4	SS	G2	SS	G4	SS
10	G4	SS	G2	SS	G3	SS	G3	SS	G4	SS	G2	SS	G4	OS	G2	OS	G3	OS	G3	OS
11	G4	OS	G2	OS	G3	SS	G3	SS	G4	OS	G2	OS	G4	OS	G2	OS	G3	SS	G3	SS
12	G4	OS	G2	OS	G3	OS	G3	OS	G4	OS	G2	OS	G4	SS	G2	SS	G3	SS	G3	SS
13	G5	SS	G5	SS	G5	SS	G5	SS	G5	SS	G5	SS	G5	OS	G5	OS	G5	OS	G5	OS
14	G5	SS	G5	SS	G5	SS	G5	SS	G5	SS	G5	SS	G5	SS	G5	SS	G5	SS	G5	SS
15	G5	OS	G5	OS	G5	OS	G5	OS	G5	OS	G5	OS	G5	SS	G5	SS	G5	SS	G5	SS
16	G6	SS	G6	SS	G6	SS	G6	SS	G6	SS	G6	SS	G6	OS	G6	OS	G6	OS	G6	OS
17	G6	OS	G6	OS	G6	OS	G6	OS	G6	OS	G6	OS	G6	OS	G6	OS	G6	OS	G6	OS
18	G6	OS	G6	OS	G6	OS	G6	OS	G6	OS	G6	OS	G6	SS	G6	SS	G6	SS	G6	SS

Notes: Game sequence is the order in which games are played in each session. G1 denotes game 1, G2 is game 2, etc. The column titled 'pair' shows the gender pairings: SS means same-sex pairings while OS means other-sex pairings. The value is missing for Game 1 since that game is played individually. Game 5 in period 14 is always with a same-sex partner while Game 6 in period 17 is always with an opposite-sex partner.

Appendix B: Detailed analysis by gender pairings

We first examine whether gender pairings affect the extent to which input choices x_{it} track: (1) the optimal input allocation x^*_{ik}; (2) the initial input endowment m_{ik}; and (3) the input allocation $\widetilde{x}_{ik}$ that maximizes own output. Put differently, we estimate regression model (3) separately for each gender pairing. Detailed regression results are provided in Appendix Table B4 and summarized here with graphs. In Figure B1 we show the estimated coefficients of x^*_{ik} (efficiency), m_{ik} (endowment); and $\widetilde{x}_{ik}$ (own output maximum) separately for each gender pairing, averaged over all games. The whiskers show one standard error each side of the estimated coefficient.[14] We see that, as already noted in Table 2, subjects put most weight on the optimal input allocation, less weight on their initial endowment. The input allocation that would maximize own output occupies an intermediate position. These effects tend to be statistically significant for all gender pairings, with a couple exceptions. In general, mixed gender pairings are more influenced by the efficient input allocation than single gender pairings, while single gender pairings track more closely the input allocation that maximizes the output of their assigned production.

In Figure B2 we display the variation of the coefficient of the efficient allocation x^*_{ik} by gender across the four games. We see that the tendency for mixed gender pairs to better track x^*_{ik} is strongest in Games 2 and 3. For mixed gender pairs in Games 4 and 5, female subjects track x^*_{ik} more than male subjects. These point estimate differences are not generally significant statistically, however.

In Figure B3 we show in the same manner the coefficient of input endowment m_{ik} for each of the four games. We see that, in general, subjects tend to ignore their input endowment when deciding x_{ik} – except in Games 4 and 5, where it plays a significant role in some of the gender pairings. In particular, women matched with a man in Game 4 tend to select an input allocation that partly reflects their initial endowment – possibly staking a claim on the output of their assigned production. Similarly, in Game 5, three of the four gender pairings show a significant emphasis put on input endowments, again suggesting that initial endowments affect the outcome of the negotiation game.

Figure B4 shows the same thing for the coefficient of $\widetilde{x}_{ik}$, that is, the input allocation that maximizes own production. While there is considerable commonality across games and pairings, we note that in Games 4 and 5, female subjects put a significantly different emphasis on $\widetilde{x}_{ik}$ depending on whether they are paired with a man (little emphasis) or a woman (more emphasis). In those two games, female subjects paired with a man track more closely efficiency and input endowments, and less own production, than when matched with another woman.

Next, we turn to aggregate efficiency y_k and we replicate regression (4) separately for each gender pairings. The three regressors of interest are the maximum output y^*_k, the output y^m_{ik} produced by the decision maker i with his/her initial input endowment; and the aggregate output y^q_k when decision maker i maximizes his/her own production. Detailed estimates are reported in Appendix Table B5. Coefficient estimates for the pooled regression are plotted in Figure B5.

[14] This is achieved by showing the coefficient plus and minus its estimated standard error.

We see that, across games, the coefficients do not vary massively by gender pairing: as in Table 3, subjects closely track the maximum achievable output – and in general avoid the allocation that maximizes their own output. The output from one's initial input endowment y^m_{ik} only plays a subsidiary role, although it is significant at the 10% level or better in two of the gender pairings. Coefficient estimates are shown for each game in Figures B6 to B8 for y^*_k, y^m_{ik}, and y^q_k, respectively. In line with what we documented earlier, we find in Figure B6 that more emphasis is put on efficiency in mixed gender pairings than in female-only pairings. In Figure B7 we see that female subjects matched with a man tend to distort aggregate output in the direction of their initial endowment in Games 2 and 3. From Figure B8 we conclude that female-female pairs are more likely to distort output in the direction of their own maximum output in all games, and significantly so in three out of four. This again confirms earlier findings.

The last set of gender comparisons focuses on income sharing. Here, as in Table 4 and regression model (6), we only have two regressors of interest: z^m_{ik}, the share of aggregate production corresponding to initial input endowments; and z^q_{ik}, the share of aggregate output realized from the production activity assigned to the decision maker. Detailed estimates can be found in Appendix Table B6. In Figure B9 we show the coefficient estimates of z^m_{ik} and z^q_{ik}. As already noted in Table 4, subjects alter the allocation of income to partially reflect the share of their assigned activity in aggregate production – with little difference across gender pairs. Endowment income does affect income sharing, particularly when the decision maker is male. Figure B10 shows considerable variation in the coefficient of endowment income z^m_{ik} across games and gender pairings. There isn't any discernible pattern, however. A more systematic pattern is apparent in Figure B11, where we see that income sharing puts most weight on own realized output z^q_{ik} in Game 4, and least in Game 5. This confirms what we have noted earlier, namely, that Game 5 is less affected by endowment effects and more likely to converge to an equitable sharing outcome.

Tables and Figures for Online Appendix B

Table B1.Input allocation choice, by gender pairing

	Game 1	Game 2	Game 3	Game 4	Game 5	Games2-5
Female-male dummy		1.275	0.0402	-2.946	-1.163	-0.758
		(2.309)	(2.814)	(3.621)	(2.889)	(1.353)
Male-female pair dummy		1.732	2.599	-7.041**	0.270	-1.194
		(2.345)	(2.316)	(3.546)	(3.052)	(1.414)
Female-female pair dummy	2.372* (#)	2.871	-0.325	-2.048	-0.337	0.595
	(1.262)	(2.445)	(2.079)	(4.133)	(2.271)	(1.411)
x* (optimal input allocation)	0.728***	0.640***	0.450***	0.464***	0.460***	0.570***
	(0.0357)	(0.0542)	(0.0904)	(0.120)	(0.0816)	(0.0410)
m (initial input endowment)	0.0399**	0.0368*	0.00287	0.0655**	0.122***	0.0558***
	(0.0174)	(0.0190)	(0.0229)	(0.0264)	(0.0331)	(0.0128)
x~ (input allocation maximizing	-0.00205	0.169***	0.198***	0.129	0.0817	0.130***
own output)	(0.0380)	(0.0494)	(0.0577)	(0.0928)	(0.0651)	(0.0310)
Dummy if game order =3						-2.040*
						(1.229)
Dummy if game order =4						-2.283**
						(1.151)
Dummy if game order =5						-4.127***
						(1.258)
Dummy if game 6		-2.106			-3.006	-2.071
		(1.922)			(3.130)	(1.550)
Dummy if round=2		-2.757	1.083	0.854	4.008*	-0.0671
		(1.887)	(2.657)	(3.033)	(2.093)	(1.106)
Dummy if round=3	4.447**	-4.974***	-1.751	-0.162	1.384	-2.135*
	(2.161)	(1.563)	(1.834)	(2.784)	(2.375)	(1.102)
Constant	10.36***	8.916***	15.07***	19.84***	14.54**	14.85***
	(3.031)	(2.880)	(3.399)	(4.736)	(5.573)	(2.079)
Observations	480	649	240	240	311	1,440
R-squared	0.734	0.531	0.529	0.372	0.277	0.450

Notes: (#) Female dummy. In all regressions, the dependent variable is the quantity of input allocated by the decider to his/her own activity. Each column corresponds to a separate regression, estimated using all available observations for a particular game. Single corresponds to the single player game G1; there are two observations per player pair since the game is played individually, and three rounds, hence a total number of observations of 160x3=480. The ultimatum and trust games are all played in pairs over three rounds, for a total of 240 observations. In the dictator game played on its own, both players make a selection, producing 480 observations. To these are added the dictator games that are played as part of Game 6. In this case, only one player makes a selection, hence the odd number of additional observations. The number of observations for the negotiation game similarly combines 240 observations of Game 5 played on its own, and 71 as a result of Game 6. For the dictator and negotiation games, we include a Game 6 dummy to capture possible differences due to game self-selection. Similar results are obtained if observations from Game 6 are omitted. The omitted gender pairing is male-male. In Game 1 (individual play), the coefficient of the female dummy is reported on the female-female pairing line. Robust standard errors are reported in parentheses *** p<0.01, ** p<0.05, * p<0.1

Game 1: single subject game. Game 2: one subject allocates inputs and income, other subject is passive. Game 3: one subject allocates inputs and income, other subject can reject or accept. Game 4: one subject allocates inputs, other subject distributes income. Game 5: subjects take turns making offers and counter-offers on input allocation and income division until an offer is accepted, or N=6.

Table B2. Joint surplus decision, by gender pairing						
	Game 1	**Game 2**	**Game 3**	**Game 4**	**Game 5**	**Games2-5**
Female-male dummy		-0.976	-1.509	3.620	3.775	1.102
		(1.359)	(1.771)	(4.733)	(3.122)	(1.101)
Male-female pair dummy		-2.366	-0.0655	-0.649	0.0370	-0.630
		(1.720)	(1.679)	(4.336)	(3.038)	(1.270)
Female-female pair dummy	0.617	-0.899	-0.138	0.145	2.451	0.362
	(1.014)	(1.516)	(1.428)	(5.002)	(2.235)	(1.247)
Joint surplus with:						
optimal intput allocation	1.146***	0.915***	1.060***	1.140***	0.692***	1.013***
	(0.0461)	(0.0498)	(0.0313)	(0.0828)	(0.217)	(0.0323)
initial input endowment	0.0300***	0.0480**	-0.0171*	-0.00938	0.114***	0.0363***
	(0.00974)	(0.0201)	(0.0103)	(0.0275)	(0.0404)	(0.0132)
maximizing own output	-0.00636	0.147***	0.0950*	-0.0132	-0.189*	0.0730**
	(0.0365)	(0.0411)	(0.0518)	(0.0821)	(0.114)	(0.0301)
Dummy if game order =3						2.662***
						(0.928)
Dummy if game order =4						-1.466
						(1.706)
Dummy if game order =5						-1.036
						(1.096)
Dummy if game 6		0.979			-0.706	2.066**
		(1.206)			(3.010)	(0.960)
Dummy if round=2	6.175***	2.671**	2.307	-3.515	-2.409	0.301
	(1.642)	(1.241)	(1.662)	(4.201)	(2.080)	(0.915)
Dummy if round=3		1.295	3.705***	-6.281*	-3.128	-0.573
		(1.063)	(1.231)	(3.397)	(2.268)	(0.894)
Constant	-23.50***	-15.33**	-21.92***	-21.72*	45.65	-19.15***
	(3.827)	(6.417)	(6.148)	(11.35)	(38.92)	(4.435)
Observations	480	649	240	240	311	1,440
R-squared	0.763	0.592	0.826	0.359	0.207	0.502

Notes: The dependent variable is the joint surplus resulting of the input allocation chosen by the decision maker. Each column corresponds to a separate regression, estimated using all available observations for a particular game. Single corresponds to the single player game G1; there are two observations per player pair since the game is played individually, and three rounds, hence a total number of observations of 160x3=480. The ultimatum and trust games are all played in pairs over three rounds, for a total of 240 observations. In the dictator game played on its own, both players make a selection, producing 480 observations. To these are added the dictator games that are played as part of Game 6. In this case, only one player makes a selection, hence the odd number of additional observations. The number of observations for the negotiation game similarly combines 240 observations of Game 5 played on its own, and 71 as a result of Game 6. Similar results are obtained if observations from Game 6 are omitted. The omitted gender pairing is male-male. In Game 1 (individual play), the coefficient of the female dummy is reported on the female-female pairing line. Robust standard errors are reported in parentheses *** p<0.01, **

Game 1: single subject game. Game 2: one subject allocates inputs and income, other subject is passive. Game 3: one subject allocates inputs and income, other subject can reject or accept. Game 4: one subject allocates inputs, other subject distributes income. Game 5: subjects take turns making offers and counter-offers on input allocation and income division until an offer is accepted, or N=6.

Table B3. Division of joint surplus, by gender pairing					
	Game 2	Game 3	Game 4	Game 5	Games2-5
Female-male dummy	0.0295	-0.0114	0.0942*	-0.00861	0.0179
	(0.0212)	(0.0261)	(0.0497)	(0.0214)	(0.0119)
Male-female pair dummy	-0.00744	-0.0148	0.0292	-0.0212	-0.0134
	(0.0324)	(0.0253)	(0.0489)	(0.0208)	(0.0173)
Female-female pair dummy	-0.0291	-0.0105	0.0791	-0.0203	-0.0103
	(0.0334)	(0.0220)	(0.0526)	(0.0167)	(0.0156)
Share of output					
with initial input endowment	-0.0449*	0.0483*	0.0557	0.0681***	0.0164
	(0.0230)	(0.0264)	(0.0530)	(0.0229)	(0.0152)
from own realized output	0.146***	0.326***	0.0615	0.394***	0.190***
	(0.0425)	(0.0716)	(0.0814)	(0.0715)	(0.0319)
Dummy if game order =3					-0.197***
					(0.0160)
Dummy if game order =4					-0.567***
					(0.0219)
Dummy if game order =5					-0.289***
					(0.0158)
Dummy if game 6	0.117***			0.00749	0.0787***
	(0.0178)			(0.0196)	(0.0140)
Dummy if round=2	0.00531	0.00742	-0.0623	-0.0136	-0.00188
	(0.0161)	(0.0205)	(0.0404)	(0.0140)	(0.00920)
Dummy if round=3	0.0260*	0.0339*	-0.0690*	0.0120	0.0108
	(0.0154)	(0.0185)	(0.0366)	(0.0168)	(0.00956)
Constant	0.719***	0.396***	0.158***	0.296***	0.684***
	(0.0419)	(0.0426)	(0.0577)	(0.0464)	(0.0287)
Observations	649	240	239	311	1,439
R-squared	0.086	0.220	0.050	0.373	0.561

Notes: The dependent variable is the share of the joint surplus assigned to himself/herself by the decision maker. Each column corresponds to a separate regression, estimated using all available observations for a particular game. Single corresponds to the single player game G1; there are two observations per player pair since the game is played individually, and three rounds, hence a total number of observations of 160x3=480. The ultimatum and trust games are all played in pairs over three rounds, for a total of 240 observations. In the dictator game played on its own, both players make a selection, producing 480 observations. To these are added the dictator games that are played as part of Game 6. In this case, only one player makes a selection, hence the odd number of additional observations. The number of observations for the negotiation game similarly combines 240 observations of Game 5 played on its own, and 71 as a result of Game 6. Similar results are obtained if observations from Game 6 are omitted. The omitted gender pairing is male-male. In Game 1 (individual play), the coefficient of the female dummy is reported on the female-female pairing line. Robust standard errors are reported in parentheses *** p<0.01, ** p<0.05, * p<0.1

Game 2: one subject allocates inputs and income, other subject is passive. Game 3: one subject allocates inputs and income, other subject can reject or accept. Game 4: one subject allocates inputs, other subject distributes income. Game 5: subjects take turns making offers and counter-offers on input allocation and income division until an offer is accepted, or N=6.

Table B4. Input allocation choice, interacting tests with gender pairing

	Game 2	Game 3	Game 4	Game 5	Games2-5
x* (optimal input allocation) interacte					
Male-male pair dummy	0.527***	0.455***	0.494**	0.548***	0.512***
	(0.125)	(0.142)	(0.211)	(0.173)	(0.0778)
Female-male dummy	0.694***	0.559**	0.392**	0.312	0.612***
	(0.0791)	(0.246)	(0.173)	(0.231)	(0.0697)
Male-female pair dummy	0.677***	0.568***	0.620***	0.539***	0.636***
	(0.0878)	(0.152)	(0.193)	(0.0996)	(0.0633)
Female-female pair dummy	0.591***	0.371***	0.266	0.404***	0.478***
	(0.107)	(0.142)	(0.271)	(0.0996)	(0.0732)
m (initial input endowment) interacted with:					
Male-male pair dummy	0.0261	-0.0251	0.0355	0.141**	0.0465*
	(0.0427)	(0.0465)	(0.0615)	(0.0693)	(0.0269)
Female-male dummy	0.0278	0.0674	0.0362	0.151**	0.0542***
	(0.0337)	(0.0477)	(0.0371)	(0.0653)	(0.0202)
Male-female pair dummy	0.0296	-0.0117	0.153***	0.136*	0.0612**
	(0.0329)	(0.0350)	(0.0475)	(0.0772)	(0.0236)
Female-female pair dummy	0.0632	-0.00425	0.0513	0.0562	0.0472*
	(0.0396)	(0.0432)	(0.0684)	(0.0439)	(0.0245)
x~ (input allocation maximizing own output) interacted with:					
Male-male pair dummy	0.219**	0.205**	0.202	0.0216	0.172***
	(0.104)	(0.0816)	(0.167)	(0.129)	(0.0552)
Female-male dummy	0.137**	0.0811	0.210*	0.146	0.0983**
	(0.0585)	(0.152)	(0.108)	(0.143)	(0.0453)
Male-female pair dummy	0.154**	0.153	-0.0574	0.0340	0.0753
	(0.0713)	(0.110)	(0.135)	(0.0768)	(0.0466)
Female-female pair dummy	0.202**	0.245**	0.316	0.159**	0.205***
	(0.0917)	(0.0953)	(0.222)	(0.0749)	(0.0589)
Game dummies	na	na	na	na	Yes
Dummy for game 6	Yes	na	na	Yes	Yes
Round dummies	Yes	Yes	Yes	Yes	Yes
Constant	10.51***	15.22***	15.12***	14.08***	14.52***
	(2.580)	(3.045)	(3.983)	(5.392)	(1.863)
Observations	649	240	240	311	1,440
R-squared	0.536	0.542	0.404	0.289	0.455

Notes: The dependent variable is the quantity of input allocated by the decider to his/her own activity. Each column corresponds to a separate regression, estimated using all available observations for a particular game. Single corresponds to the single player game G1; there are two observations per player pair since the game is played individually, and three rounds, hence a total number of observations of 160x3=480. The ultimatum and trust games are all played in pairs over three rounds, for a total of 240 observations. In the dictator game played on its own, both players make a selection, producing 480 observations. To these are added the dictator games that are played as part of Game 6. In this case, only one player makes a selection, hence the odd number of additional observations. The number of observations for the negotiation game similarly combines 240 observations of Game 5 played on its own, and 71 as a result of Game 6. For the dictator and negotiation games, we include a Game 6 dummy to capture possible differences due to game self-selection. Similar results are obtained if observations from Game 6 are omitted. The omitted gender pairing is male-male. In Game 1 (individual play), the coefficient of the female dummy is reported on the female-female pairing line. Robust standard errors are reported in parentheses *** p<0.01, ** p<0.05, * p<0.1

Game 2: one subject allocates inputs and income, other subject is passive. Game 3: one subject allocates inputs and income, other subject can reject or accept. Game 4: one subject allocates inputs, other subject distributes income. Game 5: subjects take turns making offers and counter-offers on input allocation and income division until an offer is accepted, or N=6.

Table B5. Joint surplus decision, interacting tests with gender pairing					
	Game 2	**Game 3**	**Game 4**	**Game 5**	**Games2-5**
Joint surplus with optimal allocation, interacted with:					
Male-male pair dummy	0.983***	1.029***	1.110***	0.765***	1.052***
	(0.0792)	(0.0558)	(0.166)	(0.267)	(0.0448)
Female-male dummy	0.958***	1.158***	1.295***	0.763***	1.064***
	(0.0632)	(0.129)	(0.132)	(0.226)	(0.0513)
Male-female pair dummy	0.848***	1.173***	1.067***	0.655***	0.956***
	(0.0771)	(0.0944)	(0.146)	(0.228)	(0.0494)
Female-female pair dummy	0.866***	1.003***	0.922***	0.739***	0.971***
	(0.0836)	(0.0638)	(0.195)	(0.258)	(0.0489)
Joint surplus with initial input endowment, interacted with:					
Male-male pair dummy	-0.0104	-0.0270**	-0.0489	0.186*	0.0242
	(0.0202)	(0.0125)	(0.0841)	(0.109)	(0.0302)
Female-male dummy	0.0364	-0.0261	-0.0464	0.0316	0.0150
	(0.0260)	(0.0210)	(0.0397)	(0.0668)	(0.0190)
Male-female pair dummy	0.0967**	-0.0433	0.0123	0.199**	0.0681**
	(0.0400)	(0.0304)	(0.0490)	(0.0984)	(0.0263)
Female-female pair dummy	0.0360	0.00627	0.0587	0.0496	0.0398**
	(0.0326)	(0.0194)	(0.0484)	(0.0337)	(0.0171)
Joint surplus when maximizing own output, interacted with:					
Male-male pair dummy	0.129	0.142*	0.0206	-0.334*	0.0345
	(0.0883)	(0.0782)	(0.189)	(0.170)	(0.0575)
Female-male dummy	0.103	-0.0278	-0.164	-0.155	0.0370
	(0.0683)	(0.133)	(0.134)	(0.178)	(0.0474)
Male-female pair dummy	0.168**	-0.0227	0.0246	-0.211	0.104*
	(0.0747)	(0.109)	(0.176)	(0.195)	(0.0559)
Female-female pair dummy	0.217***	0.145*	0.174	-0.148	0.123**
	(0.0740)	(0.0872)	(0.248)	(0.119)	(0.0510)
Game dummies	na	na	na	na	Yes
Dummy for game 6	Yes	na	na	Yes	Yes
Round dummies	Yes	Yes	Yes	Yes	Yes
Constant	-16.43***	-21.97***	-18.54*	43.64	-18.94***
	(6.128)	(6.163)	(10.58)	(42.22)	(4.328)
Observations	649	240	240	311	1,440
R-squared	0.599	0.830	0.370	0.237	0.505

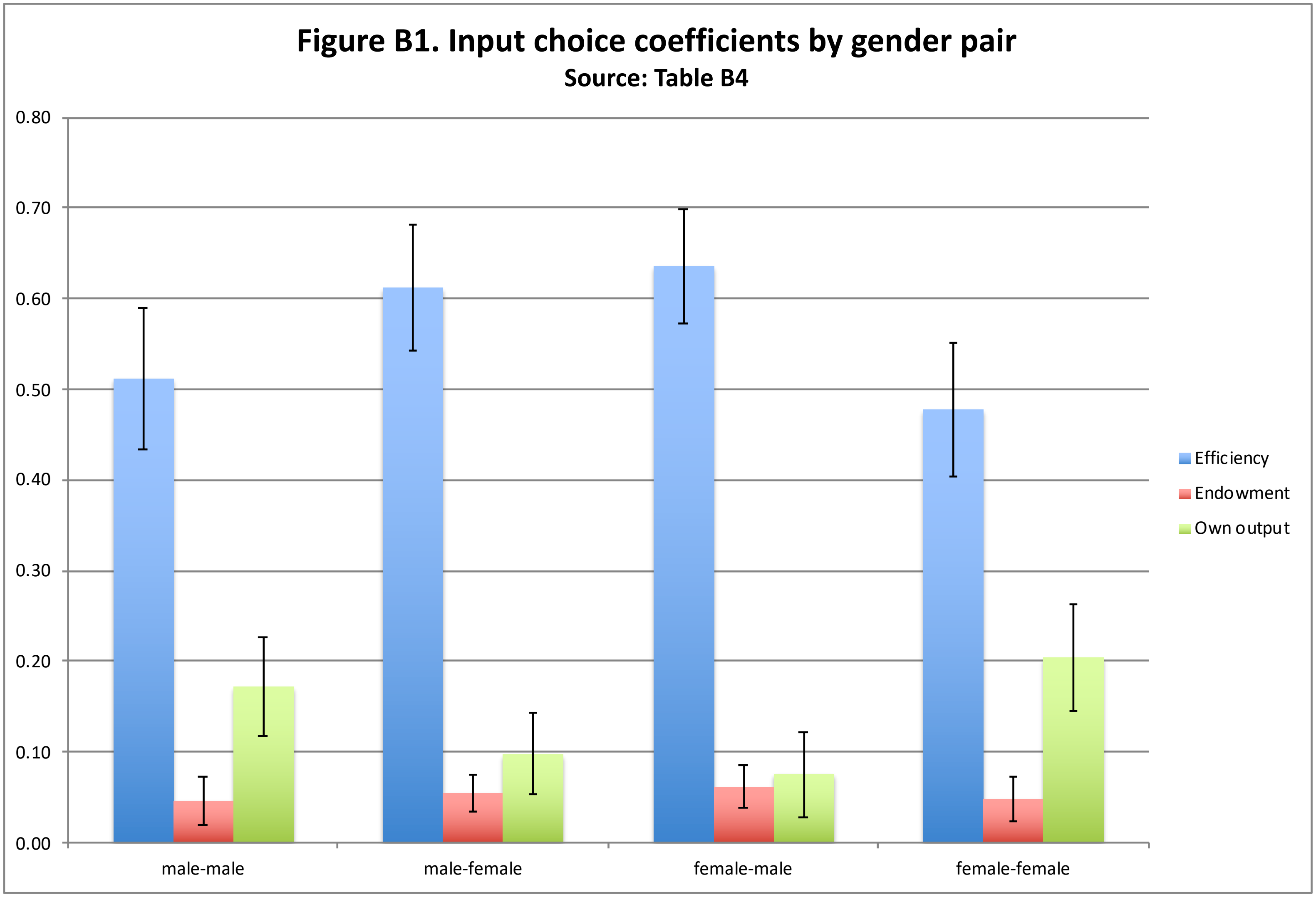
Notes: The dependent variable is the joint surplus resulting of the input allocation chosen by the decision maker. Each column corresponds to a separate regression, estimated using all available observations for a particular game. Single corresponds to the single player game G1; there are two observations per player pair since the game is played individually, and three rounds, hence a total number of observations of 160x3=480. The ultimatum and trust games are all played in pairs over three rounds, for a total of 240 observations. In the dictator game played on its own, both players make a selection, producing 480 observations. To these are added the dictator games that are played as part of Game 6. In this case, only one player makes a selection, hence the odd number of additional observations. The number of observations for the negotiation game similarly combines 240 observations of Game 5 played on its own, and 71 as a result of Game 6. Similar results are obtained if observations from Game 6 are omitted. The omitted gender pairing is male-male. In Game 1 (individual play), the coefficient of the female dummy is reported on the female-female pairing line. Robust standard errors are reported in parentheses *** p<0.01, ** p<0.05, * p<0.1

Game 2: one subject allocates inputs and income, other subject is passive. Game 3: one subject allocates inputs and income, other subject can reject or accept. Game 4: one subject allocates inputs, other subject distributes income. Game 5: subjects take turns making offers and counter-offers on input allocation and income division until an offer is accepted, or N=6.

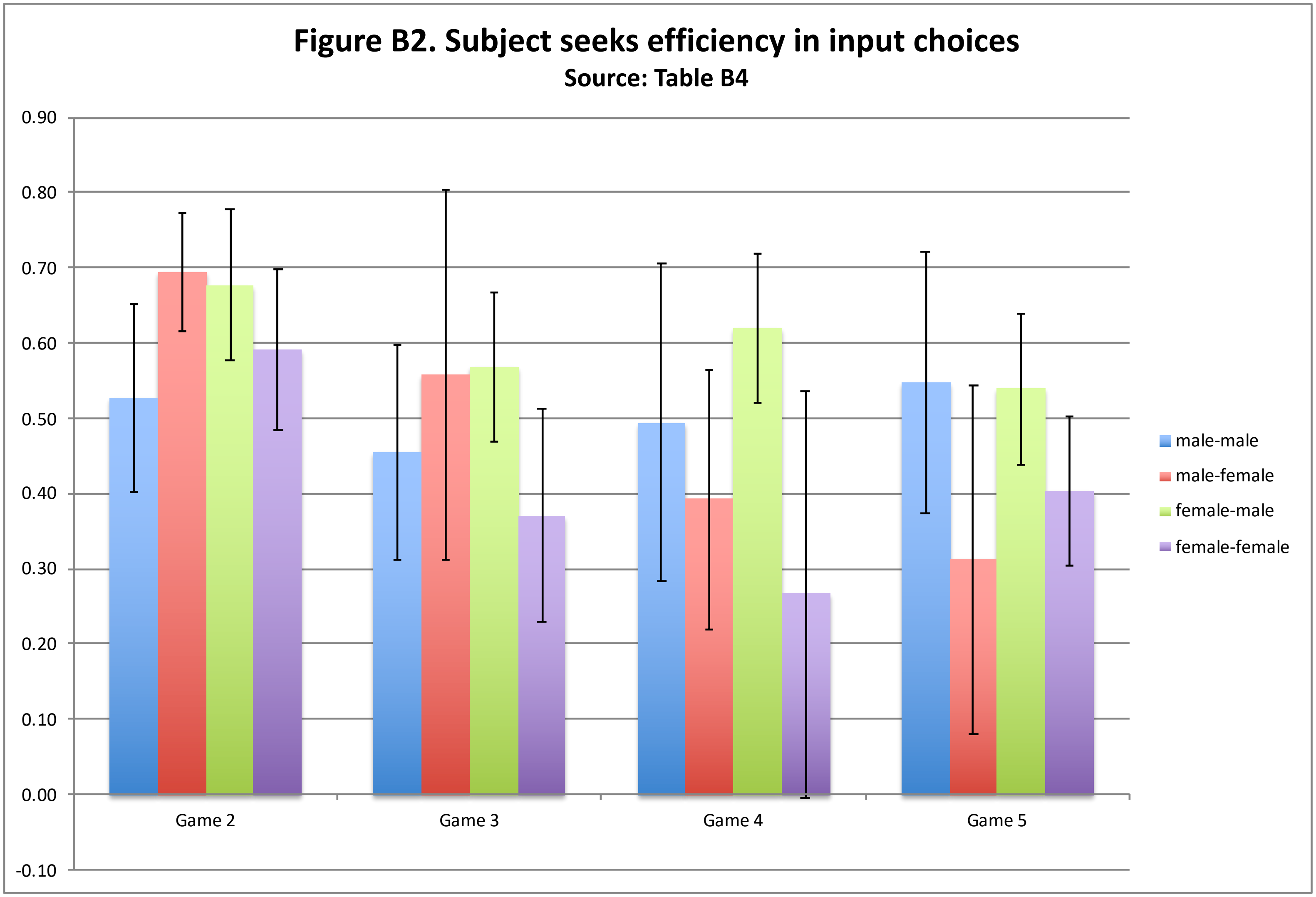
Table B6. Division of joint surplus, interacting tests with gender pairing					
	Game 2	Game 3	Game 4	Game 5	Games2-5
Share of output with initial input endowment, interacted with:					
Male-male pair dummy	-0.0727	0.111***	-0.149	0.0999**	0.00619
	(0.0493)	(0.0411)	(0.0929)	(0.0506)	(0.0319)
Female-male dummy	-0.0216	-0.0985	0.181**	0.105***	0.0437
	(0.0464)	(0.0692)	(0.0730)	(0.0390)	(0.0303)
Male-female pair dummy	-0.00916	0.0156	-0.0275	0.0521*	0.0119
	(0.0466)	(0.0718)	(0.111)	(0.0281)	(0.0301)
Female-female pair dummy	-0.116**	0.0630	0.115	0.0220	-0.00297
	(0.0537)	(0.0533)	(0.101)	(0.0388)	(0.0308)
Share of output from own realized output:					
Male-male pair dummy	0.188***	0.285***	0.126	0.370***	0.209***
	(0.0551)	(0.0740)	(0.143)	(0.0871)	(0.0447)
Female-male dummy	0.166***	0.478***	0.0148	0.361***	0.193***
	(0.0580)	(0.122)	(0.114)	(0.0726)	(0.0432)
Male-female pair dummy	0.101*	0.360***	0.0895	0.413***	0.175***
	(0.0527)	(0.101)	(0.138)	(0.0784)	(0.0419)
Female-female pair dummy	0.149**	0.297***	0.0407	0.432***	0.189***
	(0.0631)	(0.0942)	(0.116)	(0.0882)	(0.0432)
Game dummies	na	na	na	na	Yes
Dummy for game 6	Yes	na	na	Yes	Yes
Round dummies	Yes	Yes	Yes	Yes	Yes
Constant	0.717***	0.392***	0.219***	0.283***	0.682***
	(0.0344)	(0.0398)	(0.0532)	(0.0422)	(0.0272)
Observations	649	240	239	311	1,439
R-squared	0.090	0.242	0.075	0.377	0.561

Notes: The dependent variable is the share of the joint surplus assigned to himself/herself by the decision maker. Each column corresponds to a separate regression, estimated using all available observations for a particular game. Single corresponds to the single player game G1; there are two observations per player pair since the game is played individually, and three rounds, hence a total number of observations of 160x3=480. The ultimatum and trust games are all played in pairs over three rounds, for a total of 240 observations. In the dictator game played on its own, both players make a selection, producing 480 observations. To these are added the dictator games that are played as part of Game 6. In this case, only one player makes a selection, hence the odd number of additional observations. The number of observations for the negotiation game similarly combines 240 observations of Game 5 played on its own, and 71 as a result of Game 6. Similar results are obtained if observations from Game 6 are omitted. The omitted gender pairing is male-male. In Game 1 (individual play), the coefficient of the female dummy is reported on the female-female pairing line. Robust standard errors are reported in parentheses *** p<0.01, ** p<0.05, * p<0.1

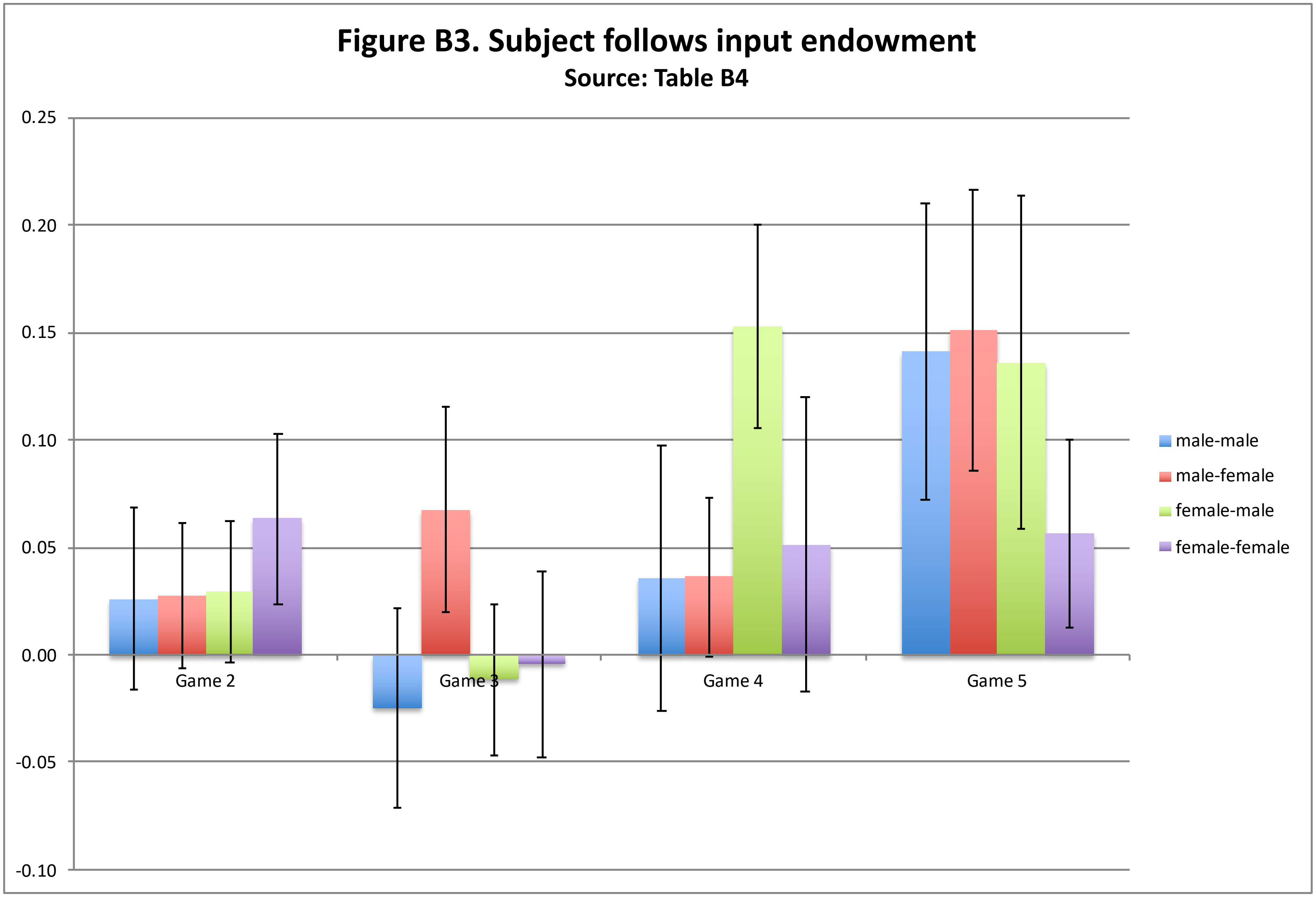
Game 2: one subject allocates inputs and income, other subject is passive. Game 3: one subject allocates inputs and income, other subject can reject or accept. Game 4: one subject allocates inputs, other subject distributes income. Game 5: subjects take turns making offers and counter-offers on input allocation and income division until an offer is accepted, or N=6.



Notes: This whisker plot shows the size (bar) and standard error (whisker) of all the gender pairing coefficients estimated in column Games2-5 of Table B4.



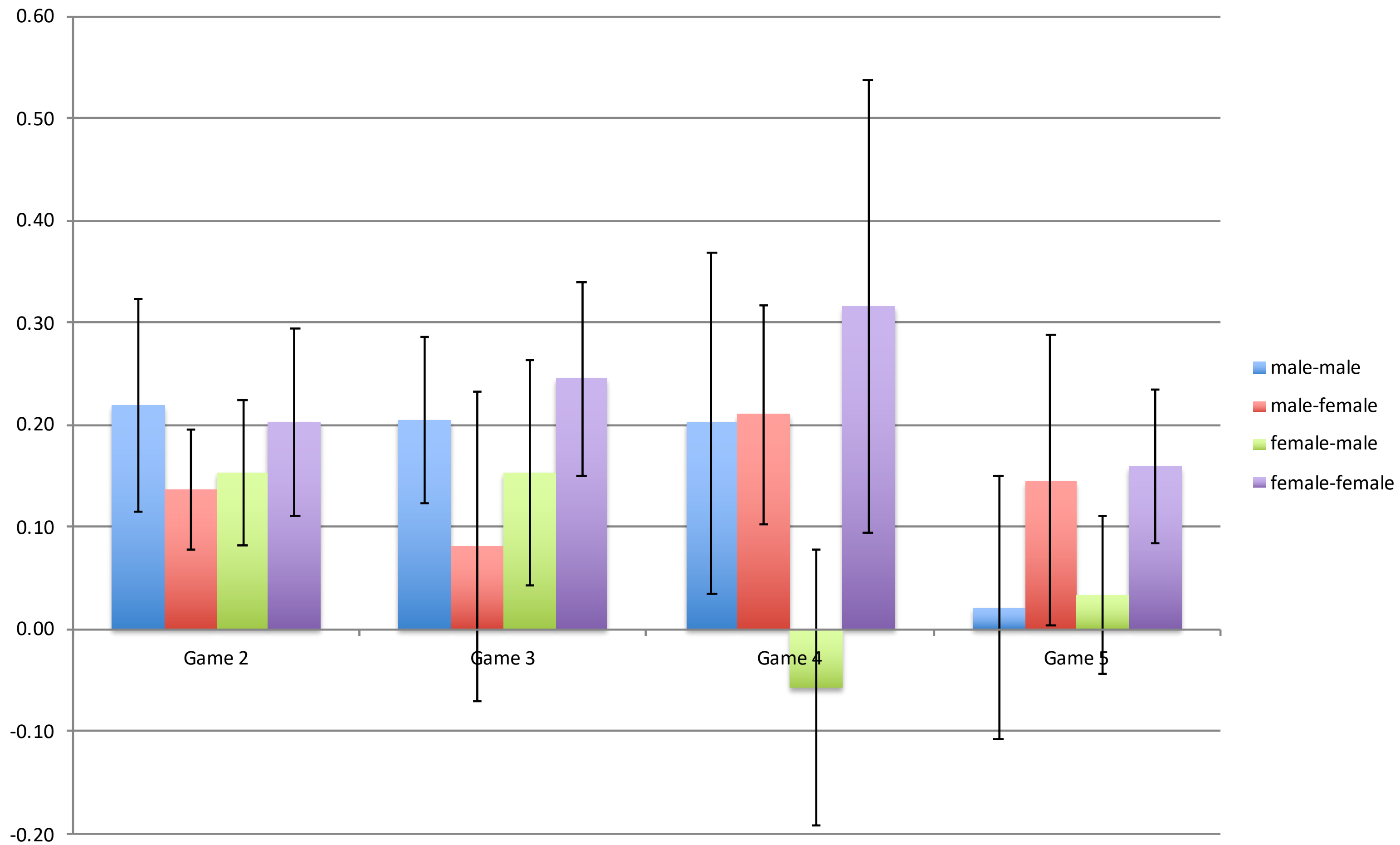
Notes: This whisker plot shows the size (bar) and +1/-1 standard error (whisker) of the gender pairing coefficients estimated for regressor x* (optimal input allocation) in columns Game 2 to Game 5 of Table B4.



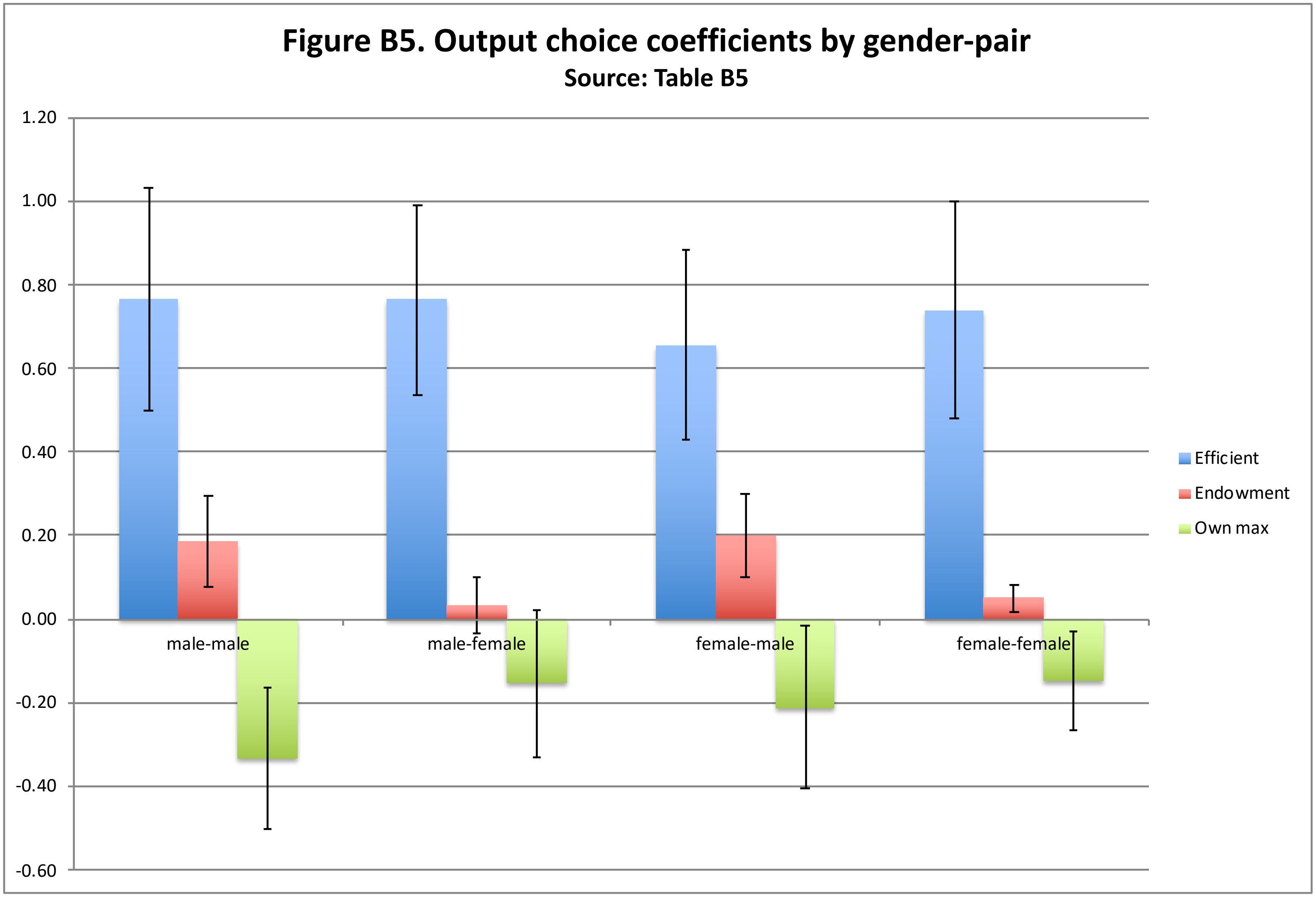
Notes: This whisker plot shows the size (bar) and +1/-1 standard error (whisker) of the gender pairing coefficients estimated for regressor m (initial input endowment) in columns Game 2 to Game 5 of Table B4.

Figure B4. Subject maximizes own output

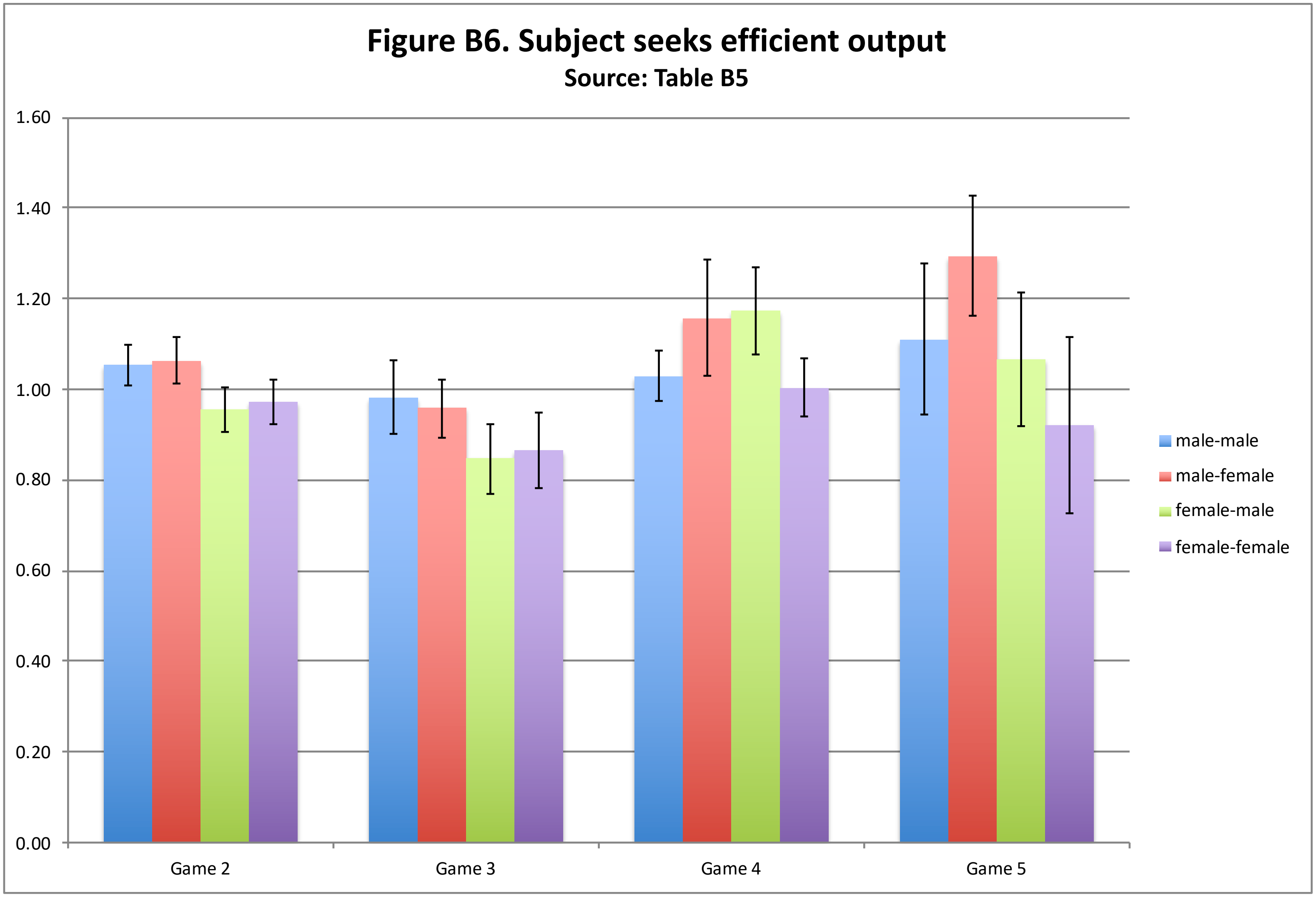
Source: Table B4



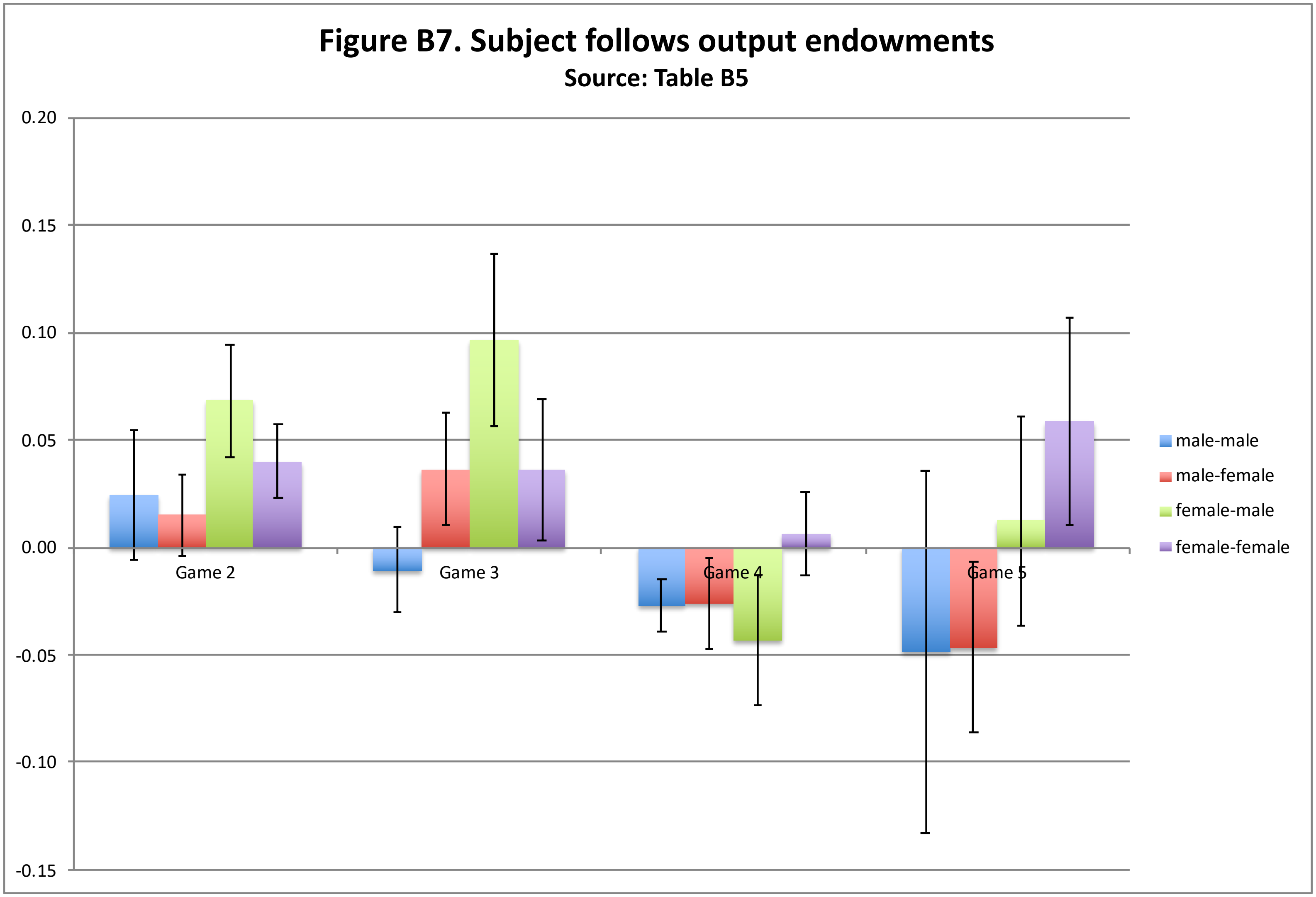
Notes: This whisker plot shows the size (bar) and +1/-1 standard error (whisker) of the gender pairing coefficients estimated for regressor x~ (input allocation maximizing own output) in columns Game 2 to Game 5 of Table B4.



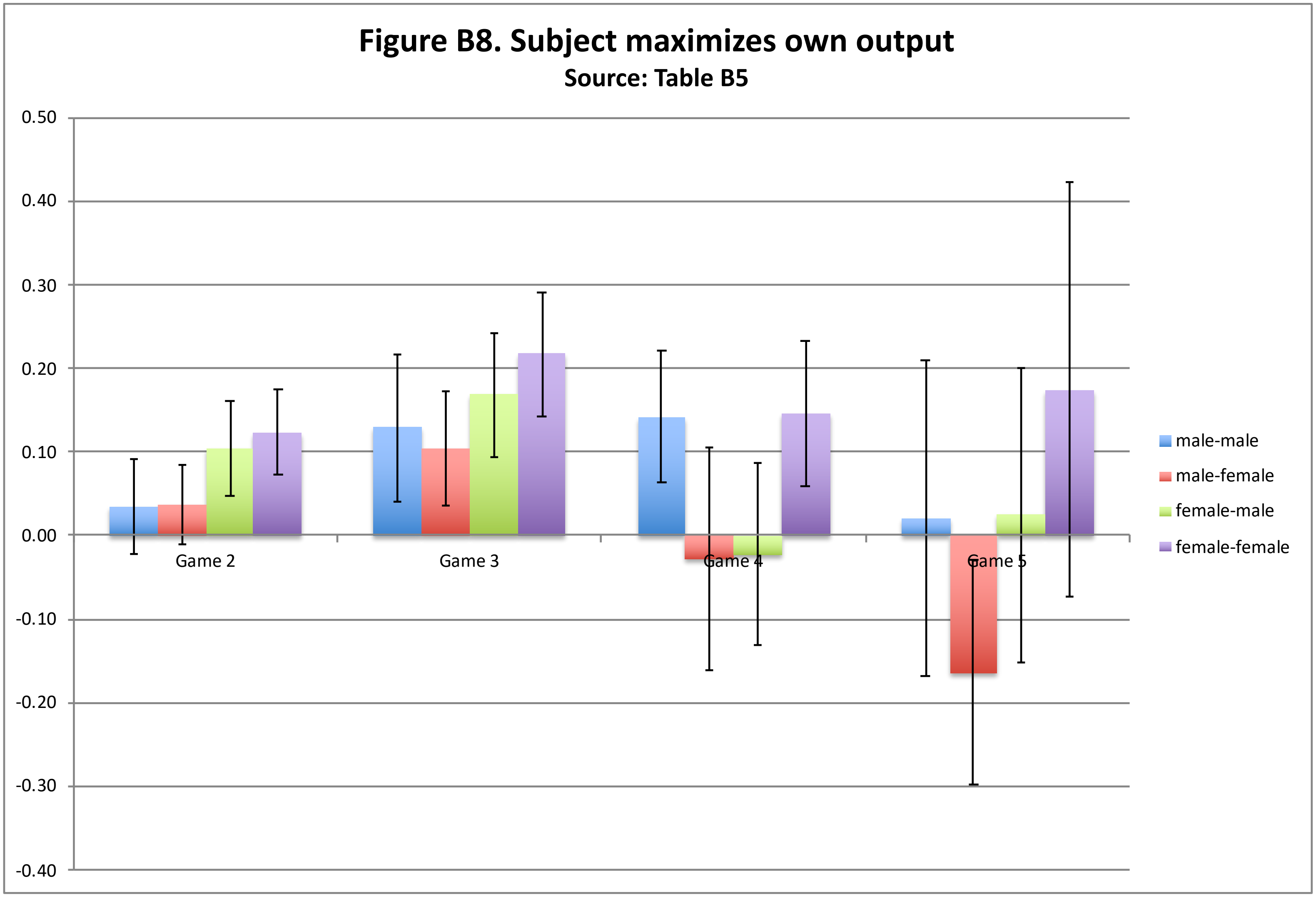
Notes: This whisker plot shows the size (bar) and standard error (whisker) of all the gender pairing coefficients estimated in column Games2-5 of Table B5.



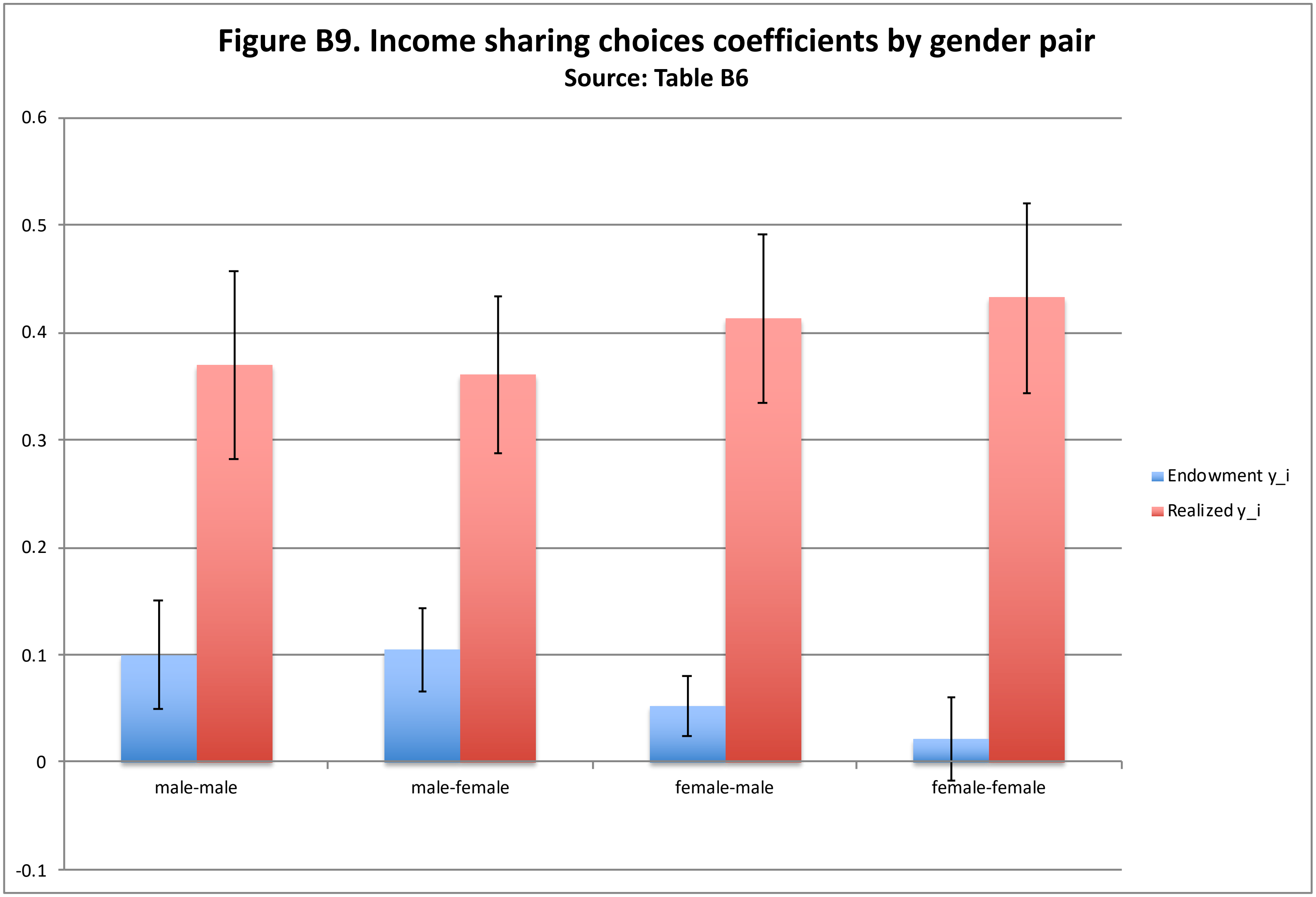
Notes: This whisker plot shows the size (bar) and +1/-1 standard error (whisker) of the gender pairing coefficients estimated for regressor 'Joint surplus with optimal allocation' in columns Game 2 to Game 5 of Table B5.



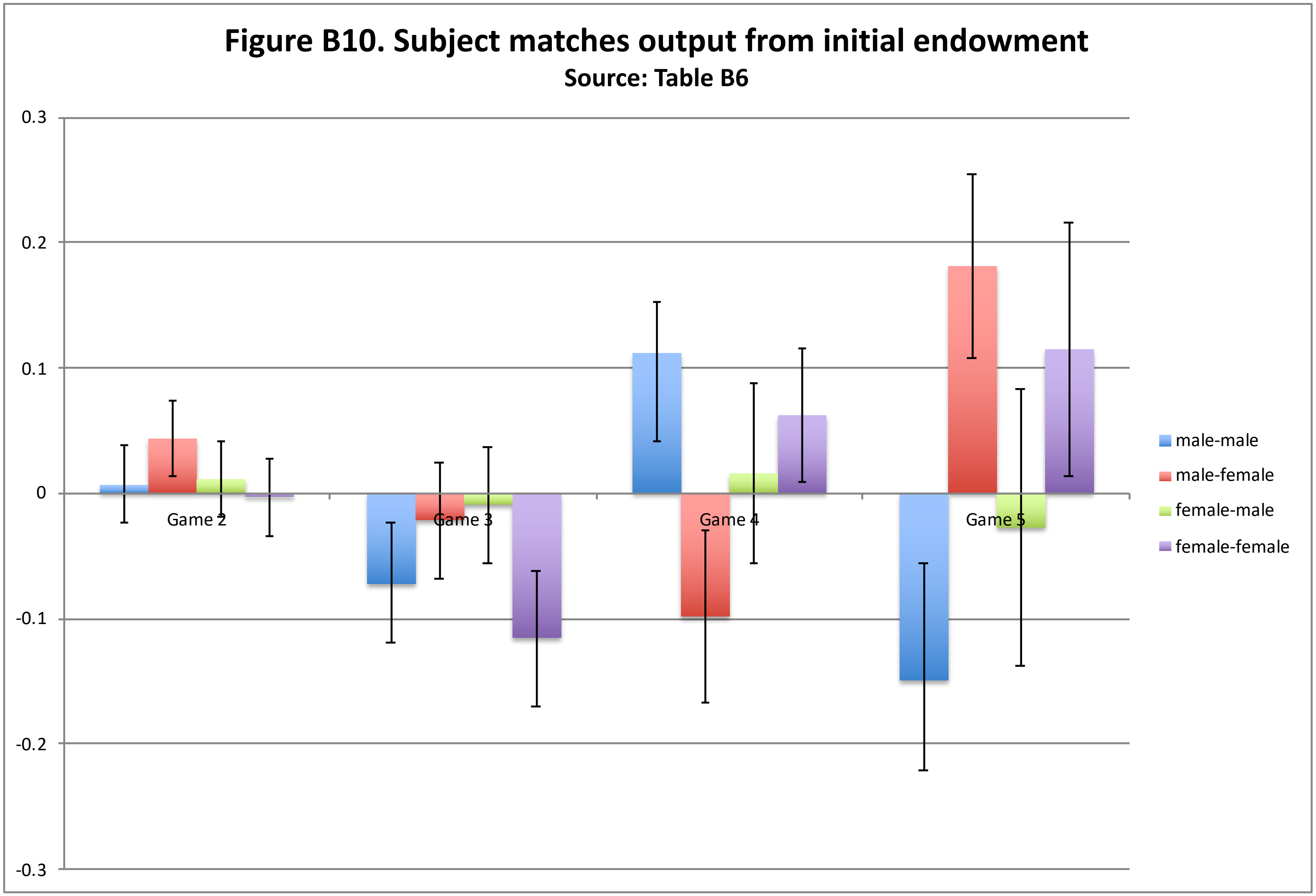
Notes: This whisker plot shows the size (bar) and +1/-1 standard error (whisker) of the gender pairing coefficients estimated for regressor 'Joint surplus with initial input endowment' in columns Game 2 to Game 5 of Table B5.



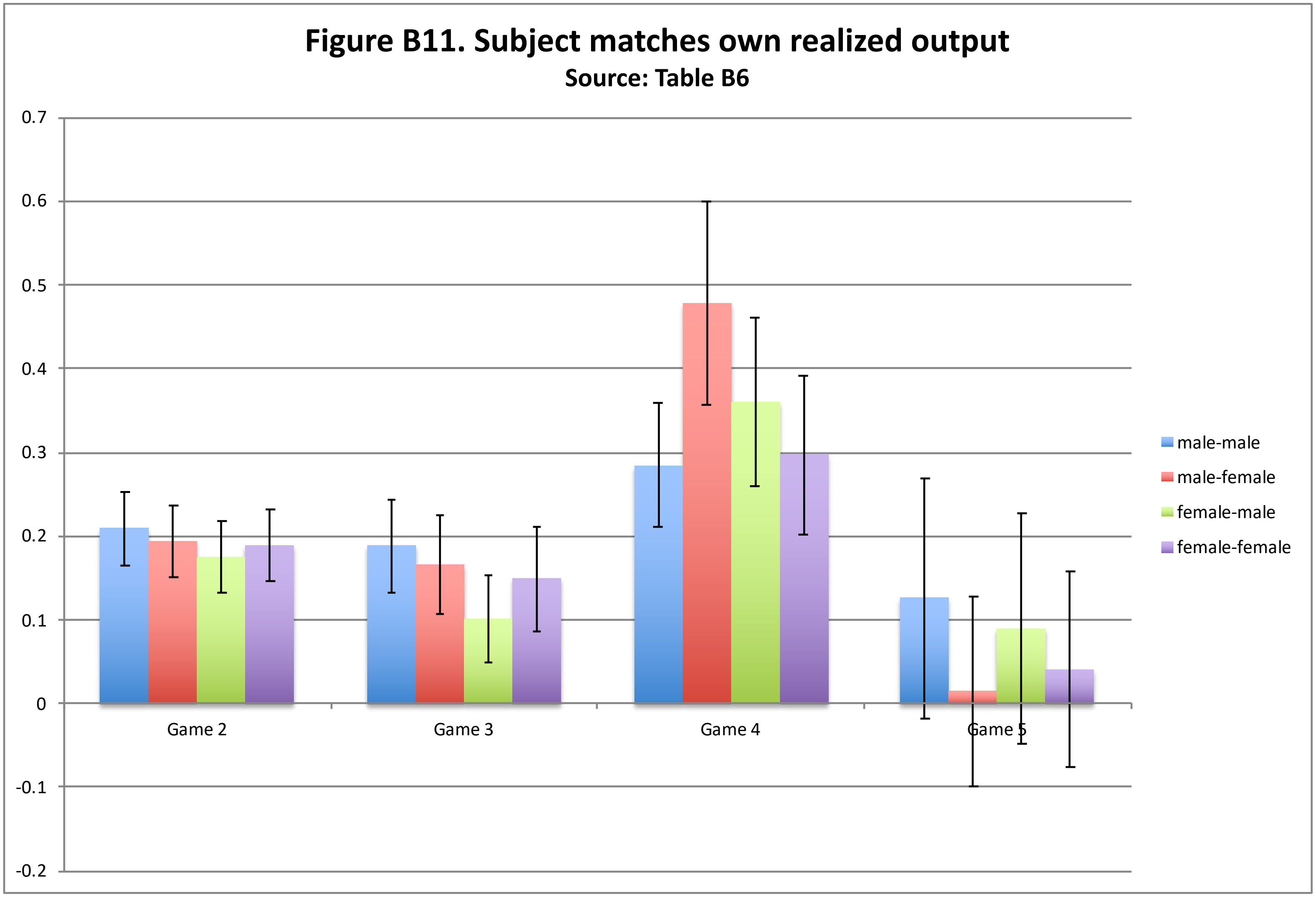
Notes: This whisker plot shows the size (bar) and +1/-1 standard error (whisker) of the gender pairing coefficients estimated for regressor 'Joint surplus when maximizing own output' in columns Game 2 to Game 5 of Table B5.



Notes: This whisker plot shows the size (bar) and standard error (whisker) of all the gender pairing coefficients estimated in column Games2-5 of Table B6.



Notes: This whisker plot shows the size (bar) and +1/-1 standard error (whisker) of the gender pairing coefficients estimated for regressor 'Share of output with initial input endowment' in columns Game 2 to Game 5 of Table B6.



Notes: This whisker plot shows the size (bar) and +1/-1 standard error (whisker) of the gender pairing coefficients estimated for regressor 'Share of output from own realized output' in columns Game 2 to Game 5 of Table B6.