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THE FRAMES BEHIND THE GAMES: PLAYER'S PERCEPTIONS OF PRISONER'S DILEMMA, CHICKEN, DICTATOR, AND ULTIMATUM GAMES

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ABSTRACT

The tension between cooperative and competitive impulses is an eternal issue for every society. But how is this problem perceived by individual participants in the context of a behavioral games experiment? We first assess individual differences in players' propensity to cooperate in a series of experimental games. We then use open-ended interviews with a subset of those players to investigate the various concepts (or 'frames') they used when thinking about self-interested and cooperative actions. More generally, we hope to raise awareness of player's perceptions of experimental environments to inform both the design and interpretation of experiments and experimental data.

JEL Classification Numbers: C70, C72, C90

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Introduction:

Cooperation is the foundation of human social life. It is a source of many benefits; it may also be a source of many of our dispositions. Although progress toward an adequate understanding of cooperation has been made in recent years it remains insufficiently understood. Cooperative choices may benefit the group, and thus be collectively rational, but sometimes this choice for an individual implies that the fundamental assumption of both economics and evolutionary biology - that of individual self-interest - appears to have been violated. This tension between cooperative and competitive impulses is an eternal issue in all human societies, but how is this problem perceived by individual participants?

For much of the twentieth century economics was concerned principally with the underlying mathematical structure of its models, not with social context or actual human psychology. This perspective was also adopted by game theory in the mid-twentieth century. Although many game theorists still view game theory as intended only to describe idealized players inhabiting abstract worlds rather than real players in human societies, this view is being increasingly challenged both in game theory and economics more generally (see Bruni and Sugden 2007). For example, Gold and Sugden comment in Bacharach (2006, p.xvi):

“Conventional game theory confuses the world as seen by the theorist with the world as seen by the decision-making agent. In constructing a stylized mathematical model of an interaction, the game theorist *imposes* a particular conceptual scheme on the world.”

We don't intend to pursue this debate here, but simply note that it is to the behavioral approach to game theory that this paper seeks to make a contribution. There is currently no one accepted 'best approach' to the study of cooperation. It remains a significant problem not only in the social sciences but also in economics and evolutionary biology, where the concept carries immense theoretical weight. Influential approaches from economics include, but are not limited to,

Bolton and Ockenfels (2000), Sugden (2003), Dufwenberg and Kirchsteiger (2004), Burnham (2005) and Bacharach (2006). Most of these and numerous other scholars have run experiments under the broad umbrella of ‘behavioral game theory’ in the rather artificial context of a laboratory (see Camerer 2003 for a review), but to what extent do the experimentalists’ assumptions about how students interpret their experimental environment coincide with players’ actual beliefs?

We present an analysis of interviews with university students about the ways in which they played a series of one-shot Prisoners Dilemma and Chicken games, as well as a Dictator and Ultimatum game. Games such as these are routinely used by economists to explore aspects of human cooperation and competition. In a larger study of which these interviews are a part, we used this series of games to ask questions about the sources and circumstances of self-interested and cooperative human action. As a secondary issue we wanted to use established methodologies from anthropology in a novel application to economics. We also hope to raise researchers’ awareness in the wider field of behavioral game theory of players perceptions such as those presented in the body of this paper. This knowledge can inform both the future design of experiments and the understanding of experimental data.

1. Description of the Games

1.a) Prisoner’s Dilemma

In a standard two-person “Prisoner’s Dilemma” (PD) game, each player chooses to cooperate or defect. There are four possible outcomes: both players co-operate, so each receives (**R**eward); both players defect, so each receives (**P**unishment) (R&P together constitute the ‘main diagonal’); one player cooperates, one defects; so the cooperator receives (**S**ucker) and the defector receives (**T**emptation). The PD game’s dollar payoffs always satisfy: $T > R > P > S$.

The following diagram shows the first Prisoner’s Dilemma game the students were asked to play. In our notation ‘cooperate’ is choice ‘A’ and ‘defect’ is choice ‘B’:

Figure 1: The 2x2 PD Game

		Player 2	
		A	B
Player 1	A	4,4	0,6
	B	6,0	2,2

The PD game has a dominant-strategy equilibrium for both players of [B, B]. However economists call this self-interested solution ‘Pareto inferior’ as both players would have done better with [A, A]. The cooperative joint outcome [A, A] (also the payoff-dominant outcome [Harsanyi and Selten 1988]) can only be achieved if each player is motivated by the ‘best for both’ aspect of an ‘A’ choice, *and* has sufficient trust that the other player will share that motivation. A willingness to take on some risk, as well as a cooperative disposition, is then required before a player can justify choosing option ‘A’. Both risk-aversion and selfishness will lead an individual to a ‘B’ choice (see Colman 1995).

To illustrate the importance of the differing implicit preconceptions even eminent scholars bring to the study of the PD, perhaps reflecting different assumptions about the purpose of economic models, consider the following statements. Referring to the one-shot PD, Anatol Rapoport (1989 p.203) comments:

“The different prescriptions of decisions based on individual and collective rationality in some conflict situations cast doubt on the very meaningfulness of the facile definition of ‘rationality’ as effective maximization of one’s own expected gains”

But in the same volume Aumann (1989 p.23), although not addressing Rapoport, stridently opposes any effort to justify a cooperative choice in the one-shot PD game:

“Worse than just nonsense, this is actually vicious, since it suggests that the prisoner’s dilemma does not represent a real social problem that must be dealt with”.

Binmore (1993 p.133) makes similar observations to Aumann when commenting on Gauthier’s (1986) book ‘Morals by Agreement’ in which Gauthier develops a model called ‘constrained

maximization' which promotes the rationality of cooperation in the one-shot PD. Gauthier's reply to Binmore (1993, p.186) is equally uncompromising.

Much more recently, Bacharach's (2006) theory has provided a broader framework within which to place this fundamental divide. In particular the discussion contained in pp.169-175 presents a perspective that seems compatible with the body of evidence from social psychology (Colman et al 2008). Bacharach argues that the main diagonal of a symmetric PD game will for some people prompt a frame in which the common interest lets them see themselves as part of a group and the choice to be made as one for 'us' rather than for 'me'.

Gold and Sugden (2006) note that Bacharach hoped¹ to build the agents' frames—"the sets of descriptions that the players use to represent the problem to themselves" into the model of a game². Frames are then the set of concepts used when thinking about one's situation in a games context. The 'we'-thinking is then a frame some players unconsciously bring to the decision at hand that in certain circumstances can lead a player to pursue joint-payoff maximization. (See also Tomasello et al. (2005) on the evolution and development of the uniquely human capacity for "shared" or "we" intentionality.) For other players no such frame is prompted and the problem is perceived as one for 'me'. Bacharach (2006) likens this (p.170) to the famous drawing which some see as a dark vase and others see as two white faces pointing at each other.

The competing intuitions that lie behind the logic of cooperating and defecting positions are clearly strongly held. For Bacharach, both intuitions are equally valid so that cooperation may indeed be rational if the 'we'-frame is perceived. In this light, the fact that top theorists continue to defend the logic of their positions in full knowledge of the reasoning of others is less surprising than it might first seem. As we happen to share Bacharach's view we are content to let our subjects interpret the games as they see fit and pass no judgment on the "rationality" of either their decisions or explanations. Finally, another strength of Bacharach's approach is that it is not restricted to

¹ Gold and Sugden brought Bacharach's unfinished work to fruition following his untimely death.

² Bacharach's 'variable frame' theory is described in more detail in Bacharach and Bernasconi (1997).

Prisoner's Dilemma-type games, but explicitly applies more broadly to coordination games and other common interest games, including Chicken games.

1b) Chicken

There are a number of important similarities and differences between PD and Chicken games. The Chicken Game takes a similar form to PD, except that the payoff rankings always satisfy: $T > R > S > P$; the first such game our participants played follows.

Figure 2: The 2x2 Chicken Game

		Player 2	
		A	B
Player 1	A	5,5	4,14
	B	14,4	2,2

In the Chicken game there is also a tension between cooperative and selfish impulses. But this time mutual cautiousness leads to outcome [A, A] as the payoff from avoiding the lowest minimum, reinforcing any 'We'-frame triggered by the payoff-dominant solution. Option B is only selected by a player who appears to be both willing to take on risk, and who seeks an advantage over the other. This game is less controversial than the PD in the sense that a cooperative choice can be rational whether a player sees the choice as for 'us' or as for 'me'. Instead it is the *frequency* of 'A'-choices rather than the *existence* of 'A'-choices that creates a puzzle for standard theory. Indeed, Colman (1995) explains why Chicken is in many ways more suited to investigating cooperative versus competitive tensions than Dilemma games.

1c) Ultimatum and Dictator Games

The Ultimatum and Dictator games are quite different to PD and Chicken, and nearly as well-known. In our Ultimatum game example the proposer can propose a division of \$30 and the

responder chooses whether to accept or decline. If he accepts, the division is as proposed; if he declines, each party gets zero. In the Ultimatum game standard economic theory suggests only a tiny offer will be made by the proposer and accepted by the responder. This contrasts with numerous studies which have found a prevalence of substantial offers in experiments. In our Dictator game the dictator also proposes a division of \$30, but this time the responder has no choice but to accept any proposal. Economic theory predicts an offer of zero in the Dictator game, but as with the Ultimatum game many experiments find positive offers from the proposer, suggesting anomalous generosity.

1d) The Frames

We interviewed subjects to probe any conscious motives the players recognized they were using, which may assist economists' model development. The idea here is analogous to the labor and macroeconomic literature in which business leaders are interviewed to shed light on issues such as downward wage rigidity (e.g., Campbell and Kamlani 1997; Bewley 1998)³. Our interviews were designed to elicit material that would help us to identify and describe frames used by the students to guide or rationalize their decisions to cooperate or defect in these games. Subject's reflections can help us to better understand the perceptions that influence people's play in these sorts of laboratory environments. We sought to discover whether any of the following conceptualizations from the behavioral game theory literature finds support in players' reflections: self-interest, fairness, 'we'-thinking (Bacharach 2006), inequality-aversion (Bolton and Ockenfels 2000), or guilt-aversion (Battigalli and Dufwenberg 2007). Or are there other, as yet unanticipated, models that better account for players' actions?

Another reason we are interested in perceptions of decisions to cooperate or defect is that we assume that frames would necessarily intervene between any evolved psychobiological potentials to cooperate or compete and the current environment. Indeed we argue that frames are necessarily a

³ We thank Martin Dufwenberg for suggesting this connection.

part of, or reflect, any psychological mechanism whereby such dispositions to action become action. Bacharach (2006, chapter 3) makes a radical attempt to unify facets of economic and evolutionary theories of cooperation as being adaptive and rational via the concept of contingent ‘we’-thinking. He also derives an evolutionary explanation for the origins of the potential for ‘we-thinking’ frames based upon the evolutionary origins of group identification:

“Group identity implies affective attitudes which are behaviorally equivalent to altruism in Dilemmas, and it can explain what altruism cannot, notably human success in common-interest encounters” (p.111).

Although not referenced by Bacharach, we suggest one proximate mechanism for how ‘we’-thinking is manifested in individual affective attitudes can be explained by drawing on Damasio’s (1994) ‘Somatic Marker Hypothesis’. This hypothesis holds that because nature ‘built the apparatus of rationality [the cerebral cortex] not just on top of the apparatus of biological regulation [the limbic system], but also from it and with it’, our emotional responses “mark,” or represent, the body’s (soma’s) interests in decision making. In other words, when decisions involve cooperation, these affective hunches are nature’s way of disposing individuals to capture the future rewards of current cooperation.

2. Methods

We assessed individual differences in subjects’ propensity to cooperate experimentally, using a computerized series of: a) twenty one-shot PD games; b) twenty one-shot Chicken games; c) an Ultimatum game as the proposer; d) an Ultimatum game as the responder; e) a Dictator game, and finally one more PD game shown first with a male name [John] for the other player and then with a female name [Susan].

One hundred and three university student players from a variety of disciplines were recruited in groups of 8-12 to play the games in a computer lab. Subjects sat in front of a PC on which the introductory web-page for the experiment was displayed. The administrator also

projected the display onto a large white screen at the front of the lab, to assist in the explanation. The students were shown how to read the matrix displays (which also had a verbal explanation next to each matrix) and how to record their guesses of how others might choose in the same game. After completing some practice games and having an opportunity to ask questions, subjects were left to complete the series of games in their own time.

For payment, an incentive-compatible design was used, and explained carefully during the introduction. We used a fictional currency, Ducats, with 1 Ducat = A\$2. Students were paired randomly at the end of the experiment and their previous response to one randomly selected game was retrieved and played for real money, analogous to the ‘random lottery incentive system’ used for individual choice experiments (see Starmer and Sugden 1991). The games were assigned different payoff values to reflect a wide range of incentives to co-operate or defect, while maintaining the requisite rank-order of the payoffs. Of course, defection is always dominant under the ‘me’-frame in PD games, but we hypothesized that for those using the ‘we’-frame the actual crystallization of cooperative choices would be sensitive to payoff values.

2a) The Interviews

Two research assistants, one man and one woman, both graduate students in anthropology, conducted tape-recorded, open-ended interviews with 30 people, the first 15 men and 15 women from our main sample to volunteer for this aspect of the research. Volunteers were paid a flat fee of \$20 for the interview. Prior to the conversation the interviewer was provided with a printout summarizing the play of the interviewee in the computerized games session. Interviewers began showing interviewees a diagram of the first game (prisoners’ dilemma) they had played and asking why they had made the choice shown in the diagram and what they were thinking of when they made this choice. They were also shown their estimate of the other player’s choice, an indication that they thought the other player would be more likely to choose A or B, and asked what they were thinking about the other player when they thought about which choice to make.

These initial two questions were followed by seven more about the games the students had played. Finally students were asked several questions that asked them to associate the games to experiences of daily life, people, relationships and cultural products such as movies or songs. Participants were also asked a series of questions about their feelings in the game they played for real money, how they felt about playing and talking about the games and why they chose to be interviewed about them. (Interview questions are listed in Appendix 1). Consonant with anthropological methods, the interviewers were instructed to encourage as open-ended, subject-directed conversation as possible. The verbatim interview transcripts displayed a close adherence to this stricture.

2b) The Participants:

All participants (n = 103) were undergraduate students at the University of Western Australia (although some were mature age). Characteristics of the full sample are provided in Table 1, which also shows that the students who volunteered for the interviews (n = 30) were not different to the rest (n = 73), except for fewer females among the volunteer interviewees, as we aimed to interview equal numbers of men and women.

Insert Table 1 about here.

2c) The Analysis:

In-depth, qualitative analysis of the thirty interviews is a necessarily intensive and time-consuming activity. The technique discussed in Section 3, inspired largely by the method of Naomi Quinn (e.g. 1997, 2005), requires repeated readings of the verbatim interview transcripts. As a first step in the analysis one of us conducted a debriefing with each of the two interviewers, asking them for overall impressions of the content and the general tone of the interviews they had conducted. Several themes, metaphors and patterns were found to be important. We discuss these in detail in Section 3.

3. Interpretations of the Interviews

The interviews are interpreted to provide an overall picture of the ways in which players describe their play. To provide context, Table 2 summarizes the pattern of play for each of the interviewees and assigns each a participant number. We then use this number to let the reader tie each of the more significant quotations back to their play.

Insert Table 2 about here.

Although we obviously anticipated reference would be made by players to concepts such as selfishness and fairness, the anthropological method we used seeks only to guide players to reflect upon our questions of interest, while avoiding ‘leading’ participants by making explicit reference to specific concepts. Several concepts and issues were nonetheless raised explicitly by participants in a number of the interviews, which we reflect in our sub-headings for this section. We discuss these alongside relevant quotes from the transcripts. While some of these concepts offer support to standard economic theory, many appear at odds with it but are instead supportive of alternative models. Also noteworthy are some interesting subtleties in player’s perceptions of these concepts compared with the assumptions commonly made in behavioral game theory research. We shall see examples of these also. Other comments, such as on the efficacy of using financial incentives and direct evidence that player’s make mistakes also appear, but less frequently.

3a) Selfishness

Not surprisingly, the interviews provided plenty of evidence that many players embrace self-interest as the motive for their decisions, even if they know others will lose out. In the words of one female:

S₂: I am just assuming that, because once, I had a practice game and I realized, hey this is Game Theory, I was thinking that I want to optimize my outcomes. For that [other] person, that person may not have that same imprint of an inkling that this is an imperial, Western way of working.

I: What did you imagine about the other player?

S: Selfish like me, trying to optimize his incentives and all that. I will assume that he will also choose B throughout, if he has caught the whole of the game.

I: What would you think of him if he just chose A?

S: At the beginning of the [series of] games, probably that he doesn't know. At the end of the game, I would probably think that he was very stupid.

I: So if they are still going for A by the end of the game...

S: He cannot survive in this world, if he's going to continue choosing A.

Or this man, who offered his respondent \$0 in the Dictator Game:

S₁₄: I wanted to offer them nothing, basically, because it maximizes what I get. I wanted to keep \$30 dollars myself.

One woman respondent made the following reflections:

S₂₄: Yeah, I can be pretty competitive, and if I can do something to outdo the next person to get me in front then I'll do it.

I: Do you think if you had known which person you were playing against that this would have affected your choice?

S: Yes, because when I met the girl I was playing against for the last game, she seemed really polite, she let me pick the number out and she was quite shy and that. Just my perception was that she was 'A', which can be wrong first judgments anyway, but I thought she would be the type of person that would be fairer, like going for A when it was more an equal value. And that would have made me play B for all the extra money anyway.

Clearly, these participants conveyed no hint of we-thinking, guilt-aversion, or other exotic preferences. The following woman also describes herself as selfish, but seems more tortured about it, and gave a very careful explanation to justify her motivation, when she decided to keep \$30 and give the respondent \$0 in the Dictator Game:

S₁₈: I guess for me, my thinking changed in that I thought... to be selfish to a stranger, where their life still continues on going as it was going before.... being unselfish to a stranger really had no effect on their life except in that one instance, that one moment, and even then, they might not notice it or it might not even trigger a reaction, they just carry on [with] their life as it was; but to be unselfish to someone I know, it does affect where they are going because I am a part of their life as opposed to a part of a stranger's life.

But not all players accept that self-interest either should or did guide their choices in these games, as we see in the next sub-section.

3b) The Fairness Affect

Because we asked the students how they felt about the game they played for real it is not a surprise to find emotion words in their answers. Psychological frames would necessarily intervene between any evolved psychobiological potentials to cooperate or compete and actual behavior in our society, and are a necessary part of, or reflection of, individual experience in early risk and uncertainty via the attachment process (Weingarten and Chisholm, 2009). But following Wierzbicka (e.g. 1999; see also Reddy 1997, 2001) we assume that what humans as a species share are not emotions but 'feelings', and that the more complex subjective experience of emotions is in fact an emergent product of those feelings manifest in the terms provided by their frames.

The interviewers asked many of the student players not only how they felt about the choices in the real game, but also how they would have felt if it had gone differently, if say, instead of coming out even, they had won more or less than the other person. Players associate good feelings

with receiving an equal amount or winning more than one's pair. Bad feelings are associated with winning less than one's pair, but also for some players with winning more. As was the case with our male 'winners' in their real game, both men and women said they expected to feel bad if they were to win at the other player's expense. For example:

S₁₆: [If I got more than the other player] I might have felt bad. . . 'Oh now she thinks I'm really selfish because I took the higher number'.

I: What would you find hard about [taking more]?

S: Thinking that the other person is not happy with it or thinking that the other person is disappointed in me or... 'Selfish' comes to mind, that I am taking more than I should or not caring enough about what the other person wants or needs.

Her reflections are clearly consistent with the concept of guilt-aversion (Battigalli and Dufwenberg 2007). The introduction of these hypothetical situations into the interview was initiated by the interviewers, spontaneously and independently, asking the student how they would feel in the event that they won more than the other player. Out of the twelve interviewees asked this question, the replies of eleven included an expression of feeling bad. While clearly offering support to guilt-aversion as a motive, this finding is not necessarily inconsistent with either inequality-aversion or 'we- thinking'.

One man gave the following thoughtful explanation for equality when his respondent chose to keep \$15 and offer him \$15 in the first Ultimatum Game:

S₂₃: I guess it's just... everyone getting... I mean there is no point in being selfish. The way I see it is that if you have \$30, give \$15 and keep \$15 – it makes sense to do it that way.

I: How do you respond when you meet people who don't share that attitude [of equality]?

S: I just feel a bit sad because... either they haven't been taught, or they are simply ignorant so they become selfish, and, well, I guess there is not much I can do about it except show them by what I do, because I think my actions do speak louder than my words, so I want to

really show them what it means to share equally, rather than just try to talk you out of it, which doesn't help much, so I want to prove it to you by doing it.

The following man interpreted the instructions for the Dictator game as 'you were *meant* to split [the \$30]' which might come as a surprise to some experimentalists, but is also consistent with the 'guilt-aversion' concept:

S₂₅: It was the fairest way to go. It was not like I didn't like the other person, or if I did I didn't know it... and I was asked to split it and you were meant to split it – and you know, that suggests that you aren't meant to keep it for yourself – then split it half and half... if you don't know why you're splitting it then that would be the fairest way to go.

The next male player justified his willingness to share by reference to the money being unearned by him:

I: Would you have offered [just] \$5, would you have considered offering \$5?

S₂₆: To the other person? No!

I: Why?

S: Because I mean, in this sort of situation it's just so, it's not as if I have done all the hard work and they have done nothing and they deserve less than me. And considering that I would hope that if I was in the opposing situation that someone would have offered me \$15, I just thought that was the fairest way to do it. So both people come out at even levels; I didn't write essays, I didn't do any more than the other person, so it was fair to split.

I: So what if it was actually your money and you had earned it or whatever?

S: If I had earned it working and the other person hadn't as much, I would have taken a higher share; if I felt I had done more. By the same token, if I felt they had done more, I would have been more than happy to accept the fact that they should get more profit from it.

His comments may go some way to explaining why it is that individuals who are generous to the point of equality in the context of a Dictator game exhibit proportionally much less generosity in society at large when it comes to donating a substantial fraction of their salary to charity. We return to this point in sub-section 3f).

3c) A Choice For 'Me' Or For 'Us'?

While our students were not part of any obvious team, they did share some common experiences, such as all being UWA students volunteering to see if they can win money from UWA professors. Our design's use of intermediate social distance, by allowing players to see the community of other volunteers, and our use of symmetric payoffs, is also likely to have enhanced the possibility of group identification and so 'we-thinking'. Twenty-five of the thirty interviewees ended up winning equal sums of money in the real game either because they and their pair both chose 'A', both chose 'B', or evenly split the money in the Ultimatum or Dictator Games. There was a suggestion of gender difference at least in the way players talked about this experience. One kind of answer, one we interpret as statements of team-identification, was found in the texts of both men and women. Here are two examples:

S: I was happy. We both ended up with 8 [Ducats]. We were both quite pleased.

S: I think we both picked 'A' and it came out as 10 [Ducats] each. I was glad I went with A. I was relieved that the other person went with A as well. I thought, 'Hey, maybe they thought like I did'.

Seventeen of these twenty five participants who won equal sums described the game in such terms. A second kind of answer, however, one we might label competitive, characterized three of these twenty five replies, all those of men. An example of this kind of answer follows:

S₁₄: We both chose B. She wasn't supposed to choose that one. I would have liked more [money].

One male interviewee gave an answer that was a blend of the two:

S₂₁: We both got 'A'. . . But why didn't I choose B. . . so I would have got more money? While you were pleased that you both got an OK payout, it was kind of like "Ooh why couldn't I have got B and they got 'A'?" ...I actually knew the person that I ended up with . . . I am kind of glad that we did get the same thing because you would have felt really, really guilty . . . you would remember it, maybe not for the whole year, but maybe for a week or so afterwards . . . you left [the other player] with not much and you got all this money.

Four of the thirty interviewees 'won' the 'real' game, two men and two women. Both of the women focused on their pleasure in winning, for example:

S₂₄: I got \$38 and she got \$18 because I played B and she played A . . . I was happy that I won. And then I heard how much she was getting, I went 'Sorry', but I was really happy that I had beaten her, basically. And I think I was the highest out of that game of the people who played that day, money winner, so 'Yeah, I won!'

Both male winners in contrast expressed concern for the other player. One said he offered to split his win of \$20 with the woman he played against who had won only \$8. She refused his offer. The other male winner's comments can be summed up in his words as follows:

S₂₈: I played against a girl. I got 11 [Ducats, or \$22] and she got nothing. I felt quite bad. It was as if I had taken something from her and left her with nothing. But, it was her particular choice. She chose wrong and I chose right.

There was one other difference that we noticed in the interview texts of men and women talking about the real game. This was the apparent salience that it had in the men's talk. Six men but

only one woman raised the topic of the ‘real game’ in advance of being asked about it by the interviewer. The only interviewee out of thirty to ‘lose’ the game played for real received only \$8 compared to the other player’s \$28. Her emotion was negative:

S₆: Yeah, I was a bit annoyed because the choice that she chose, I didn’t think she would choose. Like my whole plan of, in a way of the whole outcome, which was a lot of the A’s... she actually didn’t go that way, she went a different way. So I thought, ‘Yeah, the whole thing must be wrong’.

Her motivation seems to be consistent with ‘contingent we-thinking’ (Bacharach 2006) but in this case she was unlucky with the outcome. There is explicit evidence that some subjects might frame the game as a problem for ‘us’ rather than a problem for ‘me’, as for this female player:

S₆: I guess I was imagining someone identical to me, and I was just thinking about them as, basically what I choose would be what they would choose. I didn’t really think that it could be someone who is just jumping out and wanting to get like all the big money and taking big risks, because that obviously didn’t come into any of my choices. So basically it was someone with the same ideas as me.

Or in the words of another woman:

S₁₂: When I was doing it I was thinking that if I was going to do this then why wouldn’t they do the same thing, basically.

I: So you were assuming that the other person would pretty much do the same thing that you would do?

S: Yeah.

One male interviewee implicitly identifies the difference between a PD and a zero-sum game for a ‘we’-thinker:

S₁: I was thinking about Monopoly just because it has got money in it. But I don't really think there is any connection because I play Monopoly a lot different, I don't share at all in Monopoly. You go all out to try and kill the other person, pretty much. Whereas, in this game, I am likely to sympathize with the other person a lot more, basically because you don't lose in a game. You can only win and I think, 'hey, why don't we win together?'

This participant also appears to share the view that because players can't lose any of their own money, there is no opportunity cost to playing fair. We will see more evidence of this framing below in 3f).

3d) Anonymity

Over half of the interviewees raised a series of points that revolve around the issues of playing with an unknown person or a computer instead of a known person or a friend. The remarks from eighteen of the thirty interviewees made the point that their play would have been different if they had known the person they were playing against.

S₂₅: I ended up playing my friend [in the real game.] . . . Well, we didn't actually know until it was the end of the game, so you can't really collaborate.

For some of the players, 'knowing' someone might only take a few minutes.

S: So I think some of the decisions might have been different if you had five minutes to sort of get to know the person you were playing against. I am sure that would have affected the outcome of some of my responses.

Or this male:

S₁₁: I wish I could have had a better idea of who I was playing against because I think I if I had been able to know who it was or talk to them before hand, not about the game, but just to talk to them to get an idea of who they were.

So ‘knowing’ someone may only take a brief meeting, supporting evidence in Dawes (1991), on the rapid acquisition of group identity. Bacharach [2006, chapter 2] also needs this assumption for his theory to have explanatory power. Five of the participants mentioned that they looked around the room trying to learn something about the other players. Four men mentioned that they would have chosen to cooperate had they known the other player; for example:

S: Obviously it would always be best if the two players playing off each other knew who they were and knew what they were thinking. And also it would be great if you could discuss it with them before each game and work out . . . which one was the most money and split it.

The woman who said even five minutes with the other player would make a difference also said that if she had met the other player and ‘didn’t like them, then I would have gone for the higher [B] option.’ This hints at a need for ‘assurance’ regarding the other’s choice, itself an important issue in this literature. While Sugden sees assurance as necessary before acting on we-thinking, Bacharach’s (2006, p.168) theory of circumspect team-thinking does not.

Knowing the other person often seemed to represent information that could have been used by our players, had we permitted it. This aspect of knowing the other players was especially apparent in the texts of the male players. Seven of the fifteen men but only three of the fifteen women volunteered that information about the other player would have informed their play or that their play was difficult because they lacked this information. While our experiment deliberately avoided the artificially sterile ‘double-blind’ conditions that researchers have used on occasion, as we required a more ‘social’ environment for our research, evidently the remaining degree of anonymity caused our players some consternation. In the texts of nine men and six women, discussions of the known person/stranger contrast were associated with sharing. Sharing or ‘being greedy’, in a hypothetically constructed situation, often depended upon whether or not the

interviewee was thinking about playing with a friend or a stranger. One interviewee provided the following account in her interview:

S₃: If someone ended up really worse, say someone got \$2 and someone got \$20, often they ended up just splitting it when they went up to the offices [to get their payout on the ‘game played for real’].

I: Did they?

S: Yeah, because they felt so bad that they had done so much better than the other person.

I: Right, you saw that happen?

S: Yeah.

I: Wow, that’s really interesting.

S: Well because at first you think, ‘This is great’, because me and my friends are trying to find jobs and so it is so hard and you think this should be cool, we can get some money, but when it actually comes down to it, if you are going against people you don’t actually want to be getting more than everybody else when everybody else has done the same as you. It just seems fair that everyone gets around about the same.

Two points regarding this observation should be made. First, while *ex ante* the choice was made in a PD game; *ex post* the choice instead resembles a Dictator game. This is because the strategic element of the decision is over, and the winning player instead faces a choice over whether to share a fixed sum with the other person. Clearly, defecting in the context of a PD does not indicate that a player would give the other zero in a Dictator game. Indeed, the correlation between the number of cooperative choices in the series of PD’s and the level of giving in the Dictator game was not statistically significant in this study (Brosig et al. found a similar result (2002 p.285)). However given that the winner may now view herself as having earned her winnings, her generosity may be lessened compared with the usual Dictator Game scenario (see also sub-section 3f).

Second, the anonymous conditions under which the initial choice was made are removed when a game is played for real, replacing the unknown other player with an identifiable person. This can be expected to increase generosity by the 'winner'. Consistent with this interpretation, nine participants associated the known person/stranger contrast with future consequences, demonstrating a concern for their reputation. For example, referring back to her reasons for splitting the \$30 as she did, one woman talks about her sister:

S₇: She is the one where finding money [the \$30] or something like that is where that situation would come up. And she would be one that is most likely to battle me to the death, until it is like evenly split. She wouldn't be... she wouldn't give in, because she knows, she is a stubborn person by nature, but because she knows that there will be another fight a week, a month down the track.

Both of the previous quotes appear to be consistent with the 'inequality-aversion' concept. Taking a different tack, one man focused on the anonymity of the games in contrast with real life:

S₂₈: Perhaps because it is anonymous. I think that is probably a big thing, the fact that you have anonymity there. That people won't know who it is that's choosing the bigger numbers or going for this, therefore it can't reflect back upon yourself and people's opinion of you. So, self image perhaps, self-presentation.

Or another man:

S₄: And it is kind of difficult because you were under controlled situations where you are asked not to know who the other person is, or not to talk with them or anything like that, and it made it difficult because it takes away something that you rely on as a person. Like learning how to write and then you lose your hands. You've lost something that you rely on to communicate with.

All of these quotes are consistent with extant evidence that the ‘social distance’ used by the experimental conditions can affect play (Hoffman, McCabe and Smith 1996). When it came down to playing out a game for real, players who were strangers did meet if just for a moment. This was for some a moment of discomfort:

S₂₁: It was interesting to stop and think ‘Well, what am I going to do and what do I think the other person is going to do in this particular game. It became a bit of a fun competition about who could come out of the game with the most money.

I: Who did out of your friends [in the session with you]?

S: The guy who [I talk about earlier] who chose B. . .He got \$32. . . [the other player got nothing] . . . I think amongst us, because none of us actually knew the person who got nothing, it was like ‘Wow, good on you, you got this money. . .’ You know I think we could all see . . . because he was feeling guilty that he had left [the other player] with nothing, we could all see quite easily how he would feel guilty about it . . . We kind of stood around waiting to see how he was going to react to getting the money before saying, ‘Congratulations’, while he was feeling really guilty, it’s like you were trying to congratulate him for getting the most instead of saying, ‘Oh you left this girl with nothing’.

3e) Safety

One notable pattern was the oft-repeated description of one’s own choice, whether of A or of B, as playing it safe, taking the safe option. Because the B option is usually referred to as the strategy of defection, we found players’ self-description of their B choice as safe rather than selfish of interest. Out of the 30 interviews, 11 participants used the words ‘safe’ or ‘safety’ as an influence on their own choices in the games. For example, ‘Most of what I chose was the safe option...so there wasn’t a lot of risk’, said one female player. Three of these eleven players were describing the A option with these words, seven, however, were describing their choice of the ‘selfish’ B option, and one player was describing her choice of first A and then B in different games. (Recall that those

players using the word safety to mean avoiding the choice with the lowest outcome will choose B in a PD game but A in a Chicken game.)

There were also an additional number of participants who did not use the words “safe” or “safety”, but made similar points. While 11 interviewees used the words “safe” or “safety” to describe their play, a total of 16 interviewees, 9 women and 7 men, used these words at some point in the interviews; for example, to describe how they viewed others’ play or in generalizations they made from the games to other aspects of life. In the vast majority of statements it was apparent that safe was being contrasted to the word ‘risk’.

In both the men’s and women’s interviews, but especially in women’s⁴, harm minimization seems a fair way of interpreting what is being said when players talk about ‘playing it safe’. For example, one woman speaking of herself and some of her friends who had played the game said: “we never picked the option where we could get zero... we just played it safe because it would be kind of crappy to come out of it with nothing’. Another woman said, ‘B would be the safe option because you would definitely get some money’. A third said, ‘I would have chosen ones where you would at least get something, that’s better than risking it all for a big number or getting zero...it is always better to get something than nothing’.

It thus seems a legitimate interpretive move to return to the interview texts to see how many others described their play in terms of harm minimization, though they did not actually use the words safe or safety. This increased the number of interviewees whose choices appear to be influenced by self-protective concerns to 20, that is, two-thirds of the 30 interviewees were motivated, at least in part, by a concern to play it safe. For example, one of the women said, ‘There wasn’t that much of a high risk involved in choosing option B’. And as a man explained his play, ‘If I selected A and they selected B I would have nothing, so in selecting B I still would have got something regardless.’ As mentioned previously five other students used the words safe or safety at

⁴ Eckel and Grossman (2003) survey and build upon evidence that shows women tend to greater risk-aversion than men, albeit with substantial heterogeneity within both genders.

some point in the interview to describe others play or in generalizations from the game to life.

Taken together, these reflections provide support for the game-theoretic concept of choosing so as to maximize the minimum outcome.

The possible relevance of the conceptual shift that we make in viewing much of peoples' play in these sorts of games as harm minimization or self-protection rather than selfish defection is suggested in the following text from one of the women players generalizing from her game play to her life experiences and expectations:

S₂: I think that what that is actually going on in the world, people find success for themselves. It is actually difficult to condemn anybody about it. Especially staying in Singapore, it's like a dog-eat-dog world out there. If you don't make it, that's it. The government is not going to give you welfare programs; they are not going to give you funds or whatever. They just remind you to save early and then spend later, that sort of thing. . . . But all the general cases, you will lose out if you don't optimize, optimize what you have or what you can get... It's much slower in Perth. People don't compete as much. In Singapore it is very bad. You start from when you are very young. You have to have the top grades to make it to the best school. If you don't make it to the best school, you make sure you excel. The most fear that the children have here is the TEE [university entrance] exams. I think in Singapore by the time we come to the TEE exam, we are well equipped with the idea that if I don't make it, someone else will. And if that person will lose, [they] will not have a place in society, which is very true.

Returning to the safe/risk contrasts and their associations, three of the men made reference to the other player being unknown. For example one man, commenting on the games generally, said:

S: I definitely didn't like that I didn't know the person. . . I was actually thinking about that quite a bit as I was playing. . . it was like. . . what is this person really going to do? I figured

it was better to play it safe than to try to go for it all and trust the other person to do the same, to agree with you.

A fourth man discussed this issue generalizing from his experience with the games to his experience of sailing:

S₂₉: If you are in the situation where you are like in a one-on-one [competition] and you are not sure what they are going to do. So you make decisions based on playing it safe until you see what they are going to do . . . It depends upon if you are one of fifty boats in a race and you are sort of in the middle and you don't want to lose by too much, you play it a little bit safe.

Dixit and Nalebuff (2008, p.11) describe an analogous example of the 'play it safe' strategy in sailing, i.e., copy the other boat, and how the failure of the American team to use it in the final race of the 1983 America's Cup led directly to that team's defeat. Two other male players imagined relationships in their associations to safety or the risk/safe contrast. One made the following comment about the Dictator Game, where the player gets to dictate a split of \$30: 'In choosing \$15 you are taking the safer way, or the more likeable' He then went on to generalize from his games experience to life experience saying:

S₂₈: I think that friendship and relationship between others is very important to everybody. . . . And they like to keep that, they wouldn't want to hurt people or, and get people on the bad side of them . . . So I think that people prefer to play it safe . . . They don't want to get on the wrong side of the mob.

His last comment also suggests another, more negative, concept of risk, this time leading to cooperation rather than defection. It also ties in with an alternative explanation for the existence of 'we-thinking' frames; the concept of 'Machiavellian Intelligence' has been shown to be an

important factor in the evolution of the human brain and its capacity for predicting the intentions and responses of others (e.g., Dunbar 1993).

3f) The 'Experimenter's Money' Fallacy

One female commented as follows:

S₁₅: Well in respect to the money... it just doesn't seem right to me that I should get more than the other person when I have done nothing to earn the money. It's not mine anyway; it's just being shared or divided between us. If it's going to be divided between us then 'fair', to me, is that each person gets treated equally without preference.

A male player made a similar comment, having chosen to give the other player \$15 in the Ultimatum Game:

S₃₀: Well if someone is giving me \$30 free and there's two people then I would give it out evenly, because it is not my money to start with and I am just getting it free, so it is a bonus anyway.

For them, as for a number of other interviewees, two things seem to be going on. One is the distinction between earned and unearned money, in which generosity with the latter feels much more natural than with the former (see Guala and Mittone (2009) on the impact of such social norms). The importance of this distinction has probably been under-emphasized in the existing experimental literature on cooperation and generosity in laboratory experiments, which for the most part use 'unearned' money. Cherry et al (2002) is a notable exception; they found that if the proposer has to earn the money before dividing it, the proportion of proposers in Dictator Games offering zero rose from 19% when unearned to 79% when earned. Importantly, Ruffle (1998) found that when the *recipient* successfully wins a test of skill with other recipients, which in his version

increased the sum for their dictator to divide, the average dictator offer is nearly half of the total sum, including 21% of dictators who offered more than half of their money to the recipient.

Second, the concept of opportunity cost does not seem to be readily understood. They do not appear to view their participation in the experiment as earning them this money. Just because the money wasn't theirs before the experiment does not imply it is not theirs now, so cooperative and altruistic actions can still have an opportunity cost to them in dollars foregone.

Finally, experimental economists may benefit from a look at the diverse ways seemingly straightforward instructions or features of the experiment can be (mis)interpreted by players.

3g) Perceptions of the Presentation of the Experiment

One student, S₄, referring to the authors, quoted a line from the song 'He got Game' by *Public Enemy*: "Who's behind the game behind the game?" which subsequently inspired our title. Perhaps naively, our recruiting literature made reference to 'an experiment involving games'. This female was not impressed:

S₁₈: I didn't expect this, the whole experiment was about games – I was expecting physical games – so when I came in I was quite put off by that.

Another woman was more positive:

S₆: I found it interesting because we were basically sitting in front of computers and just, you know, thinking up these imaginary people in our heads and just deciding on what it would be on information on people and what they would be thinking. But, you know what I mean, it is something that we make up, it's actually not there.

A third female felt the background of the subjects would affect their ease of comprehension of the experiment:

S₁₇: Also for me, it's a way of thinking... it is quite alien to me to think in squares and to make choices based on [how things are] positioned [relative to each other]. It took me a while to get into, ... I think someone like an engineer would have an advantage in understanding that set up because that is the way they often work, with models that capture a lot with a little...

Supporting the current practice in experimental economics, the importance of financial incentives was noted by several subjects, for example this woman:

S₂₀: The games were fun, they were well organized... it was good that there was a money incentive to do it properly, and that there was a payment. I thought that was a good idea. I have done so many psychology experiments where there was no payment and people weren't doing it properly.

Ethical issues were also touched upon by a couple of players. One man reflected on his previous experimental experiences:

S₂₇: I have been very suspicious of the psych department ever since they tricked us into, in one of the labs they gave us all a sheet of paper that we all assumed was the same, talking about a diagnosis of mental illness. And we watched a video and were asked to like diagnose this person's thing. And then we all found out that the little introductory thing was all different and that sneaky psych department by tricking us into doing a primary experiment rather than doing an exercise on mental illness thingy.

We hasten to add that none of us were from the Psychology department, but his observation does raise the issue of contamination of the subject pool at a university. The many methodological differences between experiments in psychology and in economics are discussed at length in Hertwig and Ortmann, (2001). But it is not always so easy to avoid causing distress to subjects. To our

surprise, one woman found playing our games to be a slightly frightening experience, particularly the anonymity involved:

S₁₆: I was really confused [by the games] actually, I was sitting there... before the game I sort of... don't know if I got scared, but it was something along the lines of... 'What is it'... we didn't [discuss] anything about what the game actually was. Then while [I was] sitting at the computer going through [the] instructions etc it all seemed so anonymous and so ... although we had been told that we could walk away from it at any time - have you seen the movie "The Game"? He [Michael Douglas] plays a game that he doesn't realize is a game and all these things happen to him, he nearly gets killed... and I just kept thinking back to that and I was thinking... it was kind of scary how anonymous it was...'

Fortunately she went on to say:

'I am really glad I did it. It was weird, it was strange to me, I have never done anything like it before, so I am really pleased I did it'

Nevertheless her experience, which was only uncovered because we subsequently interviewed participants, should alert experimentalists to taking extra care that all subjects are comfortable with their participation. Perhaps one reason for the pervasive dislike of anonymity by our participants in these games (which to us is standard practice) is because players feel they can spot a cooperator or a defector in real life, which would influence their decisions, and we deny them that opportunity (see sub-section 3d). This would be an illustration of the 'Greenbeard effect' (Dawkins, 1976) that has also been noted in the social psychology literature (e.g., Yamagishi et al, 2003) in which cooperators think they can spot and reward others who share their cooperative traits.

Finally one male was quite excited by his experience:

I: How did you feel about the games overall? Did you enjoy playing them?

S₂₈: I enjoyed playing them. I thought it was really interesting, an interesting experience. I hadn't thought about that type of stuff before, and how your choice can be influenced by differing numbers, differing outcomes for each person. I found it really cool. And I was telling heaps of people after.

5. Conclusion.

I: The person you played against, did you talk with her afterwards?

S₇: Yes, I think it was just 'what did you think of that?'

S: 'Well it was a bit strange'

S₇: 'Oh, what are you going to spend the thirty dollars on?'

Application of the anthropological interview method to a behavioral games experiment has offered us new insight into players' perceptions of these important games. We have seen that our players are heterogeneous regarding the belief systems they bring into the economists experimental environment, so that traditional game theory can describe play accurately only for some. The behavioral approach to game theory then needs a richer framework in which the diverse motives our players revealed can find expression. Bacharach's dual-levels of agency approach is one possibility, as are other models such as guilt-aversion which can find expression only within the broader theoretical structure of 'Psychological Game Theory' (Battigalli and Dufwenberg, 2009).

Our interviews provide evidence for selfish motives, but also for the presence of emotions that dispose us to weigh the interests of others against our own. They also point to a concern for 'safety' and the significance of whether a player conceives of their money from the experiment as being earned or unearned, as well as to a pervasive dislike of the common practice of anonymity in such experiments. Other details of the experimental instructions and context also took on relevance in unanticipated ways in the eyes of some players, which may also prove to be of interest to experimentalists.

These prisms through which our players interpreted the games they were presented with are important because they help us understand the frames that influence decision-making in games

which expose the tension between the interests of the 'self' and the 'other'. Identification of the frames behind these games is then a critical step in understanding and validating how each of us balances these motives.

Appendix 1

Generally, interviews were conducted according to the protocol presented below. As the interviewers were instructed to follow student leads as much as possible, the order and number of specific questions asked varied, for example, an interviewee might answer Question 2 spontaneously when answering Question 1. In such a case the interviewer would not ask Question 2. One interviewer routinely began interviews with the last question listed here; the other used the order listed.

Sample Interview Protocol

1. Interviewer presents interviewee with a diagram of the first game [prisoners' dilemma see diagram 1]. Here is the first game that you played and you chose [student's choice]. Could you tell me why you made this choice? What were you thinking of when you made this choice?

2. In this first game, your estimate of the other player's choice was [give number] indicating that you thought they would be more likely to choose [A or B]. What were you thinking about the other player when you thought about what they would do?

3. Here is a summary of a sample of your choices [read ratio of A and B]. Could you tell me why in [first ratio] % of the games you chose A? Could you tell me why in [second ratio] % of the games you chose B? What were you thinking about when you made your choices?

4. Here is a summary of a sample of your estimates of the other players' choices [read mean of expectation]. Thinking of all the games, could you tell me why you thought that the other player would choose A? Thinking of all the games you played, could you tell me why you thought the other player would choose B? What were you thinking about when you made your estimates about the other player?

5. In one game you were asked to propose an amount of \$30 to keep in a division of the money with another player. You chose to keep \$____. Why did you choose this amount? What were you thinking about when you made this choice?

6. You were next asked to propose an amount of the \$30 that you would accept from the other player. You chose to accept \$____. Why did you choose this amount? What were you thinking about when you made this choice?

7. In the next game you were asked how much of \$30 you would keep for yourself if the other player had to accept your choice. You chose to keep \$____. Why did you choose this amount? What were you thinking about when you made this choice?

8. When you played a game with 'John' you chose [student's choice]. Could you tell me why you made this choice? What were you thinking of when you made this choice? What did you imagine about the other player?

9. When you played a game with 'Sue' you chose [student's choice]. Could you tell me why you made this choice? What were you thinking of when you made this choice? What did you imagine about the other player?

10. Overall did playing the games remind you of any experience in your daily life, or in your past?

11. Overall did playing the games remind you of particular people or particular relationships?

12. Overall did playing the games remind you of a particular story, poem, song or movie?

13. In the game you played for real with another player, how did you feel about the choice you made? How did you feel about the other player's choice?

14. Overall what do you think/feel about the games and talking about playing them?

15. Why did you choose to be interviewed about the games?

Table 1: Characteristics of the Sample

Full sample (n = 103)*		Interviewed (n = 30)*	Not interviewed (n = 73)*	<i>P</i> <
<i>Variable</i>	<i>N</i>	<i>N</i>	<i>N</i>	
Age	102	30	72	
(mean)	(19.96)	(19.2)	(20.28)	ns
Sex	102	30	73	.02
male	34	15	19	
female	68	15	54	
Ethnicity	91	25	68	ns
African	2	1	1	
Asian	17	2	15	
European	48	11	37	
other	24	11	13	
Marital status	102	29	73	ns
never married	100	29	71	
married	1		1	
widower	1		1	
SES	102	29	73	ns
lower middle	9	1	8	
middle	55	18	37	
upper middle	30	7	23	
wealthy	8	3	5	
Religion	100	29	71	ns
Buddhist	3	0	2	
Christian	57	18	39	
Hindu	1	0	1	
Jewish	2	2	0	
other	5	0	5	
no religion	32	9	23	
Strength of religious belief	100	29	101	ns
not at all strong	32	9	23	
not very strong	16	2	14	
medium	21	7	14	
fairly strong	20	7	13	
very strong	11	4	7	
English first language	100	29	73	ns
yes	94	27	67	
no	8	2	6	

* Numbers less than this below indicate missing data.

Table 2: Interviewee's Choices in the Games

Subject	% Cooperation in PD Games	% Cooperation in Chicken Games	\$ Offer in Ultimatum Game	\$ Offer in Dictator Game	% Expectation of Cooperation in PD Games	% Expectation of Cooperation in Chicken Games
S ₁ ♂	60	70	10	15	65.8	71.0
S ₂ ♀	5	25	15	0	97.5	77.4
S ₃ ♀	5	75	10	5	34.2	70.8
S ₄ ♂	10	65	15	15	8.7	90.0
S ₅ ♀	40	75	15	15	37.2	48.2
S ₆ ♀	65	90	15	5	63.5	65.0
S ₇ ♀	45	55	10	10	57.8	76.5
S ₈ ♂	25	70	15	0	55.2	60.4
S ₉ ♂	10	70	15	15	19.2	59.1
S ₁₀ ♂	20	70	10	5	44.3	67.9
S ₁₁ ♂	10	60	15	10	21.7	45.7
S ₁₂ ♀	20	75	12	5	35.1	63.7
S ₁₃ ♀	30	70	15	15	54.2	69.2
S ₁₄ ♂	5	50	15	0	32.6	46.5
S ₁₅ ♀	30	65	15	15	47.8	56.4
S ₁₆ ♀	45	85	15	15	54.7	62.4
S ₁₇ ♀	10	15	10	10	70.5	73.5
S ₁₈ ♀	75	55	15	0	90.0	73.9
S ₁₉ ♀	45	55	15	10	59.0	54.2
S ₂₀ ♀	15	65	15	15	54.8	69.4
S ₂₁ ♂	40	80	15	5	45.6	66.9

S ₂₂ ♀	15	75	15	5	25.2	64.8
S ₂₃ ♂	75	75	15	30	43.2	53.2
S ₂₄ ♀	30	65	10	15	50.2	60.2
S ₂₅ ♂	5	60	15	15	30.3	71.0
S ₂₆ ♂	15	65	15	15	19.2	61.2
S ₂₇ ♂	10	35	15	0	50.6	56.8
S ₂₈ ♂	5	50	10	15	19.4	57.7
S ₂₉ ♂	20	55	15	15	43.5	72.8
S ₃₀ ♂	10	70	15	15	36.9	60.9

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