



Coordination and focality under gain–loss framing: Experimental evidence[☆]

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HIGHLIGHTS

- We examine if the power of a label-based focal point in coordination games is affected by gain or loss framing.
- Loss framing reduces the power of the focal point.
- Loss framing reduces the positive effect of high stakes on the power of the focal point.

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ABSTRACT

Are people better at coordinating on a focal point when the game is framed as coordinating on a division of losses rather than gains? In an experimental coordination game, we vary the payoff framing (gain vs loss) and stake size (low vs high) to examine this question. We find that loss framing reduces coordination on the focal point, with the strongest effect observed in high stakes games.

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1. Introduction

A defining feature of coordination games is the multiplicity of equilibria, which creates an equilibrium selection problem for decision makers as they try to avoid coordination failure (Camerer, 2003; Devetaj and Ortmann, 2007).

How do players coordinate on an equilibrium? An important hypothesis, first proposed in Schelling (1960), is that players can

coordinate on a *focal point*,¹ even if this is based on purely contextual, payoff irrelevant features, e.g. strategy labels (Sugden and Zamarrón, 2006).²

In this paper we use an economics experiment to investigate if the power of a label-based focal point in a symmetric coordination

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¹ The hypothesis that focal points increase coordination has been generally confirmed for symmetric coordination games, where players have identical preferences and payoffs and are indifferent about exactly how they coordinate as long they manage to coordinate on something (Mehta et al., 1994; Camerer, 2003). Relatedly, Parravano and Poulsen (2015) demonstrate that the power of focal points increases with increases in payoff stake size. In contrast, the power of focal points is substantially reduced in games with asymmetric coordination payoffs, where players prefer coordination on different actions (Crawford et al., 2008; Van Elten and Penczynski, 2015; Isoni et al., 2013, 2014; Parravano and Poulsen, 2015; Poulsen et al., 2016).

² In this paper ‘focal point’ refers to label-based focal points, unless otherwise mentioned. Focality can of course also be based on properties of the game’s payoffs, such as equality or efficiency; see for example Galeotti et al. (2016), Bett et al. (2016), and Van Huyck et al. (1992).

game is affected by what we refer to as the *gain–loss frame*, namely whether payoffs are presented as gains (positive amounts) or as losses (negative amounts). We use a coordination game with two choices labeled A and B, and we assume that the strategy label A is the focal point.³ Our experimental treatments vary the framing of the decision (gains vs. losses) across environments where stake size is also manipulated between low and high payoffs. Across treatments that vary the gain–loss frame, we keep net monetary payoffs identical, enabling us to precisely identify if there is an effect of gain–loss framing on behavior.

The existing literature has found that behavior in coordination games is sensitive to changes in the level of the game's *real* payoffs (Cachon and Camerer, 1996; Feltovich, 2011; Feltovich et al., 2012).⁴ We augment the literature by asking: Can a change in the *frame*, namely framing all payoffs as losses rather than gains, but keeping all net payoffs unaffected, also affect behavior in coordination games? A finding that there is an effect of framing would violate the axiom of rational decision making known as *description invariance* (Tversky and Kahneman, 1986), according to which behavior under two different but normatively identical representations of the decision problem should be the same. This has been found to fail in many individual choice settings and some interactive situations (Neale and Bazerman, 1985; Druckman, 2001; Payne et al., 1992).⁵ Our paper can be seen as extending this investigation to coordination settings.⁶

Our ex-ante hypothesis was that a shift from a gain to a loss frame would have a positive effect on the power of the focal point and coordination. First, a loss frame might make subjects more keen to achieve coordination due to loss aversion (Kahneman and Tversky, 1979; Tversky and Kahneman, 1986). Loss framing might also make subjects better able to understand and appreciate the role of the focal point as a means to ensure coordination – strengthening team reasoning (Faillo et al., 2017; Sugden, 1993; Bardsley et al., 2010; Bacharach et al., 2006) where players in a coordination game reason and act as a team to consider how coordination is best achieved.⁷

Our main finding – and contrary to our expectation – is that switching from a gain to a loss frame tends to *reduce* coordination, with the strongest reduction observed under high stakes. Our findings suggest that description invariance does not hold in symmetric coordination games and any effect of going from a gain to a loss frame will never increase coordination rates.

One interpretation of these results is that the loss frame affects reasoning in a way that makes people less able to recognize the focal point or less confident that the other player will choose the focal point; and our analysis of the post-experiment survey

³ There are a number of reasons why A is considered focal: letter A comes before B in the alphabet, or the use of A in phrases such as the A plan, the A team, an A grade, and the A list.

⁴ See also Rydval and Ortmann (2005). There is a large experimental literature on other framing effects: Bazerman et al. (1985), Carnevale and Pruitt (1992), Dreu et al. (1994), Andreoni (1995), Cookson (2000), Cubitt et al. (2011), and Dufwenberg et al. (2011), Ellingsen et al. (2012) and Dreber et al. (2013).

⁵ Some bargaining studies have found an effect of loss versus gains frame. Bazerman (1983) and Neale and Bazerman (1985) observe that negotiators with a gain frame were more willing to concede, and earned more money than negotiators with a loss frame. See also Bazerman et al. (1985).

⁶ We emphasize that we do not have real losses in our experiment. All net payoffs are positive. It is only the game payoffs that are framed as gains or as losses. We explain the method used in the Experimental Design section.

⁷ Note that other theories about how people deal with losses in games, such as loss avoidance (cf. the papers described), do not apply to our games, since in the loss-framed games there is no safe strategy that is sure to not yield any losses. Thus, there are different theories about framing that make different predictions for our games. Of course, it is possible that both operate to some extent, and indeed that they could cancel out. Our paper was not intended to test these theories, but rather to exploratively generate data from plausible gain–loss framed coordination games with label based focal points.

data supports this interpretation as loss framing increased the frequency of random decisions, and reduced the discussion of A as a focal point.

The rest of the paper is organized as follows. Section 2 outlines the experiment design. We describe and analyze the data in Section 3 and Section 4 concludes. The Appendix contains the experiment instructions.

2. Experimental design

The 2×2 factorial design consists of four treatments that vary the size and framing of payoffs. The data presented for the gain frame treatments were collected in an earlier set of experiments and the findings were reported in Parravano and Poulsen (2015).

In all treatments each player had two actions, labeled A and B. If the players coordinate by both choosing A or both choosing B, each receives a coordination payoff, which exceeds what they receive if they fail to coordinate.

The gain frame. In the Gain (+) frame, all coordination payoffs are strictly positive and symmetric. In the case of coordination failure, each player receives zero. Treatments varied the stake size between low and high payoffs, where high payoffs were obtained by multiplying all low payoffs by three.

The games with gain framing are shown below. Payoffs are in British Pounds (£).

		A	B
Low (L+)	A	5, 5	0, 0
	B	0, 0	5, 5
High (H+)	A	15, 15	0, 0
	B	0, 0	15, 15

The loss frame. To examine the effect of a loss frame, the above games were transformed into games with negative payoffs, but in such a way that all final payoffs were the same as the gain frame. This was done by giving subjects a cash voucher that losses were taken from. The value of this voucher was £10 for Low stakes and £30 for High stakes. The losses for each game are presented below.

		A	B
Low L– (endowment £10)	A	–5, –5	–10, –10
	B	–10, –10	–5, –5
High H– (endowment £30)	A	–15, –15	–30, –30
	B	–30, –30	–15, –15

Consider any two games that differ only in the frame (+ vs. –), and consider some action profile. In these games net final earnings (game payoffs and any fixed payment) are the same and thus strategically identical and theoretically result in the same equilibria.⁸

Subjects were randomly assigned to a private cubicle and communication was not allowed. Each subject was given a brown envelope that contained two slips of paper, one labeled 'A' and the other 'B' (for an example see Fig. 2.1). Each slip indicated the payoffs that the subject would receive if both subjects chose the same slip. Subjects were also instructed of their payoffs in the event that they did not coordinate. In the gain frame, they were told that their earnings would be zero; in the loss frame they were told that they would lose the entire endowment amount.

⁸ In these games, (A, A) and (B, B) are the two pure strategy equilibria which exist in addition to a unique mixed strategy equilibrium.

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