

Experimental Design: Focality and Asymmetry in Multi-battle Contests

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1 Experimental Design

This is a summary of our experimental design. Additional details about the motivation and objective of the experimental design can be found in Section 3.1 of the main paper.

We have three main treatments: the symmetric treatment, the focal treatment, and the asymmetric treatment. In the symmetric treatment, subjects play 20 periods of a Colonel Blotto game with the same parameters throughout the session. Both subjects have a budget of $X_i = 200$ tokens that they are required to allocate across the different battlefields.¹ The four battlefields are represented by a row of four boxes, each containing a white circle. Every box is valued at $v_j = 15$ points.

The other two main treatments present alternative methods to single out one box (the target box) from the others. In the focal treatment, the game is identical to the symmetric treatment except that a *label asymmetry* is added: one box contains a black circle and the remaining boxes a white circle. Thus, following other focal point experiments, we induce the salience of a target while maintaining minimal asymmetry to test the salient target hypothesis. In the asymmetric treatment, the game is identical to the symmetric treatment but a *value asymmetry* is induced: one box is assigned a value of $v_T = 16.5$ points while the others are valued at $v_{-T} = 14.5$ points. Hence, the sum of the values of the battlefields is identical across the three main treatments (i.e., 60 points).

Our games have the following features. First, subjects can only distinguish the boxes either by position or by being the target box.² Second, the positions of the boxes are randomized across pairs every period; and subjects are informed of this. This randomization allows potential position effects of the boxes to be controlled.

¹Because we employ a lottery CSF and budgets are use-it-or-lose-it, any optimal allocation must exhaust the budget. In addition, continuity in the space of allocations is approximated by allowing subjects to include one decimal in their allocations. Actually, only 5.71 percent of all allocation decisions included decimals.

²The experimenter, however, can identify each box by an ID number from 1 to 4. The box with ID 1 is always the target box in each treatment (even in the symmetric treatment where boxes cannot be distinguished otherwise).

In addition, we design four other treatments to check for the validity and robustness of our results. First, the motivating applications in the introduction suggest a positive relationship between salience and allocations to the target box. However, salience can also affect behaviour negatively. To control for that, we introduce a game with a target box valued at 13.5 and others at 15.5: *low value asymmetry* treatment. Second, we examine the same three main treatments implementing a *budget asymmetry*: one subject (the strong player) receives a budget of $X_s = 200$ tokens and the other one (the weak player) receives a budget of $X_w = 160$ tokens.

Thus, we have 7 treatments. Each treatment is represented by a two letter acronym. The first letter indicates whether budgets are identical (I) or asymmetric (A) and the second letter indicates whether boxes are symmetric (S), one is focal (F) or asymmetric in values – with the case in which the target has higher value labelled (V) and the case in which it is of low value labelled (L). For example, IF means identical budgets and a focal box. For treatments with identical (asymmetric) budgets, we run two (four) sessions with a total of 32 subjects with 200 tokens (and 32 subjects with 160 tokens) – see Table 1 for a summary.

Table 1: Experimental design

Treatment	Budget (X_A ; X_B)	Label (target; others)	Value (target; others)	# Sessions	# Subjects
Main treatments					
IS	(200; 200)	(White; White)	(15; 15)	2	32
IF	(200; 200)	(Black; White)	(15; 15)	2	32
IV	(200; 200)	(White; White)	(16.5; 14.5)		
Robustness checks					
IL	(200; 200)	(White; White)	(13.5; 15.5)	2	32
AS	(200; 160)	(White; White)	(15; 15)	4	64
AF	(200; 160)	(Black; White)	(15; 15)	4	64
AV	(200; 160)	(White; White)	(16.5; 14.5)	4	64

Note: Each treatment is represented by a two letter acronym. The first letter indicates whether budgets are identical (I) or asymmetric (A) and the second letter indicates whether boxes are symmetric (S), one is focal (F) or asymmetric in values – with the case in which the target has higher value labelled (V) and the case in which it is of low value labelled (L). For example, IF means identical budgets and a focal box.

Each subject is allowed to take part in only one session. Within a session, two groups are formed; and, in every period, subjects are matched randomly and anonymously with a subject from the other group. Each subject is informed of their own allocations, their opponent’s allocations, the winner of each box and earnings at the end of each period. To show how a winner is determined in each battlefield, subjects are shown a roulette wheel divided into two portions corresponding to each player’s proportional allocation for that battlefield. An animated spinning arrow determines the winner randomly by stopping in one of the subjects’ portions (see the Online Appendix for screenshots). At the end of the experiment, subjects receive a payment based on the points they accumulate in five randomly selected periods, with an exchange rate of \$1 for every 20 points.

The experiment was conducted at the Economic Science Institute Laboratory at Chapman University. Subjects were recruited from the common subject pool – excluding subjects who had previous experience in contest experiments – and participated anonymously at computer workstations. The show-up fee was \$7. Instructions (reproduced in Appendix B) were presented on a separate piece of paper and subjects were informed that the same instructions were given to every subject in the session. After reading the instructions, subjects were required to complete a quiz (see Online Appendix). Sessions lasted for approximately

65 minutes – including 10 minutes for instructions. Subjects are bound to receive average earnings of \$14.5.