**1) Data collection.** Have any data been collected for this study already?

* Yes, we already collected the data.
* No, no data have been collected for this study yet.
* It's complicated. We have already collected some data but explain in Question 8 why readers may consider this a valid pre-registration nevertheless.

(Note: "Yes" is not an accepted answer.)

**2) Hypothesis**. What's the main question being asked or hypothesis being tested in this study?

In a previous study (see pre-registration #9750 for full details) we showed that people infer that they are supposed to avoid a door if an object is blocking the way (e.g., a piece of tape across the door). However, people do not infer this when the object is near the door and does not block the way (e.g., if the tape is taped on the side of the door). This study established that costs are critical when inferring the communicative meaning of objects. In this study, we test the hypothesis that people will continue to treat an object as meaning “avoid” after they have seen it block the way, even if the object is not blocking the way in future trials.

Participants will be presented with two identical doors and will have to decide which door they have to walk through. One of the doors will have an object nearby (the “modified” door) while the other door will have nothing near it (the “unmodified” door). Participants will be told that an agent placed the object near the modified door. Participants will then decide if they should or should not walk through the modified door using a 2AFC paradigm.

Participants will complete two trials. In one of the trials (the “object” trial), participants will see a physical object (see Q4 for list of objects) near one of the doors. In the other trial (the “symbol” trial), participants will see a picture of the same physical object (e.g., a picture of a potted plant or a picture of a stack of books) near one of the doors.

We predict that when participants undergo the object trial first (and see it as costly; see Q6) and the symbol trial second, they will infer that they should walk through the unmodified door in both trials. By contrast, we predict that when participants undergo the symbol trial first and the object trial second, they will show a weaker preference for the unmodified door in the symbol trial. We do not have expectations about whether participants will systematically favor the modified door, perform at chance, or have a weak preference for the unmodified door in this trial. We predict that participants will continue to infer that they should walk through the unmodified door in the object trial, even when it comes after the symbol trial.

**3) Dependent variable**. Describe the key dependent variable(s) specifying how they will be measured.

The two dependent variables are the doors that the participants choose in the object trial and in the symbol trial. Both will be measured using a 2AFC paradigm where the options are “you should walk through the door with the *object*” and “you should not walk through the door with the *object*”.

**4) Conditions.** How many and which conditions will participants be assigned to?

We will have two conditions that vary the order of our trials. In the first condition, participants will undergo the object trial first and the symbol trial second. In the second condition, participants will undergo the symbol trial first and the object trial second. After the test trials, participants will be asked which door is more difficult to walk through in the same order (see Q6).

The stimuli will consist of eight trials in each condition (all tested across participants). The objects we have chosen for our stimuli are: a plant, a chair, a stack of books, an unstacked pile of cinderblocks, tape across the door/opening of the door, a collection of three rulers taped to the top of the door frame, a hat, and a string tacked to the top of the door frame and tied to a fishbowl.

**5) Analyses.** Specify exactly which analyses you will conduct to examine the main question/hypothesis.

Our main analysis consists of a Fisher’s exact test of participant responses on the symbol trial and the trial order (symbol-first or object-first). We predict a significant difference due a stronger preference to walk through the unmodified door in the object-first trial.

We will also compute a two-tailed binomial test on participant answers in the symbol trial in the object-first trial. We predict that participants will show a significant preference to walk through the unmodified door.

Finally, as a conceptual replication of our original study (see pre-registration XXX), we will pool participant choices on the object trial across both conditions, and compute binomial test. We predict that participants will show a significant preference to walk through the unmodified door.

To supplement these analyses, we will also compute 95% bootstrapped confidence intervals for (1) the percentage endorsement of the unmodified door in both trials as a function of the trial order and (2) percentage endorsement of the unmodified door in both trials as a function of each object type. These confidence intervals will not constitute hypothesis tests and are meant to only help readers in interpreting the data.

**6) Outliers and Exclusions.** Describe exactly how outliers will be defined and handled, and your precise rule(s) for excluding observations.

After the test trials, we will also elicit an auxiliary variable (one for each trial and in the same order as the test trials) where we ask participants which door they think takes more effort to walk through (with three options: the modified door, the unmodified door, or equal).

For our hypothesis, we are only interested in participant responses when they see the object trial as costly. Participants who answer “unmodified door” or “equal” for the auxiliary variable will be excluded from the study (note that this implies that although the auxiliary variable has three levels, it will become a binary variable for the analyses).

**7) Sample Size.** How many observations will be collected or what will determine sample size? No need to justify decision, but be precise about exactly how the number will be determined.

We will test 10 participants in each of our eight modified doors across our two conditions, adding up to a total of 160 participants. We verified that this sample size is overpowered for our critical analysis (p=0.913) by running a Monte Carlo power analysis using pilot data (n=3 participants per condition). Participants that are excluded (see Q6) will be replaced so that the final sample size is 160 participants.

**8) Other.** Anything else you would like to pre-register?

(e.g., secondary analyses, variables collected for exploratory purposes, unusual analyses planned?)

See experiment materials at: <https://osf.io/qkjpd/?view_only=3a18a85adc5e49378fe0dd0e3808718b>

**9) Name.** Give a title for this AsPredicted pre-registration.

Suggestion: use the name of the project, followed by study description.

Symbols