Pilot study of Experiment 1

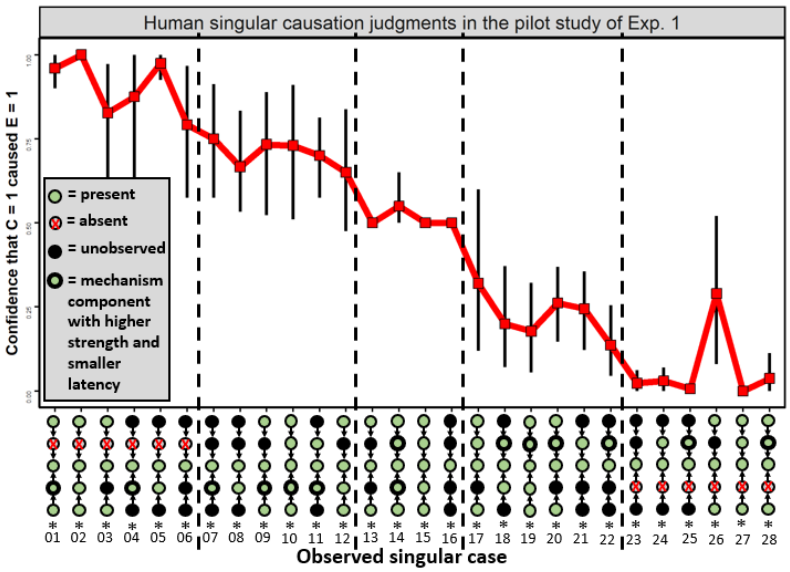

Figure P 1. Results of the pilot study of Experiment 1.

In the pilot study of Experiment 1 we tested twenty-five participants (mean age = 37.15 years, *SD* of age = 12.67 years; 9 subjects were male, 16 female) who, like in the main study, were recruited via Prolific and selected based on the same criteria. The procedure was largely identical to the one of the main study, except that each participant was shown only ten out of the total set of 28 test cases. The ten cases were randomly selected for each participant. The second difference was that subjects were asked to write short explanations for each of their ten singular causation judgments. One goal of the pilot study was to see whether our selection of model parameter values was appropriate. The singular causation judgments measured in the pilot study are summarized in Fig. P1 above. It can be seen there that the overall pattern was quite consistent with the results of the main study. However, it can also be seen that judgments for individual target cases were measured with less precision than in the main study. One reason for this lack of precision is the smaller sample size of the pilot study. A second reason is that participants were shown only ten randomly selected cases out of the whole set. As a result, not all means are based on same number of data points. A second goal of the pilot study was to find out how subjects think about the different mechanism components (telegraph towers and pony riders) that we used in our fictitious scenario. This was the reason why we had subjects write short explanations for their singular causation judgments. We will focus on these verbal descriptions in the following analysis. These verbal descriptions are useful in another respect: A crucial aspect of the generalized power model is that it integrates causal strength and temporal information (e.g., about causal latency). We therefore used the verbal descriptions obtained in the pilot study to see to which

extent subjects actually follow the generalized power model of causal attribution and integrate strength and temporal information.

Subjects' verbal descriptions were coded by an independent rater. The coding file can be accessed under (XXXOSF-LINKXXX). For each justification, central aspects that were coded were (1) whether the justification focuses solely on the target cause-path or also integrates information about the alternative-cause path, (2) whether it mentions differences between the different mechanism components, (3) whether it refers to causal strength, and (4) whether it includes temporal considerations. The test cases of the first and the last subset were those for which the singular cause can be determined by means of eliminative reasoning and without exact parameter knowledge. This aspect was coded only for these cases, and the analysis revealed that out of the 147 justifications that we collected in total for these cases, 65 explicitly described an eliminative reasoning strategy. For example, one justification read: ``NO message was received at the station for the Western Castle, therefore no signal had been sent to the Palace. It is not possible for the Western Castle emergency system to have triggered the Palace alarm on this day. The Eastern Castle did send a carrier pigeon and it's station did send a pony rider. Given that the Palace alarm is triggered, the signal must have come from the Eastern Castle.". 35 justifications were coded as clearly not mentioning eliminative reasoning. For example, one explanation read: ``Because the message system appeared to be working.". The remaining justifications were coded as ``unclear" in this respect. Moreover, out of the 250 total justifications made across the whole set of test cases, 176 (70.4 %) explicitly integrated information from both causal paths, while 74 focused only on a single causal path and neglected the other.

We next focus on the subset of test cases that require the integration of information about the parameters of both causal paths. Interestingly, even for those cases, 25 % percent of the given justifications (103 in total) focused solely on a single causal path. This suggests that a ``target-cause path" bias might be quite prevalent. Concerning the question to which extent subjects incorporate differences between different mechanism components, we found that about 40 % of the justifications explicitly mentioned such differences. Moreover, we found that about 17 % of the justifications given for the test cases that require a comparison of the different causal paths and assumptions about their parameters explicitly referred to causal strength. Importantly, we also found that even more justifications (about 25 %) explicitly mentioned temporal information. For example, one justification read: ``It would depend on the time of day that the carrier pigeons were sent out as to who first triggered the alarm in this instance, though given that the pony riders are much slower than the telegraph system, I would expect that the alarm was triggered by the Eastern Castle emergency system." Finally, the justifications that were given for the symmetrical test cases indicate that the uncertainty expressed in subjects' singular causation judgments for these cases were indeed motivated by the possibility of causal preemption. For example, for test case number 14, one participant justified her

uncertainty by saying ``Both castles sent a message via the same method and there is no way of knowing which one reached the palace first."