ETIQUETTE AND EFFORT: HOLDING DOORS FOR OTHERS*

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Abstract

Etiquette, the customary code of polite behavior among members of a group, provides a means of conveying respect for others, but what is the basis for etiquette's unwritten rules? Here we show that one form of etiquette, holding a door open for another person, has properties consistent with the hypothesis that the first person at the door continues to hold the door if s/he has reason to believe the follower shares the belief that the total effort expended by the two of them will be less than the sum of the two individuals' acting on their own. Our observations extend recent work on effort reduction in motor control to the management of social interactions.

Keywords: Etiquette, effort, motor control, social cognition

Running Head: Etiquette and Effort

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Although cooperation and other forms of social behavior have been studied for decades (Darley & Latane, 1968; Fehr & Rockenbach, 2006; Wilson, 1975), little attention has been paid to social interactions requiring, or benefiting from, physical cooperation. What little research that has been done on this topic has looked at how people work together on physical tasks when their cooperation is explicitly required (Knoblich & Jordan, 2003; Mottet et al, 2001; Newman-Norlund et al, 2008; Schmidt, Carello, & Turvey, 1990). Such work has been pursued to broaden research on perceptual-motor control, which has traditionally focused on individuals working in isolation. Looking at how individuals cooperate when they are required to do so has helped confirm the hypothesis that people rely on internal models of the consequences of their own actions when they plan those actions (Wolpert & Flanagan, 2001). In keeping with the view that such internal models are flexible and sophisticated, it has been found that people's internal models can also reflect predictions of the consequences of others' actions (Flanagan & Johansson, 2003).

The present study was motivated by the hypothesis that internal models for perceptual-motor control can serve altruistic purposes. We hypothesized that everyday acts of etiquette like handing a fork to another person in a way that minimizes the amount of hand rotation the recipient must produce reflects sophisticated, though typically unconscious, calculations of the effort required for the two people acting together compared to the two people acting alone. Specifically, we hypothesized that one person exerting more effort in a social context than he or she would on his or her own reflects his or her expectation that his or her effort plus the effort of the other person would be less than sum of the efforts of the two individuals acting individually. According to this view, etiquette, or the form of physically expressed etiquette considered here, is not just a symbol for respect; it is also a means of reducing physical effort for the group.

The context in which we pursued this hypothesis was people passing through a doorway. We were interested in the probability that people who opened the door for themselves would continue to hold the door open for people coming behind. We hypothesized that each moment of holding the door for the next person would add extra effort to the effort of the first person, but the first person would continue to hold the door if s/he had reason to believe the follower would share the belief that the total effort expended by the two of them would be less than the sum of their individual door-opening efforts. To the best of our knowledge, this everyday behavior has not been systematically studied before, nor has the connection between etiquette and physical effort more generally.

The model introduced above can called the shared effort model. We also considered an alternative model. According to this critical-distance model, the first person held the door if s/he noticed that there was a follower within some critical distance from the door at the moment the first person reached it. The latter account need not rely on internal simulation of the effort to be expended by the first and second person at the door. Rather, the first person can be assumed simply to obey a social rule concerning door holding: If someone is within some critical distance, hold the door for him or her. The latter hypothesis is plausible given that people are more likely to help others when they are close by than when they are farther away (Pancer et al., 1979).

The critical-distance model and the shared-effort model made different predictions about three measures of performance: (1) the physical distance between the first person at the door and whomever followed, (2) the time the first person held the door for whomever followed, and (3) the number of followers, either one or two, approaching the door when the first person reached the door.

The critical distance model predicted that the likelihood of holding the door would decrease with the distance between the first person at the door and the follower(s). It also said that the rate of decrease of probability of door holding relative to distance would be lower when two people followed than when one person followed. The latter prediction was based on the idea that when two people followed, there would be a higher likelihood of noticing that someone was behind. The shared effort model made no specific prediction about the interaction between number of followers and following distance.

Regarding the time spent holding the door, the critical distance model predicted that the sole determinant of holding time would be the distance to be covered by the follower(s), with the rate of decrease of door holding time being no different for one follower or two. The shared effort model, by contrast, predicted that the time spent holding the door would depend not just on the distance of the follower(s) but also on his, her, or their expected arrival time(s). Specifically, the shared effort model predicted that the first person at the door would be willing to hold the door longer for two followers than for one because holding the door for two followers would extend the benefit of effort reduction to more people.

A third prediction concerned the behavior of the person or persons for whom the door was held. The shared effort model predicted that individuals approaching a door being held open might speed up as they approached the door. They would do so, according to the shared effort model, to reduce the door holder's door-holding time and so increase the likelihood that the joint effort expended by the holder and follower would be less than the sum of the two individuals' door opening efforts. Speeding up would increase the effort of the follower, but doing so might still help fulfill the implicit pact between the opener and follower to keep their joint effort below the sum of their individual door-opening efforts. The critical distance model made no prediction about followers' approach times.

Method

We studied the door-holding behavior of individuals exiting the door leading to the patio of the Hetzel Union Building of Penn State University (University Park). With our digital video camera, we recorded the behavior of 148 individuals approaching and passing through the door. We determined whether they held the door for the follower(s), the distance between the first person at the door and the follower(s), the amount of time it took for the follower(s) to reach the doorway, and whether one follower or two (two people walking side by side) followed the predecessor at the door. We did not study cases where there were more than two followers, nor did we examine the door-holding behavior of pairs of people arriving at the door, one or both of whom could have held the door for others. We only analyzed cases where the first person who reached the door was judged to have seen the follower(s). All judgments and other measures were made off-line from the videos and were performed by two independent raters, one of whom was naive to the hypothesis. Personal characteristics of the observed individuals were not coded.

To determine the distance between the individuals passing through the door, we extracted a still-frame image from the video stream at the moment the first person was judged to touch the door. The distance was defined as the separation between the center of the head of the door opener (the first individual) and the center of the head of the follower or, if there were two followers, the center of the head of the one follower judged closer to the door at the moment the first person touched the door. The distance was recorded using a point-and-click method validated in other studies in our laboratory (Cohen & Rosenbaum, 2004). To obtain the time measure, we retrieved a frame count between when the person who opened the door touched the door and when the (first) follower's head reached the doorway. The temporal resolution achievable with this method was limited by the video frame rate (about one frame

every 67 ms). We generated data bins based on equally spaced normalized values.

Results and Discussion

The inter-rater reliability for the coding of whether doors were held open indicated that the two raters agreed 95% of the time. The inter-rater reliability for the coding of whether the door opener saw a follower indicated that the two raters agreed 92% of the time. The reliability of the distance measure was not specifically analyzed, as the method for determining distance was previously validated. The data described below only apply to cases where both raters agreed on whether the door was held.

The results for distance are shown in Figure 1. The slope, zero-intercept, and r^2 values of the best-fitting straight line fitted to the single-follower points were -.20, 1.20, and .73, respectively. The slope, zero-intercept, and r^2values of the best-fitting straight line fitted to the two-follower points were -.20, 1.12, and .81, respectively.

Regarding the predictions concerning distance, the results contradicted the prediction of the critical distance model because the slopes of the best-fitting straight lines were identical in the one-follower and two-follower cases and the zero-intercepts were not significantly different in these two cases ($p = .90$).

The results for holding time are shown in Figure 2. The slope, zero-intercept, and r^2 values of the best-fitting straight line fitted to the single-follower points were -.20, 1.37, and .88, respectively. The slope, zero-intercept, and r^2values of the best-fitting straight line fitted to the two-follower points were -.05, .99, and .84, respectively.

Regarding the relation of the holding-time data to the predictions, the results again contradicted the critical distance model. As predicted by the shared effort model, the time the

first person held the door was generally longer for two followers than for one. This outcome was reflected in the shallower slope of the best-fitting straight-line function relating probability of holding the door to holding time for the two-follower case than for the one-follower case ($p < .06$). The zero intercepts of the two functions did not differ ($p = .39$).

The final set of results concern the approach times to the door. As stated above, the shared effort model predicted that individuals approaching the door if it was held open would try to help ensure that the joint effort was less than the sum of the individual efforts. From this premise, the shared effort model predicted that the more often the door was held open for followers as they approached the door, the more often they would switch from a normally paced approach to a quicker approach. As a result, the more often the door was held open, the larger the approach-time coefficient of variation (standard deviation divided by the mean) would be.

Figure 3 shows that this prediction was confirmed. The coefficient of variation was higher when the door was held open more often (short distances) than when the door was held open less often (longer distances). This was true both for the one-follower and two-follower cases. That this outcome was due to social interactions between the door holders and the followers was supported by the fact that, in separate analyses, the coefficient of variation of the door-approach times was a flat function of distance when the first person arriving at the door did not hold the door for the follower or followers (all p's $> .10$).

Conclusion

In this study we joined two lines of research that have so far been independent -- research on cooperation/altruism and research on internal simulation of actions. We hypothesized that everyday acts of social cooperation and altruism expressed in the form of holding doors for

others reflect the intersection of these two processes. Specifically, we hypothesized that decisions about when and whether to hold a door open for others depends on calculations of the odds that holding the door would result in less effort being expended than if each individual opened the door on his or her own.

Consistent with this shared effort hypothesis, we found that people arriving at a door before others were more likely to hold the door the closer the follower(s). Also consistent with the shared-effort hypothesis, first arrivers were willing to hold the door longer when two people followed than when only one person followed. This outcome fits with the idea that, by expending more effort than usual, the first person at the door could reduce group effort. Finally, consistent with the idea that the sharing of effort was a value shared by those passing through the door, followers tended to mix fast approaches to the door with normally paced approaches to the door more often the greater the frequency with which the door was held open for them, as reflected in the inverse relation between coefficients of variation for approach times and door-approach distances.

A final remark concerns the form of etiquette we focused on here. Some forms of etiquette do not concern physical effort (e.g., napkin folding), and some forms of social effort reduction are not about etiquette (e.g., team sports). Etiquette differs from these other situations in that it is optional. Indeed, it is possible that precisely because etiquette is optional, it carries special social significance. If door holders engage in door holding selectively -- holding for doors for those they find attractive, for example -- this shows that such selectivity is an important component of this form of social behavior. Understanding how such selectivity is expressed in different contexts (e.g., among people of different race, gender, and locale) remains a challenge for this new line of inquiry.

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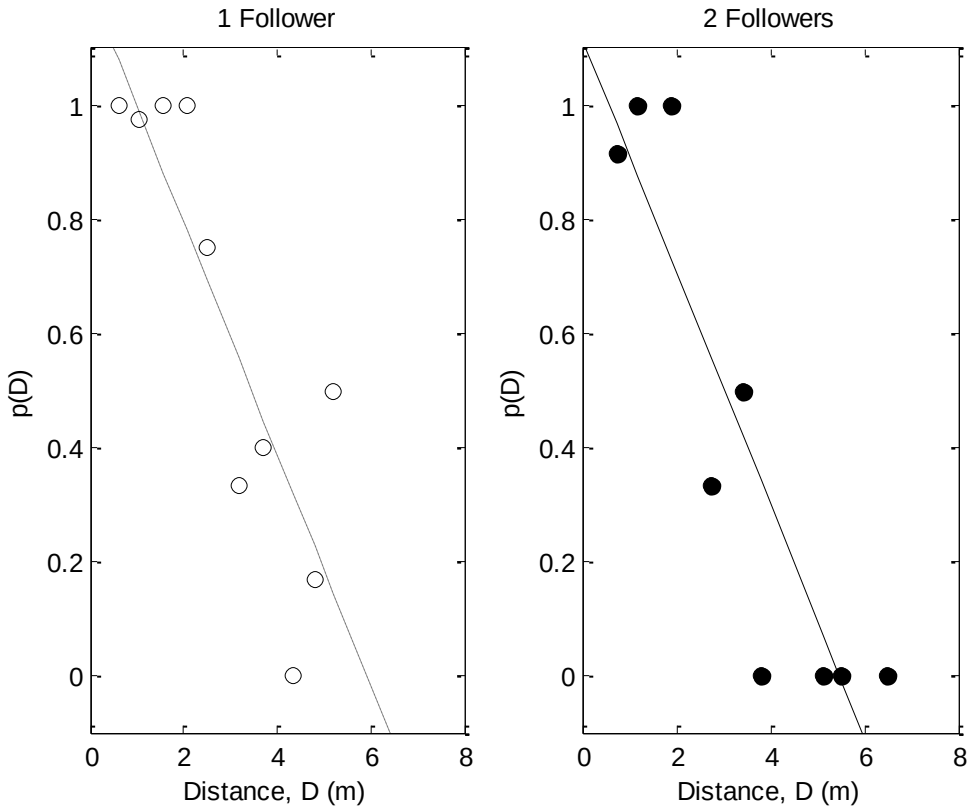

Figure 1. Probability, p(D), of holding the door for 1 follower (left panel) or 2 followers (right panel) as a function of distance, D, to the door at the moment the first person touched the door.

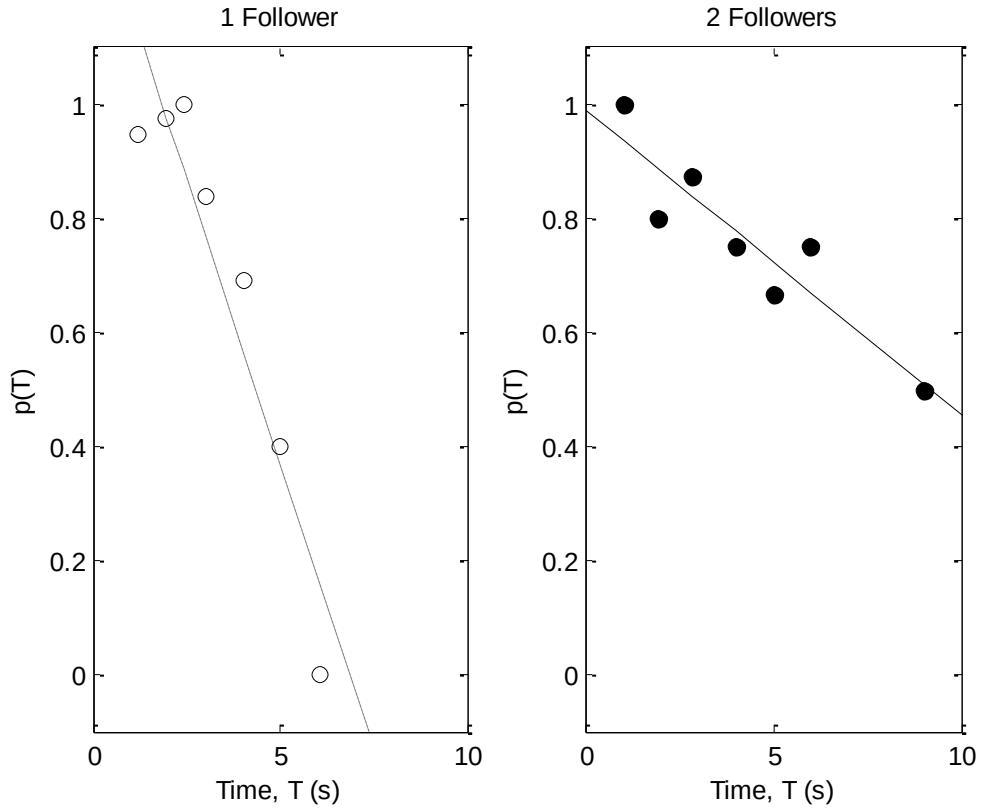

Figure 2. Probability, p(T), of holding the door for 1 follower (left panel) or 2 followers (right panel) as a function of holding time, T.

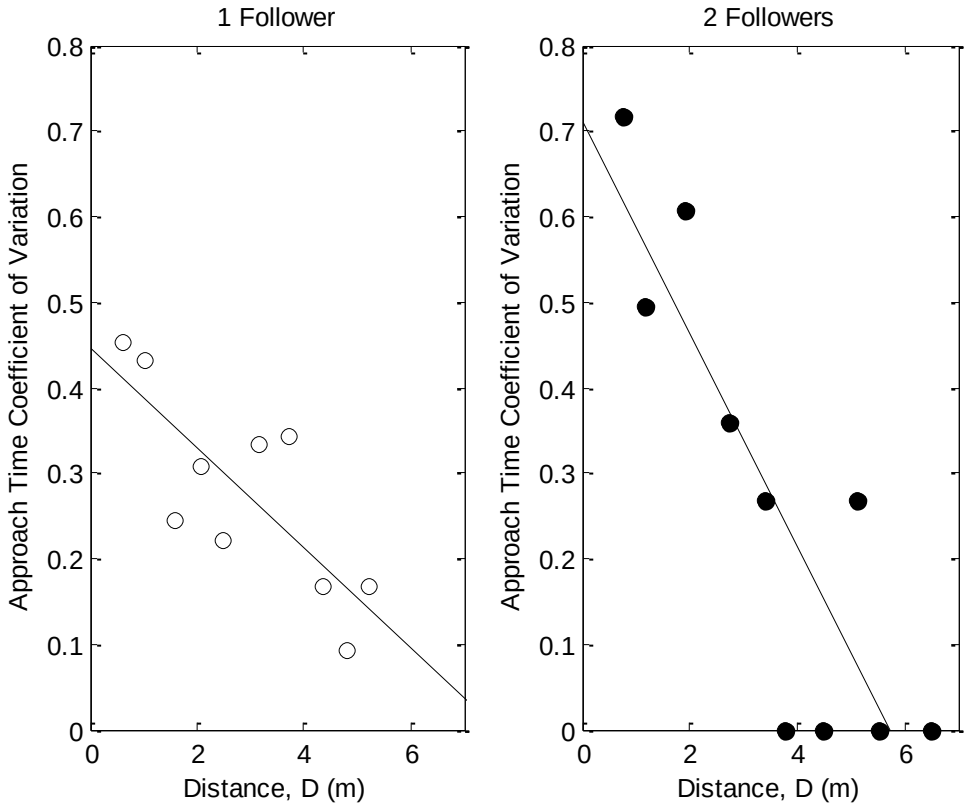

Figure 3. Coefficient of variation of approach time for 1 follower (left panel) or 2 followers (right panel) as a function of distance, D, to the door at the moment the first person touched the door. The four points on the bottom of the right panel come from cases with just one observation per point.