Rich and Famous: Recognition-based judgment in the *Sunday Times Rich List*

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Abstract

Recognition as a cue to judgment in a novel, multi-option domain (the *Sunday Times Rich List*) is explored. As in previous studies, participants were found to make use of name recognition as a cue to the presumed wealth of individuals. Names that were recognized were judged to be the richest name from amongst the set presented at above chance levels. This effect persisted across situations in which more than one name was recognized; recognition was used as an inclusion criterion for the sub-set of names to be considered the richest of the set presented. However, when the question was reversed, and a "poorest" judgment was required, use of recognition as an exclusion criterion was observed only when a single name was recognized. Reaction times when making these judgments also show a distinction between "richest" and "poorest" questions with recognition of none of the options taking the longest time to judge in the "richest" question condition and full recognition of all the names presented taking longest to judge in the "poorest" question condition. Implications for decision-making using simple heuristics are discussed.

Introduction

Recognition-based choice has been argued to be a fundamental component of "fast and frugal" decision-making (Goldstein & Gigerenzer, 1999; 2002). In situations where the probability of recognition correlates well with the criterion of interest (e.g., judgments of city size), people who have the opportunity to base their judgments purely on recognition - those who recognize some, but not all, of the names presented to them - have been shown to be at an advantage relative to those who recognize all the names. This latter, ostensibly well-informed group must rely on some other criterion for judgment (Borges, Goldstein, Ortmann & Gigerenzer, 1999; Goldstein & Gigerenzer, 1999). Recognition guided judgments are said to employ a "recognition heuristic" wherein, in the absence of other cues, recognition is used as the basis for inferences of size or magnitude.

Such recognition-based judgments have, however, only been studied in a limited number of domains, and using a limited range of choice tasks. Even studies critical of the special status of recognition in decision-making (e.g., McCloy & Beaman, 2004; Newell & Shanks, 2004; Oppenheimer, 2003) have employed, to a large extent, the same basic task. Goldstein and Gigerenzer's (1996) "drosophila" environment for recognition-based choice is a two-alternative forced choice task (2AFC) where people are presented with the names of two cities and asked to judge which of the two is the larger. Both the 2AFC task and the city choice domain have been used almost exclusively in studies exploring Goldstein and Gigerenzer's recognition heuristic (e.g., McCloy & Beaman, 2004; Oppenheimer, 2003; Reimer & Katsikopoulos, 2004). One aim of the current paper is to further consider the generality of recognition heuristic by extending its consideration to a new and potentially fruitful domain - that of the *Sunday Times Rich List*. Theoretically, the recognition heuristic should generalize across all domains of magnitude judgment. However, some domains seem intuitively more likely to encourage such heuristic-based inference than others.

Rich and Famous

People who are well-known or famous, as a general rule, tend to be wealthier than people who are not famous. If asked which of two people is the wealthier, it may therefore be rational to choose recognized names over unrecognized names, i.e., to apply a recognition heuristic. The area of fame and wealth should be an interesting domain in which to study recognition-based choice. Each year, the *Sunday Times* newspaper in the United Kingdom prints an ordered list of the 1000 richest people in the country, alongside several additional lists (e.g., 100 richest people under 30 year old). As the wealth of the people on this list comes from a wide range of sources (e.g., business, inheritance, entertainment) there is scope for wide variation in recognition, not only across the people named, but also across participants in any experiment (depending on their areas of interest). This makes it a very rich domain in which to study the impact that recognition has on judgments of magnitude - in this case the relative wealth of the people under consideration. In addition to checking whether the application of the recognition heuristic generalizes to a novel domain, we will also examine some new choice situations (multiple option choices, alterations in question framing) and new dependent measures (time taken to make a decision), which may reflect the processes underlying choice.

Multiple Alternatives

Even studies of recognition-based judgments that have moved outside of the standard "cities" domain (e.g., Newell & Shanks, 2004 - choices between stocks) and have tried to broaden the methodologies used, have limited their scope to what is essentially the same basic two-alternative forced choice task. Goldstein & Gigerenzer (1999) suggest that looking at choices between 2 alternatives is a valid task for capturing everyday choice behavior, as it "is an elementary case to which many problems of greater complexity (multiple choice, for instance) are reducible" (p. 41). However, this may not necessarily be the case. People's behavior in *n*-alternative choices may not be as straightforward as Goldstein and Gigerenzer suggest.

What happens if we increase the number of options that people must chose between? Take the example of the cities task, and imagine that, instead of being presented with two cities as in the traditional version, we present participants with three names and ask them to choose the largest. Where participants recognize none of the names, their accuracy should be at chance levels (1/3), as they guess between the three options presented. Where participants recognize one option out of three, the recognition heuristic states that they should choose this option - so their accuracy should reflect their recognition validity (RV) for the domain. Where participants recognize two out of the three names presented, they should be able to use the recognition heuristic to exclude the name that they do not recognize. They will then need to use their knowledge to decide between the remaining two options - so their accuracy should reflect both their recognition validity and their knowledge validity for the domain (RV x KV). Where participants recognize all three options, they cannot use the recognition heuristic to guide their choices, so must rely on knowledge, and their accuracy should therefore reflect knowledge validity alone (KV).

Framing

Varying the options available is not the only possible innovation that might shed light on when and why recognition-based inference is used. McCloy and Beaman (2004) showed with the 2AFC cities task that changing the question, from "which is larger?" to "which is smaller?", could alter adherence to the recognition heuristic. People use the recognition heuristic less often for the smaller question than for the larger question, despite recognition being as valid a criterion for choice in both cases (as a criterion for inclusion for the larger question, and exclusion for the smaller question). The effect of altering the framing of the question may have more pronounced consequences when we consider situations with choices between more than two options. If we present participants in the cities task with three names and ask them to choose instead the smallest of the three names, we would predict a difference in the role played by recognition. Where participants recognize none of the names, we would again predict that their accuracy should be at chance levels (1/3), as they still must guess between the three options presented. Where participants recognize one option out of three, participants should be able to use the recognition heuristic to exclude the recognized option, and then should guess between the remaining two unrecognized names - so their accuracy should reflect both recognition validity and chance (RV x 1/2). Where participants recognize two out of the three names presented, they should be able to use the recognition heuristic to exclude the two recognized names, and therefore choose the unrecognized name - so their accuracy should only reflect their recognition validity and for the domain (RV) - this should be equivalent to the case when one out of three is recognized with the "largest" question. Where participants recognize all three options, they again cannot use the recognition heuristic to guide their choices, so must rely on knowledge, and their accuracy should therefore reflect knowledge validity alone (KV), as is the case for the "largest" question.

Reaction Times

Finally, if processing progresses as described above, one place where we would additionally expect to see differences as a result of question framing is in the time it takes people to make their choices. This is due to the different steps involved in applying the heuristic depending on the question being asked. As noted earlier, recognition-driven inference is considered a fundamental component of other decision-making heuristics. One such heuristic is "take-the-best" (Gigerenzer & Goldstein, 1999), which makes judgments on the best cue available. In circumstances where not all of the options under consideration are known, the best cue is frequently recognition. Other "fast and frugal" heuristics (e.g., "minimalist", "take-the-last"; Gigerenzer & Goldstein, 1999) take the same general form, including the use of recognition, and differ only in terms of the type of search carried out at "step 1" (see below). The steps along which the take-the-best heuristic proceeds are as follows:

> Step 0: If only one object is recognized, predict that it has the higher value on the criterion. If neither is recognized, then guess. If both are recognized, go to step one.
> Step 1: Ordered search. Choose the cue with the highest validity that has not yet been tried. Look up the cue values of the two objects.
> Step 2: If one object has a positive cue value and the other has not, go to step three. If not, go to step one.
> Step 3: Predict that the object with the positive cue has the higher value on the criterion.

This series of sequential steps entails some predictions about relative speed to respond depending on the options presented.

Where none of the options presented is recognized, and participants are hypothesized to guess for both question framings, we would predict no difference in the time taken to choose when we change the question asked from largest to smallest (both Step 0). If pure guesswork is involved, choice should also be relatively fast. For the larger question, when 1 out of the 3 options is recognized, choice should also be relatively fast, as people can apply the recognition heuristic and select the recognized option (also Step 0). For the smaller question, when 1 out of 3 options is recognized, choice should be slower, as an additional step is required. People should use the recognition heuristic to exclude the recognized option and then guess between the remaining two unrecognized options.

For the larger question, when 2 out of 3 options are recognized choice should be slower than it is when only 1 out of 3 is recognized. In this case, the recognition heuristic rules out only 1 of the 3 options, and participants must use knowledge to decide between the remaining 2. If we assume that using knowledge is relatively more effortful than guessing, then choice in this case should also be slower than with the smaller question when 1 out of 3 is recognized. For the smaller question, when 2 out of 3 are recognized, choice should, in contrast, be relatively fast. People can use the recognition heuristic to exclude the two recognized options and hence choose the one unrecognized option.

Finally, when all 3 options are recognized, people must use their knowledge to make a choice, regardless of the question asked. Choice should, therefore, be relatively slow for both question framings. However, differences could still be found here depending on whether or not the cues used to guide choice beyond recognition are the same for both question framings.

Aims

The analyses presented above of the steps involved in choice in 3AFC were originally taken from the cities task, but are domain-independent and should apply equally to versions of the cities task and to materials taken from the *Sunday Times Rich List*. With regards to the framing of questions, asking "who is richest?" should correspond directly to the "largest" question in the cities task, and asking "who is poorest?" should correspond directly with the "smallest" question. By broadening our scope to consider situations with multiple options and by looking at alternative question frames we should additionally be able to address questions concerning the generality of recognition-based judgment.

Experiment

Method

35 Adult volunteers took part in the experiment. The triplets of names used in the experiment were made up of names taken from the 2005 *Sunday Times Rich List*. These materials had previously been shown to elicit strong recognition heuristic usage in a 2AFC task (McCloy, Beaman, Goddard & Smith, 2006). The experiment was presented to participants on a PC laptop running Windows XP, using a dedicated Visual Basic computer package. Participants were presented with 200 triplets of names. Each triplet was paired with one of two questions: either "who is the richest of these people?" or "who is the poorest of these people?". Participants indicated their responses by pressing a button. The program recorded both the choice that participants made, and the time they took to make their choice (in hundredths of a second). When participants had completed the choice phase of the experiment they were then presented with a list of all of the names that they had seen in the experiment, and were asked to indicate (by ticking a box next to the name) which of the names they recognized from before the experiment. The program also recorded this information. The design of the experiment was therefore wholly within-participants. The independent variables were the frame of the question (richest / poorest) and the number of names recognized in each triplet (0, 1, 2 or 3). The dependent variables were the option chosen by participants (recognized / unrecognized) and the time taken to make the choice.

Results

Choices What happens if we consider participants choices for the situations in which they could use the recognition heuristic (i.e., when they recognized 1 or 2 out of 3 in a triplet), as in previous experiments? For the richest question, when participants recognized 1 out of 3 names they chose the recognized option significantly more often than at chance ($t(34) = 12.60$, $p < 0.001$). When they recognized 2 out of 3 names, they also choose a recognized name significantly more often than chance ($t(34) = 10.13$, $p < 0.001$). For the poorest question, when participants recognized 1 out of 3 names, they chose the recognized option significantly less often than chance ($t(34) = -12.19$, $p < 0.001$). When they recognized 2 out of 3 names, however, they failed to choose a recognized option significantly less often than chance ($t(34) = 1.59$, $p < 0.122$).

Comparing like with like, if we compare participants choices when recognition heuristic use alone should account for their choices (where 1 out of 3 is recognized for the richest question, and where 2 out of 3 are recognized for the poorest question) we can see that the proportion of recognition heuristic usage is significantly higher for the richest question (RH use = choose recognized), than for the poorest question (RH use = choose unrecognized; $t(34) = 3.15$, $p < 0.003$). This is in line with previous findings (McCloy & Beaman, 2004), which show a framing effect in recognition-based judgment in the original domain of 2AFC city judgment tasks.

Reaction Times Figure 1 shows participants' mean reaction times by the number of names they recognized. A repeatedmeasures ANOVA shows that overall there is no significant effect of the framing of the question on reaction time ($F(1, 34) = 3.012$, $MSE = 204$, $\eta^2 = .081$, $p < 0.092$). There is a significant main effect of the number of names recognized ($F(3, 102) = 4.795$, $MSE = 138.3$, $\eta^2 = .124$, $p < 0.004$). There is also a significant interaction between question frame and reaction time ($F(3, 102) = 9.573$, $MSE = 234.6$, $\eta^2 = .220$, $p < 0.001$). From Figure 1 you can see that, for the poorest frame, participants choices get slower with the number of names recognized in each triplet (Means: recog. 0 = 1.92s, recog. 1 = 1.98s, recog. 2 = 2.02s, recog. 3 = 2.11s). For the richest frame, participants' choices are slowest when no names are recognized (mean 2.04s), but do not differ significantly once at least one name is recognized (Means: recog. 1 = 1.95s, recog. 2 = 1.97s, recog. 3 = 1.96s).

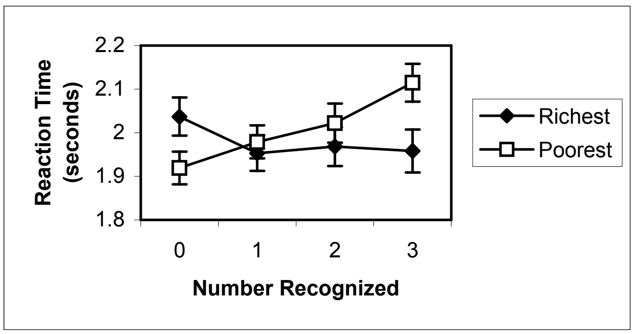

Figure 1: Mean reactions times by question frame and number of options recognized.

If we again compare like with like, and look at situations where participants could base their judgments on recognition alone (where 1 out of 3 is recognized for the richest question, and where 2 out of 3 are recognized for the poorest question), we can see that participants' choices were significantly slower in the poorer frame (mean 2.02 seconds, s.d. = 0.26) than in the richer frame (mean 1.95 seconds, s.d. = 0.22; $t(34) = 2.341$, $p < 0.025$).

General Discussion

When people are shown three names and are asked to judge which of the three is the richest they use recognition to guide their choices if it is a discriminating cue. This occurs not only when people recognize one name out of three, but also when they recognize two out of three names. This suggests that recognized options are not chosen purely because they are salient, and therefore provides some further evidence for the use of a recognition heuristic in magnitude judgments.

When one out of three names presented is recognized, an people are instead asked to judge which of the three names is the poorest, we again find evidence for the usage of a recognition heuristic, as participants choose an unrecognized option significantly more often than would be expected by chance. However, when two out of three options are recognized, people answering the poorest question did not show evidence of using a recognition heuristic - despite the salience of the "to-be-chosen" (unrecognized) option. Recognition-based judgment appears to operate in a different manner when the magnitude judgment at hand is a lesser or least judgment than when it is a greater or greatest judgment. This is most obvious when we compare the situations in which recognition alone can guide choice (i.e., recognize 1 for richest and recognize 2 for poorest). People are significantly less likely to use recognition to guide their choices when they are asked who is poorest than when they are asked who is richest. In this study we have therefore replicated the framing effect in recognition-based judgment first observed by McCloy and Beaman (2004) in a novel domain and with multiple options.

We had hoped that by extending the dependent measures that we used in our study to include reaction times, that we would gain some insight into the processes underlying recognition-based judgment. The predictions that we had made on the basis of an assumption of "take-the-best" style sequential processing were not supported by the data. The pattern that we observe in people's choice times is not just an artifact of the domain we have used, as an identical pattern of results is found if the same experimental design is used within a cities choice domain (McCloy et al., 2006).

We did not find an overall effect of the framing of the question asked on people's choice times. People are not slower overall to make one kind of judgment than the other. However, there was a clear interaction in our data between the framing of the question asked and the number of options recognized, such that the reaction time data for the poorest question is an approximate mirror image of the reaction time data for the richest question.

When looked at more closely, for the richest question there appears to be an advantage of some knowledge over no knowledge, but the exact extent of the knowledge does not appear to be important. For the poorest question, there is an increasing decrement in speed of choice with the number of items recognized. These results are clearly inconsistent with the kind of sequential processes outlined by Gigerenzer and Goldstein (1999). Thus, although we were able to confirm in a novel, multi-option domain the outcome of recognition heuristic type judgments, we are unable to confirm that the processes involved operate in the manner suggested by the analysis of Gigerenzer and Goldstein (1999). If decision-making is not carried out in this sequential, stepwise fashion, then many of the advantages claimed for single-reason, non-compensatory heuristics may no be warranted. People clearly do use recognition to guide their judgments and choices, but the circumstances in which they do so remain to be fully explored.

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