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In two parallel experiments, conducted 17 months apart, we examined the relations among population estimates, availability, and media coverage of the 100 countries with populations of 4 million or more. The results were consistent with the main hypothesis, that availability influences population estimates. Specifically, we found that (1) rated knowledge of each country (our measure of availability) was strongly correlated with estimated population for that country; (2) rated knowledge was more strongly correlated with estimated population than were other plausible predictors, such as land area; (3) a strong partial correlation between rated knowledge and estimated population remained even after true population and true land area were partialed out; and (4) longitudinal changes in rated knowledge predicted longitudinal changes in estimated population. Also as hypothesized, media coverage was positively related to availability and to population estimates. Further, we found that population estimates, rated knowledge, and amount of media coverage that each country received were very stable over the year-and-a-half period. These results led us to consider when availability is most likely to be relied upon heavily in quantitative estimation and how it may be integrated with other knowledge to derive quantitative estimates.

Most people, at least most Americans, do not know the populations of most countries. Yet they often do have strong intuitions about the number of people living in a given country. In some cases, these intuitions are quite accurate; in others, they are not. For example, most people are not surprised to learn that Japan has a population of about 125 million, Mexico 85 million, Somalia 8 million, and Burundi 5 million. In contrast, most people are surprised to learn that Indonesia has a population of 180 million but Sweden less than 8 million, or that Nigeria has a population of 110 million but Israel less than 5 million.

The purpose of this article is to obtain an initial understanding of why people have such intuitions, and more generally, of how they estimate national populations. Population estimation is important for both theoretical and applied reasons. Theoretically, estimation is one of three main quantification processes, the others being subitizing and counting. Although estimation is applicable to a larger range of situations than the other two quantification processes are (it is the only one that can be used practically with very large quantities), it is far less well understood (Klahr & Wallace, 1976; Newman, 1984). From an applied perspective, population estimation seems a particularly important form of estimation. An accurate understanding of the sizes of populations is often necessary to keep world affairs in perspective. For example, the understanding that Nicaragua has about 2.5 million people and El Salvador about 5 million, whereas Argentina has about 32 million and Brazil 147 million (*Information Please Almanac*, 1990), provides a context for evaluating foreign policies that in the 1980s focused far more on the former pair of countries than on the latter pair.

In this article, we investigate the hypothesis that one major factor in the creation of people's intuitions about the size of a country's population is the ease with which facts about that country can be brought to mind. According to this hypothesis, people tend to believe that a country has a relatively large population when facts about the country are readily available. In proposing that *availability* (Tversky & Kahneman, 1973, 1974) plays a role in population estimation, we assume that people learn from experience that there is a relation between a country's population and its importance. That is, they learn that important countries tend to have relatively large populations and that unimportant countries tend to have relatively small populations. We also assume that people believe that they know more about important countries than they do about unimportant ones. It should follow that people believe that well-known countries have larger populations than obscure countries.

The belief that availability and population size are related is likely to be one of the many types of information considered when people are asked to estimate a country's population (Collins, 1978). In general, the role that availability plays in determining the size of an estimate should depend both on how confident the subject is that availability is a good predictor of the to-be-estimated value and on the specificity and credibility of competing sources of

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information. In the current situation, for reasons discussed below, availability seemed to be the best predictor of national population available to our subjects. For this reason, we expected that subjects would rely on it quite heavily.

If people do base population judgments in large part on availability, and if availability imperfectly predicts true population, population estimates should show an *availability bias.* Populations of well-known countries with small populations, such as Israel and Sweden, should be overestimated; populations of obscure countries with large populations, such as Nigeria and Indonesia, should be underestimated. It should be noted that availability biases have been found in other real-world estimation tasks such as estimates of frequency of lethal events (Combs & Slovic, 1979; Lichtenstein, Slovic, Fischhoff, & Combs, 1978), date estimation (Brown, Rips, & Shevell, 1985), and social judgments (Ross & Sicoly, 1979). Thus, one of the aims of the research reported here is to provide additional evidence that availability can influence estimation in knowledge-rich domains.

A second issue that we addressed comprised the factors that determine availability. We hypothesized that availability of different countries would be positively correlated with exposure to those countries in the news media. *The New York Times* publishes a convenient measure of such exposure each year—*The New York Times Index.* This index indicates the number of articles that were published in a given year about a given topic, such as a particular country, gentrification, or taxes. Although most of the subjects in our sample did not read *The New York Times*, we assumed that there would be enough overlap in the relative amounts of coverage of different newspapers, magazines, and radio and TV programs that *The New York Times Index* would be a reasonable measure of relative coverage of different countries. Presumably, all media pay more attention to countries that are considered politically, economically, militarily, and culturally important, although *The New York Times'* coverage is probably distributed somewhat more broadly than most.

An initial analysis indicated that a country's frequency of citation within *The New York Times Index* correlated positively with its population. We correlated the populations of the 99 countries other than the United States with populations of 4 million or more in 1989 with the frequency of mention of each country in *The New York Times Index* for 1988, 1989, and 1990. The rank order correlations were .56 for 1988, .50 for 1989, and .59 for 1990 (all $ps < .0001$). These correlations compared favorably with those for other plausible predictors of national population, such as land area. Relating each of the 99 countries' land area to its population revealed a rank order correlation of .48. Thus, if subjects relied exclusively on frequency of mention in the media, they would do at least as well in estimating national populations as they would if they relied on the area that the country included.

Both land area and frequency of mention in the media are indirect indices of population. Reliance on such indirect indices would be unnecessary if people knew actual population statistics. However, as mentioned above, such knowledge is rare. This prevents subjects not only from retrieving answers to specific questions but also from using known populations as the basis for inferences that either anchor estimates within a small range or sharply truncate one end of the range (Brown, 1990; Collins, 1978). Thus, such inferences will rarely compete with those based on availability.

To summarize, we expected that media coverage would correlate positively with availability and that availability would correlate positively with population estimates. We tested these hypotheses in twin experiments, one conducted in December 1989 and the other in April 1991. Subjects in both experiments estimated populations of the countries listed in the 1989 *Information Please Almanac* as having 4 million or more people living within their borders. Each country's availability was measured through a subjective knowledge rating, in which subjects estimated on a 0–9 scale how much they knew about the country. Thus, we collected measures of media coverage, availability, and estimated population for each country at two times, 17 months apart.

This design also allowed us to examine a third set of issues: stability and change over the 17-month period in media coverage, availability, and population estimates for different countries. This set of issues was of interest for several reasons. First, it provided a more rigorous test of the role of availability in population estimates than did simple regression analyses (cf. Brown et al., 1985; Gabrielcik & Fazio, 1984). We suspected that some of the test countries (e.g., Iraq) might have become better known over this time period, whereas others (e.g., Libya) might have become less well known. If availability does play an important role in population estimation, longitudinal changes in country knowledge should be associated with longitudinal changes in estimated population. Specifically, when knowledge of a country increases over time, its estimated population should also increase, and when knowledge of a country decreases, its estimated population should decrease. This leads to the prediction that the between-experiment difference in knowledge ratings for each country should correlate positively with the between-experiment difference in population estimates. The double-testing procedure also allowed us to address further the relation between media coverage and population estimates. To the degree that media coverage contributes to impressions of a country's population, and to the extent that *The New York Times Index* is a useful measure of media coverage, we would expect that changes in media coverage over the 17-month period should correlate positively with changes over the period in population estimates for each country.

In principle, one of the best ways to demonstrate that availability plays a role in the estimation process is to directly manipulate the availability of the test items and to observe whether the manipulation has the predicted effect on the size of the estimates. This strategy has been employed in a number of studies (e.g., Brown et al., 1985; Gabrielcik & Fazio, 1984; Jacoby, Woloshyn, & Kelley, 1989; Zajonc, 1980). In these prior studies, availability was inevitably manipulated (increased) in the laboratory either by varying the number of exposures that the test items received or by having subjects perform an orienting task on a subset of test items before they performed the estimation task. The double-testing procedure used in the present study extends this previous research in two ways: first by taking advantage of naturally occurring, within-item changes in availability, and second by demonstrating that decreased availability leads to smaller estimates as well as demonstrating that increased availability leads to larger ones. Prior laboratory manipulations, which were capable of increasing availability but incapable of decreasing it, could produce only the latter pattern of change.

Finally, the design allowed us to address the degree of stability of each of the three variables: media coverage, knowledge ratings, and population estimates. Intuitively, one might expect the amount of media coverage that a country receives to vary a great deal from year to year. It certainly is easy to think of once-obscure countries that vaulted to prominence in the news and remained prominent for an extended period (e.g., Iraq). Other countries, such as Libya, have a burst of fame and then return to relative obscurity. Such examples may be the exception, however. News media may generally focus on a country to the extent that the country is perceived as powerful, important, and/or directly involved with the United States. To the extent that perceived power, importance, and involvement are stable over time, we would expect media coverage also to be. Similarly, to the extent that our knowledge of different countries and our beliefs about their populations reflect enduring rather than transitory aspects of our knowledge, we would expect considerable stability on these measures over the 17-month period.

EXPERIMENTS 1 AND 2

Method

Subjects. Different sets of 24 subjects, all Carnegie-Mellon undergraduates, participated in Experiments 1 and 2. In the first experiment, all subjects participated for course credit; in the second, some participated for course credit and others were paid for their time. The subjects in Experiment 1 were tested in December 1989, those in Experiment 2 in April 1991.

Materials. In 1989, exactly 100 countries were believed to have at least 4 million people (*Information Please Almanac*, 1989). These countries served as the test items in Experiment 1 (with the exception of the United States, whose population was alluded to in the instructions to explain the task). The mean population for this set of 99 countries was 48.3 million people; the median was 15.1 million. As these statistics suggest, the distribution of populations was highly skewed and highly peaked.

There were three differences between the test set just described and the set used in Experiment 2. First, East Germany was eliminated from the test set, reducing the number of test countries to 98. Second, West Germany was relabeled United Germany. Third, North Yemen was relabeled Yemen. The first two changes resulted from the unification of Germany, the third from the unification of Yemen.

Procedure. The same procedure was followed in Experiments 1 and 2. The subjects first performed a knowledge rating task. Names of the 99 (98) test countries were shown one at a time in the middle of a computer terminal's screen. The subjects were instructed to consider how much they knew about the currently displayed country and to type the number from 0 (*no knowledge*) to 9 (*a great deal of knowledge*) that best reflected their knowledge of the country relative to their knowledge of other countries. The typed number appeared in a response field two lines beneath the country's name. When the subjects were satisfied that the displayed response was the one that they wanted, they pressed the Enter key. This caused the computer to record the rating and to clear the display. After a .5-sec interval, the next country's name appeared on the screen.

Next, the population estimation task was presented. As in the knowledge rating task, the 99 (98) country names were presented in the middle of the display, one at a time. The subjects were instructed to estimate the current population of the displayed country and to take their best guess when they had no strong belief. They also were told that all countries were among the 100 most populated countries, and that the current population of the U.S. was 246.1 (250.4) million. Responses were to be made in terms of millions and tenths of millions. Thus, a response of 14.5 indicated an estimate of 14.5 million people. The subjects were encouraged to check their responses and to change them if they thought that a different response would be more accurate. When they were satisfied that they had given their best estimates, they were to press the Enter key. This cleared the display and initiated the next trial. The subjects received no feedback on the accuracy of their estimates. Unique random orderings of the 99 (98) test countries were created for each subject for both the knowledge rating and the population estimation tasks.

Results and Discussion

In this section, we describe both the subject data aggregated over countries and the country data aggregated over subjects. For the most part, we report only responses to the 96 test countries that were described in identical manners across the two studies. In other words, responses to East Germany, West Germany, and North Yemen were excluded from the Experiment 1 data set, and responses to United Germany and Yemen were excluded from the Experiment 2 data set.

Four dependent measures are considered below: median estimated population,[1] mean knowledge rating, mean signed order of magnitude error (signed OME), and mean absolute order of magnitude error (absolute OME). Signed OME was computed for each response according to the following formula:

$$\text{Signed OME} = \log_{10}(\text{estimated population/true population}).$$

Absolute OME was computed by taking the absolute value of each response's signed OME.

The OME measures have three attractive features. First, taking the ratio of estimated-population-to-true population normalizes the data over a range of possible responses that spans several orders of magnitude. This is important, because estimation errors tend to increase with true size of the estimated quantity. Second, taking the log of the ratio helps equate order-of-magnitude underestimates with order-of-magnitude overestimates. This was done in the belief that when the response range spans several orders of magnitude, the psychological significance of an error is at the level of an order of magnitude (Nickerson, 1981). Finally, with absolute OME, error is summed rather than canceled. Thus, the smaller the absolute OME, the more accurate the response, and the larger the absolute OME, the less accurate the response, regardless of whether subjects tended to overestimate all items, underestimate all items, or distribute their responses equally on both sides of the true value.

General level of performance. Median estimated population, mean absolute OME, mean signed OME, and mean knowledge rating were computed for each subject over the 96 test countries. Also for each subject, over the 96 countries, we computed rank order correlations among true population, true land area, *New York Times Index* count, estimated population, and rated knowledge.[2] The correlations of the two variables of greatest interest—estimated population and knowledge ratings—with the other variables are presented in Table 1.[3]

Overall, performance on the population estimation task was moderately good in a relative sense, but quite poor in an absolute sense. The claim that performance was moderately good in a relative sense is based on a moderate rank order correlation between estimated and actual population. The back-transformed means of these r to z transformed correlations was .41 in Experiment 1 and .45 in Experiment 2. The correlation between estimated and true population was reliable at the .05 level for each of the 48 subjects.

The claim that performance was quite poor in an absolute sense is supported by the fact that the differences between each country's true and estimated population were generally quite large; mean absolute OME was .61 in Experiment 1 and .62 in Experiment 2. In other words, in both experiments, the average population estimate deviated from the true population by about 60% of an order of magnitude. More concretely, for a country with a true population of 15 million, a deviation of 60% of an order of magnitude on the low side leads to an estimate of 6.9 million; a comparable deviation on the high side leads to an estimate of 96 million. Mean signed OME was −.06 (range, −.74 to .81) in Experiment 1 and −.25 (range, −1.72 to .32) in Experiment 2.

Table 1
Mean Rank Order Correlations (Back Transformed from Mean r to z Transformed Correlations) for Experiments 1 and 2

	True Population	True Land Area	*NYT Index*	Estimated Population
	Experiment 1			
Estimated population	.41	.26	.57	
Rated knowledge	.37	.14	.70	.58
	Experiment 2			
Estimated population	.45	.32	.59	
Rated knowledge	.39	.15	.70	.60

Availability effects. The basic prediction regarding availability effects is that population estimates should be greater for well-known than for obscure countries, other things being equal. As shown in Table 1, subjects did generate higher estimates for well-known than for less well-known countries; the mean rank order correlation between estimated population and rated knowledge was .58 in Experiment 1 and .60 in Experiment 2. These correlations between estimated population and rated knowledge were significantly greater than the ones between estimated population and true population [for Experiment 1, $t(23) = 4.74$, $p < .0001$; for Experiment 2, $t(23) = 4.06$, $p < .001$]. Likewise, subjects generated higher estimates for countries that received a great deal of media coverage than for countries that received little coverage; the mean rank order correlation between estimated population and *New York Times Index* count was .57 in Experiment 1 and .59 in Experiment 2.

The data presented in Table 1 also indicate that population estimates were predicted better by rated knowledge (availability) than by true land area. The mean rank order correlation between estimated population and true land area was .26 in Experiment 1 and .32 in Experiment 2. These correlations between estimated population and true land area were significantly smaller than the correlations between estimated population and rated knowledge in both Experiment 1 [$t(23) = 6.21$, $p < .0001$] and Experiment 2 [$t(23) = 6.48$, $p < .0001$].

Although rated knowledge was a better predictor of estimated population than either true population or true land area, it also turned out that rated knowledge was correlated with both of these predictors. The mean rank order correlation between rated knowledge and true population was .37 in Experiment 1 and .39 in Experiment 2. The mean rank order correlation between rated knowledge and true land area was .14 in Experiment 1 and .16 in Experiment 2.

Because rated knowledge covaried with true population, and to a lesser extent with true land area, the basic availability prediction was best tested as follows; population estimates should be larger for well-known countries than for obscure countries, holding constant true population and land area. To test this prediction, a partial correlation was computed for each subject over 93 countries.[4] These correlations related estimated population to rated knowledge, controlling for the linear effects of true population and true land area.

As predicted, there was a significant correlation between estimated population and rated knowledge, even when true population and true land area were statistically controlled; the average partial correlation was .45 in Experiment 1 [$t(23) = 11.72$, $p < .0001$] and .44 in Experiment 2 [$t(23) = 9.19$, $p < .0001$]. Thus, regardless of actual population and land area, subjects displayed the predicted tendency to overestimate the populations of well-known countries relative to those of poorly known ones.

In a parallel analysis, partial correlations were computed between signed OME and rated knowledge, controlling for true population and land area. The prediction here was that signed error (OME) should be positively correlated with rated knowledge, other things being equal. In other words, holding constant true population and land area, subjects should overestimate the populations of well-known relative to poorly known countries.

Again, the data supported this prediction. The mean partial correlation between signed OME and rated knowledge was .36 [$t(23) = 8.43, p < .0001$] in Experiment 1 and .38 in Experiment 2 [$t(23) = 9.21, p < .0001$].

Examples from specific countries may help illustrate just how strong this availability bias was. Three countries—Indonesia, Nigeria, and Bangladesh—had true populations over 100 million but median knowledge ratings below 2.5 (these and all data in this example are from Experiment 1). The median estimates of their populations were 19.5, 16.5, and 14.0 million, respectively. In contrast, three other countries—Israel, Norway, and Libya—had true populations below 5 million but median knowledge ratings above 3.0. The median estimates of their populations were 22.5, 24.5, and 32 million, respectively. Despite each of the less well-known countries' having more than 20 times as many people as any of the better known ones, the better known countries were viewed as having the larger populations.[5]

Stability of estimated population, rated knowledge, and media coverage. The subjects performed in much the same way in the two experiments. Between-experiment differences in median estimated population were nonsignificant [$t(46) = 1.29, p > .05$], as were between-experiment differences in mean absolute OME [$t(46) < 1.0$], mean signed OME [$t(46) = 1.36, p > .05$], and mean rated knowledge [$t(46) < 1.0$]. In addition, there were no significant between-experiment differences for the correlations between estimated and true population [$t(46) = -1.26, p > .05$], between estimated population and knowledge ratings [$t(46) < 1.0$], and between knowledge ratings and actual population [$t(46) = -1.05, p > .05$].

We also examined whether individual countries were treated similarly by subjects across the two experiments. To do this, we computed a set of measures with countries, rather than subjects, as the unit of analysis. For each country, a median population estimate was computed over the 24 subjects in each experiment. Likewise, mean absolute OME, mean signed OME, and mean knowledge rating were computed for each country, on the basis of the data collected in each experiment.

The results indicated that the subjects treated individual countries in much the same way in the two experiments. The rank order correlation computed over 96 countries between the median estimated population in Experiment 1 and median estimated population in Experiment 2 was .87. The *rs* for the rank order correlation carried out on the two sets of mean knowledge ratings, the two sets of signed OMEs, and the two sets of absolute OMEs were .97, .90, and .59, respectively ($p < .0001$ in all cases).

The high degree of consistency across the two experiments suggests that the knowledge base used in the estimation and knowledge rating processes changed little from one year to the next. This is not to say that there were no changes in knowledge over the 17-month period. However, with few exceptions, the changes were small. The mean absolute difference between knowledge ratings of each country in Experiments 1 and 2 was .31 of a rating point. A change of .3 on this scale represents only a 3% change in a country's knowledge rating (.13 *SDs*).

Media coverage of different countries also was quite constant over this period. Across the 96 test countries, the rank order correlation between number of citations in the 1989 and 1990 *New York Times Indexes* was .90. As with the knowledge ratings, this high level of consistency does not imply that no changes occurred. However, despite a few cases where changes in the citation index were clearly linked to ongoing events (e.g, Iraq, Saudi Arabia, Romania), the magnitudes of the fluctuations were typically quite small. In both 1989 and 1990, the least publicized countries in the test set were not mentioned at all in *The New York Times*. In both 1989 and 1990, the most extensively mentioned country, the Soviet Union, was cited in more than 2,000 articles (2,186 in 1989, 2,383 in 1990).

These by-country data also allowed us to examine the relation between availability, as measured by the knowledge ratings, and media coverage, as measured by number of citations in *The New York Times Index*. The two proved to be closely related. Across the 96 test countries, there was a rank order correlation of .84 between number of citations in the 1989 *New York Times Index* and the mean knowledge ratings collected in Experiment 1. Similarly, the rank correlation between number of citations in the 1990 *New York Times Index* and the mean knowledge ratings collected in Experiment 2 was .82. Thus, media coverage and availability were consistently closely related.

Changes over time. Despite the high degree of stability in population estimates, rated knowledge, and media coverage, one can still ask whether changes in knowledge and media coverage were related to changes in population estimates. Two analyses were conducted to answer this question. In both, *normalized signed difference* was used as the measure of longitudinal change in estimated population. This measure was computed for each country by subtracting the median estimated population in Experiment 1 from that in Experiment 2, and by dividing the difference by the country's actual population. The division was done to correct for the tendency of variance of estimates to covary with the size of the value being estimated.

To determine whether changes in estimated population were related to changes in knowledge and media coverage, two rank order correlations were computed. The first related the normalized signed difference in estimated population for each country to the signed difference in mean knowledge ratings for that country (i.e., Experiment 2 knowledge rating − Experiment 1 knowledge rating). The second correlation related each country's normalized signed difference in estimated population to its ratio of 1990 to 1989 citations [i.e., (citations in 1990 + 1)/(citations in 1989 + 1)]. As with the estimated populations, the normalization was performed to correct for covariation between means and variances.

As predicted, longitudinal changes in knowledge about a country and longitudinal changes in media coverage of the country both predicted longitudinal changes in population estimates for that country. Across the 96 test countries, the rank order correlation between the changes in knowledge ratings and the changes in population estimates was .31 ($p < .01$). The correlation between changes in media coverage and changes in population estimates was .24 ($p < .05$). Although these correlations are not large, it should be remembered that they occurred in the context of extremely stable knowledge ratings, media coverage, and population estimates for the 2 years. Thus, it appeared that changes in knowledge of countries and media coverage of them were related to changes in how large a population the countries were thought to have.

GENERAL DISCUSSION

Three issues motivated the present investigation. First and foremost, we were interested in evaluating the hypothesis that availability plays an important role in population estimation. In agreement with this hypothesis, we found that (1) rated knowledge was strongly correlated with estimated population; (2) rated knowledge was more strongly correlated with estimated population than were other plausible predictors, such as land area; (3) a strong partial correlation between rated knowledge and estimated population remained even after true population and land area were partialed out; and (4) longitudinal changes in rated knowledge predicted longitudinal changes in estimated population. Findings 1, 2, and 4 suggested that subjects relied on availability when they estimated population. Finding 3 indicated that this reliance led to systematically biased estimates.

The second issue that motivated this research was the relation between media coverage and availability. We found that level of media coverage, as measured by *The New York Times Index*, was strongly related to availability. We also found that changes in media coverage were significantly related to changes in estimated population.

The third central issue in the study was the degree of stability over time in population estimates, availability, and media coverage. The relative status of countries on all three variables proved to be highly stable over the 17-month period that we examined.

The differential media coverage accorded to different countries, the high longitudinal stability of this coverage, and the strong relation between media coverage and availability may all reflect an underlying variable of perceived national importance. From the perspective of the United States, a country's importance may depend on its economic strength, its military strength, and the strength of its ties to the United States. It seems likely that both schools and the media pay more attention to countries perceived as important, that people learn about countries from both of these sources, and that the factors that determine a country's importance change slowly. This means that people are likely to learn more about countries perceived as important during their schooling and afterward, and that they will also have more reason to think about and draw inferences from this information. The system is not a closed one. Some countries systematically change in economic and political power over a period of years, and media coverage changes to reflect changing world circumstances. Thus, many adults today may have learned relatively little about Japan while in school, but much more afterward. Nonetheless, the present data suggest a great deal of stability in media coverage and knowledge of different countries, at least over a 17-month period.

Although a country's availability, as measured by rated knowledge, was only moderately related to its true population, availability was much more strongly related to estimates of countries' populations. We suspect that availability was weighed as heavily as it was because it predicts national population better than other available sources of information. More generally, in agreement with a Brunswikean perspective (Brunswik, 1955; Gigerenzer, Hoffrage, & Kleinbolting, 1991; Hammond, 1990), we hypothesize that the weight given to availability in a particular situation is likely to depend both on how well it predicts the to-be-estimated values and on how well competing sources of information predict them. When availability is more closely related to the outcome than are alternative known predictors, availability should dominate performance. In contrast, availability should play a reduced role when people can use more specific or more credible sources of information. This position implies that one might reduce the weight given to availability by providing subjects with highly predictive or credible information about national populations (e.g., the actual population of some countries) and allowing them to generalize from these data to estimate other populations. Research is currently underway to assess the accuracy of this hypothesis.

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NOTES

1. Medians were used as summary statistics for estimated population because the response range spanned several orders of magnitude. To have relied on means would have meant risking a great influence of outliers, particularly high-end outliers, on the measure of central tendency.

2. Rank order correlations were used here because three countries—China, India, and the Soviet Union—had much larger populations than the rest and were generally known to have much larger populations than the rest. This led to inflation in the size of the Pearson correlations that masked the fact that subjects generally had only a moderate sense of the relative size of national populations. For example, in Experiment 1, the mean rank order correlation between estimated and true population was .41, whereas the mean Pearson correlation was .81.

3. Unless otherwise noted, all correlations were transformed using Fisher's r to z method before being submitted to statistical tests. The mean correlations reported, including the ones presented in Table 1, were computed by back transforming the mean of the appropriate set of r to z transformed correlations (Silver & Dunlap, 1987).

4. For these partial correlations, Pearson product moment correlations, rather than Spearman rank order correlations, were used. Because the analyses made use of parametric properties of the data, and because the three largest countries (China, India, and the Soviet Union) dramatically inflated the amount of variance accounted for by the set of predictor variables, we excluded those three countries from the analyses.

5. This was not attributable to a regression effect. The five countries whose populations were over 100 million and whose median knowledge ratings were above 3.0 (China, India, USSR, Brazil, Japan) received much larger population estimates: 895, 200, 300, 55, and 100 million, respectively.

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