Psychological Processes
Underlying Cultivation Effects
Further Tests of Construct Accessibility

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This study tested whether the accessibility of information in memory mediates the cultivation effect (i.e., the effect of television viewing on social perceptions), consistent with the availability heuristic (Tversky & Kahneman, 1973). Accessibility was operationalized as the time needed to generate frequency estimates of the real-world prevalence of crime, marital discord, and particular occupations. The independent variable was amount of soap opera viewing, and the study used only very heavy (5 or more hours per week) and very light (zero hours per week) viewers. Heavy viewers gave significantly higher frequency estimates (cultivation effect) and responded significantly faster (accessibility effect) than did light viewers, replicating the findings of Shrum and O’Guinn (1993). Soap opera viewing also had an indirect effect on the frequency estimates of crime and occupational prevalence through its effect on response latency, supporting the notion of accessibility as a mediating variable. No such mediating effect was noted for marital discord estimates.

One of the more highly and acrimoniously debated issues in mass communication research has been whether television programming biases the social reality perceptions of viewers toward the world as it appears on television. Such a model of media effects was proposed by Gerbner and his colleagues in the 1960s and 1970s, and research in this area has since proceeded at a steady pace (for reviews, see Gerbner, Gross, Morgan, & Signorielli, 1986; Hawkins & Pingree, 1982; Morgan & Shanahan, in press).

Gerbner’s model, usually referred to as cultivation, is largely sociological in nature. It is Gerbner’s contention that television is one of, if not the dominant socializing force in American society. Moreover, television, a world of formulaic but nonetheless powerful symbols, so dominates the symbolic environment of its viewers that the messages...
television are "cultivated," and soon come to distort or even replace the real-world messages received through daily experience (Gerbner & Gross, 1976). Support for this model is typically demonstrated by a positive relation between amount of television viewing and social beliefs more in line with the television message.¹

Although a large number of studies have been published that support Gerbner's model, cultivation has also been strongly challenged (for reviews of both supportive and critical studies, see Hawkins & Pingree, 1982; Ogles, 1987). Hawkins and Pingree (1990) have conceptualized this debate in terms of internal and external validity. They suggest that the large number of studies demonstrating a cultivation effect attest to its external validity. That is, there appears to be a small but reliable relation between television viewing and real-world beliefs that generalizes over a number of different content domains. However, there is relatively less research that provides internal validity for cultivation by showing that the differences in real-world beliefs across levels of viewing are truly due to television viewing and not some unmeasured third variable.

Hawkins and Pingree (1990) propose that one way of providing internal validity for cultivation effects is to develop a psychological process model to account for them. Although the development of a model that explains cultivation effects clearly does not provide proof of their existence, it does provide powerful converging evidence across different levels of analysis.

A recent study by Shrum and O'Guinn (1993) attempted to provide such a psychological process model. That study posited the general notion of construct accessibility as a mental process explanation of why heavy viewers give higher estimates of events frequently portrayed on television than do light viewers. Specifically, Shrum and O'Guinn suggested that greater frequency and more recency of viewing will cause instances of such things as crime and violence to be more accessible in memory for heavy viewers than for light viewers. Following the notion of the availability heuristic (Tversky & Kahneman, 1973), this enhanced accessibility for heavy viewers contributes to their higher estimates.² Using speed of response (response latency) to infer accessibility, Shrum and O'Guinn found that heavy viewers not only gave higher estimates but also made the judgments faster than did light viewers.

As an initial attempt to provide a mental process explanation for cultivation effects, Shrum and O'Guinn (1993) presented evidence of an effect of information accessibility on social perceptions. However, like most cultivation studies before it, that study also has threats to its internal validity. In other words, just as with any correlational study, including cultivation research, there may be other variables contributing to the noted effects. Moreover, given that the study was only one of a few to use
a reaction-time methodology in cultivation studies (cf. Shrum, O’Guinn, Semenik, & Faber, 1991), it lacks external validation.

The present study was conducted to address both internal and external validity issues. Internal validity issues were addressed in several ways. First, the present study included a number of control variables, not included in the Shrum and O’Guinn (1993) study, that may serve as potential confounds in the relation between response latency and amount of television viewing. Because response latency is used to infer degree of accessibility, it is important to address the possibility that faster responses by heavy viewers are due to something other than accessibility. For example, heavy viewers may simply be more cognitively lazy and thus not prone to taking the time to come to a reasoned judgment. This factor could conceivably produce faster response latencies for heavy viewers that has nothing to do with information accessibility. Other variables, such as reading speed and variables related to the viewing situation (e.g., attention, involvement), could have similar confounding effects.

A second way in which internal validity issues were addressed pertains to analytical methods used to determine the mediating role of accessibility. Shrum and O’Guinn (1993) used response latency as a control variable to ascertain whether accessibility mediated the television viewing-judgment relation. They found that controlling for response latency usually, but not always, reduced the television viewing-judgment relation to nonsignificance. However, this type of analysis cannot tell whether both a direct effect (effect of viewing on judgment) and an indirect effect (effect of viewing on judgment, mediated by accessibility) are present. Specifically, failure to reduce the television viewing-judgment relation to nonsignificance is not sufficient to rule out accessibility as a mediating variable. In this study, path analysis was used to better pin down the possible mediating effect of accessibility on social perceptions.

In terms of external validity issues, the present study sought to both replicate and extend the findings of Shrum and O’Guinn (1993) to determine the stability of the effects they reported. A replication seems especially important, given that the sizes of the effects reported in that study were rather low (much like all cultivation studies) for both the cultivation effect and the accessibility effect. However, in an effort to go beyond a simple replication, this study also sought to extend the earlier findings by looking for effects within program type. Shrum and O’Guinn reported effects for both total television viewing and for viewing of particular program types, and their results suggest that the effects (both accessibility and cultivation) may in fact be greater for those who view particular types of programs (cf. Hawkins & Pingree, 1981). To further explore this issue, very heavy and very light viewers of soap operas were used as subjects in this study, and the dependent variables were constructed from a content
analysis of the specific soap operas that the heavy viewers watched. From a psychological perspective, this method should better isolate, and thus maximize, the cultivation effect, and thereby provide an ideal forum for testing underlying psychological processes.

I begin by discussing the general concept of construct accessibility and its implications for cultivation judgments. I then address in more detail the issues that Shrum and O’Guinn (1993) left unresolved and discuss how the present study was designed to deal with them.

CONSTRUCT ACCESSIBILITY AND SOCIAL REALITY CONSTRUCTION

When asked to make a social judgment, individuals typically do not perform an exhaustive search of memory for information pertaining to that judgment. Rather, they tend to rely on a subset of information that is most accessible from memory (Srull & Wyer, 1979; for reviews, see Sherman & Corty, 1984; Wyer & Srull, 1989). Research has shown that a number of factors influence either the momentary or enduring accessibility of particular information (Bruner, 1957; Higgins & King, 1981). Such factors include recency and frequency of activation of a construct (for reviews, see Sherman, Judd, & Park, 1989; Wyer & Srull, 1989), vivid or easily imagined objects or events (Gregory, Cialdini, & Carpenter, 1982; Sherman, Cialdini, Schwartzman, & Reynolds, 1985), distinctiveness, self-relevance, and similarity to other constructs (Higgins & King, 1981).

Recency, frequency, vividness, and distinctiveness have particular relevance to cultivation research. As Shrum and O’Guinn (1993) assert, heavy viewers by definition watch television more frequently than do light viewers, and they have a higher probability of having watched television more recently. Thus it is reasonable to think that constructs frequently portrayed on television would be more accessible for heavy viewers than for light viewers. Moreover, given the nature of television portrayals, the information that is stored more frequently and recently may be very vivid and distinctive as well, contributing further to its enhanced accessibility for heavy viewers.

In terms of social reality construction, the critical question, then, pertains to the nature of the television information. In other words, what types of images do heavy viewers typically encounter? The work of Gerbner and his colleagues provides some insights. These researchers have content-analyzed television programming over several years and have documented a number of particular types of images that a viewer may encounter in a typical television program. Their research indicates that violence is as much as 10 times more prevalent on television than in the
real world; men greatly outnumber women; minorities appear on television far less than their real-world representation would suggest; both younger people and older people are underrepresented on television relative to their real-world proportions; and the same is true for blue-collar workers. Police officers, lawyers, and doctors, however, are overrepresented on television relative to their real-world representation (Gerbner et al., 1986; see also Lichter, Lichter, & Rothman, 1994).

These apparent biases of television portrayals suggest that much of the information that is very accessible for heavy viewers will consist of, to use two examples relevant to this study, images of violence and images of particular occupations such as lawyers and doctors. Consequently, when asked to form a judgment related to these topics, heavy television viewers should have more accessible information in memory relative to light viewers.

The Availability Heuristic

The final consideration is how these proposed differences in accessibility of television-related information across viewing levels may contribute to judgments. To address this issue, it is necessary to consider the nature of the judgments being made. In typical cultivation studies, researchers attempt to demonstrate television's effect on social reality construction by asking individuals to estimate—using the previous examples—the prevalence of violent acts or the prevalence of doctors and lawyers in the real world. Evidence of an effect is indicated by a positive relation between amount of television viewing and such estimates.

Research on judgment and decision making provides insight as to how the accessibility of information may influence the estimates. The work by Tversky and Kahneman (1973), on what they term the availability heuristic, suggests that individuals base estimates of "the frequency of classes or the probability of events" on the ease of retrieval, or accessibility, of information from memory (p. 207). Specifically, the more easily relevant instances of a particular construct come to mind, the higher are the estimates that subjects make.³

In terms of explaining findings that heavy viewers give higher estimates than light viewers of the prevalence of crime-related activities, and higher estimates of the prevalence of certain occupations, particular instances pertaining to these topics should be more accessible in memory for heavy viewers than for light viewers. If this is so, and people do indeed judge frequency of classes or probability of events based on ease of retrieval as Tversky and Kahneman (1973) suggest, then a cultivation effect should result. In this situation, the effect of television viewing on cultivation judgments is mediated by accessibility.
Evidence of the Availability Heuristic in Cultivation Judgments

The notion that process mechanisms such as accessibility, in general, and the availability heuristic, in particular, are at work in the cultivation process is not new (see Reeves, Chaffee, & Tims, 1982). Ogles and Hoffner (1987) suggested that their results, which found a positive relation between males' exposure to media violence and estimates of their probability of personal victimization, could have been due to the enhanced accessibility of violence-related information in memory, which in turn contributed to the higher estimates by those in the violence-viewing group compared to the control group. Similarly, Tamborini, Zillmann, and Bryant (1984) indicated that their results, which found exposure to injusticedepicting crime programs to be related to higher estimates of fear and victimization, could be explained in terms of information accessibility and the availability heuristic.

Shrum and O'Guinn (1993) attempted to directly test the proposition that accessibility is enhanced by increased television viewing, which will then lead to higher cultivation estimates for heavy viewers compared to light viewers. They used response latency to infer degree of accessibility and reasoned that, all things being equal, if information is more accessible in memory for a particular individual relative to another, and ease of retrieval (i.e., degree of accessibility) is used to judge frequency or probability, the individual with more accessible information should make the judgments faster and give higher estimates.

Of course, all things are seldom equal, and other factors, such as reading speed or intelligence, may contribute to speed of response. In their study, Shrum and O'Guinn (1993) found that even when controlling for reading speed and grade point average (a surrogate measure, albeit very rough, for intelligence), heavier viewers responded significantly faster than lighter viewers. Additionally, consistent with a cultivation effect, amount of television viewing was positively correlated with the frequency and probability estimates, and these findings were more pronounced when the particular types of programs that contained these portrayals (e.g., action/adventure, drama, movies) were used as the predictor variable.

Although the results of Shrum and O'Guinn (1993) supported their hypothesis that accessibility of information in memory can explain the effects of television viewing on cultivation judgments, the results are also open to alternative interpretations that represent threats to the study's internal validity. As noted earlier, support for the accessibility hypothesis hinges on whether faster responses indicate greater accessibility. Because accessibility was not manipulated, it is possible that variables
that correlate with both speed of response and amount of television viewing were responsible for the television viewing/response latency relation. For example, heavy television viewers, because of the nature of the programming and the nature of viewing, may also be more cognitively lazy than light viewers. Television, in an effort to appeal to the widest audience, typically provides plots that are relatively easy to follow, are somewhat predictable, and do not require extensive cognitive effort to understand. If heavy viewing does indeed induce a cognitive laziness in viewers, they may simply respond quickly without much elaboration. Such characteristics may thus result in faster responses by heavier viewers independent of information accessibility.

A number of researchers have suggested that characteristics of the viewer, or the viewing situation, may also influence the relation between amount of television viewing and cultivation judgments. For example, Rubin and Perse (1986; Rubin, Perse, & Taylor, 1988) suggest that variables such as perceived reality (see also Potter, 1986), intention to view television, and attention paid to the programs may relate to cultivation effects. Similarly, it is plausible that such variables may relate not only to what information is encoded during viewing but to the accessibility of that information at the time of recall. Perceived reality and intention to view a particular program may influence how the message is received, interpreted, and subsequently encoded. Attention to the program may relate to such factors as frequency and recency of reception, and may also influence the vividness of the memory store.

RESEARCH HYPOTHESES

This study tests the proposition that, when constructing a frequency or probability estimate to a cultivation question, relevant information is more accessible in memory for heavy viewers compared to light viewers, and this accessibility bias mediates the television viewing-frequency estimate relation. This effect should be noted even when the effects of possible confounding variables are statistically controlled. Put more formally, the specific hypotheses for the study are:

H1: Heavy viewers will give higher estimates than will light viewers to the cultivation questions, consistent with a cultivation effect.

H2: Heavy viewers will respond faster than will light viewers to the cultivation questions, consistent with an accessibility effect.

H3: Accessibility will mediate the television viewing-judgment relation, consistent with an availability heuristic explanation.
METHOD

Sample

The sample consisted of students from an introductory class at a large midwestern university. At the beginning of the semester, the entire subject pool was given a preliminary questionnaire that measured various aspects of television viewing, including the frequency of viewing for specific programs. The results from this questionnaire indicated that daytime soap operas were the most popular general category. Using these results, individuals were considered eligible for the study if they indicated they were heavy soap opera viewers (5 or more hours per week) or if they never viewed soap operas (zero hours per week). Those considered eligible were given the opportunity to sign up for an experimental hour. The individuals allowed to sign up for the study were unaware of the criteria used for their selection; they were told that selection was random. Additionally, the experiment was conducted approximately 6 weeks after the preliminary questionnaire was administered so that the subjects would not make a connection between the two data collections. In total, 51 subjects participated in the study, yielding 45 questionnaires with complete data.

Dependent Measures

Cultivation Measures

To develop the dependent measures for this study, a content analysis was conducted on three soap opera programs. Two consecutive weeks of three particular soap operas (All My Children, Young and the Restless, and Days of Our Lives) were videotaped. Additionally, weekly synopses of the three soap operas, which covered a 4-week period and appeared in the student newspaper, were gathered for use in the content analysis.

Rather than employing a quantitative content analysis that counts discrete events, a more qualitative and interpretive analysis was performed. This analysis attempted to capture both the literal and symbolic content of the particular programs viewed. This approach has been recommended by others (e.g., Greenberg, 1988; Lichter et al., 1994), who suggest that a focus on “critical portrayals” may be a preferred alternative to simply counting the number of portrayals. This method was also used to some extent by Shrum and O’Guinn (1993).

This method of content analysis was considered appropriate given the study’s focus on television’s influence on information accessibility. Recall that accessibility is a function of a number of factors (e.g., frequency,
recency, vividness, distinctiveness). Merely counting the number of instances of a variable in the content analysis would pertain only to frequency, and, to some extent, recency. On the other hand, using an interpretive, thematic approach would address factors such as vividness and distinctiveness, and would also capture frequency and recency if such themes occur often.

To determine both the general and specific themes that were dealt with in the programs of interest, three trained coders were employed. Each of the coders viewed all of the episodes independently, took notes with respect to their subjective impressions of plot focus, and generated a list of the most dominant themes. The coders then met as a group to reach a consensus with respect to themes and subject matter. The newspaper synopses of the programs were also consulted to provide converging evidence.

The results of the content analysis pinpointed the following persistent themes: crime-related problems (in particular, rape) and marital discord (in particular, infidelity). In terms of occupational prevalence, doctors and lawyers were the most prominent occupations, and women within each profession were prominent as well. Agreement among coders was very consistent: All coders had crime and marital discord as either the first or second most dominant theme, and doctors or lawyers as either the first or second most salient occupation.

The information from the content analysis was then used to develop potential cultivation measures. Each coder again viewed the prerecorded episodes and independently generated potential dependent measures. All again met as a group to arrive at a tentative set of stimuli. Finally, two "experts" (self-described habitual viewers of the particular programs) were consulted to both implicitly validate the existing stimuli and to generate new items if possible.\(^5\)

The final set of stimuli are shown in the appendix. Five items pertain to crime-related issues, four items pertain to infidelity and marital discord, and four items pertain to the prevalence of particular occupations (doctors and lawyers). The topics, as well as the items developed, are consistent with previous soap opera research (cf. Buerkel-Rothfuss & Mayes, 1981; Carveth & Alexander, 1985; Perse, 1986). The items exhibited reasonable levels of internal consistency for each construct (see appendix) and were therefore combined to form composite indexes (crime: \( M = 2.48, SD = 1.26 \); marital discord: \( M = 3.49, SD = 1.29 \); and occupational prevalence: \( M = 2.11, SD = 1.53 \)).\(^6\)

Response Latencies

Response latencies associated with the answering of each of the cultivation questions were measured in milliseconds (crime: \( M = 3,999, SD = \)
815; marital discord: $M = 3,401$, $SD = 627$; occupational prevalence: $M = 3,794$, $SD = 945$). In addition, baseline latency measures (i.e., an individual’s general response time to any question) were included to account for individual differences in response time (Fazio, 1990). These measures were unrelated to the focus of the study and included six items consisting of questions such as “What percentage of cars are brown?” “What percentage of birds are blue?” and so forth. The use of such baseline measures should account for individual differences in response time that are related to speed of constructing judgments in general.

Preliminary analysis showed that, as expected, the baseline measures were related to the target latencies ($r = .63$, .35, and .40 for crime, marital discord, and occupational prevalence, respectively; all $ps < .02$; these correlations are consistent with those found in previous reaction time studies [Fazio, 1990]). Therefore, the baseline measures were used as control variables in the analysis of the response latencies ($M = 3,836$, $SD = 828$, $\alpha = .72$).

Independent Variable

The independent variable for the study was amount of soap opera viewing. As described earlier, subjects were preselected on the basis of very heavy viewing (5 or more hours per week) or very light viewing (zero hours per week) of soap operas.

Control Variables

Grade point average. Grade point average (GPA), as a surrogate measure of intelligence, may influence both reading and processing time. Additionally, GPA may relate to the accuracy of the estimates, and GPA has also been shown to correlate negatively with television viewing (Shrum, O’Guinn, & Faber, 1990). Subjects provided their GPAs in an open-ended question ($M = 4.07$, $SD = .49$; GPA based on a scale where A = 5.0).

Need for cognition. Need for cognition (NFC; Cacioppo & Petty, 1982) was measured to account for the possibility that heavy television viewers may be more cognitively lazy, and may simply respond quickly without much elaboration, compared to light viewers. NFC is an individual difference variable that measures the extent to which an individual enjoys engaging in effortful cognitive activities, and it may thus relate to the tendency to elaborate. Additionally, because this study was concerned with investigating the mental processes underlying cultivation judgments, it is important to consider variables that may be related to processing strategies. For example, the main premise of this study is that heuristic
processing strategies may result in higher cultivation estimates for heavier viewers. However, an alternative explanation is that, instead of all viewers judging frequency by degree of accessibility (i.e., a heuristic strategy), light viewers and heavy viewers may have different strategies, with heavy viewers tending toward the use of heuristics and light viewers more apt to process in a systematic manner. Because NFC has been shown to be associated with processing strategies (lower need for cognition correlates with the tendency to process heuristically; see Haugtvedt & Petty, 1992; Haugtvedt, Petty, & Cacioppo, 1992), it may thus influence the relation between amount of television viewing and the cultivation estimates.

The NFC scale contains 18 items. A 7-point Likert-type scale was used: Higher numbers indicate greater NFC ($M = 4.62$, $SD = .91$, $\alpha = .93$).

Reading speed. Heavy and light viewers may differ on reading speed. Shrum et al.'s (1990) finding that GPA was negatively correlated with television viewing suggests that light viewers may in fact read faster than heavy viewers. If so, reading speed may actually attenuate the predicted negative correlation between television viewing and response latency.

Reading speed was measured by asking subjects two questions that should not require any calculation time (“What is $2 + 2$?” “What is $4 + 4$?”). These two latencies were averaged to form an index of reading speed ($M = 2.252$, $SD = 0.905$, $\alpha = .56$).

Family income. Income of the student’s family may relate to direct experience with the topics of the cultivation questions (e.g., crime, violence, divorce, occupations) and may thus be related to both the magnitude of the estimates and the accessibility of examples. Income was measured by having subjects check the range in which they estimated their family income fell. The ranges consisted of 10 equal ranges of $10,000 ($0–$10,000 through $90,000–$100,000) and an eleventh interval of “over $100,000” ($M = 6.30$, $SD = 2.75$).

Television viewing variables. Three variables that pertain to the television viewing situation were considered as control variables. Each may be related to the amount and type of information encoded and thus may influence both the estimates and latencies. Intention to view television, attention paid to television, and perceived reality were measured using scales developed by Rubin and his colleagues (Rubin & Perse, 1987; Rubin et al., 1988). Each construct was measured via five items using 5-point Likert-type scales, and indexes were developed by averaging the scores from the five respective items; higher numbers reflect a higher score on that construct (intention to view: $M = 2.90$, $SD = .86$, $\alpha = .85$; attention to...
viewing: $M = 3.10, SD = .69, \alpha = .84$; perceived reality: $M = 1.98, SD = .54, \alpha = .79$).

**Total television viewing.** The total amount of television an individual watches may contribute to the dependent variables, independent of soap opera viewing. That is, if total television viewing is not measured and statistically controlled, an alternative explanation of soap opera viewing effects is that they are effects of heavy viewing of all television, which may correlate positively with heavy soap opera viewing. However, if significant relations are found between soap opera viewing and the dependent variables after controlling for total television viewing, we may conclude that the relations are specific to soap operas and not a global effect of television viewing.

Total television viewing was measured in the initial screening questionnaire. Subjects reported the number of hours (Monday through Friday) that they typically watch television within four day parts (morning: 6 a.m. to noon; afternoon: noon to 7 p.m.; prime time: 7 p.m. to 10 p.m. (Central Standard Time); and late night: 10:00 p.m. to 6 a.m.); they also estimated the number of hours they typically view on Saturday and Sunday. A weekly measure was obtained by summing across the time categories. Subjects were next asked to estimate the number of hours per week that they typically watch each of 11 program types (soap operas, news, sports, movies, comedies, action/adventure, drama, music videos, daytime talk shows, late night talk shows, and game shows). A weekly measure of television viewing was again obtained by summing over the viewing estimates for the program categories. A composite measure of total television viewing was then obtained by averaging the two weekly viewing measures ($M = 25.7$ hours/week, $SD = 15.49, \alpha = .87$, median = 22.5 hours/week).

**Procedure**

Subjects in the study performed the exercise on a microcomputer. Following established procedures for reaction-time studies (see Fazio, 1990), instructions emphasized both speed and accuracy. Specifically, subjects were given the following instructions:

In this exercise we are interested in both speed and accuracy. By speed, we mean that you should read each question, and as soon as you have formed an answer, press the appropriate key. However, this is not a race or contest. The goal is not to see how fast you can answer. Simply read each question, and give a response as soon as you have formed your judgment. By accurate, we mean you should not answer without understanding the question AND you should not anticipate and hit the wrong key.
Upon receiving directions to start the exercise, the subjects were instructed via the computer screen to press the space bar to receive a question. When the space bar was pressed, the first question appeared (recall that the questions asked for a response that indicated percentage). Because the particular reaction-time program employed did not allow for anything other than single digit responses, the subjects indicated their response by pressing keys labeled from 0 to 9. Each key corresponded to an intuitive percentage response range (i.e., a response of 3 indicated 30% to 39%, a response of 6 indicated 60% to 69%, etc.). The subjects received extensive practice to facilitate ease in using the scale; practice consisted of repeated trials of flashing a percentage on the computer screen and having subjects indicate that percentage using the computer keys. Practice proceeded until all subjects were comfortable with the scale.

As soon as subjects indicated their response by pressing the appropriate key, the question disappeared and the subjects received a prompt to press the space bar for the next question. An internal clock recorded the time between when the space bar was pressed (causing the question to appear) and when the response was entered.

After completing the reaction time exercise, the subjects received a pencil-and-paper questionnaire that measured the control variables.

RESULTS

Frequency Estimates

The first issue to address is whether soap opera viewing is related to perceptions of crime, marital discord, and occupational prevalence, and whether this relation holds after controlling for the possible confounding variables. To assess these relations, multiple regression analyses were performed. The control variables were first entered as a block, followed by the entry of soap opera viewing (dummy coded as 0 for light viewers and 1 for heavy viewers). If the incremental change in $R^2$ resulting from the entry of soap opera viewing is significant, it suggests that soap opera viewing does indeed influence the estimates over and above the influence of the control variables.

The results of the regression analysis for the frequency estimates are shown in Table 1. Checks for multicollinearity found no problems. For all three of the estimates (crime, marital discord, and occupational prevalence), the control variables, when entered as a block, were not significantly related to the estimates. However, the subsequent entry of soap opera was significant. These results indicate that soap opera viewing does indeed relate significantly to the estimates, even after the effects of the control variables are considered, supporting H1.
### TABLE 1
Regression Results Indicating Impact of Soap Opera Viewing on Frequency Estimates

<table>
<thead>
<tr>
<th>Independent Variable</th>
<th>Change in ( R^2 )</th>
<th>( F )</th>
<th>Change in ( R^2 )</th>
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<th>Change in ( R^2 )</th>
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<td>Step 1</td>
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<tr>
<td>Grade point average</td>
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<td>-.07</td>
<td>-.18</td>
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<td>Family income</td>
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<td>-.33*</td>
<td>-.25</td>
<td></td>
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<td>Need for cognition</td>
<td>.00</td>
<td>-.04</td>
<td>-.11</td>
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<tr>
<td>Perceived reality</td>
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<td>-.05</td>
<td>.15</td>
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<tr>
<td>Attention to TV</td>
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<td>.12</td>
<td>-.10</td>
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<tr>
<td>Intention to view</td>
<td>.11</td>
<td>-.18</td>
<td>.10</td>
<td></td>
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<tr>
<td>Total TV viewing</td>
<td>.10</td>
<td>.11</td>
<td>.05</td>
<td></td>
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<td>Controls as a block</td>
<td>.12</td>
<td>.59</td>
<td>.17</td>
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<td>.75</td>
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<td></td>
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<tr>
<td>Soap opera viewing</td>
<td>.50</td>
<td>.19</td>
<td>8.76**</td>
<td>.56</td>
<td>12.84**</td>
<td>.41</td>
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<td></td>
<td>.23</td>
<td>12.50**</td>
<td>.12</td>
<td>5.50**</td>
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*\( p < .10 \), two-tailed. **\( p < .05 \), two-tailed.

Examination of the beta coefficients in Table 1 indicates that none of the individual control variables was significantly related to the estimates of occupational prevalence, but family income was negatively related to both the crime and marital discord estimates (\( p < .10 \)). However, for all of the analyses presented here, particularly with respect to the control variables, failure to reject the null hypothesis should be interpreted with caution due to the low sample size, as the power to detect significant effects was low.

Response Latencies

H2 suggests that the time needed to respond to the cultivation questions will be negatively correlated with amount of soap opera viewing, that is, heavier viewers will respond faster (i.e., a smaller latency) than will light viewers. Evidence bearing on this proposition can be found in Table 2. Again, checks for multicollinearity found no problems. For crime, entry of the control variables as a block was significantly related to the latency (baseline latency was a significant positive predictor, and reading speed was a marginally significant positive predictor). However, the results also show that the subsequent entry of soap opera viewing provided a significant contribution, suggesting that soap opera viewing is a unique contributor to speed of response, and supporting H2.
TABLE 2
Regression Results Indicating Impact of Soap Opera Viewing on Response Latencies

<table>
<thead>
<tr>
<th>Independent Variable</th>
<th>Crime</th>
<th>Marital Discord</th>
<th>Occupational Prevalence</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>β, Change R², F</td>
<td>β, Change R², F</td>
<td>β, Change R², F</td>
</tr>
<tr>
<td>Step 1</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Baseline latency</td>
<td>.51** (.28)</td>
<td>.17</td>
<td></td>
</tr>
<tr>
<td>Reading speed</td>
<td>.26* (.23)</td>
<td>.30* (.30)</td>
<td></td>
</tr>
<tr>
<td>Grade point average</td>
<td>-.02 (.04)</td>
<td>.10</td>
<td></td>
</tr>
<tr>
<td>Family income</td>
<td>.01 (-.01)</td>
<td>.22</td>
<td></td>
</tr>
<tr>
<td>Need for cognition</td>
<td>.13 (-.01)</td>
<td>.08</td>
<td></td>
</tr>
<tr>
<td>Perceived reality</td>
<td>-.07 (-.11)</td>
<td>-.08</td>
<td></td>
</tr>
<tr>
<td>Attention to TV</td>
<td>.23 (.37**)</td>
<td>.21</td>
<td></td>
</tr>
<tr>
<td>Intention to view</td>
<td>-.05 (-.18)</td>
<td>-.27</td>
<td></td>
</tr>
<tr>
<td>Total TV viewing</td>
<td>.04 (.02)</td>
<td>-.02</td>
<td></td>
</tr>
<tr>
<td>Controls as a block</td>
<td>.48 3.31**</td>
<td>.29 1.49</td>
<td>.13 .75</td>
</tr>
<tr>
<td>Step 2</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Soap opera viewing</td>
<td>-.37 -.44</td>
<td>.15 8.23**</td>
<td>-.28 .06 3.02*</td>
</tr>
</tbody>
</table>

*p < .10, two-tailed. **p < .05, two-tailed.

For the remaining two dependent variables, marital discord and occupational prevalence, the control variables as a block were not significantly related to the latencies (although attention to television was a significant positive predictor of response latency for marital discord, and reading speed was a marginally significant positive predictor for occupational prevalence). However, as with crime, soap opera viewing was a significant negative predictor of response latency after controlling for the possible confounding variables, again providing support for H2. (For occupational prevalence, the relation between soap opera viewing and response latency only approached conventional levels of significance [p < .10, two-tailed]; however, the research hypotheses are directional, and supported from previous research, thereby permitting a one-tailed test, which resulted in p < .05.)

Accessibility as Mediator

H3 predicts that accessibility, operationalized as response latency, will mediate the relation between amount of soap opera viewing and the magnitude of the frequency estimates. This proposition was addressed through path analysis, and the results are shown in Figure 1. To conclude that accessibility is a mediator, the path from soap opera viewing to the
response latency should be significant and the path from the latency to
the frequency estimates should be significant. Such results would indicate
an indirect effect of soap opera viewing on the estimates via accessibility.
The model also allows for a direct, unmediated effect (or mediated by
other variables not included in the model) of soap opera viewing on the
frequency estimates independent of accessibility. This effect would be
shown if the direct path between soap opera viewing and the estimate
was also significant.

The path coefficients in Figure 1 were obtained through two regression
analyses for each dependent variable (Baron & Kenny, 1986). The first
analysis regressed latency on soap opera viewing, which tests the linkage between the mediator and the independent variable. The second analysis involved a regression of the particular frequency estimate on both soap opera viewing (dummy coded) and response latency. This analysis tests the linkage between the mediator and the dependent variable and also between the independent and dependent variable when the mediator is controlled. All control variables were also included in the regressions. The path coefficients represent the regression beta weights, and the coefficients can be viewed as the change in the standardized dependent variable given a standard unit change in the independent variable (for a similar analysis involving the mediating effects of accessibility on judgments, see Manis, Shedler, Jonides, & Nelson, 1993).

For crime and occupational prevalence, the results indicate that soap opera viewing did indeed exert an indirect effect on judgments through its effect on accessibility, supporting H3. The path coefficients between viewing and response latency and between response latency and the estimate were significant and in the predicted direction: Level of soap opera viewing affected speed of response, and speed of response reliably predicted the estimates of crime and occupational prevalence. However, this was not the case for estimates relating to marital discord. Even though soap opera viewing affected accessibility (heavy viewers responded faster than did light viewers), accessibility showed no relation to the frequency estimate.

Note also that the path model allowed for an effect of soap opera viewing on the particular frequency estimates independent of accessibility. If accessibility of information in memory mediates the entire soap opera viewing-frequency estimate relation, then not only should the soap viewing-latency path and the latency-frequency estimate path be significant, but the direct soap viewing-frequency estimate path should approach zero. If the direct path does not approach zero, even in the presence of an indirect effect, it suggests that soap opera viewing exerts both an indirect effect (mediated by accessibility) and a direct effect on the estimates.

For crime and occupational prevalence, the direct path was not significant ($p < .06$ and .07, respectively, one-tailed). Thus, similar to the findings of Shrum and O’Guinn (1993), accounting for the indirect effects of accessibility reduces the direct viewing-judgment relation to nonsignificance. However, this conclusion may be somewhat misleading. As mentioned earlier, power to detect significant effects in this study was low, and null findings should be interpreted with caution. Clearly, the path coefficients for the direct effect are substantial in both cases but fell just beyond the conventional $p < .05$ cutoff point. In fact, these results are similar to those found by Shrum and O’Guinn, where for particular dependent
variables, inclusion of the indirect effect in the model still left a significant or marginally significant direct effect.

For marital discord, the direct effect was significant. This finding suggests that television viewing does affect the estimates of marital discord but not through a mediating effect of accessibility (only one of the indirect paths was significant).

DISCUSSION

One of the purposes of this study was to posit and test a model of memory processes that can reasonably account for cultivation effects. The model put forth here draws on work in cognitive and social psychology that shows that the accessibility of information in memory can affect social perceptions. Specifically, that work suggests that individuals may judge frequency and probability by the ease with which relevant information is retrieved from memory (Tversky & Kahneman, 1973). The results of this study support such a model, and they bolster the findings of Shrum and O'Guinn (1993) by again showing that heavy television viewing creates an accessibility bias, and that this bias has an effect on real-world frequency estimates of things often seen on television.

If an individual's estimates of such things as the incidence of crime or occupational prevalence is indeed at least partially the result of the accessibility of relevant exemplars in memory, this process has very important implications for the study of television effects. As mentioned earlier, accessibility is affected by a number of factors that may be related to television viewing, including frequency of presentation, recency of presentation, vividness, and distinctiveness. Much of the work by Gerbner and his colleagues, as well as other researchers (critics included), has found that violence is very prevalent on television, much more so than in the real world (for a review, see Gerbner et al., 1986). In terms of the factors that influence accessibility, such an analysis focuses on frequency of representation. This frequency is both a function of how often violence is portrayed on television, and how often an individual observes these portrayals. However, from an accessibility perspective, it is not necessary that instances of violence be portrayed often for these instances to be easily accessible from memory. A very vivid portrayal of violence, which television certainly can and does provide, may be sufficient. Additionally, simply having seen a television portrayal of violence recently may affect perceptions of violence (although the effect of recency would be temporary). Thus a light viewer who recently happened to view television just prior to making a cultivation judgment, or a light viewer who viewed a particularly vivid portrayal, may provide high estimates to questions
related to these portrayals due to the enhanced accessibility of relevant information, similar to a heavy viewer. This may account for the relatively weak television effects that are often found in cultivation studies.6

The issue of vividness, and the nature of what is emphasized on television, influenced the type of content analyses used in this study. Here, content analysis was used to pinpoint particular themes that were prevalent in daytime soap operas. This method represents a more interpretive, thematic approach, rather than a quantitative counting of discrete events. This type of content analysis was used partly to address the criticisms of other researchers, in particular Greenberg (1988), who have called for a greater emphasis on “critical portrayals” rather than “total number of portrayals” (p. 97), and this type of analysis is similar to qualitative data analyses that focus on emergent themes.

Additionally, some researchers (e.g., Hughes, 1980; Newcomb, 1978) have questioned precisely what message is received by the viewer, suggesting that the typical cultivation measures are generated by the researchers strictly from the counting of events and behaviors. To speak to this issue, a procedure common to qualitative studies, called “member checks” (Lincoln & Guba, 1985), was used. Member checks involve asking those individuals being studied, or those whose views are being interpreted, to give their opinion of the researcher’s interpretation, providing an emic interpretation of the material being analyzed, as opposed to the etic view of the researcher. In this study, the three trained coders fulfilled these criteria, at least to a minor degree, in the sense that they were television viewers. More specifically, two very frequent soap opera viewers (who were not part of the sample) were asked to comment on the validity of the themes identified, and both informants agreed with the coders’ assessments. Thus the argument that viewers do actually extract these themes from the programs is bolstered.

Although the hypotheses concerning the relation between television viewing and the frequency estimates, and between television viewing and speed of response, were supported for all measures; the hypotheses that accessibility would mediate the cultivation effect was not supported for marital discord. Specifically, no relation was found between the latency and the estimate. Precisely why support for a mediating effect was not obtained is unclear, especially when the cultivation and accessibility effects were so strong. From these results, it appears that subjects did not use degree of accessibility to infer the degree of marital discord, that is, they did not use the availability heuristic. One possible explanation for this finding is that all subjects, regardless of level of television viewing, may have more direct experience with such things as divorce and infidelity than with the other dependent variables used in this study. This experience may be through their families, friends, and neighbors, as well as themselves. If this is the case, they may be more likely to have formed
general opinions relating to this topic and may construct estimates by recalling these opinions rather than recalling specific examples and basing estimates on the ease of that recall. Alternatively, but in a similar type of process, they may have recalled a previous judgment that indicated such chances were "high," and then computed a new judgment based on that initial assessment.

In interpreting the results of this study, I have claimed that they provide a psychological process explanation for television's influence on perceptions of social reality. A more precise claim would be that the results provide a process explanation for television's influence on frequency estimates of things often seen on television. These frequency estimates are then used to infer a belief about the real world.

Although this study cannot directly address the validity of such frequency estimates as an operationalization of worldview, the model proposed here does have implications for the nature of these estimates, and therefore, the nature of the social perceptions. The model I have offered as an explanation of cultivation effects is one of heuristic processing. That is, when individuals are asked to form a social judgment (in this case a frequency estimate), they seldom conduct an extensive memory search; instead, they simplify the problem by using heuristics, in this case the availability heuristic (see Shrum, 1995, for a more complete discussion).

This of course may not always be the case, but certain conditions increase the likelihood that heuristics will be used in decision making. Two such conditions are worth mentioning. First, heuristics represent task simplification procedures, and so those tasks that require more cognitive effort will be more likely candidates for heuristic processing. This is noteworthy because the task involved in constructing a judgment as to the proportion of doctors in the real world, or the percentage of people that are mugged on a given day, may be considered reasonably difficult. Such judgments are probably not spontaneously generated in the course of an individual's normal day, and the information required to reach an informed decision is probably difficult to recall, and if recalled, certainly difficult to consolidate.

The second condition relates to involvement. As Sherman and Corty (1984) point out, because heuristics are employed when the cognitive processing system is overly taxed, in the interest of cost-effectiveness, heuristics will likely be used when involvement with the judgments is low. That is, simply encountering a difficult decision is not necessarily sufficient to induce the use of heuristics. There are certainly times when an individual is willing to put forth the effort. But if the judgment is unimportant or uninvolving, then the individual may in effect take the easy way out and simplify the judgment through the use of heuristics. This is important because the nature of the typical data collection procedure used
in cultivation studies, and the nature of the questions themselves, may qualify the construction of the frequency estimate as a low-involvement task (the respondents may simply want to get the survey completed as quickly as possible, and there is no risk involved in giving an "incorrect" answer). Thus the operationalization of real-world perceptions (i.e., asking for frequency estimates of things often seen on television) may contribute to the use of heuristic processing strategies.

If, indeed, people use heuristics to construct the types of judgments required in typical cultivation studies, a number of implications are raised. First, the judgments may be relatively unstable. Judgments made via heuristics are not well thought out but are based on what comes to mind most easily at the moment. Thus such judgments may be particularly vulnerable to situational influences. However, this should not be interpreted as suggesting that such judgments are not important. People make heuristic, or "snap" judgments on a daily basis (e.g., liking for a politician, severity of crime as a social problem). These judgments are not only important themselves, but they may eventually be recalled to form the basis of other judgments (e.g., for whom to vote).

Second, as conceptualized in this study, the cultivation effect may be thought of as short term in nature. That is, the effect of the particular stimulus may have an immediate effect but may eventually wear out. This notion is consistent with the findings of Tamborini et al. (1984), who found a cultivation effect immediately after an experimental manipulation of television viewing (one-time exposure) but also found that the effect dissipated over time. However, it is just as important to emphasize that a "cumulative" effect (as Gerbner and colleagues consider the cultivation effect) is easily conceptualized as the result of a series of short-term effects. Thus, on one hand, a light viewer temporarily exposed to a violent television program may indeed be affected by the program, but the effect may wane. A heavy viewer, on the other hand, receives a constant "updating" from frequent viewing. It is also reasonable to think that eventually the images and information will become ingrained to the extent that they become difficult to eradicate. At this point, the individual will evidence a cumulative, long-term effect of television viewing, which is consistent with Gerbner and colleagues' conceptualization of cultivation effects. Thus there is no reason that the results of this study, and others like it, should be considered inconsistent with cultivation as it was originally conceived.

This study, however, did find that specific program viewing was a better predictor of the estimates of crime, marital discord, and occupational prevalence than was total television viewing; in fact, total television viewing was not a significant predictor for any of the variables. However, the student sample that was used in this study is by no means representative of the general population. As previously mentioned, students
are often very selective viewers. They may watch a particular soap opera regularly (heavy soap viewing) but because of time demands may not watch much of anything else (light total television viewing). In fact, total television viewing was only moderately correlated with soap opera viewing (point biserial $r = .23, p < .20$). Thus, even though specific program type (soap operas) was a better predictor of the dependent variables than was total television viewing, the finding should be considered sample-specific and not necessarily problematic for Gerbner and colleagues' conceptualization of cultivation effects.

Alternative Explanations of Process

Thus far, the results of this study, and the cultivation effect in general, have been conceptualized in terms of the availability heuristic. However, there are alternative explanations for the results that are worth mentioning, particularly those relating to the issue of accessibility. These explanations still revolve around the notions of heuristic processing but posit mechanisms or heuristics other than availability.

First, it is possible that individuals are not estimating probability of events or frequency of classes based strictly on the ease with which relevant examples come to mind but are basing their estimates on how easy it is to imagine a particular event or behavior. In this case, the heuristic that is applied is the simulation heuristic (Kahneman & Tversky, 1982). For example, in the present study, subjects were asked to estimate the probability that a woman will be raped in her lifetime. If a rape situation is easy to imagine, then estimates should be high. Accordingly, if such events are often portrayed on television, heavy viewers should find it easier to imagine the event than light viewers (all else equal) and thus should provide both faster and higher estimates. A number of studies have provided support for the notion that the ease of imagining an event is directly proportional to judgments of the probability of the occurrence of that event (Gregory et al., 1982; Sherman et al., 1985).

Another process explanation for the results of this study is that subjects are simply abstracting from a prototype. This is conceptually similar to the use of the representativeness heuristic (Kahneman & Tversky, 1972). That is, when asked to judge the probability of a woman being raped in her lifetime, subjects may compare this scenario to their prototype, or schema, of what the world is like, and the degree of similarity will influence the estimate. If in fact heavy television viewing contributes to a general schema of a violent world for women, heavy viewers should give higher estimates than light viewers. Moreover, if this schema is also more developed for heavy viewers, perhaps due to more frequent updating, then it may be more readily accessible and thus may account for the faster latencies for heavy viewers compared to light viewers. This explanation
may bear the closest resemblance to Gerbner and colleagues' concept of how television cultivates a "mean world" view of social reality.

It is also possible that both the availability and representativeness heuristics are employed. Some research indicates that these heuristics may be applied sequentially (Kubový, 1977). In the first stage of judgment, the accessibility of an exemplar is considered; in the second stage, the representativeness of the exemplar is considered (for a more thorough discussion of the joint application of availability and representativeness, see Sherman & Corty, 1984).

Still another explanation is that subjects are not accessing specific examples, as the availability heuristic suggests, but are simply accessing prior judgments. It seems unlikely that subjects would have made estimates in such a concrete manner recently enough to recall them, and the length of the response latencies (3.4 to 3.9 seconds) suggests that the estimates were computed in real time. However, it is possible that television viewing may induce people to form very general summary judgments regarding a particular event. So, when asked to estimate the percentage of people who will be a victim of a gunshot wound, subjects may have at some point prior to the study judged this percentage to be high, recalled this summary judgment, and then constructed a more precise estimate from the general one. Heavy television viewing may influence the degree of the judgment (higher for heavy viewers), and may also increase the likelihood that the summary judgment had been constructed or updated recently, rendering it more accessible.

Although alternative possibilities exist as to the exact mental processing mechanism that individuals use to construct cultivation judgments, for the most part, all of the examples just discussed involve some type of heuristic processing. That is, the judgments are not constructed from an exhaustive, or even extensive, review of information contained in long-term memory. Rather, cognitive shortcuts, or heuristics, are used to simplify the judgment task, and the information that is used in constructing the judgments is that which is most accessible. Moreover, in all cases, heavy viewing would be expected to result in higher estimates. Thus, although this study cannot pin down the exact heuristic mechanism that is used, it does provide convincing evidence for heuristic processing in general.

Finally, it is possible that, for whatever reason, heavy soap opera viewers simply respond faster than light viewers to all types of questions. However, analysis of the variables that were specifically measured and controlled to assess this possibility suggests otherwise. Need for cognition was not a significant predictor of any of the latencies or estimates. Thus it does not appear that general trait characteristics pertaining to the propensity to engage in effortful cognitive activities affected the magni-
tude of the estimates or speed of response. Also, although need for cognition showed a moderate but nonsignificant relation with soap opera viewing (point biserial $r = .23$, $p < .13$), soap opera viewing remained a significant predictor of the dependent variables when need for cognition was controlled.

The most direct evidence that heavy viewers do not simply respond faster to all types of questions is that soap opera viewing was uncorrelated with the baseline latencies ($r = -.09$, $p > .50$). Recall that these items asked subjects to respond to questions such as “What percentage of shoes are brown?” If the latency-soap opera viewing relation was the result of heavy viewers responding faster than light viewers to all types of questions, this propensity should have been evident for the baseline latencies as well as for the target latencies.

CONCLUSION

In many respects, the focus of this study was somewhat narrow. It has provided evidence of how a particular effect can be achieved from a cognitive perspective, given a particular methodology and operationalization. This is not at all unimportant, as evidenced by the ferocity of the debate that Gerbner’s and others’ work has generated. Admittedly, the interest in the issue of television’s effect on social perceptions has waned somewhat in recent years, perhaps because little progress has been made in addressing important validity and causality issues. Hopefully, the work on psychological process issues in social reality construction can be successfully applied to the debate over television effects. In the area of social cognition research, much has been learned in the last 10 years on how people form attitudes, beliefs, and perceptions about other people and other things, and how these constructs in turn affect behavior. The knowledge gained from this research has much to say about issues that the field of communication has debated for decades and may help move the field closer to learning how media exert their effects at the individual level.

APPENDIX

Set of Cultivation Questions Used as Dependent Measures

Crime ($\alpha = .69$)

What percentage of women are raped in their lifetime?
What percentage of Americans ever use the services of a private detective?
What percentage of police draw their guns in an average day?
What percentage of people are the victim of a gunshot in their lifetime?
What percentage of Americans have been the victim of a violent crime?
Marital Discord (α = .71)

What percentage of Americans have had an extramarital affair?
What percentage of couples get a divorce?
What percentage of women marry men they do not love?
What percentage of executives have affairs with their secretaries?

Occupational Prevalence (α = .93)

What percentage of the U.S. work force are lawyers?
What percentage of the U.S. work force are doctors?
What percentage of women in the U.S. are lawyers?
What percentage of women in the U.S. are doctors?

NOTE: Cronbach's alpha for each scale appears in parentheses next to each scale name.

NOTES

1. I thus refer to such a relation as a cultivation effect. I also use the terms cultivation research to refer to any research that attempts to assess this relation; cultivation question to refer to questions typically used in cultivation research on whose answers heavy and light viewers would be expected to differ; and cultivation estimates and cultivation judgments to refer to the answers that people give to cultivation questions.

2. The terms availability and accessibility, although often used interchangeably, are separate constructs. Availability refers to whether a piece of information is stored in long-term memory (if so, it is "available"), whereas accessibility refers to the ease or speed with which available information can be retrieved from long-term memory (Higgins & King, 1981). In this regard, availability, as it is used in the term availability heuristic, would be better termed accessibility.

3. Note that the availability heuristic refers specifically to the ease with which relevant exemplars come to mind. This is conceptually different than basing estimates on the number of instances recalled. Unfortunately, these processes are often confounded; in fact, the number of instances recalled has been used to infer ease of recall (cf. Manis, Shedler, Jonides, & Nelson, 1993; Tversky & Kahneman, 1973, Studies 1 and 2). Schwarz et al. (1991) conducted a series of experiments in which they manipulated ease of recall and number of examples recalled independently. Their results indicated that ease of recall was indeed used as a basis for judgment and in fact qualified the implications of the content of the recall. This finding is important because it suggests that observing little or no relation between the number of examples recalled and judgments of frequency or probability is not sufficient to refute an availability heuristic explanation. It may be that the first few instances of a construct are easily recalled as a result of vividness or recency, but recalling more examples may be difficult. If ease of recall of the first few examples is used as the basis for judgment, a high estimate may therefore be rendered, even though a relatively small number of examples are recalled.

4. These three soap operas accounted for more than 90% of the soap opera viewing hours indicated in the preliminary questionnaire. They also represented each of the three major networks existing at that time, and each was the highest rated soap opera for its network.

5. Prior to the construction of the actual questions, the coders were blind to the study’s purpose and were unfamiliar with cultivation theory and research. After the themes were extracted, coders were instructed to develop questions that heavy viewers would likely overestimate, relative to light viewers, if the heavy viewers were influenced by the content of the programs.
6. Subjects used a 10-point scale, where each point corresponded to 10 percentage points (see Procedure section). Thus, if the means for the estimates are multiplied by 10, they may be roughly interpreted as percentages out of 100.

7. Response latencies were analyzed for skewness (Fazio, 1990; see also Fazio, 1993). The composite latency variables (crime, marital discord, and occupational prevalence) were reasonably normally distributed (skewness coefficients generated by SPSS were near zero). Thus the latency data were not reciprocally transformed as Fazio (1990, 1993) suggests. If fact, when the latencies were reciprocally transformed and then averaged to form composite variables, the transformed composite variables were more skewed than the raw composite variables.

8. It is worth noting, however, that there is some contention as to whether the availability heuristic can explain vividness effects. Shedler and Manis (1986) found that vividness did enhance accessibility, and vividness was also related to judgments. However, in conducting the same type of path analysis that was used in this study, they found no link between accessibility and judgment. In other words, just as with the results for marital discord, subjects did not appear to infer their judgments from the degree of accessibility of information. Instead, the effect of vividness on judgments was independent of accessibility.

REFERENCES


