

# The cognitive processes underlying cultivation effects are a function of whether the judgments are on-line or memory-based

L. J. SHRUM

## *Abstract*

*The dependent variables typically used in testing for the cultivation effect have often been grouped into two categories: those that relate to the demographics or facts of television content and those that relate to the values expressed in television content (Hawkins and Pingree, 1982). This article explores this distinction in terms of the cognitive processes underlying the different types of judgments. The author argues that the demographic judgments are typically made in a memory-based fashion and the value judgments are typically made in an on-line fashion (Hastie and Park, 1986). This notion is then used to construct cognitive process models for each type of judgment that specifies when and how television information exerts its influence and results from previous research are presented that support these models. The general finding is that the same factors (motivation and ability to process information) affect the extent to which television information is used regardless of the type of judgment. However, the way in which these factors influence cultivation of demographic measures is exactly the opposite of the way in which they influence value measures.*

*Keywords: cultivation, memory based judgments, on-line judgments, motivation to process, ability to process, demographic measures versus value measures*

## **Introduction**

In many ways, cultivation research is defined by its dependent variables. Most scholars agree that absorption of television content is doing – or is supposed to be doing – the cultivating (although there is significant disagreement on how it should be measured). But precisely what is cultivated is another matter. The sheer diversity and complexity of television topics provides a vast array of possible dependent variables, and this has

for the most part been reflected in cultivation research. For example, the first studies investigating the cultivation effect focused predominantly on the viewing of crime and violence and its possible effect on such things as perceptions of societal crime, personal risk assessment, and fear (Gerbner et al., 1977). Other related topics included approval of violence, distrust, and anomie (Gerbner, Gross, Jackson-Beeck, Jeffries-Fox, and Signorielli, 1978). Later, research branched out into more diverse topics such as perceptions of affluence (Fox and Philliber, 1978; Potter, 1991), attitudes toward and perceptions of doctors (Volgy and Schwarz, 1980; Pfau, Mullen, and Garrow, 1995), beliefs about older people (Gerbner, Gross, Morgan, and Signorielli, 1980), and personal values such as materialism (Burroughs, Shrum, and Rindfleisch, 2002), and these represent only a small fraction of the topics that have been investigated.

But a focus on topic or content can go only so far. As the field has matured, the focus of cultivation research is turning increasingly toward *explaining* the effect rather than merely describing it. This focus includes the early cultivation research that investigated learning and construction processes (Hawkins, Pingree, and Adler, 1987; Potter, 1991) and more contemporary research that has dealt with memory processes and their relation with judgment (Busselle, 2001; Mares, 1996; Shapiro, 1991; Shrum, 1996, 2001; Yang, Roskos-Ewoldsen, and Roskos-Ewoldsen, 2004). In all of these cases, the objective was to identify mediators and moderators of the cultivation effect in an effort to explicate underlying processes.

The purpose of this article is to do two things simultaneously: 1) expand on current cognitive process models of cultivation effects, and 2) return to a focus on the dependent variables of cultivation. However, with respect to the latter, I argue that, rather than focusing on the *topic* of the dependent variable, progress in understanding cultivation's underlying mechanisms can be enhanced by focusing on the *type* of dependent variable that is used. Specifically, I argue that different types of judgments have corresponding differences in how they are constructed, and these differences in the judgment construction process have implications for how and when television information exerts its effect. Based on these differences, separate cognitive processing models are developed depending on the method of judgment construction and evidence is reviewed that supports these models.

## **Types of cultivation judgments**

### *The first-order versus second-order distinction*

As noted earlier, one way of grouping the dependent variables typically used in cultivation research is by topic. For example, consider four con-

structs that have frequently served as dependent variables: crime/violence, occupations, marital discord, and affluence. Using representative examples from previous research to operationalize these constructs, they can then be grouped by topic. Using two measures for each construct, this might result in the following:

<b>Topic</b>	<b>Measure</b>
Crime/Violence	What % of Americans have been involved in a violent crime? I am afraid to walk alone at night. (Agree/Disagree)
Occupations	What % of the work force is composed of lawyers? Most lawyers are dishonest.
Marital Discord	What % of men have extramarital affairs? Most husbands cannot be trusted.
Affluence	What % of Americans have a private swimming pool? I admire people who own expensive homes, cars, and clothes.

However, by topic is only one way to categorize these dependent variables. As Hawkins and Pingree (1982: 228) noted in their early review of the cultivation literature, the measures can also be grouped by the relation between the topic and television content. Specifically, some of the judgments pertain to demographics of television content or facts that might be learned from television. These television facts typically have real-world counterparts that can be objectively verified (e. g., prevalence of violence). Other judgments relate more to the values that are espoused in television programs and require some sort of extrapolation of meaning from the television message (e. g., fear of crime). These extrapolations of meaning are necessarily subjective and thus may differ across viewers. These two types of judgments are often referred to as *first-order* and *second-order* measures, respectively (Gerbner, Gross, Morgan, and Signorielli, 1986; Potter, 1991). Using this categorization, a reorganization of the measures would yield the following:

<b>Type of Judgment</b>	<b>Measure</b>
First-order	What % of Americans have been involved in a violent crime? What % of the work force is composed of lawyers? What % of men have extramarital affairs? What % of Americans have a private swimming pool?

Second-order	I am afraid to walk alone at night (Agree/Disagree) Most lawyers are dishonest. Most husbands cannot be trusted. I admire people who own expensive homes, cars, and clothes.
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In looking at the differences in the dependent variables in this manner, it becomes apparent that these two classes of variables differ in ways other than just their relation to television content. Two differences are particularly relevant to this article. First, the first-order judgments pertain predominantly to set-size or probability judgments (Manis, Shedler, Jonides, and Nelson, 1993; Shrum, 1995), whereas the second-order judgments are for the most part attitude and belief judgments. Second, these two types of judgments differ fundamentally in how they are constructed. Set-size and probability judgments tend to be constructed through a memory-based process, whereas attitude and belief judgments tend to be constructed through an on-line process (Hastie and Park, 1986). These differences have implications for both *how* and *when* television information is used in constructing the judgments.

#### *The on-line versus memory-based distinction*

One way in which first- and second-order judgments differ is whether they are predominantly made in an on-line or memory-based fashion (Hastie and Park, 1986). On-line judgments are ones that are formed as the information is encountered. Examples include forming an impression of a person while talking to them, forming an attitude about a political candidate or product while viewing an advertisement, and updating our attitudes or personal values after reading a newspaper article. Memory-based judgments are constructed based on the recall of information from long-term memory. Examples include judging the frequency of deaths due to certain illnesses, estimating the likelihood that a particular brand of automobile will break down, and trying to decide whether a friend would make a suitable roommate.

There are two key distinctions worth noting about on-line and memory-based judgments. First, there is a difference in terms of the role that memory plays in the judgment construction process. In regard to on-line judgments, memory has little or no role in the process, as people form their judgments based on the information that is in front of them. When they are later required to report these attitudes or beliefs (e. g., by a researcher), they will typically recall their previously formed, on-line

judgment and report it, rather than re-computing their judgment (Carlston, 1980; Lichtenstein and Srull, 1987; Lingle and Ostrom, 1979). Conversely, memory-based judgments are made almost solely on the basis of information retrieved from long-term memory. Thus, only for memory-based judgments would one expect to see a correlation between memory for information and the judgment (Hastie and Park, 1986). Second, on-line judgments tend to be by far the most common. Most of our judgments in everyday life involve some sort of spontaneous assessment based on information we have just encountered. In fact, as Hastie and Park (1986) note, memory-based judgments are rare (both naturally and in the lab), fairly difficult to construct, and generally represent a judgment that is both novel and unexpected.

*Cultivation implications.* The processes underlying on-line and memory-based judgments have important implications for how television information might influence the judgments. If in fact the second-order questions are made using an on-line process, it suggests that television must exert its effect when the information is encountered. In other words, the effects of television viewing must perforce occur *during viewing*. Moreover, it also implies that factors operating during viewing may also have an effect on the process, such as attention, elaboration, involvement, and so forth. However, the situation is much different for memory-based judgments. Because these judgments are not made spontaneously, but are made through the recall of information, it suggests that television exerts its effect at the time the judgment is required. If so, it in turn suggests that factors operating at *the time of recall* will likely have an effect on the process. These factors might include ability to recall information or the willingness to expend the effort to recall (e. g., involvement with the judgment task).

*The set-size/probability versus attitude/belief distinction*

Another way in which first- and second-order judgments differ is that first-order judgments pertain predominantly to set-size and probability judgments, whereas second-order judgments pertain predominantly to attitude and belief judgments. Although the distinction in the types of judgments is inextricably intertwined with the on-line versus memory-based distinction (set-size/probability judgments are memory-based and attitude/belief judgments are on-line), it has important implications for how the judgments are constructed and consequently for *how* television information might be used in the judgment construction process.

*Set-size and probability judgments.* Set-size judgments pertain to those judgments that require estimating the number or percentage of instances

in which a particular category (e. g., millionaire) occurs within a larger, superordinate category (e. g., Americans). These judgments, along with judgments of likelihood or probability, have been shown to be particularly susceptible to the application of judgmental heuristics (for a review, see Kahneman, Slovic, and Tversky, 1982). Because these judgments are often difficult, seldomly made, and low-risk (i. e., inaccurate judgments have few if any negative consequences), people simplify them by applying cognitive shortcuts or heuristics.

Two of the most common heuristics are the *availability heuristic* and the *simulation heuristic*. In using the availability heuristic, rather than engaging in an exhaustive search of memory for information relevant to the judgment, people will simply base their estimates on the ease with which an example can be recalled: The easier the example is to recall, the higher the estimate of its frequency or probability (Tversky and Kahneman, 1973). So, for example, someone might estimate the frequency with which violent crime occurs in the U.S. on the ease with which an example of a violent crime can be recalled. The simulation heuristic is similar to availability, but relies on ease of imagining rather than ease of recall (Kahneman and Tversky, 1982). The simulation heuristic is typically used when an example is not available or readily accessible from memory. Thus, a person might estimate the probability of a small nuclear bomb being detonated in a major city on the ease with which such a scenario could be imagined.

The characteristics of set-size and probability judgments, as well as judgmental heuristics, have certain implications for factors that might enhance or detract from their use. First, because heuristics rely on the accessibility (ease of retrieval) of information, and second, factors that affect this accessibility should play a role in the information that is retrieved. Although numerous factors can affect accessibility (for a review, see Higgins, 1996), three are of particular importance in the context of cultivation effects: Frequency of activation of a construct, recency of activation, and vividness. The more frequently a construct is activated in memory the easier it is to recall (Higgins and King, 1981). The same is true for the recency with which a construct has been activated, although recency effects quickly give way to frequency effects (Higgins, Bargh, and Lombardi, 1985; Wyer and Radvansky, 1999). Vividness relates to the extent to which something is imagery provoking and constructs that tend to be more vivid are more easily activated from memory (Higgins and King, 1981; Nisbett and Ross, 1980). Thus, factors that influence the extent to which a construct is frequently or recently activated, or is vivid in nature, will increase the likelihood that the construct will be used in the judgment construction process.

There are factors that can also inhibit the use of judgmental heuristics (for a review, see Sherman and Corty, 1984). Recall that heuristics are used to simplify difficult judgments, but are not necessarily the best way to reach an accurate judgment. A better judgment might be reached if more information is considered rather than just relying on the first piece of information that comes to mind (not to mention relying merely on the ease of retrieval rather than content of the retrieval). For these reasons, heuristics tend to be used when ability to make the judgment is impaired (e. g., time pressure that requires a snap judgment, having little knowledge of the topic, etc.) or when motivation to reach an accurate decision is low.

*Cultivation implications.* As noted earlier, factors that influence accessibility (frequency, recency, vividness) should influence the extent to which particular information is used to construct judgments. Given that the first-order cultivation judgments are specifically constructed because of overportrayal (i. e., higher frequency) on television relative to the real world, frequency of viewing should be directly related to the frequency with which the constructs are activated, which in turn should influence the ease with which they are recalled. The same is true for recency of activation. In addition, because of the nature of dramatic presentation, the vividness of these constructs is often high (e. g., vivid portrayals of violence, dishonesty, etc.). Going back to the examples used earlier, television viewing should make an example of a violent crime that is easier to recall or a scenario of a nuclear detonation that is easier to imagine because these constructs are frequently portrayed on television (both news and entertainment programs), and this accessibility should be greater for those who watch relatively more television.

If television viewing does indeed enhance accessibility, and the ease with which people can recall or imagine an example increases estimates of its occurrence, then we would expect a positive relation between how much television a person watches and the related estimates they make. In other words, we would expect a cultivation effect. Moreover, the magnitude of this effect should be mediated by the accessibility of the information. However, given the earlier discussion of the conditions that facilitate or inhibit the use of cognitive heuristics, cultivation effects should be particularly pronounced when ability or motivation to process (recall) information is low. Conversely, when motivation or ability is high, the cultivation effect should be inhibited.

*Attitude and belief judgments.* Attitudes and beliefs are probably the most common types of judgments studied by psychologists. Although there are a number of theories that address how attitudes and beliefs are

formed, the currently accepted model is the dual-process model of attitude formation and change (cf. Chaiken, Liberman, and Eagly, 1987; Petty and Cacioppo, 1986). This model posits two routes to persuasion. The *central* or *systematic* route or process is an effortful one in which arguments are carefully scrutinized and the judgments are a function of the quality of the arguments presented. Conversely, the *peripheral* or *heuristic* route or process is a low-effort one that involves little argument scrutiny, but rather relies on peripheral cues such as attractiveness of spokesperson or current mood, or on simple heuristics, such as experts can be trusted, length of argument implies strength of argument, and so forth.

Although there are a number of factors that can affect attitude formation and change (for a review, see Eagly and Chaiken, 1993), three are particularly relevant to potential cultivation effects: Message repetition, motivation to elaborate on message-relevant information, and ability to elaborate on message-relevant information. Message repetition has been shown to increase attitude change, at least up to a point (Cacioppo and Petty, 1979). Similarly, greater motivation and ability to elaborate increases the probability and extent of elaboration, which in turn increases persuasion (Petty and Cacioppo, 1986).

*Cultivation implications.* In attempting to understand how the television message might influence attitudes and beliefs, it is useful to view television programs as persuasive communications that present particular messages. Viewed in this way, message repetition can be operationalized as the frequency of television viewing. As just noted, message repetition tends to increase persuasion<sup>1</sup>. Thus, frequency of viewing should be positively related to the beliefs presented in the programs (again, a cultivation effect). In addition, the constructs of motivation and ability to elaborate should also play a role. Those who elaborate more on the message should be more persuaded than those who elaborate less; thus, factors such as motivation to elaborate (e. g., program involvement) or ability to elaborate (e. g., paying attention) should enhance the cultivation effect<sup>2</sup>.

### **Constructing cognitive process models for cultivation effects**

As should be apparent now from the previous discussion, it is necessary to construct separate models for first-order (set-size/probability, memory-based) and second-order (attitude/belief, on-line) judgments. The noted differences in how these judgments are constructed result in different predictions about how and when television will have an effect on judgments.



*Cognitive process model for first-order judgments*

The general assumption for first-order judgments is that they are constructed in a memory-based fashion that relies heavily on the application of cognitive heuristics, particularly the availability and simulation heuristic. Television viewing increases the accessibility (ease of recall or imagining) of exemplars relevant to cultivation judgments (violence, affluence, etc.), and people use the ease of recall to infer frequency or probability of occurrence. This process thus results in a cultivation effect. In addition, because the cultivation effect results from the application of these cognitive heuristics, factors that inhibit the use of heuristics should correspondingly reduce the effect of television information on judgments, thereby reducing the magnitude of the cultivation effect. Conversely, factors that facilitate the use of heuristics should increase the magnitude of the cultivation effect.

These general assumptions and specific propositions have been tested and supported in a number of studies (for a more extensive discussion, see Shrum, 2002; Shrum, Burroughs, and Rindfleisch, 2004a). First, television viewing has been shown to be positively related to accessibility of exemplars of constructs heavily portrayed on television. This finding has been replicated frequently using different measures of accessibility, television viewing, criterion variables, and control variables (Busselle and Shrum, 2003; O'Guinn and Shrum, 1997; Shrum, 1996; Shrum and O'Guinn, 1993; Shrum, O'Guinn, Semenik, and Faber, 1991). More importantly, this accessibility bias has been shown to mediate the cultivation effect (Shrum and O'Guinn, 1993; Shrum, 1996), a necessary criterion for validating the use of the availability heuristic (Shedler and Manis, 1986). Further, the somewhat counterintuitive use of television information to make real world judgments appears to result from lack of attention to source details, and thus lack of source discounting, when constructing the judgments (Shrum, Wyer, and O'Guinn, 1998).

Studies have also validated the proposition that conditions which inhibit or facilitate the use of heuristics in forming judgments moderate the cultivation effect. For example, when conditions under which the judgments are constructed are manipulated, participants who are given instructions to answer off the top of their head, (heuristic condition) or who are given instructions simply to answer the questions (control condition), exhibit significant cultivation effects of equal magnitude. However, when involvement with the judgment task is increased via an accuracy motivation manipulation (systematic condition), the cultivation effect is significantly reduced and eliminated (Shrum, 2001). Similarly, when ability to construct the cultivation judgments is manipulated via perceived time pressure to answer, the cultivation effect is greater under

higher perceived time pressure than under lower perceived time pressure (Shrum, 1999).

In summary, the set of findings just reviewed indicate that the cultivation effect for first-order measures can be explained in terms of heuristic processing at the time of information retrieval. However, when motivation or ability to process information *during recall* is high, the cultivation effect is *reduced*.

### *Cognitive process model for second-order judgments*

The general assumption for second-order judgments is that they are for the most part made in an on-line fashion as information is encountered during viewing. The television program or message is treated as a persuasive communication and repeated exposure to the message is expected to increase yielding, and thus attitude change. Moreover, the factors that typically increase persuasion – motivation and ability to process information – should therefore increase the cultivation effect.

These propositions have received initial support in two studies (Shrum, Burroughs, and Rindfleisch, 2004b). The first study investigated the relation between television viewing and the personal value of materialism (Richins and Dawson, 1992). This particular type of second-order judgment was chosen because of the likelihood that the judgment would be made in an on-line fashion. Judgments such as personal values are ones that everyone holds, are formed over a lifetime, are centrally held, and are used frequently as a basis for goal-directed behavior (Rokeach, 1973). Because of this centrality and importance, they are frequently updated (changed, strengthened, etc.) based on new information and experience. Given the frequent and generally favorable portrayals of material values in television programming (Hirschman, 1988; O'Guinn and Shrum, 1997), television viewing was expected to correlate positively with level of materialism. In addition, this cultivation effect was expected to be greater for those with greater motivation to process information and for those with greater ability to process information.

A random sample of the U.S. general population (18 years and older) was sent a mail survey that measured level of television viewing and level of materialism. Motivation and ability to process information was operationalized as individual differences in tendencies to elaborate during viewing and tendencies to pay attention while viewing. Tendency to elaborate was measured using a five-item short form of Cacioppo and Petty's (1982) Need for Cognition (NC) scale developed by Epstein, Pacini, Denes-Raj, and Heier (1996). Need for cognition relates to the extent to which people enjoy thinking and solving puzzles, and is frequently used as a measure of cognitive elaboration (Cacioppo, Petty,

Feinstein, and Jarvis, 1996). Tendency to pay attention during viewing was measured using Rubin, Perse, and Taylor's (1988) five-item Viewing Attention scale. As expected, television viewing was positively related to the level of materialism and this relation was moderated by both NC and attention in the expected ways. Those who were higher in NC (and thus presumably elaborated more) exhibited a significantly stronger cultivation effect than those lower in NC. Likewise, those higher in attention while viewing showed a greater effect of television viewing than those lower in attention. A second study, a laboratory experiment, validated some of the assumptions from study one, particularly showing that those higher in need for cognition do indeed elaborate more (generate more thoughts) during viewing, and these elaborations are generally positive for heavy viewers relative to light viewers.

In summary, these findings support the notion that television viewing cultivates second-order measures such as materialism in a manner consistent with persuasion theory. When motivation or ability to process information *during viewing* is high, the cultivation effect is *increased*. Note that the very same variables (motivation and ability) are thus shown to moderate the cultivation effect for both first- and second-order judgments. The key is that they exert their effects at different times (during viewing versus during recall) and in the opposite direction (decrease the effect for first-order, increase the effect for second-order).

### **When does cultivation occur? Encoding versus retrieval**

The premise of this article is that television information can have an effect at different times and in different ways, depending on the type of judgment that is measured. If this premise is indeed valid, it provides a somewhat unique way of looking at cultivation effects, and raises the question: When does cultivation occur? The prevailing notion has been that cultivation occurs when the information is received during viewing, in other words, when the information is encoded. Little concern was given to precisely how television information then gets integrated into the judgment construction process.

I would like to propose a different way of looking at the moment that cultivation occurs, namely *at the time of judgment*. That is, cultivation occurs when television information is used to make a judgment. This could be during (or at least, immediately following) encoding. This is the process that I have proposed for on-line judgments, which tend to be made spontaneously as information is acquired. However, cultivation does not have to occur at encoding, as is the case for memory-based judgments. In this instance, television information may exert its effect after (sometimes long after) the information is received and stored in long-term memory.

*Implications for future research*

*Encoding vs. retrieval process variables.* This perspective on cultivation effects has a number of implications. One is that it suggests a focus on processes occurring at two different times: During encoding and during retrieval (Shrum, 1995). Such a focus may help in uncovering patterns in previous cultivation research, particularly with respect to reconciling what may at first seem to be inconsistent data. For example, numerous studies have investigated variables such as attention while viewing and program involvement (variables that pertain to processes occurring during encoding), but little consistency has emerged in terms of their relation to cultivation. However, according to the models just presented, such variables are most likely to have an impact when judgments are made at the time of encoding. Consistent with this notion, variables such as attention while viewing and need for cognition have had no moderating effect on the magnitude or significance of the cultivation effect for first-order judgments (cf. Shrum, 2001; Shrum et al., 1998)<sup>3</sup>, but do have such an effect on cultivation for second-order judgments (Shrum, Wyer, and O'Guinn, 2004b).

Having said that, there are situations in which it is possible that viewing activity variables might have an effect on the recollection of relevant information, and thus, have an effect on first-order measures. However, this effect should occur only to the extent that these variables would affect either the extent to which information is recalled at the time of judgment or the extent to which the information is used at the time of judgment. But there are several possibilities regarding the pattern of these effects. For example, increased attention or elaboration during viewing may make for a stronger encoding process such that the information is more easily retrieved than under conditions of less attention or elaboration. If so, then attention and elaboration during viewing should increase the cultivation effect. However, recollection that the use of the more accessible television information tends to occur due to lack of motivation or ability to source discount (Shrum et al., 1998). It seems plausible that if increased attention and elaboration during viewing increase the strength of encoding of the television *example*, it might also increase the strength of encoding of television as the *source*. This, in turn, is likely to increase the probability of source discounting and thus reduce the effect of the television information on judgment (Shrum, 1995). As noted earlier, none of the studies in which I have been involved have found such an effect, but it may be due as much to problems in measurement as to problems with theory. This seems like a particularly ripe area for additional research, particularly within the laboratory, which might be able to test hypotheses about process during viewing.

*Focus on moderating variables.* The preceding example also points up the advantage of focusing on moderating variables. With only a few exceptions (e.g., testing the concepts of mainstreaming and resonance; Gerbner et al., 1980), cultivation research has ignored moderating variables and thus has seldom if ever tested for interactions between television viewing and other variables. Instead, most research has been devoted to either uncovering third variables that might render the cultivation effect spurious (Hirsch, 1980; Hughes, 1980) or looking at audience activity variables that might be a better predictor of television effects than simple exposure (for a review, see Rubin, 2002). But by ignoring moderating effects an important opportunity is missed. A particular variable may have important interactive effects but may show little effect as control variable. Indeed, in the Shrum et al. (2004b) study that showed an interaction between television viewing and both attention and need for cognition, controlling for these variables had virtually no effect on the magnitude of the cultivation effect for materialism. It is only through looking at *both* moderating and mediating variables that we can start to understand the processes underlying cultivation effects (Shrum, 2002).

### **Caveats**

In this article I have made some generalizations about the nature of cultivation judgments. As with any generalization, there are often important exceptions. One important qualification pertains to the notion that first-order judgments are always memory-based and second-order judgments are always on-line. On the one hand, I think the former proposition is in fact almost always true. Few people spontaneously generate percentage estimates of set-size or probability during viewing. On the other hand, the proposition that all second-order judgments are made on-line is clearly false. There are at least two instances in which second-order, attitude and belief judgments would be memory-based. One is if the judgment is sufficiently novel that it is not part of everyday reasoning or impression formation and thus not made spontaneously during viewing. This would occur if the viewer does not sufficiently notice particular information presented in a program to make a spontaneous judgment (e.g., whether most serial killers are likely to be left-handed) or if the judgment is simply one that would never occur to the viewer to make (e.g., whether most houses on television are white). A second instance would be if sufficient time has elapsed between the initial judgment that, even though the previous judgment can be recalled, there is not sufficient confidence that the judgment is still valid. If so, the judgment would be re-computed based on information retrieved from memory.

My reason for linking second-order cultivation judgments with on-line processing is that I think the types of second-order judgments typically used in cultivation research are in fact ones that occur often and would be made spontaneously during viewing. Examples might be updating beliefs as to whether the world is a mean and violent place, forming, updating, and strengthening attitudes toward wealth and material goods, or making inferences about the link between gender or skin color and various trait attributes. Note, however, that these spontaneous judgments are by no means necessarily conscious. In fact, given the amount of information processing that occurs beyond the level of consciousness, it is likely more the rule than the exception that these judgments are automatic and unconscious rather than controlled and conscious (Bargh, 1997).

Another important qualification pertains to the link between first-order, memory-based measures and the use of the availability heuristic. First, as should be clear, there are instances or conditions under which the availability and simulation heuristics are not used. These occur when motivation to process information is sufficiently high to interrupt this application. In such instances, motivation may be so high that there is little if any effect on the accessibility of information because many examples are recalled (only a portion of which may be television examples) and the veracity of the examples including the source of the example is scrutinized. In other instances, motivation may not be sufficiently high to induce recall of many examples, but it may be sufficiently high to interrupt the process of judging frequency or probability simply on the ease with which the examples are recalled (e. g., making inferences based on the content, rather than the ease of recall, of the examples). Although such situations may sound convoluted and rare, in fact we make snap judgments every day, whether it be about the products we buy, the politicians we vote for in unimportant (to us) contests, or whether we are going to cross a deserted street to avoid walking by a minority male.

Despite these caveats, viewing cultivation as a function of the type of judgment should be useful in gaining a greater insight into how television information can affect both ourselves and others. This insight should in turn be useful in developing media literacy principles for helping viewers combat the effects of television viewing. However, the implication of the approach outlined in this article is that media literacy programs should not only teach people how to 'read the media' (which would help them adjust for on-line judgment effects), but also how to 'read the judgment' and understand what types of judgments might be likely to be influenced by television information, allowing people to correct for this bias if they so choose.

## Notes

1. Cacioppo and Petty (1979) found that persuasion increased in a linear manner from one to three repetitions, at which point it began to decline. However, the stimuli used in those experiments were persuasive communications regarding a proposed increase in university expenditures and thus were not particularly entertaining. Cacioppo and Petty attributed the decline to tedium, which in turn induced psychological reactance (Brehm, 1972). For entertaining and voluntary stimuli such as television viewing, this tedium threshold should not be an issue (once the tedium level is reached, people will likely quit viewing).
2. A qualification to greater elaboration leading to increased persuasion is that this will occur only if arguments are considered strong. If the arguments are weak, greater elaboration leads to increased counterarguing, which in turn leads to a negative attitude change (Petty and Cacioppo, 1986). This is an important issue because it is plausible that the messages presented on television might be considered weak, either because they are not believable or because the source is considered poor. However, constant counterarguing would be a fairly miserable way to watch television. Thus, it seems likely that people who do choose to watch television would suspend their disbelief and elaborate positively during viewing.
3. This lack of a moderating effect was not reported in Shrum (2001) or Shrum et al. (1998) but was determined through a re-analysis of those data.

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