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### Antidepressant Direct-to-Consumer Advertising and Social Perception of the Prevalence of Depression: Application of the Availability Heuristic

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## ARTICLES

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# Antidepressant Direct-to-Consumer Advertising and Social Perception of the Prevalence of Depression: Application of the Availability Heuristic

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This study examined the effect of antidepressant direct-to-consumer advertising (DTCA) on perceived prevalence of depression. A survey of Midwestern residents showed that those with high recall for antidepressant DTCA tended to estimate the prevalence of depression higher than those with low ad recall. However, with a source-priming cue before their estimation, the significant association was eliminated. Results indicate that people use antidepressant DTCA as a basis for their judgment of the prevalence of depression in normal situations where the veracity of information is not highlighted.

Direct-to-consumer advertising (DTCA) for prescription drugs has been increasingly visible since the Food and Drug Administration relaxed broadcast requirements in 1997. The most heavily advertised drugs include prescription drugs for depression, marketed as *Prozac*, *Paxil*, and *Zoloft*. Donohue and Berndt (2004) found that diagnosis of depression was significantly higher for periods when antidepressant DTCA spending was highest. Although the impact of such DTCA remains controversial, little is known about the underlying communication mechanism through which people perceive the illness. More specifically, whether antidepressant DTCA makes the medical condition more common by raising perceived prevalence has yet to be systematically investigated.

Television provides images and stories of life that are often beyond viewers' direct experience, affecting their perception toward the outside world (O'Guinn & Faber, 1991; Richins, 1995). Heavy television viewing correlated with higher estimates of the prevalence of alcoholism, crime, divorce, and violence (Carveth & Alexander, 1985; Gerbner & Gross, 1976; Shrum, 1996; Shrum & O'Guinn,

1993). Frequent watching of soap operas was significantly associated with believing the world to be relatively more affluent (O'Guinn & Shrum, 1997). In line with research on media's cultivation effects, the role antidepressant DTCA plays in shaping consumers' perceptions toward depression merits scholarly investigation. This study examined whether high exposure to antidepressant DTCA leads to a heightened prevalence of the illness, cultivating a perception that there are many people who are suffering from depression.

This study also examined the underlying natural priming effect of DTCA as a heuristic cue. When making a social judgment, people rarely evaluate the veracity of information they use as a basis for the judgment (Shrum & O'Guinn, 1993; Wyer & Hartwick, 1980). Easily accessible information, although it may not be the most believable, serves as a cue to the judgment (Shrum, 1996; Shrum, Wyer, & O'Guinn, 1998). Recency, frequency, and vividness greatly enhance accessibility of information (Gregory, Cialdini, & Carpenter, 1982; Sherman & Corty, 1984; Sherman, Judd, & Park, 1989; Srull & Wyer, 1979). As such, high exposure to antidepressant DTCA will make these images and accounts easily accessible in viewers' memories, contributing to their judgment on the prevalence of depression. Then if people receive a cue that their perceptions toward depression

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came from a nonveridical source, antidepressant DTCA, would the possible cultivation effect be reduced?

Providing a source-priming cue will address the causality issue: the observed association between DTCA exposure and perception, if any, could be due to a reverse causality in which people with high perceived prevalence of depression tend to pay close attention to antidepressant DTCA. Making a source salient during the judgment process will test whether the source is a causal factor in forming beliefs in normal situations where the source characteristics are not highlighted (Shrum et al., 1998; Wyer, Bodenhausen, & Gorman, 1985; Wyer & Srull, 1989). In fact, Shrum et al. provided a cue recalling television as a source of information for crime estimates and found that the priming condition reduced the cultivation effect. The priming procedure showed television as a causal influence on perceptions, not simply a correlate of these perceptions (Shrum et al., 1998). By the same token, if DTCA information is not exerting a causal influence on perceptions; that is, if the relationship between DTCA exposure and perception is due to a reverse causality, calling attention to DTCA as a source will have little influence.

To date, much research on DTCA has focused on the behavioral outcomes, such as the doctor-patient relationship, health service utilization, medical compliance, drug choices (Donohue & Berndt, 2004; Donohue, Berndt, Rosenthal, Epstein, & Frank, 2004; Murray, Lo, Pollack, Donelan, & Lee, 2004), or content analysis of the ads (Macias & Lewis, 2003; Sumpradit, Ascione, & Bagozzie, 2004; Welch Cline & Young, 2004). Effects on social cognition, whether planned or inadvertent, have important implications for public health issues. Understanding the communication mechanism by which DTCA influences cognitions about depression can provide valuable insights as to how to increase acceptance of depression as an illness.

#### DTCA AS A HEURISTIC CUE TO SOCIAL JUDGMENT

Research on cultivation theory has found that viewers "cultivate" television information by integrating it into their perceptions of real-world phenomena (Gerbner & Gross, 1976; Gerbner, Gross, Morgan, & Signorielli, 1980, 1994). The theory suggests that the more people watch television, the more likely they will come to view the real world as similar to the world portrayed on television. To delineate the psychological process of how television messages influence social judgments, construct accessibility as a mental process has been suggested (Shrum, 1995, 1996; Shrum & O'Guinn, 1993; Shrum et al., 1998). These scholars view the cultivation effect as a result of heuristic information processing where judgments are a function of accessibility of information in memory (Shrum, 1995). People typically do not make an exhaustive information search in constructing a

judgment (Taylor & Fiske, 1978; Wyer & Srull, 1989). Instead, they prefer cognitive shortcuts and use the most accessible and easily available information as a basis (Sherman et al., 1989; Wyer & Srull, 1989).

The psychological process is largely based on Tversky and Kahneman's (1973) work on availability heuristics. People use cognitive "heuristics" to judge the likelihood of events, which involves assessing an event's probability by the ease with which various instances of it can be brought to mind (Tversky & Kahneman, 1974). High television watching increases the accessibility of instances of events that are encountered in television, for example, prostitution, divorce, alcoholism, and drug use (Shrum, 1996; Shrum & O'Guinn, 1993). Easy accessibility of an example or exemplars leads to higher estimates of real-world frequencies. Shrum et al. (1998) describe this mental process as a "natural prime," where relevant exemplars are more accessible in memory for heavy television viewers (p. 448). Heightened availability of an event in memory leads to an increase in its perceived likelihood (Sherman, Cialdini, Schwartzman, & Reynolds, 1985).

Recency, frequency, and vividness are key factors determining accessibility of particular information (Gregory et al., 1982; Sherman et al., 1985; Sherman et al., 1989; Wyer & Srull, 1989). These factors have particular relevance to television viewing in relation to cultivation judgments (Shrum, 1995). Heavy television viewers have more accessible memories on certain constructs, such as lawyers, police officers, and affluence, due to TV's frequent dramatic portrayals. These heavy viewers not only give high estimates of those constructs but also provide faster responses based on a reaction time task, indicating enhanced accessibility in memory (Shrum, 1996; Shrum & O'Guinn, 1993).

Frequent exposure to antidepressant DTCA will increase accessibility of constructs pertaining to depression symptoms and consequences. Vivid and dramatized presentations of related images greatly enhance accessibility of those constructs, which leads to higher estimates of depression among those with high exposure to antidepressant DTCA. This study hypothesizes that the more antidepressant DTCA people recall, the higher their estimation of prevalence of depression will be. If people judge the incidence of those with depression, the enhanced accessibility of exemplars from various antidepressant DTCA will lead them to make higher estimates.

However, the possible association between ad recall and perceived prevalence does not necessarily provide evidence of causality. The correlational evidence of cultivation effect is often subject to an alternative explanation. That is, it is plausible to draw a reverse causality in that individuals with certain beliefs, for example, that crime rates are high, tend to watch television with violent content. In the context of antidepressant DTCA, those with high perceived prevalence of depression may be particularly drawn to antidepressant

DTCA, which leads to high ad recall. To specify the causal flow from DCTA exposure to perception, the link needs additional investigation.

To address the causality issue, Shrum et al. (1998) used a source-priming cue to see whether priming television as a source of information could eliminate the cultivation effect. The priming condition will have an effect only if the primed source is one that individuals normally use as a basis for judgments (Wyer et al., 1985; Wyer & Srull, 1989). As hypothesized, calling attention to television as a source of information significantly reduced the cultivation effect (Shrum et al., 1998). However, when no cues were provided, participants used the television-based information to construct their estimates (Shrum et al., 1998). That is, in typical situations where the veracity of information is not questioned or highlighted, television viewing has a significant causal influence on perceptions of crime and occupations (Shrum et al., 1998).

This study replicates Shrum et al.'s (1998) priming condition with antidepressant DTCA. If calling attention to antidepressant DTCA as a source of information removes or reduces the possible cultivation effect, we can claim that antidepressant DTCA is one significant source of information affecting perception toward depression in typical environments. If a significant association between ad recall and perception is due to a third variable or a reverse causality, a priming condition will not play a role.

This study hypothesizes that if people are asked to estimate prevalence of depression after providing information about their exposure to antidepressant DTCA, the effect of DTCA on perceived prevalence will be smaller compared to when they estimate the prevalence before providing DTCA exposure information. In the latter situation, individuals will not receive a cue as to where their accessible images and information in memory come from. In contrast, a source-priming cue will cause them to think that the information they recall might have come from antidepressant DTCA and therefore correct for its influence.

## METHOD

To examine how exposure to antidepressant DTCA influences people's perception toward depression, telephone surveys were conducted. The population of interest was adults 18 years or older. Phone numbers were randomly selected from a phone directory of a Midwestern town with a total population of about 50,000. A total of 300 residents were interviewed, with a response rate of 65%. Among them, 62% were female and 38% male. Median age was 42. Regarding education, 52% of those surveyed had a bachelor's degree or higher.

Compared to 2003 U.S. population estimates (U.S. Census Bureau, 2003), women were oversampled. The median age of 42 was very close to the estimate of U.S. population

characteristics. This sample showed much higher education levels than the general U.S. population. Based on the 2003 estimate, 27% of the U.S. population had bachelor's degrees or higher, compared to the 52% of this sample. However, except gender, most demographic characteristics were quite representative of the Midwestern college town sampled.

The phone interviews measured the following key variables: (a) perceived estimate of the prevalence of depression, (b) perceived estimates of the prevalence of other illnesses, (c) recall of antidepressant DTCA, (d) amount of various media exposure, (e) personal relevance involving depression, (f) health knowledge and interest, and (g) demographic information.

To measure perceived prevalence of depression, we asked, "What percentage of adult American people do you think suffer from clinical depression? Estimate the number of people out of 100 in the U.S. population." Similar measurements have been used by previous cultivation studies (see O'Guinn & Shrum, 1997; Shrum et al., 1998). To distinguish depression that needs medical attention from simply feeling down, the term *clinical depression* was carefully used. In addition, perceived estimates of six other illnesses were assessed as a baseline measure for an individual's general perception toward diseases. An individual's overall prevalence estimate is expected to be a significant predictor of the estimate for depression. Participants were asked about the prevalence of allergies, erectile dysfunction, overactive bladder, severe heartburn, high cholesterol, and arthritis—medications for which are directly advertised to consumers—and the mean value was used as a control variable to account for individual differences.

To measure exposure to antidepressant DTCA, we first asked, "Do you know what the difference is between prescription drugs and nonprescription drugs, frequently called over-the-counter drugs?" Among 300 participants, only 3 answered "no," and the following explanation was given to them: "Over-the-counter drugs are drugs that you can get without a doctor's prescription; prescription drugs are ones that you can only get with a doctor's prescription." Ad recall for antidepressant DTCA was measured by the question: "In the last six months, do you recall seeing or hearing an advertisement for anti-depression drugs? If so, could you tell me any ads or brand names?"

Key factors affecting perception toward depression should be taken into consideration to test the hypothesized relationships. Studies of other illnesses suggest that personal relevance, general health knowledge, interest in health information, and media exposure directly influence individuals' perceived risk of illnesses (see Burkholder, Harlow, & Washkwich, 1999). Also, prior research shows that women, older consumers, and the educated are more involved in health-related issues (Huh, Delorme, & Reid, 2004; Kahn, 2001; Perri & Nelson, 1987), which will affect their perception of illnesses.

Personal relevance of depression was measured by the question: "Clinical depression is an important matter to me or my family." Possible answers ranged from 1 (*not important*) to 5 (*very important*). Health knowledge was measured by the question: "How knowledgeable would you say you are about health and medicine? Would you say you are: 1) not at all knowledgeable, 2) somewhat knowledgeable, 3) very knowledgeable, or 4) extremely knowledgeable." Interest in health information was measured by the question: "How interested are you in getting information about health and medicine? 1) none, 2) very little, 3) some, 4) quite a bit, or 5) a great deal."

To test the source-priming effect, two versions of the survey were administered. Half of the participants, 150 participants, were asked to estimate the prevalence of depression before providing ad recall information. The other half were asked to recall brand names of antidepressant DTCA first and then to estimate the prevalence of depression. Except for the order, all the questions were the same for the two versions.

## RESULTS

The awareness level of antidepressant DTCA was fairly high. A great majority, 79%, responded that they had seen or heard antidepressant DTCA. Brand recall for antidepressant DTCA was scored from 0, for those who did not recall any, to 4, for those who remembered four correct brand names. The brand names recalled were *Zoloft*, *Prozac*, *Paxil*, and *Wellbutrin*. Sixty five percent of the respondents did not recall any correct brand names; 25% recalled one correct brand name; 8% remembered two brand names; 1% recalled three brand names; and 1% recalled four brand names.

Estimates for the prevalence of depression ranged from 75% to 2%, with an average estimate of 33%. The average estimate appears to be slightly higher for those who estimated the prevalence of depression before recalling antidepressant DTCA. The mean estimate of those without source priming was 35% ( $SD = 21$ ), whereas that of those who recalled ads first and then estimated the prevalence was 31% ( $SD = 20$ ). Table 1 shows descriptive statistics for key variables.

Table 2 presents the results of regression analysis of the total sample. Missing values were deleted listwise, leading to a total sample of 267. As expected, overall perception toward other illnesses was a significant predictor of perception toward depression. Those with high prevalence of other illnesses tend to estimate the prevalence of depression high ( $\beta = .581, p < .001$ ). Health knowledge and interest were not significant predictors of perception toward depression ( $\beta = .037, p > .47$ ;  $\beta = -.035, p > .49$ , respectively). Personal relevance of depression did not approach significance ( $\beta = .063, p > .19$ ). Among demographic variables, age was negatively

TABLE 1  
Descriptive Statistics

| Variable                            | M   | SD  |
|-------------------------------------|-----|-----|
| Perceived prevalence of depression  | 33  | 20  |
| Overall perception toward illnesses | 38  | 16  |
| Health knowledge                    | 2.3 | .8  |
| Health interest                     | 3   | 1.2 |
| Personal relevance of depression    | 3   | 1.5 |
| Antidepressant DTCA recall          | .48 | .72 |

Note. DTCA, direct-to-consumer advertising.

TABLE 2  
Regression Analysis Predicting Prevalence of Depression

| Predictor variables                 | $\beta$ | t        | $R^2$ |
|-------------------------------------|---------|----------|-------|
| Overall perception toward illnesses | .581    | 11.41*** |       |
| Health knowledge                    | .037    | .72      |       |
| Health interest                     | -.035   | -.68     |       |
| Personal relevance of depression    | .063    | 1.31     |       |
| Age                                 | -.171   | -3.28**  |       |
| Education                           | -.054   | -1.11    |       |
| Gender                              | -.080   | -1.63    |       |
| TV watching                         | -.005   | -.09     | .465  |
| Antidepressant DTCA recall          | .117    | 2.34*    | .476  |

Note.  $N = 267$ . DTCA, direct-to-consumer advertising.  $\beta$  values are standardized coefficients. Gender was coded as 1 (female) and 2 (male).

\* $p < .05$ . \*\* $p < .01$ . \*\*\* $p < .001$ .

associated with perceived prevalence of depression ( $\beta = -.171, p < .01$ ). That is, the older tended to present lower estimates than the younger. The media exposure measure of TV watching was not a significant factor ( $\beta = -.005, p > .93$ ). To determine whether other media exposure played a role, total media exposure, combining television, radio, newspaper, and Internet as a surrogate measure for TV watching, was entered into regression, but it was neither significant nor did it change the direction or magnitude of other relationships. Therefore, TV watching was used in the final regression.

As hypothesized, after controlling for the above factors, the recall of antidepressant DTCA was a significant predictor of perceived prevalence of depression ( $\beta = .117, p < .05$ ). The more participants remembered correct brand names of antidepressant DTCA, the higher their estimation of the prevalence of depression. The regression in Table 2 shows that  $R^2$  significantly increased from .465 to .476 by the addition of antidepressant DTCA recall.

However, separate regressions for the two groups revealed that recall of antidepressant DTCA was a significant predictor only for those without source priming. As hypothesized, the effect of ad recall was not significant when predicting perceived prevalence of depression with a source-priming cue, as shown by the first regression in Table 3 ( $\beta = .085, p > .24$ ). In the first regression,  $R^2$  did not change much by the addition

TABLE 3  
Regression Analyses Contrasting Two Groups

| Predictor variable                  | Respondents<br>With<br>Source Priming <sup>a</sup> | Respondents<br>Without<br>Source Priming <sup>b</sup> |
|-------------------------------------|--|---|
|                                     | $\beta$  | $\beta$   |
| Overall perception toward illnesses | .570***  | .583***   |
| Health knowledge                    | -.019  | .113  |
| Health interest                     | .001   | -.111   |
| Personal relevance of depression    | .181**   | -.041   |
| Age                                 | -.183*   | -.122   |
| Education                           | -.077  | -.031   |
| Gender                              | -.044  | -.143   |
| TV watching                         | -.015  | .015  |
| Antidepressant DTCA recall          | .085   | .145*   |
| $R^2$                               | .498   | .498  |

Note. DTCA, direct-to-consumer advertising.  $\beta$  values are standardized coefficients. Gender was coded as 1(female) and 2(male).

<sup>a</sup> $n = 138$ . <sup>b</sup> $n = 129$ .

\* $p < .05$ . \*\* $p < .01$ . \*\*\* $p < .001$ .

of antidepressant DTCA, from .493 to .498. Noticeably, personal relevance of depression surfaced as a key factor ( $\beta = .181$ ,  $p < .01$ ). This group was asked to estimate the prevalence of depression after providing information about recall of antidepressant DTCA. With a cue leading them to think about antidepressant DTCA as a source of information, participants may have attempted to ignore or downplay the exemplars from DTCA and search for more veridical information related to personal contacts or experience, as evidenced by the significant effect of personal relevance.

However, when they estimated the prevalence before recalling antidepressant DTCA, the ad recall effect on perceived prevalence was significant ( $\beta = .145$ ,  $p < .05$ ). The second regression in Table 3 shows that recall of antidepressant DTCA was one of the strongest predictors, next to the overall perception toward diseases ( $\beta = .583$ ,  $p < .001$ ). Age did not reach significance ( $\beta = -.122$ ,  $p > .10$ ). It was interesting to note that the effect of personal relevance of depression was negligible ( $\beta = -.041$ ,  $p > .57$ ). Without a cue reminding them of the source of information, people appear to be relying on recall of antidepressant DTCA instead of information related to personal experience. Table 3 contrasts the different ad effects of two groups.

## DISCUSSION

This study found that those with high recall for antidepressant DTCA showed heightened perceived prevalence of depression, indicated by their high estimates. Furthermore, the source-priming test verified antidepressant DTCA as a cause for perceived prevalence in everyday situations, where people rarely evaluate the veracity of an information source.

Consistent with previous studies showing media's cultivation effects (Carveth & Alexander, 1985; Gerbner & Gross, 1976; O'Guinn & Shrum, 1997; Shrum, 1995, 1996; Shrum & O'Guinn, 1993; Shrum et al., 1998), antidepressant DTCA was a significant factor affecting people's perception of the illness. The unique contribution of this study is to extend application of the availability heuristic to DTCA information by replicating Shrum et al.'s source-priming method.

Learning from commercials and their impact on beliefs is hardly a new subject. Hawkins and Hoch (1992) labeled low-involvement learning from advertising as "memory without evaluation" (p. 212). They found that the information participants remembered had a greater impact on belief when it was learned under low involvement. Assael (1984) illustrated low-involvement learning this way:

The consumer sits in front of the television and sees an advertisement for Morton Salt that describes it as "easy to pour." Stifling a yawn, the consumer is thinking about anything but salt. The advertisement is not really evaluated. It is seen, and a few bits and pieces of information are stored in the consumer's mind without any active cognitive process. But over time an association of Morton Salt with ease of pouring is established. (p. 82)

Exposure to antidepressant DTCA can be understood by the same framework. Viewers attend to DTCA without an explicit intention to evaluate and learn from the messages. Without active evaluation or counterargument, repeated exposure over time, coupled with vivid dramatization of symptoms and consequences, makes constructs pertaining to depression highly accessible in memory. Those highly accessible images and information will function as cognitive heuristics to judge the prevalence of depression.

Raising perceptions of vulnerability or heightened prevalence of diseases has been found to be an important factor to motivate people to initiate medical treatment or change attitude toward stigmatized diseases (Alexander & Link, 2003; Burkholder et al., 1999; Gerbert, Sumser, & Maguire, 1991; Henry, Campbell, & Willenbring, 1990; Herek & Capitanio, 1997; Mickler, 1993). Carefully planned public campaigns often serve this goal, and this study shows that antidepressant DTCA, whether planned or inadvertent, can achieve the goal.

It is estimated that roughly half of the people with depressive symptoms receive no treatment (Kessler et al., 2003). Due to the shame and disdain attached to mental illness, people with depressive symptoms often choose to conceal their conditions or avoid care (Giorgianni, Grana, & Keith, 2004). With heightened prevalence of depression, those with such symptoms may feel less ashamed and more inclined to disclose symptoms to their doctors. In addition, heightened prevalence may lead the public to reduce social distance from the illness. Findings from AIDS research show that perceived vulnerability or heightened prevalence is a key mediator in changing people's attitudes toward

those with the disease (Boyer & Kegeles, 1991; Catania, Coates, & Kegeles, 1994; Kowaleski, Longshore, & Anglin, 1994; Longshore & Anglin, 1995).

At the same time, the results of this study provide some cause for concern. It is possible for those with heightened perceived prevalence to self-diagnose and strongly insist on the prescription of an advertised drug from their physicians. As opponents of DTCA argue, health care costs can rise when DTCA encourages unnecessary office visits (Pinto, 2000), and overreliance on heavily advertised drugs may increase (see Wang, Ausiellom, & Stafford, 1999; Wilkes, Bell, & Kravitz, 2000). Having established the influence of antidepressant DTCA on perceived prevalence of depression, how the heightened perceived prevalence affects attitude toward depression and drug inquiry intention warrants thorough investigation.

Although this study provides evidence of the effect of antidepressant DTCA on perceived prevalence of depression, it is not without limitations. It must be acknowledged that women and the educated were overrepresented. A more balanced national sample will broaden the generalizability of the results. This study did not differentiate different types of antidepressant DTCA. Given the different message strategies of DTCA, a further study can benefit by factoring in the message components. Comparing reaction times for low and high ad recall groups will further validate the enhanced accessibility of memory pertaining to depression to see whether those with high ad recall give faster responses.

This study calls for more scholarly attention to the cognitive effects of DTCA as one unique media message. A recent survey shows that 88% of respondents believed that DTCA gave patients confidence to talk to doctors about their concerns, and that 14% of them actually disclosed their health concerns to doctors as a result of DTCA exposure (Murray et al., 2004). However, not much has been known about the actual psychological process in which initiation of such medical treatment or discussion can occur. This study is the first step identifying the effect of DTCA on social perceptions where high exposure to DTCA makes the medical condition more common and visible by increasing perceived prevalence of depression. Nonetheless, the consequences of heightened perceived prevalence await further investigation with respect to its impact on attitude toward the medical condition and behavioral intentions on drug inquiry and request.

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