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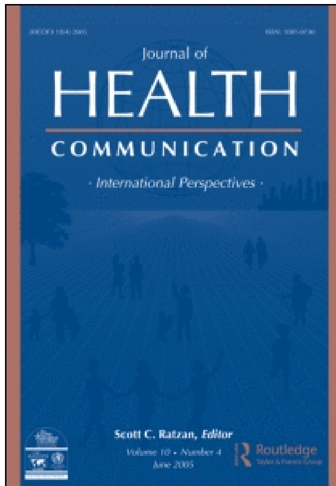

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The Role of Direct-to-Consumer Advertising in Shaping Public Opinion Surrounding Prescription Drug Use to Treat Depression or Anxiety in Youth

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The Role of Direct-to-Consumer Advertising in Shaping Public Opinion Surrounding Prescription Drug Use to Treat Depression or Anxiety in Youth

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This study investigated the impact of exposure to prescription drug advertisements for antidepressants and antianxiety medications on public opinion regarding preferred treatment options for youth suffering from depression or anxiety. The study randomly recruited a nationally representative adult sample (N = 402) through the 2007 Annenberg National Health Communication Survey. The study examined the distribution of public support for the use of antidepressant drugs to treat depression and anxiety disorders in youth. The analysis adjusted for the effects of demographic characteristics, prior knowledge about prescription drugs, and personal and familial drug history. Attitude toward direct-to-consumer advertising (DTCA, for all products) moderated the effect of exposure to ads for these drug treatments on support for their use among youth as a preferred treatment. Among respondents with negative attitude toward direct-to-consumer advertising (for all products), with increased exposure to ads for antidepressants and antianxiety medications, support for the use of these drugs to treat youth decreased. Among this group, with high levels of exposure to advertisements, the predicted probability of support decreased from 0.68 (95% CI: 0.61 to 0.76) to 0.46 (95% CI: 0.38 to 0.56). No effect was found among respondents with positive attitudes toward DTCA (for all products). The implications of the findings are discussed.

The Substance Abuse and Mental Health Services Administration estimates that 13% of youth suffer from anxiety disorders, which often are accompanied by a secondary disorder such as depression (U.S. Department of Health and Human Services, 1999). Pharmaceutical treatment options for these conditions have become a point of public debate in recent years, in light of the preponderance of advertising for antidepressant drugs. Controversies such as that surrounding the use of selective serotonin reuptake inhibitors (SSRIs), a popular class of antidepressants, and their

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possible link to a series of adolescent suicides in 2004 have further fueled the debate about whether these medications should be a preferred treatment method for mental health disorders in youth.

While much has been written regarding the impact of SSRI treatments on youth suicide, the findings in this domain are mixed. Some studies have suggested links between antidepressant treatments including SSRIs and reduced risk of suicide (Olfson, Shaffer, Marcus, & Greenberg, 2003) and lower suicide rates (Gibbons, Hur, Bhaumik, & Mann, 2006) in youth. Additionally, a review by Cheung, Emslie, and Mayes (2006) has shown that observational studies in the United States (Shaffer & Craft, 1999) and Europe (Isacsson, 2000) have demonstrated inverse associations between antidepressant treatments and suicide. A review of the literature by Safer and Zito (2007), however, suggests that current ecological data indicating any inverse relationship should be viewed with caution in light of inconsistent ecological patterns surrounding antidepressant use and decreased suicide rates.

Still other studies involving clinical trials have found contrary results indicating increased suicidal behavior and ideation (Hammad, Laughren, & Racoosin, 2006; Olfson, Marcus, & Shaffer, 2006) among youth undergoing treatment with antidepressants. The findings from the FDA's review of data from SSRI clinical trials generally have aligned with those of studies reporting adverse events such as suicidal behavior, ideation, and attempts, prompting the FDA's distribution of a black box warning on antidepressant medication in 2004 for pediatric depression, and its extension to young adults aged 18–25 in 2007. It should be noted, however, that a few recent studies have produced findings undermining this restriction (Markowitz & Cuellar, 2007; Bridge et al., 2007).

Regardless of their position in this ongoing debate, most researchers and clinicians agree that youth are an understudied population in the area of mental health and that the potential benefits and possible adverse effects of treatment of this population with prescription drugs merit further investigation. The present study, however, does not focus directly on the controversy surrounding SSRIs and their use among children. Instead, it examines the role of DTCAs for antidepressants and antianxiety medications in shaping public opinion regarding their use.

Direct-to-Consumer Advertising (DTCA)

The last two decades have witnessed an increase in the promotion of prescription drugs to the general public through the mass media (Basara, 1992), otherwise known as DTCA. A 1983 Food and Drug Administration (FDA) voluntary moratorium on DTCA, issued largely from the lack of a formal policy regarding this format of advertising (Pines, 1997), was lifted by 1985 (FDA, 1985). Since that time the presence of DTCA has proliferated at an impressive pace and has coincided with a changing media landscape that provides drug companies with new and more sophisticated ways to target consumers (Morris & Pines, 2000). In the early years, drug companies focused advertising efforts on print, cable television shows for physicians, and commercial television (Pines, 1999), but more recent efforts have been aimed at reaching consumers through the Internet (Morris & Pines, 2000). At the same time, drug companies have increased their annual spending on DTCA. Between 1996 and 2005, annual expenditures of DTCA by pharmaceutical companies almost tripled from $11.4 billion to $29.9 billion (Donohue, Cevasco, & Rosenthal, 2007).

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Recent estimates suggest that as much as 30 hours of prescription drug television advertisements reach Americans who engage in average levels of television viewing on a yearly basis (Brownfield, Bernhardt, Phan, Williams, & Parker, 2004).

The burgeoning presence of DTCA in the United States has not transpired without sparking debate over the nature of its effects on the public. While supporters maintain that DTCA offers benefits in the form of educational value for consumers regarding available treatment options (Holmer, 1999; Monaghan et al., 2003) and increased awareness of underreported conditions such as depression (Sorofman, 1992), detractors argue that this format of advertising often conveys inaccurate and misleading information to consumers. The debate over the effects of DTCA on consumer perceptions and behavior has spawned much research in the area of effects regarding this kind of advertising. Woloshin, Schwartz, Tremmel, and Welch (2001) found that most prescription drug ads presented benefits in a vague and unbalanced manner, were imbued with emotional appeals (see also Frosch, Krueger, Hornik, Cronholm, & Barg, 2007), and lacked any quantitative support. In the most recent content analysis of DTC television ads to date, Frosch and colleagues (2007) observed that although 82% of ads contained some accurate information, many omitted important information surrounding causes of condition, risk factors, or prevalence of the health condition in question. As in the case of general DTCA and relevant to our study, the quality and veracity of the information expressed in antidepressant ads, one of the most common types of DTCA (Donohue & Berndt, 2004), also has been subject to question (Lacasse & Leo, 2005).

Furthermore, some critics contend that DTCA may adversely affect the physician–patient relationship by creating a demand by the patient for specific advertised drugs (Bell, Kravtiz, & Wilkes, 1999; Bell, Wilkes, & Kravitz, 1999; Gellad & Lyles, 2007; Narayanan, Desiraju, & Chintagunta, 2004; Robinson et al., 2004; Wilkes, Bell, & Kravitz, 2000) and pressures on the physician to prescribe certain drugs (Friedman & Gould, 2007; Gellad & Lyles, 2007; Kravitz et al., 2005; Mintzes et al., 2002; Morris, Gadson, & Burroughs, 2007).

In examining the effects of DTCA on consumers, many studies have found consistent results in four aspects (outlined by Wilkes, Bell, and Kravitz, 2000) relating to how DTCA impacts consumers: consumer awareness, consumers' understanding of DTCA regulation, consumer attitudes toward DTCA, and consumer behavior. First, a number of studies consistently have shown that consumers are aware of and attend to DTCA (Bell, Kravtiz, & Wilkes, 1999; Beltramini, 2006; Murray, Lo, Pollack, Donelan, & Lee, 2004; Singh & Smith, 2005), and that this awareness has increased over time. Second, other studies have demonstrated that many consumers hold erroneous beliefs regarding the FDA's role in regulating DTCA (Singh & Smith, 2005). Bell, Kravitz, and Wilkes (1999) showed that a substantial portion of the public overestimated the trustworthiness and reliability of information from DTCA. Forty-three percent of respondents believed that the FDA allowed DTCA only for drugs that were "completely safe"; 22% thought the FDA had banned DTCA featuring drugs with serious side-effects; and 21% assumed that only drugs deemed "extremely effective" could be promoted through DTCA (Bell, Kravitz, & Wilkes, 1999). Given that many members of the public view the information in DTCA (for all products) as accurate and reliable, and assume that the advertised treatments are effective and safe (Bell, Kravitz, & Wilkes, 1999), we propose that increased exposure to this format of advertising specifically with regards to antidepressants and antianxiety

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medications will lead to greater support for the use of these drugs to treat depression and anxiety in youth:

> **H1**: Exposure to advertisements for prescription drugs to treat depression or anxiety will be positively associated with support for use of antidepressant and antianxiety medications to treat youth diagnosed with depression or anxiety.

In addition, several studies have shown that consumers who hold positive attitudes toward DTCA are more aware of it than consumers with less favorable attitudes (Bell, Kravitz, & Wilkes, 1999; Murray et al., 2004), which has a number of effects on consumer behavior. For example, some studies suggest that DTCA promotes increased physician–patient communication regarding drugs depicted in ads (Bell, Kravitz, & Wilkes, 1999; Deshpande, Menon, Perri, & Zinkhan, 2004; Murray et al., 2004), and may increase psychosocial benefits (Singh & Smith, 2005) such as enhanced sense of control or confidence during physician visits (Murray et al., 2004). Positive overall attitudes toward DTCA also have been shown to predict other consumption behaviors, such as information search and prescription requests (Herzenstein, Misra, & Posavac, 2004). Additionally, Deshpande, Menon, Perri, and Zinkhan (2004) showed that more than 40% of consumers indicated "having used direct-to-consumer ad information in their decision-making process" (p. 509). Taken together, based on the increased awareness of DTCA among individuals with positive attitudes toward DTCA, and the effects of positive attitudes toward DTCA on consumer behavior, we propose that increased exposure to ads for antidepressants and antianxiety drugs will lead to positive attitudes toward DTCA (for all products). This will then in turn lead to greater support for the use of these drugs to treat youth with depression or anxiety:

> **H2**: Attitudes toward direct-to-consumer advertisements (for all products) will mediate the relationship between exposure to advertisements for antidepressants and anti-anxiety medications and support for the use of these drugs to treat youth diagnosed with depression or anxiety.

The studies mentioned above represent the fairly small body of research in the area of DTCA for antidepressants and the effects of these ads. Given the dominance of advertisements for antidepressants relative to other categories of prescription drugs in the mass media, it remains unclear why few studies have examined DTCA promoting antidepressants and its effects on consumers. The present study will investigate how exposure to antidepressant and antianxiety medication advertising shapes public opinion surrounding their use in a specific context, namely, the use of SSRIs to treat youth. Since many people value DTCA (for all products) as a source of information for prescription drugs in general (Deshpande et al., 2004), it is important to understand the role of antidepressant drugs and antianxiety medication ads in influencing the public debate around their efficacious use, an area of study that has received little academic attention to date.

Methods

The Annenberg National Health Communication Survey collected data from a nationally representative cross-sectional sample (18 years and older) through

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Knowledge Networks, a research firm that administered the survey, recruiting respondents through list-assisted random-digit-dialing methods. Subjects who required the technology received free web access and a webTV set-top box for their participation. The present study is based on data collected from 2 months of cross-sectional data (June–July 2007). The average response rate was 31%. The final sample used in this analysis consisted of 402 participants.

Measures

The survey included questions regarding demographics and characteristics of participants, such as subjects' opinion regarding their support of the use of various treatments for youth suffering from depression or anxiety, general attitudes about DTCA (for all products), exposure to DTCA for antidepressant and antianxiety medications, and knowledge about antidepressant and antianxiety medication use (procured from ads and elsewhere). Additionally, data were gathered on the perceived use of antidepressant and antianxiety medications among participants' close contacts, household number of children, and familial history of anxiety or depression. Poststratification weights were created to adjust for nonresponse and noncoverage areas. Current Population Survey (CPS) data were used as population benchmarks for the demographic distributions. Benchmark distributions for the following variables were prepared using the most recent CPS data: age, gender, race, education, and Internet access.

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Demographics. Age was treated as a categorical variable and split into dummy variables to represent four distinct age groups: subjects aged 18–29 years, 30–44 years, 45–59 years, and 60 years and older. Male subjects were coded as 0, and females were coded as 1. Level of education was recoded into dummy variables to reflect increasing levels of education (less than and including high school; some college; college graduate and beyond). Income was measured in thousands of dollars and treated as an interval variable. Marital status was treated as a dichotomous variable where married subjects = 1 and unmarried = 0. A dummy variable was created to represent White respondents, versus respondents of other racial or ethnic backgrounds. The presence of a child or children under 18 currently residing in each household was coded as 1, and households without any residing child under 18 were coded as 0. Employment status was determined by whether the subject was currently working = 1 or not currently working for wages = 0.

Other Control Variables. Existing anxiety or depressive orders were assessed with yes/no questions, where subjects reporting either self-diagnosis or diagnosis by a doctor were coded as 1 and all others were coded as 0. To ascertain the use of antidepressant drugs among the subjects' close social contacts, participants were asked if they ever knew anyone in their close social circle or currently knew someone within their social circle who used antidepressant drugs for an anxiety or depressive disorder. If the participant answered "yes" to either question, the subject was coded as 1. Subjects who indicated "no" to both questions were coded as 0. Knowledge about specific antidepressant and antianxiety medications (Zoloft, Nardil, Buspar, Prozac, and a bogus drug Influgone) was assessed by asking participants if they had heard about each drug. If the subjects responded "yes" to having heard about a drug, they were then asked if they had heard about the drug from prescription drug

ads or another source. General media consumption was divided into two ordinal variables. The first variable measured exposure to television by computing the mean number of hours reported spent watching television in a typical week and on a typical weekend. Exposure to other media (newspapers, radio talk shows/news, and the Internet) was measured by computing the mean number of days in a typical week that respondents spent engaged with the media. Respondents were allocated to one of five equal groups (reflecting ascending exposure to media) according to their reported overall mean exposure to television and to media other than television.

Principal Variables. The primary variables of interest were exposure to DTCA for antidepressant and antianxiety medications, general attitudes about DTCA (for all products), and support for using antidepressants to treat youth. Exposure to DTCA for antidepressant and antianxiety medications was measured by asking respondents to estimate the number of antidepressant and antianxiety medication ads they recalled seeing in the past month: "In the past 30 days how often have you seen or heard advertisements for prescription drugs to treat depression or anxiety on TV, radio, in newspapers or magazines or on the Internet?" with answer options of "never" "one or two ads" "three or four ads" or "five or more ads." General attitude about DTCA (for all products) was assessed using a 4-item 5-point scale (Cronbach's alpha = 0.76) developed by Bell and colleagues (1999). The items in the scale included the extent to which respondents agreed or disagreed that prescription drug ads provided valuable information, described risks and benefits, and were deceptive in nature (reverse coded), as well as how much respondents approved or disapproved of such ads. The dependent variable, support for treating youth with antidepressant and anxiety medications, was measured on a 5-point Likert-type scale with answer options ranging from strong disapproval to strong approval. The dependent variable then was recoded into a dichotomous variable where those who approved were coded as 1 and those who disapproved or remained neutral were coded as 0. The dependent variable measuring support for use of prescription drugs to treat youth with anxiety disorders or depression was measured as an ordinal variable in order to allow respondents to choose from a range of options. This variable was dichotomized, however, so as to permit the study to focus on whether a person expressed support for treatment of youth with drugs or did not.

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Results

Table 1 presents the unweighted and weighted demographic characteristics of the participants. There were no substantial differences in frequencies once weights were applied. We address only the weighted frequencies from this point forward. The sample was split roughly equally between male and female subjects. The majority of participants were between the ages of 30–59, White, college-educated, married, and currently employed. Most respondents reported no youth under 17 currently residing in their place of residence. The average income was $49,000 (S.E. = 2,450). Between one-eighth and one-fifth of the sample indicated current experience or ever having been diagnosed with either depression or anxiety.

Table 2 describes the unweighted and weighted frequencies of all other nondemographic variables in the analysis. As with the demographic characteristics, there were no substantial differences in frequencies upon adding weights. We will refer to the weighted sample only. Most respondents reported seeing three or more

Table 1. Demographic characteristics of sample (n = 402)

	Weighted		Unweighted	
Demographic characteristics	*n*	Percent	*n*	Percent
Gender				
Female	214	53.2	216	53.7
Race/ethnicity				
White	271	67.4	323	80.4
Non-White	131	32.6	79	19.6
Education				
Less than high school	34	8.6	28	6.9
High school	135	33.5	122	30.4
College and above	233	57.9	252	62.7
Age				
18–29	73	18.1	51	12.7
30–44	113	28.0	124	30.8
45–59	108	26.8	111	27.6
60+	108	27.1	116	28.9
Marital status				
Married	218	54.3	242	60.2
Employment status				
Employed	228	56.8	231	57.5
Parent of child aged 6 to 17	89	22.2	86	21.4
Has/had anxiety disorder	49	12.2	49	12.2
Has/had depression	83	20.8	81	20.2

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DTCAs for antidepressant and antianxiety medications in the past month. Eighty-eight percent of participants indicated having obtained their information about antidepressant and antianxiety medications from sources excluding DTCAs for antidepressant and antianxiety medications. More than half of respondents reported knowing a close contact who currently used or ever had used antidepressant or antianxiety medications to treat either anxiety or depression. Over 60% of respondents held a negative attitude regarding DTCAs (for all products), while almost the same proportion also favored antidepressant and antianxiety drug treatments for youth.

All statistical analyses were performed using STATA version 10, using the SURVEY programs to calculate confidence intervals corrected for weights. Multivariate logistic regression was used to calculate adjusted odds ratios (OR). Table 3 presents the results of a logistic regression analysis using the weighted sample on the likelihood of support for use of antidepressant and antianxiety medications as a preferred treatment for anxiety and depression among children and youth, controlling for all covariates ($n = 402$).

In Model 1 (refer to Table 3), we see a negative association between exposure and support, which is contrary to the hypothesized positive association between these two variables (H1). When accounting for the effects of other covariates, respondents who reported having seen three or more advertisements for drugs to treat anxiety or depression in the last 30 days have predicted odds of support for

Table 2. Distribution of principal variables ($n = 402$)

Variables	Weighted *n*	Weighted Percent	Unweighted *n*	Unweighted Percent
Exposure to direct-to-consumer ads for antidepressant and antianxiety medications in past 30 days				
No ads	69	17.2	63	15.7
1 to 2 ads	136	33.9	132	32.8
3 to 4 ads	92	22.9	94	23.4
5 or more ads	105	26.0	113	28.1
Exposure to television				
0 to 3 hours per day on average	100	24.8	106	26.4
3.1 to 4.5 hours per day	65	16.2	64	15.9
4.51 to 6.4 hours per day	76	18.9	76	18.9
6.51 to 10 hours per day	73	18.2	79	19.7
10.1 to 24 hours per day	88	21.9	77	19.1
Exposure to other media (printed and Internet)				
0 days to 1.8 days per week on average	99	25.6	83	20.7
1.9 to 2.8 days per week	93	23.2	92	22.9
2.9 to 3.6 days per week	70	17.4	74	18.4
3. 7 to 4.6 days per week	67	16.7	74	18.4
4.7 to 7 days per week	73	18.1	79	19.6
Knowledge of drugs for anxiety/depression				
Knows from ads and/or other sources	45	11.3	47	11.7
Knows from other sources only	357	88.7	355	88.3
Knows someone who uses/d drugs for anxiety	221	55.0	225	56.0
Knows someone who uses/d drugs for depression	262	65.1	267	66.4
Attitude toward direct-to-consumer ads (for all products)				
Positive	159	39.5	156	38.8
Negative	243	60.5	246	61.2
Support for use of prescription drugs to treat Anxiety/depression among youth	246	61.2	240	59.7

treatment of these conditions among youth with prescription drugs lower (OR = 0.74) than the predicted odds of support among respondents who reported having seen fewer than three advertisements. Model 2 tests whether attitudes toward DTCA (for all products) mediate the association between exposure to DTCA for antidepressant and anxiety medications and support for these treatments among youth (H2). The findings do not support this hypothesis.

However, in Model 3 (refer to Table 3), when an interaction term was added to the model to account for the interaction between attitude toward DTCA (for all products) and exposure to ads for antidepressant and antianxiety medications,

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Table 3. Logistic regression analysis—Support for use of drugs to treat anxiety or depression among youth ($n = 402$)

	Model 1		Model 2		Model 3	
Variables	OR	95% CI	OR	95% CI	OR	95% CI
Gender (Female = 1)	0.99	(0.56–1.74)	1.01	(0.56–1.78)	0.98	(0.55–1.75)
Race (White = 1)	0.72	(0.37–1.37)	0.73	(0.38–1.42)	0.67	(0.34–1.30)
Age						
18–29 (reference)	–		–		–	
30–44	1.03	(0.42–2.56)	0.92	(0.38–2.24)	1.17	(0.48–2.89)
45–59	1.18	(0.48–2.9)	1.04	(0.43–2.53)	1.19	(0.48–2.97)
60+	3.99**	(1.44–11.0)	3.65*	(1.34–9.94)	3.64*	(1.33–9.97)
Marital status (Married = 1)	1.91*	(1.07–3.43)	1.97*	(1.10–3.52)	2.21**	(1.23–3.97)
Education						
Less than high school	0.99	(0.36–2.72)	0.99	(0.35–2.78)	0.92	(0.32–2.66)
High school	1.57	(0.82–3.00)	1.61	(0.83–3.10)	1.68	(0.88–3.19)
College and above (reference)	–		–			
Income	1	(0.99–1)	1	(0.99–1.01)	1	(0.99–1.01)
Employed (currently employed = 1)	1.52	(0.79–2.92)	1.57	(0.82–3.02)	1.4	(0.72–2.74)
Parent of child aged 6 to 17	2.39*	(1.21–4.70)	2.39**	(1.23–4.67)	2.15*	(1.11–4.15)
Had/has anxiety	2.03	(0.82–5.03)	2.1	(0.87–5.12)	2.45*	(1.00–6.00)
Had/has depression	0.9	(0.42–1.96)	0.82	(0.38–1.78)	0.63	(0.28–1.39)
Knows user/s of antidepressants	1.51	(0.70–3.29)	1.4	(0.63–3.13)	1.36	(0.60–3.07)
Knows user/s of medication for anxiety	1.35	(0.63–2.87)	1.38	(0.63–3.00)	1.53	(0.70–3.36)
Knowledge about medication for anxiety/depression from sources other than direct-to-consumer ads	0.74	(0.30–1.80)	0.69	(0.27–1.78)	0.75	(0.28–1.98)
Exposure to TV	1.35**	(1.10–1.65)	1.32**	(1.07–1.62)	1.29*	(1.05–1.59)
Exposure to other media	1.04	(0.84–1.28)	1.04	(0.84–1.29)	1.09	(0.88–1.36)
Exposure to direct-to-consumer ads for drugs for depression/anxiety	0.74***	(0.63–0.87)	0.75**	(0.64–0.89)	0.78**	(0.66–0.92)
Attitude toward direct-to-consumer ads (for all products; positive attitude = 1)	–		1.71	(0.97–3.00)	0.86	(0.44–0.70)

(*Continued*)

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Table 3. Continued

	Model 1		Model 2		Model 3	
Variables	OR	95% CI	OR	95% CI	OR	95% CI
Attitude to direct-to-consumer ads (for all products) × Exposure to direct-to-consumer ads for drugs for depression/anxiety	–		–		2.83***	(1.60–5.02)
Chi-square		63.28		62.99		68.28
Sig.		<0.001		<0.001		<0.001
Nagelkerke R-Sq.		0.147		0.155		0.183

Interpretation Example: The adjusted odds for support are approximately four times higher among people age 60+ relative to people younger than 60 (Model 1) Cohen, Cohen, West, and Aiken, 2003.

Odds ratios were calculated by exponentiating the coefficients.

$^{*}p < 0.05$; $^{**}p < 0.01$; $^{***}p < 0.001$.

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the negative effect of exposure to DTCAs for antidepressant and antianxiety medications on support for treatment of youth with these drugs was moderated by respondents' attitude toward DTCA (for all products). According to this model, exposure to three or more ads for antidepressant and antianxiety medications is still negatively associated with support (OR = 0.78). This negative effect of exposure, however, is found only among those who feel negatively toward DTCA (for all products). For those with a positive attitude toward DTCA (for all products), the effect of exposure is entirely reversed (OR for interaction between exposure and attitude = 2.99). Thus, among this group, the negative effect of exposure to ads for antidepressant and antianxiety medications on support for use of these drugs for treatment among youth is counterbalanced by the effect of attitude toward DTCAs (for all products), so that increased exposure to antidepressant and anti-anxiety medication advertisements has no significant effect on support for their use among youth.

The shape of this association is captured in Figure 1, which shows the predicted probability of support for treating youth with these drugs among respondents who reported low levels of exposure to advertisements for drugs to treat anxiety and depression (seeing up to two advertisements in the past 30 days) and high levels of exposure (reported seeing more than three advertisements), and have either positive or negative attitudes toward DTCA (for all products), controlling for all other covariates in the model (see Model 3).

In addition (please refer to Model 3), the analysis points to an association between respondents' age, marital status, and the presence of a child under 17 living in the household and the likelihood of support for treatment of youth with anxiety and depression with prescription drugs. Respondents aged 60 or older are more than three times as likely than younger respondents to support using these prescription drugs to treat these conditions among youth (OR = 3.42), and respondents who currently are married are also more than twice as likely to

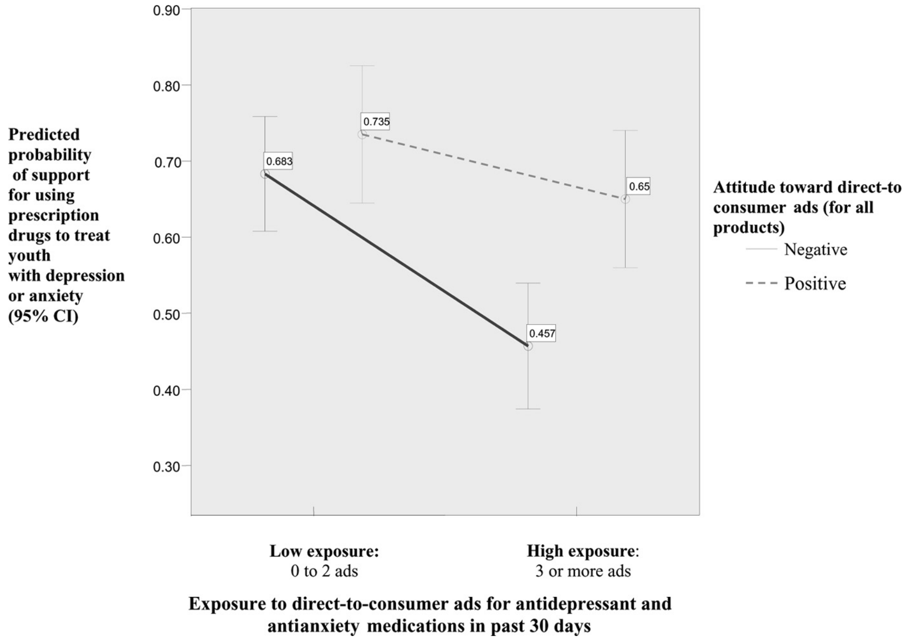

Figure 1. Predicted probability of support for treating youth with prescription drugs for depression and anxiety *x* exposure to direct-to-consumer ads for antidepressant and antianxiety medications *x* attitude toward direct-to-consumer ads (for all products).

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support use of these prescription drugs to treat youth with depression or anxiety (OR = 2.21). Additionally, respondents indicating the presence of a child under 17 currently residing in the household were more than twice as likely to support antidepressant and antianxiety medications as treatments for youth (OR = 2.15). Unlike in the first model, we see here that having had or currently experiencing anxiety is associated with higher support for treating youth with antidepressants (OR = 2.45).

Last, there is a significant positive association between exposure to television and support for use of prescription drugs to treat youth with depression or anxiety (OR = 1.29).There are no significant effects of interactions between gender, race, education or age of respondent and exposure to DTCAs for antidepressant and antianxiety medications in the logistic regression model predicting support for use of drugs to treat anxiety and depression among youth.

It should be noted that one additional data analysis was performed in which the analysis reported in Table 3, Model 3 was replicated when the weighted sample was restricted to the two extreme exposure groups, comparing only subjects reporting no exposure ("no ads") to antidepressant and anxiety drug advertising with subjects reporting having seen "five or more ads" during the previous 30 days. This analysis was conducted in order to test whether a comparison of these two extreme exposure groups would be more sensitive to the interaction effect. The results of this analysis, reported here, however, were not substantially different from the results of the logistic regression analysis using the restricted sample (not reported here).

Discussion

This study extends existing research into the debate surrounding the use of antidepressants to treat children and youth, and the effects of exposure to DTCAs for antidepressant and antianxiety medications on the public by linking exposure to these advertisements for these prescription drugs with public opinion. The central finding was that exposure to advertising for antidepressant and antianxiety medication *does* play a role in public opinion surrounding this issue, but that attitude toward DTCAs (for all products) moderates the effect of exposure to ads for antidepressant and antianxiety medications on support for using these medications in the treatment of youth with depression or anxiety.

There are two alternative perspectives that could help explain the reduced support for these treatments for youth among respondents with negative attitudes toward DTCAs (for all products) and higher rates of (recalled) exposure to ads for prescription drugs for these conditions. One explanation is that consumers may perceive advertisements in general as an interruption, and with increased exposure to advertising, especially when the option of avoiding the ad is limited, consumers will develop an increasingly negative reaction toward the interruption (advertising) and the form in which it appears more generally (DTCA). Thus, it is exposure to advertising for prescription drugs (in this case ads for antidepressant and antianxiety medications) that may lead to negative attitudes toward DTCA (for all products), and the effect of the interaction between these elements could explain decreased support for use of antidepressant and antianxiety medications among youth.

A second explanation for the causal mechanism is based on Reactance theory (Brehm & Brehm, 1981). According to this theory, when there is a threat to a person's freedom, that person will attempt to restore the freedom by exhibiting opposition or resisting pressures to conform (Brehm & Brehm, 1981). Clee and Wicklund (1980) describe reactance as a boomerang effect in which the perception of coercion is met with an equal but opposite influence, which is used by consumers to restore their freedom of choice. To the degree that advertising is perceived as not providing value (containing useful information), it may be perceived as coercive and unwelcome.

According to Reactance theory (Brehm & Brehm, 1981), respondents who perceive DTCA (for all products) as untrustworthy and misleading should be expected to exhibit greater reactance to advertisements for antidepressant and antianxiety medications than respondents whose attitude toward DTCA (for all products) is positive. As a result of their negative affective reaction to advertisements for antidepressant and antianxiety medications, these ads will elicit increased level of attention and should therefore facilitate greater memory for the advertisement. Thus, we would expect recall of exposure to ads for antidepressant and antianxiety medications will be greater among respondents with a negative attitude toward DTCA (for all products) than among those with neutral or positive attitudes. This would explain why respondents who reported greater exposure to ads for antidepressant and antianxiety medications exhibited lower support for their use to treat youth. Their preexisting negative attitudes toward DTCA (for all products) may have shaped both their reaction to, and subsequent recall of, advertisements for antidepressant and antianxiety medications, as well as their likelihood of supporting use of these treatments for youth. This cross-sectional association,

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however, does not allow us to extricate the causal direction of influence between exposure to DTCA for antidepressant and antianxiety medications and support for their use to treat youth. It is possible that individuals who experience feelings of anger or annoyance in response to such ads are more likely to remember them. Similarly, we do not know the causal order of effects between attitude toward DTCA (for all products) and recalled exposure to advertisements for antidepressant and antianxiety medications. Future research may determine the validity of these perspectives by temporally disassociating exposure to advertising for antidepressant and antianxiety medications and support for treatments involving these drugs along with attitudes toward DTCA (for all products), so that the causal direction of effect can be determined.

Regardless of which of these explanations is more valid, the findings of this study have implications for mental health care providers who advocate the use of these drugs. If exposure to DTCA for antidepressants leads to more a more negative opinion among consumers with regard to their status as a treatment option for youth, this may undermine compliance to such treatments among parents of youth diagnosed with depression or anxiety. Additionally, companies invested in promoting sales of these drugs might consider focusing efforts on improving the public's general attitude toward DTCA (for all products), given its significant role in shaping the effect of exposure to advertising among consumers.

Some demographic characteristics were found to be associated with public support for treatment of anxiety and depression among youth with prescription drugs, specifically, age, marital status, and the presence of a child under 17 in the household. The finding that people aged 60 and over are more than three times as likely to support use of prescription drugs to treat anxiety and depression among children and youth could be related to the increased tendency of older people to use prescription drugs relative to younger people. This might positively influence their perception of the efficacy of prescription medication and lead to increased support for using antidepressant and antianxiety medications among youth.

Limitations

While this study contributes to research into of the role of DTCA in the public debate surrounding the use of antidepressants in treating children and youth, it has a number of limitations. First, while it focuses on a particular issue in debate—the use of SSRIs to treat children and youth, it does not address a wide range of DTCAs, focusing on only two types of medications. Thus, the findings that relate to exposure to DTCAs should be considered only in relation to drugs to treat anxiety and depression. It might be possible that exposure to advertisements for other kinds of medication has a different effect on the public. Second, the measurement of exposure to advertisements combined exposure to advertising for antidepressants and advertising for drugs to treat anxiety. It might be the case that advertising for one of these drugs has a different effect on public opinion than the other, and it might be worth considering these separately in future research.

Third, the results reported here are based on cross-sectional data, which presents an array of difficulties in establishing causality. We do not know if support for antidepressant and antianxiety drug treatments among youth causes recall of DTCA of such drugs or if recall is a response to them. Last, the sample size of this study did not provide enough statistical power to capture a possible effect of history of anxiety

and depression, or that of prescription drug use to treat these conditions by a close personal contact, on support for antidepressant drug treatments among youth. A larger sample might help to detect the effect of these, if any, on public opinion surrounding the treatment of children and youth with these drugs.

Another avenue for research may examine the effect of exposure to DTCAs of antidepressants over time in order to establish the direction of causal order. This would provide evidence of the role in which exposure to DTCAs for antidepressant and antianxiety medications may play in shaping attitudes surrounding the use of advertised drugs. Additionally, future research also should examine the content of advertisements for drugs to treat depression and anxiety. This would offer an interesting perspective that could help propose reasons for the negative effect of exposure to these advertisements on public opinion that was found in this study. One possible explanation might be that these advertisements do not tend to feature children and youth, and thus imply that these medications are not suitable for these population groups in the population. Thus, with increased exposure to this form of advertising, the public's support for use of these drugs to treat children and youth is reduced.

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