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The Effect of Inconsistency Appeals on the Influence of Direct-to-Consumer Prescription Drug Advertisements: An Application of Goal Disruption Theory

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Scholars across multiple domains have identified the presence of inconsistency-arousing information in direct-to-consumer prescription drug advertisements and have suggested that these appeals, which highlight differences between people's actual and desired lives, may create psychological disequilibrium. However, experimental assessment of the distinct influence of inconsistency-arousing information in this domain is rare. Guided by goal disruption theory—a framework that outlines people's reactions to goal expectation violations—we created direct-to-consumer advertisements designed to make people's life inconsistencies salient. The influence of these ads on people's perceptions of, and intentions to use, prescription drugs was then assessed. Results from a structural equation modeling analysis supported the proposed model, indicating that compared to a control ad, an ad containing a goal expectation violation manipulation resulted in higher levels of psychological disequilibrium; in turn, psychological disequilibrium led to positive evaluations of the ad and the drug, positive outcome expectations of the drug, increased purposive harm endurance, and increased usage intentions. The current results suggest a psychological pathway that begins with a negative goal expectation violation and ends with increased usage intentions and a greater willingness to endure harm to make use possible.

Direct-to-consumer (DTC) advertising of prescription drugs, which is defined as “any promotional effort by a pharmaceutical company to present prescription drug information to the general public in the lay media” (Wilkes, Bell, & Kravitz, 2000, p. 112), was not always a common marketing strategy. Indeed, the government only began allowing DTC advertising of prescription drugs in 1997 (for a review, see Kravitz & Bell, 2013). Since then, the prevalence of DTC advertising has increased dramatically, with the average television viewer seeing roughly 30 hours of ads each year (Brownfield, Berhnhardt, Phan, Williams, & Parker, 2004). Furthermore, spending on DTC ads for prescription drugs is now the fourth-largest spending category in advertising (Cheong & Kim, 2014). This marked proliferation of DTC prescription drug ads has drawn the interest of a wide range of scholars in domains including the assessment of DTC ads' influence on consumers' attitudes, behaviors, and propensity to recall information presented in DTC ads (e.g., Bell, Kravitz, & Wilkes, 1999; Frosch, May, Tietbohl, & Pagan, 2011; Gilbody, Wilson, & Watt, 2005; Royne & Myers, 2008).

One notable program of research focuses on the range of characteristics typically present in DTC ads (e.g., Frosch, Krueger, Hornik, Cronhlo, & Barg, 2007; Woloshin,

Schwartz, Tremmel, & Welch, 2001). A common finding across this literature is the tendency of DTC prescription drug ads to use negative emotional appeals to focus on inconsistencies between viewers' desired lives and their daily experiences (e.g., Frosch et al., 2007; Kravitz & Bell, 2013)—a tendency that is common both on television and in print (e.g., Hollon, 2004; Main, Argo, & Huhmann, 2004). Authors have speculated about the effect that these emotional appeals may have on viewers of DTC ads (e.g., Stange, 2007), particularly on people whose psychological state makes them increasingly susceptible to persuasive attempts (Hollon, 2004). Indeed, scholars have called for increased experimental assessment of the influence of inconsistency-arousing emotional appeals on consumers (e.g., Kravitz & Bell, 2013; Stange, 2007; Wilkes et al., 2000). In view of these recommendations, the aim of the current study was to use goal disruption theory (GDT; Siegel, 2004, 2011, 2013; Siegel et al., 2012; also see Lewandowski, Rosenberg, Parks, & Siegel, 2011; Rosenberg, Lewandowski, & Siegel, 2015) to guide an experimental assessment of how and why, if presented in a DTC prescription drug ad, inconsistency-arousing information could affect consumers.

Inconsistency Theories

The assumption that humans strive to maintain consistency (i.e., equilibrium or balance) and have an automatic aversion to inconsistency (i.e., disequilibrium or imbalance) represents a foundational component of classic and contemporary

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psychological theories (for a review, see Proulx, Inzlicht, & Harmon-Jones, 2012). As Moskowitz (2009) stated, “Humans have a natural tendency toward homeostasis, balance, and equilibrium. Imbalance, tension, and disequilibrium need to be reduced” (p. 331). Put differently, even though consistency is associated with steadiness, inconsistencies cause internal discomfort, or a state of tension (e.g., Richter, 1943) that pushes people to seek balance (Tolman, 1926, 1932; also see Selye, 1956).

The disorienting nature of inconsistency has long played a central role in a variety of frameworks, including Asch’s (1952) conformity theory, Heider’s (1958) balance theory, and Festinger’s (1957) cognitive dissonance theory. Furthermore, the motivating role of inconsistency continues to play a pivotal role in psychological descriptions of behavior (e.g., self-discrepancy theory, Higgins, 1989; subjective well-being homeostasis theory, Tomy & Cummins, 2011). When psychological disequilibrium occurs, it is considered the driving force behind feelings of stress and anxiety, guilt (e.g., O’Keefe, 2002), and numerous other psychological challenges (e.g., psychopathology; Solomon, 1943; Stagner, 1951, 1954, 1977).

GDT

In line with these motivational accounts of inconsistency (see Proulx et al., 2012), GDT (see Siegel, 2013) is a theoretical framework that brings together research across numerous domains to explain when goal expectation violations (i.e., disconfirmations of people’s beliefs about their goals) are most likely to cause psychological disequilibrium, and the breadth of outcomes that occur as a result (e.g., increased stereotyping, Lewin, 1951; increased willingness to endure harm, Rosenberg et al., 2015). Influenced by Tolman (1932) and Lewin (1951), among others, GDT posits that not all goal expectation violations cause psychological disequilibrium, but those that do will result in an automatic and system-wide response to regain equilibrium (for similar theorizing, see Arndt & Solomon, 2003; Proulx et al., 2012). People who experience goal expectation violations that cause psychological disequilibrium are considered to be in a state of goal disruption—a state characterized by a disproportionate focus on regaining equilibrium (Moriya & Tanno, 2009; Tolman, 1932) and a constricted mental field (Lewin, 1946, 1951; Wolff & Moser, 2008).

Even though numerous theories assess outcomes associated with inconsistencies or expectation violations (e.g., Brehm, 1966; Higgins, 1989; Lewin, 1951; Tolman, 1932), GDT attempts to explain the factors that cause psychological disequilibrium and outline the breadth of outcomes associated with goal expectation violations. Building on decades of scholarship on expectations, goals, psychological disequilibrium, and mental constriction, GDT categorizes the range of compensatory adjustments as changes in ability (e.g., lack of creativity, Baas, De Dreu, & Nijstad, 2011), disposition (e.g., intolerance of uncertainty, Kruglanski & Webster, 1996), allocation of resources (e.g., rumination, Treynor, Gonzalez, & Nolen-Hoeksema, 2003), processing and

perception (e.g., increased stereotyping, Koenig & King, 1962), and tactics (e.g., impulsive behavior, Finke & Huston, 2003).

Placed in the realm of DTC drug ads, GDT is a useful framework because ads that point out inconsistencies between viewers’ desired lives and their daily experiences (see Frosch et al., 2007) are essentially making prior goal expectation violations salient. According to GDT, if an ad leads to psychological disequilibrium, viewers’ mental fields will constrict, and a return to equilibrium will become paramount. The entire system will adjust to maximize the likelihood of reestablishing equilibrium, affecting the way in which people perceive subsequent stimuli and paths to equilibrium. For instance, this myopic focus on a return to equilibrium should result in goal shielding (Shah, Friedman, & Kruglanski, 2002), an outcome of which may be an increased willingness to endure harm to reach a highly desired goal (e.g., McGregor, Nash, & Prentice, 2012; Organista et al., 2013; Rosenberg et al., 2015; Siegel et al., 2012). In the current context, feelings of disequilibrium could lead people to consider a drug that they would normally be opposed to as increasingly appealing and worth pursuing—with less consideration of potential collateral damage.

The Current Study

Using GDT as a guide, we proposed one hypothesis. Specifically, we predicted that an inconsistency appeal has the potential to cause psychological disequilibrium, which will then be associated with a series of differential responses to the advertised product: (a) greater willingness to endure physical harm to obtain the product, (b) more favorable evaluation of the ad, (c) more favorable evaluation of the product, (d) more favorable outcome expectations, and (e) greater intentions to use the product. Simply, we predicted that psychological disequilibrium would mediate the effect of a negative goal expectation violation on a host of outcomes related to the drug and the ad. The mediating force of psychological disequilibrium is central to the current experiment because it provides a theoretical explanation for the relationship between inconsistency-type appeals and drug-related outcomes.

In addition to considering inconsistency appeals, scholars have speculated that the way in which side effects information is presented might affect viewers’ perceptions of DTC ads (e.g., Hoek, Gendall, Rapson, & Louviere, 2011; Royne & Myers, 2008). However, research examining these ordering effects is sparse (e.g., Faerber & Kreling, 2012; Schwartz, Woloshin, & Welch, 2009). To begin addressing this gap in the literature, we built on the findings of Aikin, O’Donoghue, Swasy, and Sullivan (2011) to explore the potential moderating effect that side effects presentation may have on viewers’ perception of inconsistency-arousing ads. Thus, we posed an exploratory research question in the present study (Research Question 1): Does the placement of side effects information influence people’s perceptions of an advertised drug, perceptions of an advertisement itself, outcome expectations, willingness to endure purposive harm, or usage intentions?

Method

Participants

Respondents in the current study were recruited from Amazon’s Mechanical Turk (see Chandler, Mueller, & Paolacci, 2014). Using a brief recruiting note (e.g., “10 min survey for 40 cents!”), only U.S. residents who were older than 18 years were recruited.

The original sample consisted of 472 adult residents of the United States. However, Mahalanobis distances were used to determine that 25 cases were multivariate outliers (Tabachnick & Fidell, 2007), and 32 cases reported that the advertisement failed to play correctly; these 57 cases were excluded from analyses. Thus, the final sample consisted of 415 participants. Participants ranged in age from 18 to 71 years ($M = 35.00$, $SD = 12.90$), about half of the participants were male (47%), and the majority of participants were Caucasian (79%).

Procedure

The current study utilized a 2 (side effects: beginning/end) \times 2 (condition: goal expectation violation/control)

factorial design. Participants first offered their consent; they then answered pretest scales, were randomly assigned to view one of four brief advertisements (length = 40–60 seconds; see Table 1), and finally answered several posttest scales. An institutional review board reviewed and approved all procedures.

Experimental Conditions

After considering the costs and benefits of using a fictional versus real product, we decided to portray a fictional drug. The advantage to using a real drug would have been increased generalizability; however, we feared that prior experience or knowledge of a real drug could confound results. Furthermore, as new drugs are often introduced in the marketplace, we thought the harm of a fictional drug was less problematic than the potential confounds that would exist if we used an existing product. To increase the relevance of the drug for participants, we made the description of the drug vague, making it applicable to any condition associated with negative affect. Despite the fact that it might decrease the generalizability of our findings, another advantage of using a fictional drug was that it allowed us to use an

Table 1. Factorial experimental conditions

Side effect placement	Violation condition	
	Expectation violation	Control
Beginning	0–10 seconds: Please read some of the side effects associated with its use. Side effects include: Anxiety, constipation, abnormal thoughts, diarrhea, confusion, difficulty breathing, drooling, severe dizziness.	0–10 seconds: Please read some of the side effects associated with its use. Side effects include: Anxiety, constipation, abnormal thoughts, diarrhea, confusion, difficulty breathing, drooling, severe dizziness.
	11–30 seconds: Do you sometimes feel lonely? Not as happy as you could be? A little lost? Do you sometimes feel vulnerable? Scientists may know why. Everyone has unaccomplished goals. Dreams they have never fulfilled. Dreams that unexpectedly fell apart. Have you let people down? Have your relationships ended in betrayal? Scientists believe these prior life disruptions could be eating away at your happiness.	11–40 seconds: Risperoff is a new drug that can improve your life. Risperoff can help you live better! Risperoff can make you happier!
	31–60 seconds: Risperoff is a new drug that can improve your life. Risperoff can help you live better! Risperoff can make you happier!	
End	0–20 seconds: Do you sometimes feel lonely? Not as happy as you could be? A little lost? Do you sometimes feel vulnerable? Scientists may know why. Everyone has unaccomplished goals. Dreams they have never fulfilled. Dreams that unexpectedly fell apart. Have you let people down? Have your relationships ended in betrayal? Scientists believe these prior life disruptions could be eating away at your happiness.	0–30 seconds: Risperoff is a new drug that can improve your life. Risperoff can help you live better! Risperoff can make you happier!
	21–50 seconds: Risperoff is a new drug that can improve your life. Risperoff can help you live better! Risperoff can make you happier!	31–40 seconds: Please read some of the side effects associated with its use. Side effects include: Anxiety, constipation, abnormal thoughts, diarrhea, confusion, difficulty breathing, drooling, severe dizziness.
	51–60 seconds: Please read some of the side effects associated with its use. Side effects include: Anxiety, constipation, abnormal thoughts, diarrhea, confusion, difficulty breathing, drooling, severe dizziness.	

extreme version of the typical DTC ad to emphasize the psychological processes by which inconsistency appeals influence people's perceptions of the ad and drug itself.

To guide generation of the text used in the ads, we considered a series of content analyses from the DTC drug ad literature. First we drew on Frosch and colleagues' (2007) description of medication-portrayal DTC ads; these authors identified several common themes that align with GDT's description of a goal expectation violation—loss of control, desire to regain control and social approval through drug use, and distress about health condition. The content of the ads was also based on the work of Woloshin and colleagues (2001), who found that many ads encourage unhappy consumers to become active participants in their health (e.g., by seeking prescription drugs). We further considered a content analysis by Parker and Delene (1999), whose data suggested that many DTC ads position themselves as a solution to consumers' problems.

We created four ads that varied based on experimental condition (expectation violation/inconsistency vs. control) and placement of side effects information (beginning vs. end of the ad). The ads contained three distinct parts: (a) expectation violation/inconsistency manipulation (20 seconds; only in two experimental conditions), (b) information about the drug (30 seconds; in all conditions), and (c) side effects information (10 seconds; in all conditions). All participants were exposed to the same core 30 seconds of information about the drug and 10 seconds of side effects information. The differences between the conditions were the presence of a 20-second expectation violation/inconsistency manipulation in the experimental ad and the placement of the 10 seconds of side effects information (i.e., at the beginning or end; see Table 1 for full on-screen text). Video in each ad consisted of clips from real DTC ads that included men, women, and families engaging in activities such as riding bikes and playing with a dog.

Measures

Response options for all measures ranged from 1 (*strongly disagree*) to 7 (*strongly agree*) unless otherwise indicated.

Psychological Disequilibrium

To assess the underlying core psychological processes that accompany a goal disruption, we used the 5-item Psychological Disequilibrium Scale (Siegel & Lyrantzis, 2015). Sample items included "I am mentally uneasy" and "I feel psychologically off-balance." The Psychological Disequilibrium Scale is related to a range of outcomes associated with negative affectivity, including depression, anxiety, incidence of negative life events, and the discrepancy between people's ideal and desired selves (Siegel & Lyrantzis, 2015).

Purposive Harm Endurance

This 4-item measure (Rosenberg et al., 2015; Siegel, 2011) was designed to assess participants' willingness to risk physical harm to attain a previously violated goal. We included this scale as a complementary assessment of the intensity with which participants desired the advertised drug. Items included "I would be willing to endure harm if I thought it

would lead to getting this drug" and "I would be willing to get physically hurt if I thought it would lead to getting this drug." Recent research has shown that purposive harm endurance is related to increased need for a desired goal (Rosenberg et al., 2015), uncertainty (Siegel et al., 2012), and people's willingness to sacrifice for their group (Orehek, Sasota, Kruglanski, Dechesne, & Ridgeway, 2014).

Evaluation of the Advertisement

Participants' evaluations of the ad were assessed with a semantic differential scale with five 7-point items (Crano, Siegel, Alvaro, & Patel, 2007). Participants evaluated the ad on the following dimensions: bad–good, boring–interesting, useless–useful, unhelpful–helpful, and unbelievable–believable.

Evaluation of the Drug

Participants' attitudes toward the drug were assessed with a semantic differential scale with four 7-point items (Crano et al., 2007). The drug was evaluated on the following dimensions: bad–good, not relevant to me–relevant to me, ineffective–effective, and useless–useful.

Outcome Expectations

Adapted from prior studies (Bolles, 1972; Christiansen, Smith, Roehling, & Goldman, 1989), five items measured participants' expectations about the impact that the drug would have on their lives. The items were preceded by the stem "If I take this drug..." and followed by items such as "...my life will improve" and "...I will feel better."

Intentions to Use the Drug

Created for the purposes of this study, but based on previously validated scales (e.g., Crano et al., 2007), this 3-item measure was designed to assess a range of participants' behavioral intentions regarding the advertised drug. Items included "I intend on using this drug" and "If this drug were free, I would use it."

Data Analysis Plan

First, to examine the effects of side effects placement on the outcomes of interest (Research Question 1), we conducted a multivariate analysis of variance (MANOVA). Then, to test the current hypothesis, we proposed a structural equation model (SEM)—an appropriate method of data analysis because it allows for a simultaneous test of the direct effects of a goal expectation violation on the outcomes of interest and for the mediating role of psychological disequilibrium. Using the maximum likelihood approach in AMOS, the SEM tested the predictive pathways between condition (i.e., negative goal expectation violation vs. control); the mediator (i.e., psychological disequilibrium); and the outcomes of purposive harm endurance, evaluations of the ad and drug, outcome expectations, and intentions to use the drug.

More specifically, the hypothesized model for the current study consisted of a mediation model predicting indirect effects for a goal expectation violation on purposive harm endurance, evaluation of the ad, evaluation of the drug, outcome expectations, and usage intentions through the mediator of psychological disequilibrium. The condition

Table 2. Bivariate correlations

Measure	Bivariate correlations					
	1	2	3	4	5	6
1. Psychological Disequilibrium Scale	(.97)					
2. Harm endurance	.32***	(.87)				
3. Ad evaluation	.19***	.35***	(.90)			
4. Drug evaluation	.30***	.28***	.71***	(.85)		
5. Expectations	.28***	.29***	.55***	.67***	(.98)	
6. Usage intentions	.36***	.45***	.60***	.63***	.60***	(.94)

Note. Cronbach’s alphas are represented on the diagonal.
 *** $p < .001$.

Table 3. Multivariate analysis of variance means (*SD*)

Variable	Condition			
	Expectation violation/beginning (<i>n</i> = 111)	Expectation violation/end (<i>n</i> = 97)	Control/beginning (<i>n</i> = 100)	Control/end (<i>n</i> = 107)
Psychological disequilibrium	2.24 (1.23)	2.40 (1.45)	2.03 (1.27)	2.08 (1.31)
Purposive harm	1.23 (0.46)	1.23 (0.47)	1.19 (0.46)	1.21 (0.47)
Ad evaluation	3.40 (1.41)	3.45 (1.42)	2.96 (1.43)	2.96 (1.28)
Drug evaluation	3.36 (1.38)	3.43 (1.33)	2.97 (1.36)	2.97 (1.28)
Outcome expectations	3.50 (1.51)	3.01 (1.57)	2.94 (1.48)	2.91 (1.46)
Usage intentions	2.20 (1.09)	2.13 (1.13)	1.99 (1.08)	1.83 (1.01)

was represented as an exogenous, manifest variable; psychological disequilibrium had a one-factor latent variable made up of five indicators. All dependent variables were one-factor latent variables, including purposive harm (four items), evaluation of the ad (five items), evaluation of the drug (four items), outcome expectations (five items), and usage intentions (three items).

Results

Descriptive Statistics

Prior to hypothesis testing, the data were assessed for outliers and violations of normality. All measures had adequate reliability (see Table 2) and met the assumptions of univariate normality. However, as noted, 25 cases were removed from further analysis because Mahalanobis distances identified them as multivariate outliers (Tabachnick & Fidell, 2007), and 32 were removed because they reported that the video failed to play. For means and standard deviations of the manifest indicators, please see Table 3.

Research Question

MANOVA

To assess Research Question 1, we conducted a MANOVA to examine differences on the dependent measures in the four conditions. This test allowed for a comparison of group means on each of the five dependent measures of interest

(i.e., intentions to use the drug, evaluation of the advertisement, evaluation of the drug, outcome expectations of the drug, and purposive harm endurance) and the proposed mediator (i.e., psychological disequilibrium). For Research Question 1, we did not make any specific predictions, so the main effects of side effects placement (i.e., beginning vs. end) and the interaction of condition and side effects placement were examined.

The results of the MANOVA suggested that the placement of the side effects in an inconsistency-arousing DTC ad did not affect participants’ level of psychological disequilibrium, usage intentions, evaluation of the ad or drug, outcome expectations, or willingness to endure purposive harm, $F(1, 415) = 1.34, p = .24$ (see Table 3 for means and standard deviations for all variables across conditions). Furthermore, we did not find any evidence of an interaction between condition and side effects placement on any of the outcomes of interest, or on the proposed mediator, $F(1, 415) = 0.91, p = .49$. Given that there were no effects for the placement of harms manipulation in the current study, with this particular sample, and these ads, and that there were significant effects of the goal violation manipulation, the side effects conditions were collapsed.¹ Subsequent analyses looked exclusively at the differences between the goal expectation

¹Please note that a MANOVA was run separately for each side effects condition, and the results remained the same. That is, in both the beginning and the end conditions, the only significant effects were main effects of goal expectation violation.

violation condition and the control condition, regardless of where participants saw the side effects information.

To illustrate the effects of the goal expectation (vs. control) ad, we conducted an additional MANOVA. Results suggested significant main effects of condition for the proposed mediator and four out of five outcomes of interest. Compared to those in the control condition, participants in the goal expectation violation condition displayed significantly more psychological disequilibrium, had greater usage intentions, had more positive evaluations of the ad, had more positive evaluations of the drug, and had more positive outcome expectations: psychological disequilibrium, $F(1, 415) = 5.24, p = .02, d = .26$; usage intentions, $F(1, 415) = 7.57, p < .01, d = .24$; evaluations of the ad, $F(1, 415) = 11.50, p = .001, d = .33$; evaluations of the drug, $F(1, 415) = 10.36, p = .001, d = .31$; outcome expectations, $F(1, 415) = 6.22, p = .01, d = .24$. However, there was no main effect of condition on purposive harm endurance, $F(1, 415) = 0.59, p = .44$.

Hypothesis Testing

Model Evaluation Criteria and Model Fit

As a preliminary check for the anticipated fit of the model, we examined bivariate correlations to determine whether the hypothesized variables were related (see Table 2). Furthermore, we conducted confirmatory factor analysis for each scale to examine the fit of the data and the factor loadings for all items. As can be seen in Table 4, the model fit for each latent construct was adequate, and all but four of the factor loadings had standardized estimates above .70 and were significant at the $p < .05$ level. These findings indicated that the items used loaded sufficiently onto the latent constructs.

We used several additional criteria to evaluate the extent to which the hypothesized model approximated the data (see Byrne, 2010). A nonsignificant chi-square test, leading to nonrejection of the model, would have suggested a good approximation of the data. Although the chi-square statistic

Table 4. Confirmatory factor analysis model fit indicators for latent constructs

Latent construct and item	Factor loading	Indicator				
		χ^2	χ^2/df	CFI	IFI	RMSEA
Psychological disequilibrium		16.68	4.17	0.996	0.996	.088
I am mentally uneasy	.84					
I feel psychologically off-balance	.94					
I feel psychologically disoriented	.96					
I have lost my psychological center	.96					
I feel mentally disrupted	.92					
Purposive harm		0.031	0.031	1.000	1.001	.000
I would be willing to endure discomfort93					
I would be willing to endure harm83					
I would be willing to sacrifice89					
I would be willing to get physically hurt70					
Ad evaluation		57.02	14.26	0.964	0.910	.179
Bad/good	.78					
Boring/interesting	.60					
Useless/useful	.94					
Unhelpful/helpful	.94					
Unbelievable/believable	.69					
Drug evaluation		6.299	3.150	0.996	0.996	.072
Bad/good	.82					
Not relevant to me/relevant to me	.43					
Ineffective/effective	.92					
Useless/useful	.95					
Outcome expectations		0.111	0.111	1.000	1.000	.000
... my life will improve	.94					
... I will feel better	.97					
... I will be happier	.99					
... my life will be more satisfying	.92					
... I will enjoy life more	.96					
Usage intentions		5.874	5.874	0.990	0.990	.109
I intend to learn more about Risperoff	.71					
I intend on using Risperoff	.95					
If Risperoff were free, I would use it	.67					

Note. CFI = comparative fit index; IFI = incremental fit index; RMSEA = root mean square error of approximation.

Table 5. Direct and indirect effects of the structural equation model

Regression path	Coefficient <i>B</i> (β)	Bootstrapped <i>SE</i>	BCa 95% CI
Direct effects			
Condition → PDQ	.26 (.11)*	.12	[.01, .20]
Condition → harm	.003 (.003)	.04	[-.09, .10]
Condition → ad evaluation	.44 (.18)***	.12	[.08, .27]
Condition → drug evaluation	.32 (.12)*	.13	[.03, .22]
Condition → expectations	.30 (.10)*	.13	[.01, .20]
Condition → usage intentions	.18 (.09)	.10	[-.01, .18]
PDQ → harm	.13 (.36)***	.02	[.24, .47]
PDQ → ad evaluation	.19 (.19)***	.05	[.01, .28]
PDQ → drug evaluation	.17 (.12)**	.06	[.06, .26]
PDQ → expectations	.31 (.26)***	.06	[.17, .35]
PDQ → usage intentions	.31 (.36)***	.05	[.25, .46]
Indirect effects			
Condition → harm	.03 (.04)*	.02	[.005, .08]
Condition → ad evaluation	.05 (.02)*	.01	[.003, .05]
Condition → drug evaluation	.04 (.02)*	.01	[.003, .04]
Condition → expectations	.08 (.03)*	.01	[.004, .06]
Condition → usage intentions	.08 (.04)*	.02	[.004, .08]

Note. Bootstrapped estimates of 10,000. *B* = unstandardized effect; β = standardized effect; BCa 95% CI = Bias Corrected 95% confidence interval; PDQ = Psychological Disequilibrium Scale.
 p* < .05. *p* < .01. ****p* < .001.

for the current data was significant, $\chi^2(27, N = 415) = 1050.59, p < .001$, this test is overpowered with large sample sizes (*N* = 415; Bollen, 1989). Thus, we also assessed the ratio of chi-square to degrees of freedom (acceptable $\chi^2/df < 3$, Kline, 2005; acceptable $\chi^2/df < 5$, Bollen, 1989).

In the present data, $\chi^2/df = 3.46$, indicating a moderate fit. We also assessed the two other commonly reported indices, the comparative fit index (CFI) and incremental fit index (IFI), which range from 0 to 1, with higher values indicating better fit (Ullman & Bentler, 2003). In general, these indices

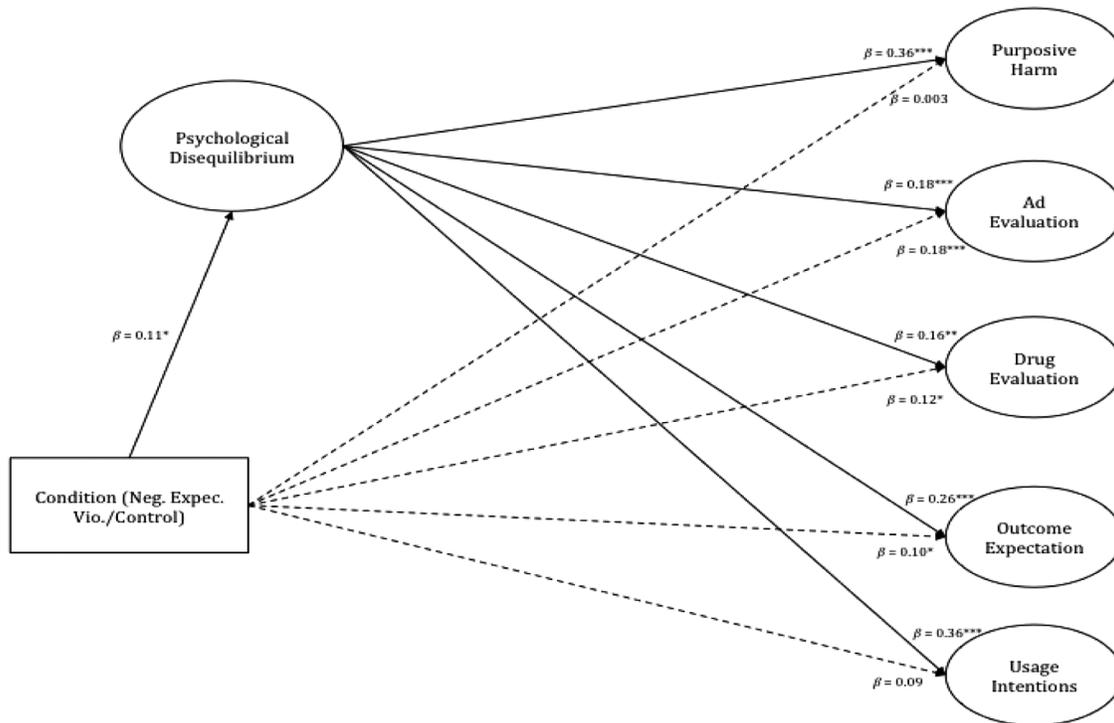


Fig. 1. Structural equation model. Condition is represented by a manifest variable, and all other variables are latent. Dashed lines represent direct paths from condition to outcomes. Neg. Expec. Vio. = negative goal expectation violation. **p* < .05. ***p* < .01. ****p* < .001.

of fit suggested good model fit (CFI = .94 and IFI = .94). As a final indicator of model fit, we examined the root mean square error of approximation (RMSEA), a residual-based index (acceptable RMSEA < .10, Browne & Cudeck, 1993). For these data, RMSEA was beyond the threshold of acceptance (RMSEA = .08), with a 90% confidence interval of .07 to .08. Taken together, these five indicators suggested that the data fit the hypothesized model adequately well.

Full Mediation Model

We used maximum likelihood estimation SEM with 10,000 bootstrapped samples using the partial mediation model to assess the unstandardized direct, indirect, and total effects of the hypothesized paths between scale composites (see Table 5 and Figure 1). As predicted, the direct effect from condition to psychological disequilibrium was significant ($\beta = .11$, $SE = .12$, $p = .03$). Also as expected, the direct paths from psychological disequilibrium to purposive harm endurance ($\beta = .36$, $SE = .02$, $p < .001$), evaluations of the ad ($\beta = .18$, $SE = .05$, $p < .001$) and drug ($\beta = .16$, $SE = .06$, $p = .002$), outcome expectations ($\beta = .26$, $SE = .06$, $p < .001$), and usage intentions ($\beta = .36$, $SE = .05$, $p < .001$) were significant. These paths suggested that a 1-point increase in psychological disequilibrium was associated with a .36 increase in willingness to endure purposive harm, a .18 increase in ad evaluation, a .16 increase in drug evaluation, a .26 increase in outcome expectations, and a .36 increase in usage intentions.

Furthermore, the direct effects from condition to evaluation of the ad ($\beta = .18$, $SE = .12$, $p < .001$), evaluation of the drug ($\beta = .12$, $SE = .13$, $p < .05$), and outcome expectations ($\beta = .10$, $SE = .14$, $p < .05$) were significant; however, the path to usage intentions ($\beta = .09$, $SE = .10$, $p = .09$) was marginally significant, and the path to purposive harm ($\beta = .003$, $SE = .04$, $p = .94$) was nonsignificant. Finally, significant indirect effects of condition, through the mediator of psychological disequilibrium, on each outcome suggested mediation: purposive harm endurance, indirect effect = .04, $SE = .02$, $p = .02$; evaluation of the ad, indirect effect = .02, $SE = .01$, $p = .02$; evaluation of the drug, indirect effect = .02, $SE = .01$, $p = .02$; outcome expectations, indirect effect = .03, $SE = .01$, $p = .02$; and usage intentions, indirect effect = .04, $SE = .02$, $p = .03$. Despite the presence of inconsistent direct effects, the fact that all of the indirect effects of condition through psychological disequilibrium were significant was sufficient to conclude mediation (Hayes & Preacher, 2013; Preacher, Rucker, & Hayes, 2007).

Taken together, the results of the SEM supported the hypothesized mediation model—a goal expectation violation's influence on participants' purposive harm endurance, ad and drug evaluations, outcome expectations, and usage intentions was dependent on the arousal of psychological disequilibrium.

Discussion

Scholars across multiple disciplines have identified the presence of inconsistency-arousing information in DTC ads (e.g., medication portrayal ads; Frosch et al., 2007) and have called for increased empirical assessment of negative

emotional appeals in DTC ads (Stange, 2007; Wilkes et al., 2000). Guided by GDT (Siegel, 2011, 2013; Siegel et al., 2012; also see Lewandowski et al., 2011; Rosenberg et al., 2015), which outlines what occurs when people experience goal expectation violations, the present study experimentally examined the ways in which making inconsistencies between people's desired and actual lives salient could influence people's perceptions of, and intentions to use, an advertised drug. We predicted that viewing an inconsistency-arousing DTC ad could lead to outcomes that would mimic the effects of a goal expectation violation—in particular, that the inconsistency-arousing ad would produce feelings of psychological disequilibrium. As a consequence, we predicted that psychological disequilibrium would result in a breadth of changes, including increased willingness to endure harm to obtain the advertised drug, positive evaluations of the ad and drug, positive outcome expectations of the drug, and increased intentions to use the drug. Simply, we hypothesized that psychological disequilibrium would mediate the effect of a negative goal expectation violation on a host of drug-related outcomes.

To examine the hypothesized model, we used SEM, which allowed for simultaneous tests of the direct effects of the ad on psychological disequilibrium and all outcomes and the mediating role of psychological disequilibrium. The current results support the proposed model, indicating that if a DTC ad focused on inconsistencies and aroused psychological disequilibrium, it could affect people's expectations, attitudes, and usage intentions. That psychological disequilibrium mediates the relationship between the goal expectation violation and the compensatory adjustments indicates that the inconsistency appeal did more than just provide participants with more information about the utility of the product—it made people mentally uneasy, which drove the increased attractiveness of the product.

An implication of these findings is that people who are opposed to prescription drug use in one psychological state might start to think differently when inconsistencies are made salient, causing them to experience a goal expectation violation. In support, the present results indicate that people who viewed the ad that highlighted their inconsistencies (i.e., made goal expectation violations salient) reported increased psychological disequilibrium and an increased willingness to endure harm to obtain the drug. Conversely, people whose inconsistencies were not made salient did not indicate increased psychological disequilibrium and did not display an increased willingness to endure harm. Furthermore, the current data provide empirical support for the suggestions of Main and colleagues (2004) and Hollon (2004), who speculated that negative emotional appeals have the potential to augment patients' vulnerability about their condition by highlighting the condition's abnormality. Put differently, if negative emotional appeals affect consumers' psychological state, they may not adequately assess the risk associated with using an advertised drug. This finding is in accord with Hoek and colleagues (2011), who suggested that “disclosing risk information will not assist consumers' decisions if they cannot access and understand the details provided” (p. 250).

The current results indicate that if DTC ads cause people to enter a state of goal disruption, the ads can influence subsequent thought and behavior, causing a drug to become more attractive and potential harms to become less relevant. To be sure, this is not to say that DTC ads intentionally encourage goal expectation violations, nor does this suggest that any DTC prescription drug ads arouse feelings of psychological unease. Rather, these findings indicate that an ad that makes viewers' inconsistencies salient has the potential to make a drug seem more appealing than it would be otherwise—and psychological disequilibrium serves as a partial mechanism. Indeed, the goal of the current study was not to uncover a means of persuading people to buy prescription drugs but rather to understand the psychological processes through which people's desire to obtain the drugs is motivated. As Kravitz and Bell (2013) stated, "When patients ask for medications, they may be seeking something else entirely" (p. 6), perhaps even relief from inconsistency or psychological disequilibrium. The current study illustrates one potential pathway through which this occurs.

Given that the current ads were intentionally vague (i.e., did not pertain to one specific condition), we can speculate that the current findings are relevant to conditions in which being made aware of inconsistency could be most problematic (e.g., anxiety, depression). However, even though the present ad focused on this constellation of negative affective symptoms, the psychological processes should be similar for a range of conditions (e.g., hypertension, diabetes). Future studies should investigate this possibility.

Finally, based on prior speculation (e.g., Hoek et al., 2011; Royné & Myers, 2008), Research Question 1 examined the influence that the placement of side effects information has on people's perceptions of DTC ads. As noted, including side effects information at the beginning (unique to the current study) versus the end (as is typical) did not affect participants' ad or drug evaluations or usage intentions. Given that ads rarely use this approach, participants may have found the inclusion of side effects at the beginning of the ad surprising or novel. In reality, this may lead people to simply change the channel; however, in the context of the study, people may have felt compelled to continue watching the ad. In other words, this particular effect could be an experimental artifact that would function differently if people were watching a DTC ad in the comfort of their own home.

Conclusion

Utilizing video clips from real DTC prescription drug ads, and creating text in line with inconsistency-arousing appeals (Frosch et al., 2007), we experimentally assessed the possibility that activating goal expectation violations influences people's perceptions of an ad and an advertised drug. Using GDT as a guide, we predicted that the fictional inconsistency-arousing ad would have the potential to arouse psychological disequilibrium, which would then lead to a series of compensatory responses, including more positive evaluations of a fictional ad and drug, more positive

expectations about the fictional drug, increased usage intentions, and an increased willingness to endure purposive harm to obtain the fictional drug. The results of an SEM supported all of these contentions, suggesting a psychological pathway that begins with a negative goal expectation violation and ends with increased usage intentions and a greater willingness to endure harm to make use possible.

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