

Journal of Health Psychology

<http://hpq.sagepub.com/>

Belief in a Just World, Social Influence and Illness Attributions : Evidence of a Just World Boomerang Effect

Todd Lucas, Sheldon Alexander, Ira Firestone and James M. Lebreton

J Health Psychol 2009 14: 258

DOI: 10.1177/1359105308100210

The online version of this article can be found at:

<http://hpq.sagepub.com/content/14/2/258>

Published by:



<http://www.sagepublications.com>

Additional services and information for *Journal of Health Psychology* can be found at:

Email Alerts: <http://hpq.sagepub.com/cgi/alerts>

Subscriptions: <http://hpq.sagepub.com/subscriptions>

Reprints: <http://www.sagepub.com/journalsReprints.nav>

Permissions: <http://www.sagepub.com/journalsPermissions.nav>

Citations: <http://hpq.sagepub.com/content/14/2/258.refs.html>

Belief in a Just World, Social Influence and Illness Attributions

Evidence of a Just World Boomerang Effect

TODD LUCAS, SHELDON ALEXANDER, & IRA FIRESTONE
Wayne State University, USA
JAMES M. LEBRETON
Purdue University, USA

ACKNOWLEDGEMENTS. Portions of this research were conducted while the first author was a visiting professor at Albion College (Albion, MI) and a postdoctoral researcher at the Center for Behavioral and Decision Sciences in Medicine (Ann Arbor, MI). I (T.L.) am grateful to Dennis Gibson, Mike Schwartz, Amanda Suydam and Kathrine Vojtko for their assistance in the execution of this research. We also thank Susan Goold, Louis Penner and Dylan Smith for their comments on previous drafts of this manuscript.

COMPETING INTERESTS: None declared.

ADDRESS. Correspondence should be directed to:
TODD LUCAS, Division of Occupational and Environmental Health,
Department of Family Medicine and Public Health Sciences, Wayne State
University, 3800 Woodward Avenue, Suite 808; Detroit, MI 48201, USA.
[email: tlucas@med.wayne.edu]



Journal of Health Psychology
Copyright © 2009 SAGE Publications
Los Angeles, London, New Delhi,
Singapore and Washington DC
www.sagepublications.com
Vol 14(2) 258–266
DOI: 10.1177/1359105308100210

Abstract

Characteristics of individuals and illnesses can both influence receptivity to preventative health messages. We examined whether receptivity to health messages depends on interactions between illness characteristics and dispositional concern for justice. Participants considered the preventability of six illnesses after exposure to a message that manipulated personal responsibility for illness. Paradoxically, participants with strong just world beliefs reported greater preventability for less preventable illnesses, such as brain cancer, when exposed to an *unpreventable* health message. In parallel, participants with low justice beliefs reported less preventability for lung cancer when exposed to a *preventable* message. This *just world boomerang effect* suggests that individual dispositions and illness characteristics can interact in ways that can produce either acquiescence or opposition to persuasive health messages.

Keywords

- *boomerang effect*
- *illness attribution*
- *just world*
- *procedural justice*

BEHAVIORAL choices are important predictors of health and illness (e.g. Mokdad, Marks, Stroup, & Gerberding, 2004, 2005). Moreover, poor health behavior can be financially costly (e.g. Department of Health and Human Services, 2003). Many nations have therefore launched efforts to encourage preventative health behaviors (e.g. Rothman & Salovey, 1997). Although well intended, resulting education programs and media campaigns often attain only modest success in altering individual health behaviors (e.g. Ringold, 2002; Salovey & Rothman, 2003). One proffered explanation is that health messages sometimes give impetus to unintended and counterproductive health attributions and behaviors (for recent review see Cho & Salmon, 2007). In this vein, researchers have described the potential of preventative messages to produce 'boomerang effects', whereby some individuals paradoxically decrease rather than augment their preventative health efforts (e.g. Dillard & Shen, 2005; Hovland, Janis, & Kelly, 1953; Ringold, 2002). In the present study, we suggest that boomerang effects may result from individuals' justice beliefs. Specifically, we suggest that individuals may reject health messages in an attempt to protect their belief in a fair (or unfair) world, and that this effect depends on whether justice beliefs agree with both health message content, and also preventability attributions that are readily associated with particular illnesses.

Sources of illness attributions

Illness attributions, or attempts by individuals to explain the causal origins of illness, are linked to important health cognitions and behaviors (Leventhal, Benyamini, & Shafer, 2007). Many preventative health messages therefore attempt to alter personal beliefs about the causes of illness (e.g. Rothman, Salovey, Turvey, & Fishkin, 2003). Research suggests that individuals are usually healthier when they feel personally responsible for their well-being (for reviews see Ouellette & DiPlacido, 2001; Salovey, Rothman, & Rodin, 1998). Thus, health messages often attempt to convince individuals to make internal attributions for maintaining health and avoiding illness. However, experts also have noted that internal attributions can be counterproductive in preventative health endeavors. For example, internal attributions may create illness stigma (e.g. Visser, Makin, & Leboye, 2006) or impede health related helping behaviors (e.g. DePalma, Madey, Tillman, & Wheeler, 1999). Thus,

health messages that attempt to decrease internal attributions also may be adaptive.

Of primary importance, boomerang effects are a possible result of exposing individuals to messages that either attempt to increase or decrease perceived preventability of illness. An important issue in health communication thus concerns developing methods to identify when health messages of either type might backfire. One possible strategy is to consider the extent to which preventative messages agree with individuals' preexisting beliefs about illnesses. In the present research, we suggest that health messages can interact with two important sources of illness beliefs. Foremost are the characteristics of illnesses themselves. That is, individuals often perceive some illnesses as stemming from more controllable or personal causes than other illnesses (e.g. Leventhal et al., 2007). For example, because it is readily associated with a preventable health behavior (smoking), lung cancer usually seems more personally preventable than brain cancer (e.g. Lucas, Lakey, Alexander and Arnetz, *in press*). A second source of preventability attributions is the dispositional characteristics of individuals (for review see Ouellette & DiPlacido, 2001). That is, while lung cancer may be viewed as more preventable than brain cancer, dispositional characteristics suggest that some individuals will see illnesses *in general* as more preventable.

Prior research has shown how characteristics of illnesses and individuals may both affect health message receptivity. For example, rejection of a health message may reflect preexisting folk beliefs about the characteristics of particular illnesses (e.g. Leventhal et al., 2007), and also may reflect individual differences characteristics such as strong Type A personality or an internal locus of control (for review see Ringold, 2002). It is also possible to direct health messages at appropriate combinations of individuals and illnesses (e.g. Albrecht & Bryant, 1996). In the present research, we suggest that belief in a just world is an important psychological variable through its capacity to interact with both message content and beliefs about specific illnesses.

Belief in a just world

Belief in just world theory proposes that individuals need to perceive the world as predictable and controllable (Lerner, 1980). Accordingly, individuals strive to believe that people 'get what they deserve' and 'deserve what they get'. Attempts to preserve beliefs

about justice may encourage either helping or derogating victims of misfortune, seeking revenge or even cognitively reinterpreting an injustice as 'actually beneficial' to a victim (for recent review see Hafer & Bègue, 2005). Theory and research also have suggested that just world beliefs comprise an important dispositional characteristic of individuals, and that some individuals will view the world as a generally fairer place than others do (for review see Furnham, 2003).

Of present interest, dispositional justice beliefs have been strongly linked to research on health and illness attributions (e.g. Connors & Heaven, 1990; DePalma et al., 1999; Fetchenhauer, Jacobs, & Belschak, 2005; Lambert, Burroughs, & Nguyen, 1999). Given such links, justice beliefs should be useful in predicting receptivity to attribution-oriented preventative health messages. Individuals with strong justice beliefs might react defensively to 'unpreventable' health messages by subsequently rejecting attempts to undermine individual responsibility for illness. In parallel, individuals with less robust justice beliefs could view 'preventable' health messages unfavorably, and similarly reject attempts to paint illnesses as controllable. Thus, just world beliefs may embody a form of defensive processing that, in some cases, leads to counterproductive rejection of a well-intended health message.

The present research

In the present study, we considered whether individual differences in justice beliefs would be useful in predicting health message boomerang effects. We measured participants' dispositional beliefs about justice and exposed them to a persuasive health message that emphasized either preventable or unpreventable causes of illness. Participants then considered the preventability of six different illnesses. When illness and message characteristics were incongruent with individuals' justice beliefs, we predicted a boomerang effect. In this vein, we expected high justice individuals to perceive *more* personal responsibility for unpreventable illnesses (such as brain cancer) after exposure to an 'unpreventable' health message. Alternatively, we expected low justice individuals to make *fewer* attributions of personal responsibility for preventable illnesses (such as lung cancer) after exposure to a 'preventable' health message.

To measure individual differences in justice beliefs, we used a new multidimensional measure of

Procedural (PJW) and Distributive (DJW) Just World Beliefs (Lucas, Alexander, Firestone, & LeBreton, 2007). Distributive justice involves evaluations of the fairness of outcomes, allocations or resources while procedural justice involves evaluations of rules, processes or interpersonal treatment (for review see Tyler & Smith, 1998). When construed as individual differences, PJW and DJW suggest that dispositional beliefs about the deservedness of rules, processes or other forms of interpersonal treatment are distinct from those that encompass outcomes, resources or allocations. Although there are numerous conceptualizations of just world beliefs (see Furnham, 2003), no other individual differences measure formalizes the distinction between fair processes and outcomes. Moreover, previous research has suggested that the PJW/DJW distinction may be particularly useful in linking justice beliefs to health attributions and outcomes (e.g. Lucas, 2008; Lucas et al., 2007; Lucas, Alexander, Firestone, & LeBreton, in press). We deemed the PJW/DJW distinction to be potentially useful in the present research, especially since preventative messages may differentially target antecedent health processes and resulting health outcomes.

Method

Participants

One hundred and fifty-two (54 male) participants were recruited from undergraduate psychology courses at a small Midwestern (United States) liberal arts college to complete a survey on 'Perceptions of health and illness.' Participants ranged in age from 18 to 24 years old ($M = 19.38$, $SD = 1.30$), and received a small amount of research credit as compensation.

Belief in a just world

Dispositional justice beliefs were measured using the multidimensional Procedural (PJW) and Distributive (DJW) Just World Beliefs scales (Lucas et al., 2007). In construing procedural and distributive justice as individual differences, PJW and DJW suggest that dispositional beliefs about the deservedness of rules, processes or other forms of interpersonal treatment (e.g. 'People are generally subjected to processes that are fair') are distinct from those that encompass outcomes, resources or allocations (e.g. 'People usually receive outcomes that they deserve'). PJW and DJW are each measured using

four items that are rated on a seven-point Likert-type scale (1 = *strongly disagree*; 7 = *strongly agree*). In the present study, both PJW ($\alpha = .92$) and DJW ($\alpha = .91$) measures were internally consistent.

Social influence manipulation

Approximately one-third ($n = 56$) of participants were exposed to an internal (preventable) attribution message, and one-third ($n = 52$) to an external (unpreventable) attribution message. The final third ($n = 44$) of participants served as a control, and were exposed to a neutral message. We presented the persuasive manipulation as a written description in the survey instructions. Participants in the internal and external attribution conditions read the following message, which differed only for words or phrases given in parentheses:

Last year the *Journal of the American Medical Association* reported on a study conducted by the Harvard School of Public Health. This study was largely supportive of something many people already accept: that many serious illnesses are (largely/not) preventable. That is, (individuals are often responsible for the condition of their health through their own health behavior and lifestyle choices/many individuals fall victim to serious illness through no fault of their own, and despite a generally healthy lifestyle). In this survey, we are interested in your perceptions of the extent to which various illnesses (are/are not) preventable. Using the seven-point scale and items provided, please rate the extent to which you perceive each of the following illnesses to be (avoidable by making good personal choices and living a healthy lifestyle/unavoidable, even though good personal choices and a healthy lifestyle exist).

Illnesses and attribution ratings

Six illnesses were selected. Based on the results of a small pilot study, we selected two illnesses that were perceived to be less preventable, and two illnesses that were perceived to be more preventable. We also selected two 'middle illnesses' that were not perceived to be either explicitly preventable or unpreventable. Perceived unpreventable illnesses included Alzheimer's disease and brain cancer, while perceived preventable illnesses included AIDS, and lung cancer. Middle illnesses included diabetes and stroke.

We used three items to measure *perceived preventability*. These included: 'Individuals with (specific illness) are somewhat responsible for their unfortunate health condition'; 'Most people with

(specific illness) could have done something to prevent their condition'; and '(Specific illness) is usually preventable through a healthy lifestyle'. All items used a seven-point Likert-type scale (1 = *strongly disagree*; 7 = *strongly agree*), and we created six illness preventability scores by summing the three item ratings for each illness. Higher scores indicated more internal (preventable) attributions while lower scores indicated more external (unpreventable) attributions. Cronbach's alpha for these three items averaged $\alpha = .92$ across all six illnesses, and ranged from a low of $\alpha = .84$ (AIDS) to a high of $\alpha = .96$ (lung cancer).

Procedure

To control for order effects, we presented illnesses to participants using two different orderings. To determine orderings, we created randomized blocks of three illnesses, each containing one unpreventable, middle and preventable illness. We randomly arranged these blocks to create an initial order, and then we created one additional order by rotating them. Univariate ANOVAs revealed that there were no mean differences in attribution ratings between the orders, after correcting for multiple comparisons, $ps > .01$. All participants completed the survey during a regularly scheduled class session as a pencil and paper measure, and the report of all information was anonymous.

Results

Illness categories

First, we conducted a series of analyses to confirm the attribution categories that were initially assigned to each illness. Illnesses were rank ordered by their preventability scores and divided into the aforementioned illness categories. Unpreventable illnesses included Alzheimer's disease ($M = 5.23$, $SD = 2.89$) and brain cancer ($M = 5.34$, $SD = 3.42$). Middle illnesses included diabetes ($M = 10.73$, $SD = 4.53$) and stroke ($M = 11.29$, $SD = 4.66$). Preventable illnesses included AIDS ($M = 15.64$, $SD = 3.74$) and lung cancer ($M = 16.76$, $SD = 3.97$). The obtained rank order was consistent with pilot testing, and a repeated measures analysis of variance (ANOVA) verified that attribution ratings were significantly different between groups, $F(2, 300) = 508.91$, $MSE = 8.84$, $p < .001$, partial $\eta^2 = 0.77$. The mean attribution score for the two unpreventable illnesses, $M = 5.29$, $SD = 2.78$, was significantly lower than the

Table 1. Belief in a Just World and Social Influence as Predictors of Illness Attributions

	Unpreventable		Middle		Preventable	
	Alzheimer's	Brain Tumor	Diabetes	Stroke	AIDS	Lung Cancer
Step 1 Δr^2	.02	.01	.02	.01	.04	.04
DJW	-.10	-.09	.01	.02	-.03	-.03
PJW	.13	.13	.02	-.03	.17	-.03
Internal	.06	.04	-.01	.09	-.10	.06
External	.01	-.01	.15	.06	.04	.23**
Step 2 Δr^2	.05*	.05*	.03	.02	.01	.04*
DJW \times Internal	-.12	.05	-.04	.10	.01	.06
DJW \times External	-.21	-.01	.09	.05	.12	.11
PJW \times Internal	-.01	-.06	.19	.05	.06	.25**
PJW \times External	.29**	.27**	.20	.13	.05	.07

Notes. * $p < .10$ ** $p < .05$

mean for the middle two illnesses, $M = 11.01$, $SD = 3.87$; $t(151) = -16.82$, $p < .001$, $d = -1.70$, which in turn was significantly lower than the mean for the two preventable illnesses, $M = 16.20$, $SD = 3.16$; $t(151) = -15.11$, $p < .001$, $d = -1.47$.

Belief in a just world and social influence

We examined the potential of just world beliefs and social influence to moderate illness attributions by conducting six hierarchical multiple regressions. The message manipulation was dummy coded as two separate vectors (Cohen & Cohen, 1983). Participants exposed to the preventable (internal) and unpreventable (external) messages were coded as a one in the first and second vectors, respectively, while participants in the control group were coded as zero in both vectors. Scores on the PJW ($M = 16.01$, $SD = 4.59$) and DJW ($M = 17.73$, $SD = 4.87$) measures were centered about their mean, and four interaction terms were created by multiplying the two influence vectors by PJW and DJW scores. We used simultaneous entry for all multiple regressions, with illness attribution ratings serving as criterion variables. We entered PJW and DJW scores and the two social influence vectors into the first step of each hierarchical regression, and assessed the main effect of each using r-square and the individual regression weights. The four interaction terms were added at the second step of each regression and assessed using r-square change and individual regression weights. Because our sample size was small and the primary hypothesis concerned an interaction of just world beliefs, social influence

and illness type, we interpreted moderate ($p < .10$) r-square change values when accompanied by at least one significant ($p < .05$) regression weight.

Regression results are presented in Table 1. No significant main effect emerged for either type of just world perception or message condition for any illness. The most notable evidence of any external message main effect occurred for lung cancer ($\beta = .23$, $p < .05$). In this case, a general boomerang effect suggested that exposure to the external message paradoxically increased internal attributions for this illness. Of greater interest, the second step of the regression was significant for both unpreventable illnesses. In both cases, a significant PJW \times external message interaction suggested procedural just world beliefs moderated the impact of the external message. To interpret this effect, we calculated mean illness ratings separately for participants exposed to external and non-external (internal and control) messages. In addition, we distinguished between high, medium and low PJW participants by performing a tertiary split one standard deviation unit above and below the mean. We adopted this tertiary split approach to achieve the clearest possible illustration of our findings, although a similar interpretation resulted from using a traditional moderated regression approach (Aiken & West, 1991).

Figure 1a presents the interaction for brain cancer. Perceived preventability was lower for low PJW participants exposed to the external message, *external* $M = 4.00$, $SD = 2.12$ vs *non-external* $M = 5.87$, $SD = 3.60$; $t(22) = -1.60$, $p = .06$, $d = -0.63$, and to a lesser extent for moderate PJW participants, *external* $M = 4.66$, $SD = 2.59$ vs *non-external* $M = 5.53$,

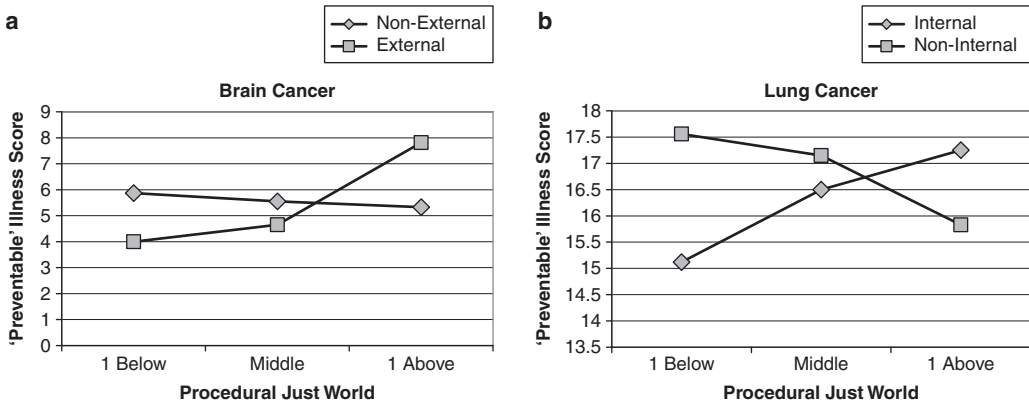


Figure 1. Procedural just world beliefs and message exposure as predictors of preventable attributions for brain cancer and lung cancer.

SD = 3.43; $t(98) = -1.41, p = .08, d = -0.29$. However, high PJW participants perceived more rather than less preventability for brain cancer when exposed to the external message, *external* $M = 7.82, SD = 5.90$ vs *non-external* $M = 4.33, SD = 2.19$; $t(24) = 1.87, p = .04, d = 0.79$. Thus, the external message produced acquiescence in low and moderate PJW participants, while a boomerang effect occurred for high PJW participants. This pattern also occurred for Alzheimer’s disease. Namely, while perceived preventability was marginally lower for low PJW participants, *external* $M = 4.56, SD = 2.01$ vs *non-external* $M = 5.60, SD = 3.14$; $t(22) = -1.00, p = .19, d = -0.39$, and also for moderate PJW, *external* $M = 4.72, SD = 2.67$ vs *non-external* $M = 5.31, SD = 3.04$; $t(98) = -0.94, p = .18, d = -0.21$, it was paradoxically higher for high PJW participants, *external* $M = 7.10, SD = 3.65$ vs *non-external* $M = 4.67, SD = 1.84$; $t(24) = 2.03, p = .03, d = 0.84$.

There were no significant just world x message interactions for either of the middle illnesses. In addition, results for AIDS were not significant. However, there was a PJW x internal message interaction for lung cancer ($\beta = .25, p < .05$). As seen in Fig. 1b, this effect mirrored the impact of the external message for unpreventable illnesses. Specifically, high PJW participants exposed to the internal message viewed lung cancer as more preventable, *internal* $M = 17.25, SD = 4.06$ vs *non-internal* $M = 15.83, SD = 5.94$; $t(24) = 0.61, p = .27, d = 0.28$. Moderate PJW participants exposed to the internal message perceived slightly less preventability, though this difference was not significant, *internal* $M = 16.50, SD = 4.30$,

vs *non-internal* $M = 17.15, SD = 3.03$; $t(98) = -0.88, p = .20, d = -0.17$. Low PJW participants exposed to the internal message also perceived less preventability for lung cancer, *internal* $M = 15.13, SD = 6.15$ vs *non-internal* $M = 17.56, SD = 2.30$; $t(22) = -1.42, p = .09, d = -0.53$. Thus, the internal message effect was complimentary to that of the external message in producing acquiescence in high PJW participants, but a marginal boomerang effect for low PJW participants.

Discussion

This study examined how characteristics of individuals and illnesses are relevant to effective use of preventative health messages. Paradoxically, participants with strong justice beliefs reported *greater* preventability for less preventable illnesses when exposed to an *unpreventable* health message. In parallel, participants with low justice beliefs reported *less* preventability for a preventable illness when exposed to a *preventable* message. This finding suggests new directions for theory and research linking effective health communication to social influence processes. Specifically, when compared to research on situational factors, a paucity of research has examined the role of psychological dispositions in social influence (for review see Lucas, Alexander, Firestone, & Baltes, 2006). Thus, our results are important in suggesting that just world beliefs may be linked to both compliant and noncompliant social response to health communication.

One possible interpretation of the presently obtained ‘just world boomerang effect’ is that of a

buffering hypothesis (e.g. Lambert et al., 1999). Namely, while justice beliefs may allow individuals to accept congruent health messages, they also encourage rejection of messages that threaten justice beliefs. Prior theories of social influence have suggested similar motives. Notably, the most popular explanations of boomerang effects usually implicate *reactance*—a motivational state encompassing one's desire to restore a threatened freedom (Brehm, 1966). Similar to a possible justice motive (see Lerner, 2003 for review), reactance theory has posited that embracing oppositional attitudes and behaviors may protect an individual's sense of independence (Brehm & Brehm, 1981). It could be that justice beliefs influence social response through processes or motives that are similar to those posited by reactance theory, or that reactance itself mediates the effect of justice beliefs on health message receptivity. However, we could not empirically address these possibilities in the present research since quantitative measures of threat were not available.

Although researchers have suggested numerous ways to combat boomerang effects (e.g. Silvia, 2005), a paucity of methods incorporate matching psychological dispositions with illness characteristics. In recognizing that justice beliefs play a role in health message receptivity, experts might further enhance their ability to tailor health messages to appropriate people and illnesses. However, additional and important questions require consideration before such practices can be utilized. For example, relatively little is known about the malleability of individual justice beliefs, and this may prove important (e.g. Lucas & Goold, 2008).

Another implication of this research is the need for additional research on the interplay of specific types of justice beliefs and health communication. Our results suggest that it may be beneficial to distinguish between the procedural and distributive content of just world beliefs. However, the reasons for the importance of procedural justice beliefs in the present study are not altogether clear. One possibility is that our health messages were more relevant to procedural than distributive justice concerns. Specifically, to the extent that health behavior can be viewed as an antecedent process along the path to health and illness outcomes, messages that implicate personal action might naturally invoke procedural justice concerns. This interpretation is supported by prior research that has also shown the superior importance of procedural justice beliefs to some health attributions (e.g. Lucas et al., 2007). An interesting direction for future

research might thus be to develop messages that specifically tap distributive justice, and to document any possible or analogous relationships between DJW and message receptivity.

Finally, the present research suggests interesting directions for future research on *unjust* world beliefs. While belief in a just world suggests a need to perceive the world as orderly and fair, belief in an unjust world may encourage a tendency to react in contrast to any fairness rules (Dalbert, Lipkus, Sallay, & Goch, 2001). Our results suggest that low PJW (i.e. unjust) individuals could attempt to protect an unjust world view, similar to high PJW attempts to protect a just world view, by rejecting preventable illness messages. However, because only unidimensional measures of just world beliefs were utilized, this interpretation is limited as illustrating a possible effect of low justice beliefs, and not necessarily belief in an unjust world.

Limitations

Two limitations mandate a conservative interpretation of results. Foremost, our sample was comprised of young college students from relatively advantaged socioeconomic backgrounds. Future studies must consider other groups, especially since just world beliefs, health messages and illness characteristics may interact in unique ways for various cultures and social classes. Second, this study was restricted to a small and somewhat arbitrary set of physical illnesses. Although we attempted to select illnesses that would represent a broad range of perceived preventability, it is possible that different patterns of results would emerge for other illnesses. Related to this is that we observed no effect for AIDS, suggesting that illnesses may be classified by criteria that were not considered here. In spite of these limitations, this research provides an initial step in integrating theoretical and applied issues related to fairness beliefs and preventative health. In general, we suggest that health communication efforts may benefit from recognizing the importance of justice beliefs to preventative health messages, especially since they may interact with message and illness characteristics in ways that could produce unique responses to preventative health campaigns.

References

- Aiken, L. S., & West, S. G. (1991). *Multiple regression: Testing and interpreting interactions*. Los Angeles, CA: SAGE.

- Albrecht, T. L., & Bryant, C. (1996). Advances in segmentation modeling for health communication and social marketing campaigns. *Journal of Health Communication, 1*(1), 65–80.
- Brehm, J. W. (1966). *A theory of psychological reactance*. New York: Academic Press.
- Brehm, S. S., & Brehm, J. W. (1981). *Psychological reactance: A theory of freedom and control*. New York: Academic Press.
- Cho, H., & Salmon, C. T. (2007). Unintended effects of health communication campaigns. *Journal of Communication, 57*(2), 293–317.
- Cohen, J., & Cohen, P. (1983). *Applied multiple regression/correlation analysis for the behavioral sciences*, 2nd edn. Hillsdale, NJ: Lawrence Erlbaum Associates.
- Connors, J., & Heaven, P. (1990). Belief in a just world and attitudes towards AIDS sufferers. *Journal of Social Psychology, 130*(4), 559–560.
- Dalbert, C., Lipkus, I. M., Sallay, H., & Goch, I. (2001). A just and an unjust world: Structure and validity of different world beliefs. *Personality and Individual Differences, 30*(4), 561–577.
- DePalma, M. T., Madey, S. F., Tillman, T. C., & Wheeler, J. (1999). Perceived patient responsibility and belief in a just world affect helping. *Basic and Applied Social Psychology, 21*(2), 131–137.
- Department of Health and Human Services. (2003). *Prevention makes common 'cents'*. <http://aspe.hhs.gov/health/prevention/> (accessed 8 March 2006).
- Dillard, J. P., & Shen, L. (2005). On the nature of reactance and its role in persuasive health communication. *Communication Monographs, 72*(2), 144–168.
- Fetchenhauer, D., Jacobs, G., & Belschak, F. (2005). Belief in a just world, causal attributions, and adjustment to sexual violence. *Social Justice Research, 18*(1), 25–42.
- Furnham, A. (2003). Belief in a just world: Research progress over the past decade. *Personality and Individual Differences, 34*(5), 795–817.
- Hafer, C. L., & Bègue, L. (2005). Experimental research on just-world theory: Problems, developments, and future challenges. *Psychological Bulletin, 131*(1), 128–167.
- Hovland, C. I., Janis, I. L., & Kelly, H. H. (1953). *Communication and persuasion: Psychological studies of opinion change*. New Haven, CT: Yale University Press.
- Lambert, A. J., Burroughs, T., & Nguyen, T. (1999). Perceptions of risk and the buffering hypothesis: The role of just world beliefs and right wing authoritarianism. *Personality and Social Psychology Bulletin, 25*(6), 643–656.
- Lerner, M. J. (1980). *The belief in a just world: A fundamental delusion*. New York: Plenum Press.
- Lerner, M. J. (2003). The justice motive: Where social psychologists found it, how they lost it, and why they might not find it again. *Personality and Social Psychology Review, 7*(4), 388–399.
- Leventhal, H., Benyamini, Y., & Shafer, C. (2007). Lay beliefs about health and illness. In S. Ayers, A. Baum, C. McManus, S. Newman, K. Wallston, J. Weinman, & R. West (Eds.), *Cambridge handbook of psychology, health and medicine* (2nd edn, pp. 124–128). Cambridge: Cambridge University Press.
- Lucas, T. (2008). Justifying outcomes versus processes: Procedural and distributive just world beliefs as predictors of positive and negative affect. Manuscript submitted for publication (copy on file with author).
- Lucas, T., Alexander, S. A., Firestone, I. J., & Baltes, B. B. (2006). Self efficacy and independence from social influence: Discovery of an efficacy-difficulty effect. *Social Influence, 1*(1), 58–80.
- Lucas, T., Alexander, S., Firestone, I. J., & LeBreton, J. M. (2007). Development and initial validation of a procedural and distributive just world measure. *Personality and Individual Differences, 43*(1), 71–82.
- Lucas, T., Alexander S., Firestone, I. J., & LeBreton, J. M. (in press). Just world beliefs, perceived stress, and health behavior: The impact of a procedurally just world. *Psychology & Health*.
- Lucas, T., & Goold, S. (2008). The malleability of belief in a just world: Evidence from a health resource allocation exercise. *Psychology Journal, 5*(1), 92–104.
- Lucas, T., Lakey, B., Alexander, S., & Arnetz, B. B. (in press). Individuals and illnesses as sources of perceived preventability. *Psychology, Health & Medicine*.
- Mokdad, A. H., Marks, J. S., Stroup, D. F., & Gerberding, J. L. (2004). Actual causes of death in the United States. *Journal of the American Medical Association, 291*(10), 1238–1245.
- Mokdad, A. H., Marks, J. S., Stroup, D. F., & Gerberding, J. L. (2005). Correction: Actual causes of death in the United States. *Journal of the American Medical Association, 293*(3), 293–294.
- Ouellette, S. C., & DiPlacido, J. (2001). Personality's role in the protection and enhancement of health: Where the research has been, where it is stuck, how it might move. In A. Baum, T. A. Revenson, & J. Singer (Eds.), *Handbook of health psychology* (pp. 175–194). Hillsdale, NJ: Lawrence Erlbaum Associates.
- Ringold, D. J. (2002). Boomerang effect: In response to public health interventions: Some unintended consequences in the alcoholic beverage market. *Journal of Consumer Policy, 25*(1), 27–63.
- Rothman, A. J., & Salovey, P. (1997). Shaping perceptions to motivate healthy behavior: The role of message framing. *Psychological Bulletin, 121*(1), 3–19.
- Rothman, A. J., Salovey, P., Turvey, C., & Fishkin, S. A. (2003). Attributions of responsibility and persuasion: Increasing mammography utilization in women over 40 with an internally oriented message. In P. Salovey & A. J. Rothman (Eds.), *Social psychology of health: Key readings in social psychology* (pp. 261–271). New York: Psychology Press.
- Salovey P., & Rothman, A. J. (2003). Social psychology of health: Key readings in social psychology: An overview. In P. Salovey & A. J. Rothman (Eds.), *Social psychology of health: Key readings in social psychology* (pp. 1–4). New York: Psychology Press.

- Salovey, P., Rothman, A. J., & Rodin, J. (1998). Health behavior. In D. T. Gilbert, S. T. Fiske, & G. Lindzey (Eds.), *The handbook of social psychology* (4th edn, vol. 2, pp. 633–683). Boston, MA: McGraw-Hill.
- Silvia, P. J. (2005). Deflecting reactance: The role of similarity in increasing compliance and reducing resistance. *Basic and Applied Social Psychology*, 27(3), 277–284.
- Tyler, T. R., & Smith, H. J. (1998). Social justice and social movements. In D. T. Gilbert, S. T. Fiske, & G. Lindzey (Eds.), *The handbook of social psychology* (4th edn, vol. 2, pp. 595–629). Boston, MA: McGraw-Hill.
- Visser, M. J., Makin, J. D., & Lehobye, K. (2006). Stigmatizing attitudes of the community towards people living with AIDS. *Journal of Community and Applied Social Psychology*, 16(1), 42–58.
-

Author biographies

TODD LUCAS is a social and health psychologist. He is an assistant professor in the Division of Occupational and Environmental Health, Department of Family Medicine and Public Health Sciences at Wayne State University (Detroit, MI). His research interests encompass psychosocial and environmental determinants of stress and health behavior.

SHELDON ALEXANDER is a social psychologist and professor emeritus in the Department of Psychology at Wayne State University (Detroit, MI). His past and ongoing research interests include the social psychology of justice and fairness.

IRA FIRESTONE is a social psychologist and professor in the Department of Psychology at Wayne State University (Detroit, MI). His research interests encompass attitudes and the relation of belief and knowledge to action.

JAMES M. LEBRETON is an industrial/organizational psychologist and an associate professor in the Department of Psychological Sciences at Purdue University (West Lafayette, IN). His research interests encompass personality assessment and organizational behavior.
