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Effects of Humor on Presence and Recall of Persuasive Messages

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This investigation examined how exposure to a humorous persuasive message affects antecedents of presence (i.e., the sensation of being "in" a mediated environment) facilitating message recall. Participants in an experimental study viewed either a humorous or non-humorous version of an alcohol public service announcement and then completed measures of positive emotion, perceived credibility, psychological reactance, presence, and message recall. As predicted, positive emotion was related to an increase in perceived credibility and a decrease in reactance. Increased perceived credibility was associated with greater feelings of presence, negatively affecting recognition memory. These findings suggest that presence may sometimes impede persuasive message recall, although not necessarily to the detriment of attitude change.

Keywords: Health Communication; Persuasion; Presence

The recent emergence of virtual reality and other immersive technologies has led many to consider how the concept of *presence*, "the perceptual illusion of nonmediation" (Lombard & Ditton, 1997), affects outcomes of media exposure. A substantial body of literature on presence has already accumulated and, although there have been some recent disagreements about the precise nature of the concept (David, 2004; Lee, 2004), most conceptualizations share the idea that presence is a psychological state involving some failure to acknowledge the role of technology in an experience (International Society for Presence Research, 2000). Technology's ability to evoke

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presence is thought to depend largely on its capacity to focus a user's attention on media content (Fontaine, 1992). Witmer and Singer (1998) contended that such focus leads users to become *involved* and *immersed* in media environments—two psychological states said to embody the essence of presence.

It is generally agreed that presence has multiple dimensions, the most prominent of which are *telepresence–spatial presence*, or feeling present *in* a media environment (Steuer, 1995), and *social presence*, or feeling present *with* a mediated other (Biocca, Harms, & Burgoon, 2003). Although interest in presence has primarily been driven by the emergence of new media technologies, the concept has considerable potential to advance understandings of traditional media as well because it addresses the complex differences in ways users experience media (Tamborini, 2000). As such, presence has the potential to inform the study of *any* mediated messages, including those communicated through non-interactive media, such as television.

Despite substantial recent progress in our understanding of presence, much remains to be discovered about how the concept relates to prominent variables in the study of communication. Of central interest in this investigation is the relationship between presence and persuasive message variables. Does the experience of presence affect responses to persuasive communication? In their seminal explication of presence, Lombard and Ditton (1997) suggested that presence may enhance persuasion. Scholars have recently begun to investigate the relationship between presence and persuasion (e.g., Li, Daugherty, & Biocca, 2002; Skalski & Tamborini, 2007), but few have done this from the perspective of familiar variables in the persuasion literature.

This research examines how several common persuasive message variables—positive emotion, message credibility, message reactance, and recognition memory—influence presence and persuasion. It presents the results of an experiment manipulating humor in a persuasive public service announcement (PSA), and predicts that positive emotion resulting from humor exposure will influence credibility and reactance responses affecting presence and the subsequent recall of message content.

Humor and Persuasion

The effectiveness of humor as a persuasive message strategy has received considerable attention from scholars, particularly in the area of advertising (e.g., Alden, Mukherjee, & Hoyer, 2000; Chattopadhyay & Basu, 1990; Shabbir & Thwaites, 2007; Speck, 1991; Spotts, Weinberger, & Parsons, 1997; Weinberger & Spotts, 1989). A recent meta-analysis of this literature by Eisend (2009) found that humor in advertising significantly enhances positive affect and attention. In an earlier review, Weinberger and Gulas (1992) concluded that humorous messages generally do not harm comprehension and almost always attract attention. This makes them particularly valuable in PSAs and other campaign messages appearing in today's cluttered media landscape. Although humor does not appear to offer a significant advantage over non-humor at increasing persuasion, some studies have found a positive relationship, and

Weinberger and Gulas pointed out that these effects were qualified by variables such as gender and the nature of the product or event being promoted. This highlights the utility of considering mediating and moderating variables in research examining humor effects on persuasion, and this study looks at several such variables—most notably, presence.

Humor and Presence

The relationship between humor and presence has received little attention, but there is reason to expect that humor may intensify feelings of being present in a media environment based on its potential to influence several antecedents of presence. This logic is based on the simple premise that humor facilitates amusement—a positive emotion (Lazarus, 1991). Two things are expected to result from this. First, positive emotion is predicted to increase perceived credibility. Second, in line with experimental research by Berkowitz (1973), the type of positive emotion resulting from humor is predicted to reduce *psychological reactance*—a motivational state characterized by attempts to restore personal freedom in response to a persuasive message by adopting a position counter to the advocated one (Brehm, 1966).

In both cases, positive emotion is held capable of distracting attention in a manner that could reduce forms of cognitive elaboration that might influence credibility and reactance. This reasoning is consistent with Slater's (2002) Extended Elaboration Likelihood Model logic, wherein he argued that the type of positive hedonic processing that arises from engrossing media exposure is incompatible with counter-arguing and message elaboration. With less elaboration, internally generated challenges to message credibility should be fewer and, as such, perceived credibility is predicted to increase. This is true particularly with entertaining media where audience identification with media characters is likely to be strong, in which case the persuasive benefits from argument strength become irrelevant (Slater, 2002).[1] At the same time, we should expect reductions in counter-arguing to inhibit psychological reactance almost by definition.

The influence of positive emotion on presence continues from this point as a function of perceived credibility and reactance. In simple terms, positive affect should draw receivers into the experience and increase feelings of presence, whereas negative affect is expected to push them away and decrease presence. This is relevant for relationships of both psychological reactance and perceived credibility with presence. The influence of psychological reactance on presence is expected to occur through two routes. The first is a direct relationship between psychological reactance and presence, which is accounted for through an understanding of negative emotion and the message elaboration logic already advanced.

We construe psychological reactance as a form of negative message elaboration, characterized by counter-arguing and a profusion of negative thoughts about message attributes. Research on the frequency of source-related thoughts and presence in persuasive media settings demonstrates that diminished presence is

associated with increased negative thoughts and decreased positive thoughts (Skalski & Tamborini, 2007), which is precisely the pattern expected when reactance is high. When reactance occurs, a person develops an intense single-mindedness in response to the feeling that freedoms are being threatened (Burgoon, Alvaro, Grandpre, & Voloudakis, 2002), and this acts as a barrier against persuasion. Although such an ''intense feeling'' might seem consistent with being engrossed in a manner earlier identified as denoting presence, the engagement associated with increased psychological reactance should deter identification, not generate it. It should draw attention away from feeling with a message or source and toward the elaboration of counter-arguments. This reasoning is consistent with Worchel and Brehm's (1970) account of how psychological reactance can explain change in message receivers away from an advocated position. The broader sensation of feeling ''in'' a location or ''with'' another should be minimized by the need to distance oneself from the person or message being resisted. Hence, reactance is expected to directly *detract* from presence.

The second route through which psychological reactance is expected to impede presence is indirect, through its influence on credibility. Burgoon et al. (2002) contended that psychological reactance theory provides a strong foundation for examining the persuasive influence of source credibility and other message variables applied in a public health context. They argued that reactance to a PSA is more likely in this context because receivers are liable to perceive an intent to persuade—perceptions expected to produce source and message derogation. White (1959) suggested that the apparent intent to persuade can be felt as a strong threat to freedom. Accordingly, psychological reactance in persuasive health messages is predicted to reduce message credibility. However, certain message strategies can curtail feelings of authoritative control and reduce the likelihood that a ''reject all authorities'' heuristic will be used to generate such source derogation (Burgoon et al., 2002). One such strategy is humor, where diminished reactance and its associated influence on source credibility are anticipated from the positive emotion humor creates.

Subsequent to this, credibility is expected to strengthen feelings of presence. The increased trust and liking generally associated with perceived credibility helps account for the expected influence of perceived credibility on presence. Trust and liking should reduce counter-arguing and the type of negative cognitive elaboration said earlier to interfere with presence. As such, the positive effect from perceived credibility is expected to facilitate feelings of presence; whereas, by contrast, reduced credibility should encourage receivers to distance themselves from a message or message provider.

Recent evidence supports the predicted link between presence and perceptions of credibility. Bracken (2003) found the immersion dimension of presence to be positively related to perceived source credibility. In a related study, Gunther (1992) found a positive association between involvement and source credibility. If these core dimensions of presence (Witmer & Singer, 1998) are associated with perceptions of source credibility, there is reason to expect that this will extend to perceived message credibility as well. In general, involvement and immersion should operate in the same manner regardless of whether they are associated with source

or message attributes. Moreover, there is a natural overlap between the two types of credibility. If a message is perceived as credible, this is likely due in part to perceptions of the credibility of the message source.

Presence and Recognition Memory

Presence is expected to influence the accurate and inaccurate recall of information in a persuasive message. The limited research on presence and recall is mixed. Kim and Biocca (1997) argued that presence can increase accurate recall by minimizing distractions from the unmediated environment and focusing the receiver on the message. By contrast, Skalski and Tamborini (2004) found evidence that presence can promote inaccurate recall related to false receiver beliefs not contained in a persuasive message but commonly held as true—forms of misconceived recall defined as ''typical belief false alarms.'' Their research examined how presence can influence cognitive responses to message features that distinguish memory along different dimensions of recall, and it forms the foundation for the predictions in our study, which are fully represented in the model depicted in Figure 1.

Whereas a simple understanding of presence and persuasive message recall might lead one to predict that feeling *involved* and *immersed* in a message environment should facilitate message recall and related persuasive outcomes, close consideration of message processes expected in these circumstances produces a multifaceted set of predictions that varies as a function of message features and outcomes considered. This study looks at humor-induced presence and three different elements of message recall: message hits (i.e., the accurate recognition of information contained in the persuasive message), typical belief false alarms (i.e., inaccurate recognition of commonly held false beliefs about the persuasion topic), and message-relevant false alarms (i.e., inaccurate recognition of information that is factual, but not contained in the persuasive message). Overall, humor-induced presence is expected to interfere with the accurate recall of information. Specifically, the hypothesized model predicts that presence will decrease message hits and increase both typical belief false alarms and message-related false alarms.

The rationale for these predicted paths is based on the research by Skalski and Tamborini (2007) and message elaboration logic (Slater, 2002). Skalski and

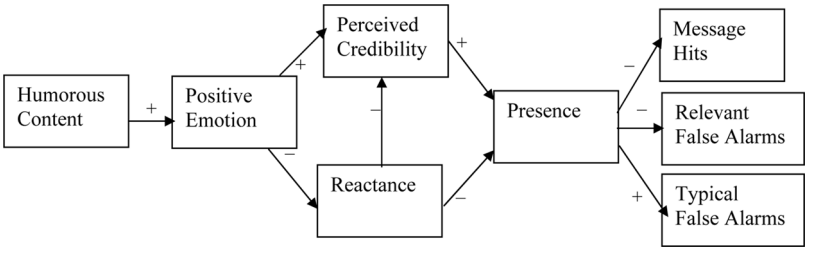

Figure 1 Model of Hypothesized Relationships. Path signs show model predictions.

Tamborini (2007) suggested that presence is strongly associated with heuristic processing for an attractive message source (but not an unattractive source). This is consistent with our basic belief that positive affect (but not negative affect) draws us into a media environment. Once drawn in, people tend to heuristically process the message. Our model represents this by showing that positive emotion will induce positive perceptions of the message and its source (represented here in perceived credibility) and subsequently experienced presence. Because presence is expected to stimulate heuristic processing of the persuasive message, message recall is expected to vary as a function of these processes.

Whereas systematic processing is understood as the type of careful contemplation and message elaboration that might produce accurate recall of the information contained in a persuasive message, heuristic processing is expected to focus attention on peripheral message cues (Skalski & Tamborini, 2007), resulting in judgments that rely more on previously held knowledge and beliefs than the strength of the argument made. We reason that reliance on such beliefs, along with the type of reduced message elaboration suggested by Slater (2002), should lead to recall errors that are consistent with those beliefs. This prediction is consistent with Skalski and Tamborini's (2004) work, and is represented in our model as a positive path from presence to typical belief false alarms. Although no prior research informs our predictions for the other two message recall outcomes, similar logic for these paths is based on our understanding of heuristic processing. Attention to heuristic cues should fail to increase (and may even interfere with) accurate recall of the facts in the message. This is represented in the model as the negative path from presence to message hits and the positive path from presence to message-related false alarms.

Method

Overview

This study employed an experimental research design with a manipulation of humor. The measured variables in this study included positive emotion, credibility, reactance, presence, and three types of recognition memory: hits, message-related false alarms, and typical belief false alarms. All variables were measured after participants watched one of two versions of a PSA on alcohol consumption (humorous or non-humorous) created for this research.

Participants

After receiving a human subjects review, 58 students enrolled in an undergraduate media arts course were recruited for this study. They were voluntary participants and did not receive credit. The sample was 81.4% male, and had a mean age of 20.8 years ($SD = 1.89$). This sample was appropriate for the study, as the heaviest consumption of alcohol on this campus is done by men under 21 years of age.

Procedures

Creation of the message. The PSAs produced for the research project were created to influence college students about the rate of alcohol consumption on campus. A game-show format was used with "Drinking Statistics" as the topic of a program entitled, *College Quiz Show*. The program was similar to the popular game show *Jeopardy!*® The host asked three contestants questions relating to normative drinking behaviors for students, and the contestants buzzed in with answers to a series of three questions. In each case, one or two contestants answered incorrectly. For the humorous version of the PSA, sarcastic chastising comments by the host were edited in as the source of humor. These comments were directed at the contestants who answered incorrectly. More important, this was the only difference between the two PSA versions; otherwise, they were identical and included the exact same footage. Each PSA was approximately 1-min in length.

Pretest. The two versions of the PSA were first pre-tested to determine if the spots were, in fact, significantly different in the positive emotion they created. Before the pre-test, the spot was shown to a test group ($N = 59$) of communication students. The main feedback from those students indicated that the extremely fast pacing of the spot made it difficult to hear all the dialogue in one viewing. The rapid pace was intentional, as there was a fear the target audience might be sensitized to the spot after one viewing. After a second viewing, the students reported that they understood the dialogue more fully. For this reason, the PSA was shown twice in the pre-test, which involved 42 communication students (90% of whom were female). Presenting a message twice to the target audience is a common method in theater testing (Atkin, 2001). The scale used to measure positive emotion is described later. The pre-testing indicated that the two spots were perceived as significantly different in the level of positive emotion they created—$t(40) = 2.39$, $p < .03$—with the humorous tape ($M = 4.48$) scoring higher than the non-humorous tape ($M = 3.82$). In addition, the mean of the humorous tape was significantly above the mean of the midpoint of the positive emotion scale, $t(21) = 2.3$, $p < .04$. As a result, the pre-test was deemed successful, and the two tapes formed part of the stimulus materials in the main experiment.

Main experiment. For the actual experiment, two different groups of respondents were employed. One group viewed the humorous version of the PSA twice, and then a 3-min piece titled, "Demystify Yoga" (also produced by a student). The other group viewed the non-humorous version twice, followed by the same 3-min yoga video that served as a distraction stimulus to achieve a more realistic memory measure in both conditions. After the 3-min video, both groups were given assessment scales to measure presence, message credibility, positive emotion, reactance, memory of the PSA, and demographic information.

Instrumentation. The measures of positive emotion, credibility, and reactance were comprised of 7-point, Likert-type items on a scale ranging from 1 (*very strongly disagree*) to 7 (*very strongly agree*), and were scored such that higher scores indicated

greater perceptions of the construct being measured (alternate measurements are discussed in detail where necessary). Given that specific items were specified *a priori* to measure only one factor, confirmatory factor analysis was employed to test the measurement model (Hunter & Gerbing, 1982). The data were found to be consistent with the proposed factors. Internal consistency tests showed that the errors calculated among items measuring the same construct were within sampling error. Likewise, the parallelism test indicated that the errors calculated among items measuring different constructs also were within sampling error.

To measure presence, a pictorial Self-Assessment Manikin (SAM) scale was used. This measure (explained in more detail later) consisted of a series of five pictures representing a continuum from "low presence" to "high presence." Respondents were asked to circle the picture that best represented how they felt, and responses were scored such that pictures representing greater levels of presence were assigned higher numeric values. Thus, higher numbers represented greater perceptions of presence. Although SAM measures are new to presence research, recent work suggests that SAM presence scaling successfully taps the construct (Schneider, Lang, Shin, & Bradley, 2004; see Table 1 for all variable means and standard deviations).

Measurement

Positive emotion. Six items were used to measure positive emotion such as, "I thought that the PSA was amusing," "I felt this PSA was entertaining," and "I found myself smiling while watching this PSA." Alpha reliability of this scale was .91.

Perceived credibility. Seven items were used to measure perceived credibility including, "I felt that the message sender in the PSA was credible," "I felt the message sender in the PSA was knowledgeable," and "I felt that the message sender in the PSA was reliable." This scale achieved Alpha reliability of .87.

Table 1 Correlations Among Means, Standard Deviations, and Ranges of Study Variables

Variable	1	2	3	4	5	6	7
1. Presence	—						
2. Positive emotion	0.13	—					
3. Perceived message credibility	0.32*	0.65*	—				
4. Message reactance	−0.26*	−0.40*	−0.55*	—			
5. Recognition memory hits	−0.20	0.11	0.00	−0.06	—		
6. Typical belief false alarms	0.30*	−0.16	0.02	−0.01	−0.21	—	
7. Message-relevant false alarms	0.16	0.10	0.12	−0.04	−0.13	0.38*	—
M	2.95	4.49	4.28	3.15	0.88	0.10	0.14
SD	1.01	1.32	1.07	1.02	0.21	0.18	0.13
Range	1–5	1–7	1–7	1–7	0–1	0–1	0–1

*$p < .05$.

Reactance. Six items measured reactance. The six reactance items were adapted from the modified Hong Psychological Reactance Scale (Hong & Faedda, 1996) by removing some items for the sake of brevity and by changing the wording slightly on included items to reflect experience with the PSA rather than situations in general. It included items such as, ''I felt resistance toward the PSA because it was designed to influence me,'' ''I was frustrated that the PSA suggested that I am unable to make free and independent decisions,'' and ''I considered the advice from the PSA to be an intrusion.'' The reactance scale had an alpha reliability of .82.

Presence. A SAM scale was used to measure presence (Schneider, Lang, Shin, & Bradley, 2004). The scale consists of pictures showing a human figure getting closer and closer to a TV until being completely enveloped by the device. The picture of the figure completely in the device represents ''highest level of presence'' (scored 5). Moving away from this endpoint, the remaining four items count downward to ''lowest level of presence'' (scored 1).

Memory recognition. In addition to the Likert-type scales, there were 15 items intended to determine memory recognition. The items consisted of three types. Five items were facts presented in the PSA. In addition to items presented in the PSA, there were ten items not presented in the PSA. Five of these items were messages contained in the same campaign, but not the PSA, called message-related false alarms; and five items were false assumptions that are typical beliefs about alcohol consumption on campus taken from a survey by the Institute for Social Science Research at Michigan State University. Respondents were asked to identify whether these items actually were presented in the PSA. Items correctly identified that did, in fact, appear in the PSA were defined as ''hits.'' Items incorrectly identified that did not appear in the PSA were defined as ''false alarms.'' As discussed earlier, two types of false alarms were possible: message-relevant and typical belief false alarms.

Results

Manipulation Check

The positive emotion scale was analyzed to perform a manipulation check that the two PSAs were significantly different in the positive emotion they created. In the main experiment, respondents viewing the humorous PSA scored higher on the positive emotion scale ($M = 5.02$) than those viewing the non-humorous PSA ($M = 3.93$), $t(55) = 3.4$, $p < .001$. Thus, participants did perceive the two PSAs to be significantly different in terms of the positive emotion they created.

Evaluation of Hypothesized Model

Path analysis was performed on the hypothesized model using the least squares method. This involves estimating the sizes of the model parameters and testing the overall model fit. Parameter size was estimated by regressing each endogenous

variable onto its causal antecedent, and model fit was tested by comparing estimated parameter sizes to the reproduced correlations (for a complete description of this analysis procedure, see Hunter & Gerbing, 1982). In short, a model that is consistent with the data is one that (a) has substantial path coefficients, (b) has differences between parameter estimates and reproduced correlations (errors) that are no greater than what would be expected through sampling error, and (c) passes tests of overall model fit. Goodness of fit was initially indicated by a nonsignificant, chi-square result. In addition, to address problems often apparent with sample sizes below 250, both the standardized root mean squared residual (SRMR) and comparative fit index (CFI) were reported (Holbert & Stephenson, 2002). SRMR values close to .08 and CFI values above .90 (Hu & Bentler, 1999) are considered representative of a well-fitting model. Because the impetus behind this research was to examine the effects of persuasion variables and presence on message recall, the first thing looked for in each model was a substantial path from positive emotion to recognition memory. A model without a continuous path from positive emotion to recognition memory is incapable of showing support for the logic underlying this study. The second two tests were performed only where evidence of an uninterrupted path was observed.

The results for the hypothesized model are shown in Figure 2, and the correlations used to test the model are shown in Table 1. The model shows that, although most observations were consistent with expectations, the predicted model did not meet the three criteria established to determine if the model was consistent with the data. Although it passed the test of overall model fit and had mostly significant path coefficients, the chain of significant links needed for the model to be supported was broken at the paths from perceived credibility to presence (path coefficient = .27) and reactance to presence (path coefficient = −.11), both of which were nonsignificant. Therefore, this model was rejected.

While the hypothesized model failed to produce the type of evidence needed to conclude that the data provide a good overall fit, the outcomes observed show patterns in line with the underlying logic for the model. In this regard, we are hesitant to dismiss the hypothesized model as completely uninformative. Keeping in mind the problems endemic in the use of path analysis for testing non-hypothesized models, *post-hoc* analyses were conducted to test a revised model with a single change—the removal of the path from reactance to presence. This change was made because of the relative weakness of this path compared to the other paths up to that point in

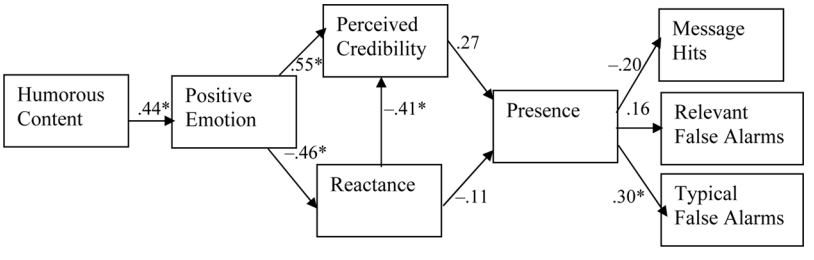

Figure 2 Results for Original Hypothesized Model. $^{*}p < .05$; $\chi^2(19, N = 57) = 11.94$, $p = .888$.

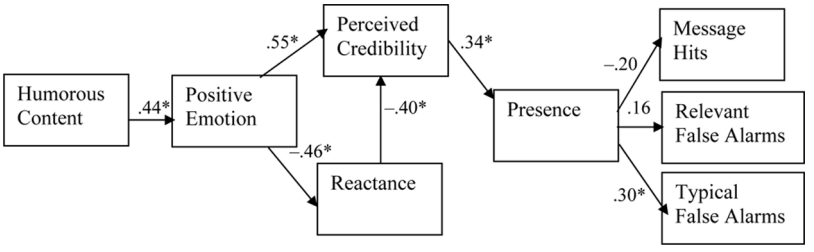

Figure 3 Results for Revised Model. $^{*}p < .05$; $\chi^2(20, N = 57) = 11.94$, $p = .918$; standardized root mean squared residual = .11; comparative fit index = .94.

the causal chain, as well as the already established, substantial relationship between reactance and perceived credibility (path coefficient = −.41). Furthermore, this new model was deemed to be consistent with the original study logic because it would still include an indirect link from reactance to presence mediated by perceived credibility.

The slight change of removing the path from reactance to presence resulted in a much stronger overall model, as shown in Figure 3. The initiating path from humor to positive emotion was significant (path coefficient = .44), $p(.20 < \rho < .68) = .95$—showing further support for a successful manipulation. Positive emotion had a positive effect on perceived credibility (path coefficient = .55), $p(.31 < \rho < .79) = .95$; and a negative effect on reactance (path coefficient = −.46), $p(-.72 < \rho < -.20) = .95$, both as expected. Reactance related negatively to perceived credibility (path coefficient = −.40), $p(-.68 < \rho < -.12) = .95$; and perceived credibility had a positive effect on presence (path coefficient of .34), $p(.08 < \rho < .60) = .95$, again as expected. Although presence did not relate significantly to all three types of recognition memory measures, it had a significant, positive effect on typical belief false alarms (path coefficient = .30), $p(.06 < \rho < .54) = .95$. Thus, a significant, unbroken chain was established from the humor manipulation to message recall, consistent with the rationale for this study.

This model fared well on the second and third model evaluation tests. The differences between predicted and obtained correlations for all unconstrained bivariate relationships were examined, and none were significantly different than what would be expected through sampling error. Furthermore, this model passed the chi-square global test of goodness of fit, $\chi^2(20, N = 57) = 11.94$, $p = .918$, and had values on the additional tests consistent with a well-fitting model. The SRMR test was close to the recommended .08 (SRMR = .11), and the CFI was above .90 (CFI = .94), both suggesting acceptable model fit. Thus, analysis of this model shows several substantial path coefficients, no significant errors, and passed global goodness-of-fit tests.

Discussion

This study set out to examine the effect of humor-induced presence on the recall of persuasive messages and the processes leading to this outcome. Rudimentary conceptions of presence argue that an increased sense of involvement with a message

environment will unilaterally advance all aspects of information processing and persuasion. In contrast to this notion, our study presented a model based on the premise that presence effects will vary according to the message features and outcomes considered. The findings of our study on humor and the recall of message content was consistent with predictions that humor-induced presence can interfere with the accurate recall of information. In showing this, we hope to focus the attention of persuasion and presence researchers on the capacity of presence to impede recall, and the potential for this to hinder persuasive results. We discuss our findings both in terms of their implications for current understandings of the relationship among humor, presence, and persuasive message processing, as well as their implications for users of future presence-inducing technologies.

Humor-Induced Presence and Persuasive Recall

The implications of this study's findings can be understood on several levels. At the most basic level, the findings support a proposed model suggesting that humor affects reactance and perceived credibility in a manner that stimulates feelings of presence and alters the subsequent recall of persuasive messages. For the most part, the model was supported and the findings were consistent with the study logic. In line with expectations, the use of humor in a PSA increased positive emotion. Positive emotion predicted diminished psychological reactance. It also predicted increased perceived credibility, both directly and indirectly through the negative influence of reactance on credibility. Subsequent to this, perceived credibility predicted heightened presence; and, although reactance did not affect presence directly, as was expected, it did affect presence indirectly through its negative relationship with perceived credibility. Finally, presence increased one important type of recognition memory error—typical belief false alarms.

Support for our model is valuable for several reasons. First, it demonstrates the potential for humor in persuasive media messages to minimize psychological reactance, heighten perceived credibility, and promote feelings of presence associated with the message environment. These findings add to the growing literature on the antecedents of presence, and show the potential for presence to be stimulated by humor and its correlates. Notably, our study's indication that message factors can influence presence touches on neglected areas of presence research, which has mostly focused on how presence is shaped by features of technology, such as vividness and interactivity. Our study suggests that contextual features that sway credibility and provoke psychological reactance, such as humor, can intercede in technology's ability to stimulate feelings of presence. When individuals feel positive emotion in response to humor, psychological processes mitigating the experience of presence are minimized, allowing feelings of presence to increase.

In addition to this study's value in uncovering antecedents of presence, it also informs us about outcomes of presence, indicating that humor-induced presence can alter the recall of persuasive messages in predictable manners. Perhaps unexpectedly to some, our findings suggest that presence did little to further the accurate recall

of persuasive arguments. Instead, presence was found to increase only typical belief false alarms, a result of considerable concern to message producers by itself. Moreover, we should not completely disregard the patterns observed for the other recall variables. Both were consistent with the model's predictions that humor-induced presence would minimize the systematic processing of message content and increase recall errors.

Does Presence Help or Hinder Persuasion?

At a different level, the implications of this study can be considered in terms of the logic underlying the model's predictions and a very practical question: Does presence increase or decrease the effectiveness of persuasive messages? At the heart of this discussion are issues concerning whether presence generally (and humor-induced presence in particular) increases or decreases message elaboration. Slater's (2002) claim that engaging media are incompatible with counter-arguing and message elaboration conforms to beliefs that presence decreases message elaboration. Skalski and Tamborini's (2007) observation that presence is positively associated with heuristic processing also substantiates this notion. Although this study does not measure message elaboration directly, the findings are consistent with this view.

If presence does decrease elaboration, the implications of this for the effect of persuasive messages are substantial. Consider, for example, what this means for the influence of strong and weak messages. If presence promotes message elaboration we would expect persuasive outcomes to benefit from argument strength. By contrast, if presence reduces message elaboration, argument strength should have little influence on persuasive outcomes. Instead, greater influence should come from other attributes of the message, receiver, or the environment. Simple heuristics and prior beliefs should take on greater import. Petty, Priester, and Brinol (2002) asserted that in situations where elaboration is minimal, a variety of heuristic cues can influence attitude change without issue-relevant thinking. These heuristics include attributes of source credibility such as likeability and expertise, the consensus of others, and the mere number of arguments or length of a message. The influence of these heuristics is considered particularly important when people are unmotivated or unable to elaborate.

In this regard, we should note that the inaccurate recall of relevant false alarm and typical false alarm messages in our study does not mean that the intended persuasive influence of related information was necessarily mitigated. For example, although it is possible that typical belief false alarms might signify counter-arguing with claims in the PSA (because they show overestimates of student alcohol consumption patterns in contrast with message claims), conceivably, these inaccuracies could denote recall distortions in line with the persuasive intent of the message. For example, if the facts erroneously recalled by the respondent are understood as consistent with the position set forth in the message, then an increase in typical belief false alarms might indicate greater acceptance of the advocated position. The message in our study tried to reduce drinking by conveying the fact that normative alcohol consumption rates were lower than what most respondents might think. Even if it was erroneous,

participants' recall that the typical belief false alarms were contained in the message might not represent misinterpretation of the message's intent to reduce drinking. Instead, it might indicate inaccurate memory of how the message tried to reduce drinking, such as erroneously recalling the message claiming that too many students drink too much, too often, and too fast, often at tailgates, and they do not keep track of how much they drink while they do. All of these inaccuracies should work in favor of the message's persuasive intent, especially in the type of situation found here where reactance is low and credibility is high.

Although not directly addressed by these data, an argument can be made that the type of heuristic processing expected to accompany humor-induced presence is superior to alternative forms of systematic processing and message elaboration in its ability to produce attitude change, perhaps even under circumstances where recall accuracy is inhibited. Moreover, the superiority of this humor-induced processing should be found with the most challenging members of an audience, those who disagree with the message. Support for this argument can be derived from Slater's (2002) comparison of statistical and anecdotal evidence. Slater contended that statistical evidence is superior to anecdotal evidence for reinforcing the beliefs of those already inclined to believe a message; however, among those who disagree with the message, statistical evidence is used to generate counter-arguments that can impede attitude change. In our case, statistical evidence is comparable to information whose influence is achieved through systematic processing and careful elaboration, whereas the effect of anecdotal evidence is attained through heuristic cues such as source credibility. As such, among those who disagree with the message, the heuristic processing expected with a humorous message should reduce psychological reactance and the elaboration of counter-arguments. Although systematic attention and the accurate recall of persuasive message facts (such as those in this study) would be mitigated by humor and positive emotion, any loss in persuasive effect resulting from reduced message recall should be matched, and perhaps superceded in persuasive effect, by the corresponding reduction in generated counter-arguments.

If our speculation is true, we need to pay closer attention to how cognitive processes related to humor-induced presence can influence persuasion, and how these processes can be used to achieve persuasive goals. Burgoon et al. (2002) maintained that psychological reactance theory is a valuable tool for understanding how source and message variables shape persuasive outcomes, and called for additional research to explain how the processes work and where they are most influential. Our study shows that reactance may play a key role in presence and message recall. It suggests the potential benefits of heuristic cues in messages designed to create humor-induced presence, and raises questions about the potential value of systematic message processing in an entertainment context.

Certainly, we do not argue that systematic processing works toward the detriment of persuasive effect under all circumstances. This would fly in the face of conventional wisdom and existing evidence, particularly evidence showing persuasive outcomes from strong arguments (Todorov, Chaiken, & Henderson, 2002). Instead, we suggest that benefits from systematic processing might typically be absent in

message environments like those often found in media entertainment, and we question if presence can somehow restore these persuasive benefits in these environments. Slater (2002) suggested that engaging narrative (i.e., presence-inducing message content) can promote the systematic processing of message content without eliciting counter-arguments when persuasive messages are seamlessly incorporated into narrative. According to this reasoning, counter-arguing is inhibited when compelling storylines produce identification with characters, resulting in greater persuasive effect. Although no research on this topic exists to our knowledge, future efforts might determine this potential.

Limitations

As with most research, this study has some limitations, three of which are now discussed. First, the paths to message hits and message-relevant false alarms failed to reach significance. It is worth noting that message hits for the sample as a whole were high (88%), and this might indicate that presence did little to interfere with recall in this regard. Conversely, it is also possible that the measure of presence suffered from a ceiling effect. If so, the influence of humor-induced presence might have been limited in this study by the fact that only moderate levels of presence ($M = 2.95$, $SD = 1.01$ on a 1–5 scale) and positive emotion ($M = 4.49$, $SD = 1.32$ on a 1–7 scale) were experienced by our participants. A stronger influence might be expected when presence-inducing experiences are more potent.

Second, although participants in the humorous PSA condition had a significantly higher positive emotion level than those in the control group, the mean level of positive emotion in the humor condition was only slightly above the midpoint of the scale ($M = 5.02$ out of 7). This may simply indicate that the humor induction was not particularly strong. It may also be a function of the yoga video that participants were shown after the PSAs. Although this yoga video was important for helping to ensure valid measures of recall, the additional time between the PSA and posttest measures could have reduced the positive affect of the intervention group or possibly even increased the positive affect of the control group. Either way, this would explain why there was not a larger difference between the two groups.

Third, some potentially important moderating variables were not addressed in this research, such as ethnicity and drinking levels. These were deemed beyond the scope of this research and should not have affected the results of interest due to random assignment to experimental conditions. However, they should be examined in future research to provide a clearer picture about how alcohol PSAs affect different types of message recipients.

Implications for Future Research on Presence

This article extends our understanding of the concept of presence by building on the burgeoning body of literature examining the role of presence in persuasion (Grigorovici, 2003; Kim & Biocca, 1997; Klein, 2001; Li et al., 2002; Skalski &

Tamborini, 2007). It also answers Lombard and Ditton's (1997) call for research on media content and user characteristics facilitating presence, and points toward a more important role for presence in future persuasive media environments.

The effect of presence on persuasion should intensify in response to more vivid and interactive media forms. Recent research suggests that increases in media vividness (Skalski & Tamborini, 2004) and interactivity (Skalski & Tamborini, 2007) relate positively to attitude, intention, and other outcomes of persuasive message exposure. Media vividness, or the extent to which a medium envelops the senses (Steuer, 1995), can be increased through large screen sizes, high resolution imagery (as through high-definition TV), and surround sound. These and other presence-inducing formal features are becoming more common in the new media age. Similarly, the Internet, cell phones, video games, and other interactive technologies make interacting with an environment or source the norm for many popular types of media experiences. Future research on how these types of interactive technologies are associated with message features, such as humor, and user characteristics, such as reactance and credibility, will help us better understand the potential for presence and persuasion in the 21st century. The capacity for presence to affect a multitude of media exposure outcomes is only beginning to be explored, and additional research on presence is vital to our understanding of new media technologies and the individuals who use them.

Note

[1] Slater (2002) also said that the traditional persuasive benefits of source credibility become irrelevant when entertainment strengthens audience identification with media characters. However, the type of traditional benefits from source credibility alluded to by Slater are more consistent with benefits derived from the type of systematic consideration of message attributes characterized by central-route processing, and not the type of heuristic benefit characteristic of peripheral-route processing we are discussing here.

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