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Communication Monographs

ISSN: 0363-7751 (Print) 1479-5787 (Online) Journal homepage: http://www.tandfonline.com/loi/rcmm20

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To cite this article: Kimberly A. Parker, Stephen A. Rains & Bobi Ivanov (2016) Examining the "Blanket of Protection" Conferred by Inoculation: The Effects of Inoculation Messages on the Cross-protection of Related Attitudes, Communication Monographs, 83:1, 49-68, DOI: 10.1080/03637751.2015.1030681

To link to this article: http://dx.doi.org/10.1080/03637751.2015.1030681

Communication Monographs
Vol. 83, No. 1, March 2016, pp. 49–68

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Examining the "Blanket of Protection" Conferred by Inoculation: The Effects of Inoculation Messages on the Cross-protection of Related Attitudes

Kimberly A. Parker, Stephen A. Rains & Bobi Ivanov

Although the effectiveness of inoculation as a strategy for promoting resistance to attitude change is fairly well established, the potential of inoculation messages to offer cross-protection for related, but untreated, attitudes warrants additional attention from scholars. The reported study tested the "blanket of protection" conferred by inoculation. Participants (N = 118) were randomly assigned to read an inoculation message addressing a target topic and subsequently had their attitudes toward three related, but untreated, topics attacked. The results offer some evidence that inoculation messages can confer cross-protection for related attitudes. Participants in the inoculation condition reported greater perceptions of threat, greater counterarguing, and less attitude change in response to attacks than participants in the control condition for two of the three untreated topics. Counterarguing in response to attacks on untreated attitudes appears to be primarily responsible for cross-protection.

Keywords: Inoculation Theory; Attitudes; Attitude Change; Message Sidedness; Persuasion

Resistance to persuasion has been a longstanding topic of interest among scholars studying social influence. Inoculation theory (McGuire, 1961a, 1961b) represents one of the first systematic attempts to understand how individuals' attitudes can be made resistant to change. Using biological inoculation as a metaphor, inoculation theory

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ISSN 0363-7751 (print)/ISSN 1479-5787 (online)
http://dx.doi.org/10.1080/03637751.2015.1030681

offers a strategy for making individuals' attitudes resistant to counter-attitudinal attacks. By forewarning individuals of an impending attack and presenting weakened arguments against an attitude they currently hold, inoculation can foster resistance. The body of research that has accumulated since McGuire's (1961a, 1961b) seminal works have demonstrated the robustness of this theory (Banas & Rains, 2010; Compton, 2013; Compton & Pfau, 2005). Yet, despite its status as the "grandparent theory of resistance to attitude change" (Eagly & Chaiken, 1993, p. 561), there is still much to be learned about inoculation theory.

The present study examines the "blanket of protection" (Pfau, 1997, p. 137) offered by inoculation. In bolstering an attitude about a target topic, inoculation has been argued also to confer resistance on attitudes toward related topics (Compton & Pfau, 2005; Parker, Ivanov, & Compton, 2012). The potential to offer such cross-protection against attacks on related attitudes not addressed by an inoculation message has significant theoretical and practical implications. In developing a health campaign, for example, practitioners using an inoculation message to target a specific pro-health attitude (e.g., benefits of regular exercise) could also help protect-related attitudes (e.g., benefits of eating healthy). Moreover, better understanding the blanket of protection can offer insights about the mechanisms that bring about inoculation and limits of the theory. Determining how inoculation messages confer resistance on related attitudes offers a novel means to evaluate the core mechanisms that make inoculation function.

An experiment was conducted in this project to examine the effects of inoculation on cross-protection. Using several cultural truisms originally studied by McGuire (1961a, 1961b) and McGuire and Papageorgis (1961), the potential of an inoculation message addressing a target attitude to foster resistance to attacks on three related attitudes was investigated. Two possible explanations for cross-protection were also evaluated. Research on inoculation theory and the potential role of cross-protection is reviewed in the following section to provide a foundation for the study hypotheses.

Inoculation Theory and Cross-protection

Inoculation theory was originally developed by McGuire (1961a, 1961b) as a means to protect attitudes from being changed. McGuire reasoned that, just as the human body could be made resistant to viruses, attitudes could be made resistant to attacks through the process of inoculation. Medical inoculation involves a process that begins with exposure to a weakened virus. In response, the body produces antibodies that function to bolster the immune system and, ultimately, become better prepared to defend against the actual virus. In the case of attitudinal inoculation, a weakened argument against an attitude one holds prompts the inoculation process. This weakened argument initiates a process in which individuals develop counter-arguments and become better prepared to defend their attitudes against an actual attack. Contemporary applications of inoculation theory are faithful to the basic process outlined by McGuire, but also typically include an explicit forewarning that one's attitudes could be attacked and offer refutations of the weakened arguments

against the attitude one holds (for reviews, see Compton, 2013; Compton & Pfau, 2005).

Prior research offers robust evidence that inoculation is an effective strategy for promoting resistance. A recent meta-analysis of 41 experiments showed that inoculation was a superior strategy to no-message control conditions in promoting resistance to counter-attitudinal attacks (d = .43; Banas & Rains, 2010). These findings are particularly noteworthy given the number of contexts in which inoculation theory has been applied. Inoculation research can be found in political (Pfau, Kenski, Nitz, & Sorenson, 1990), health (Parker et al., 2012), education (Compton & Pfau, 2008), commercial (Ivanov, Pfau, & Parker, 2009), corporate/public relations (Wan & Pfau, 2004), intercultural (Ivanov, Parker, Miller, & Pfau, 2012), and interpersonal (Sutton, 2011) contexts. Given the support that exists for the basic predictions made by inoculation theory, researchers have turned their attention to exploring some of the nuances of the theory (Compton, 2013; Compton & Pfau, 2005). Scholars have recently examined the potential spread of inoculation in postinoculation talk (Ivanov et al., 2012), implications of psychological reactance for inoculation (Miller et al., 2013), and potential to inoculate against the effects of inoculation (Banas & Miller, 2013). One important nuance that has received relatively little attention is the potential for cross-protection in which an inoculation message promotes resistance to attacks on related but untreated attitudes (Parker et al., 2012).

The roots of cross-protection extend back to research examining the degree to which the content of an inoculation message must correspond to a later counter-attitudinal attack. In one of the earliest inoculation experiments, Papageorgis and McGuire (1961) demonstrated that inoculation messages could protect against counterarguments beyond those specifically addressed in an inoculation message. Participants who received an attack message addressing different counterarguments were not less resistant than participants who received an attack message addressing the exact same arguments as in the inoculation message. This "blanket of protection" (Pfau, 1997, p. 137) is critical to the efficacy of inoculation as a strategy for promoting resistance. If attitudinal inoculation made individuals resistant only to those counterarguments addressed in the inoculation message, then it would require being aware of the exact content of an impending attack to be a useful strategy for promoting resistance. One would need to know the exact arguments contained in an attack to create an effective inoculation message.

Support for cross-protection can be found in previous studies of information processing and persuasion that show how change in one belief can affect related beliefs (e.g., Holt, 1970; McGuire, 1964; Nelson, 1968), as well as the work of Fink and colleagues on the Galileo spatial-linkage model of interattitude structure and dynamics (Dinauer & Fink, 2005; Woelfel & Fink, 1980). Congruent with Hunter and colleagues' research (Hunter, Levine, & Sayers, 1976; Poole & Hunter, 1979) on the hierarchy of internal processes and attitudes, Fink and colleagues (Dinauer & Fink, 2005; Woelfel & Fink, 1980) argued that global or more general attitudes may be linked to less general ones, such that pressure to change exerted on a general attitude

may influence the structure and/or valance of a subordinate attitude. Dinauer and Fink (2005, p. 26) provided a compelling argument and evidence that "it is possible to affect attitudes indirectly," and the position of an attitude in the hierarchy is less important than the psychological spatial closeness among the attitudes. This psychological attitudinal closeness may create pressure on the associative networks to keep the interattitudinal relationships consistent to preserve the current psychological space occupied by each related attitude. As an example, they discussed the possibility of designing health communication messages "that use the existing interattitudinal structure among … concepts to generate attitude change indirectly" (Dinauer & Fink, 2005, p. 27). This can be done by eliciting change in a related attitude to generate change in a target attitude. The same reasoning may be applied generally in the resistance context as well as to inoculation as a specific strategy for promoting resistance. Indeed, evidence from Banas and Rains's (2010) meta-analysis supports the notion that inoculation is equally effective in promoting resistance to novel attacks—as long as the attack addresses the same topic as was involved in the inoculation message.

Returning to the original inoculation metaphor proposed by McGuire (1961a, 1961b), Parker and her colleagues (Parker et al., 2012) noted the existence of cross-protection in medical vaccines in which protection from a single virus can offer protection against related viruses. They argued that, specifically among attitudes in correlated domains, inoculating one attitude should offer some measure of protection for related attitudes. Given prior research showing the interrelationships of attitudes and beliefs and the effects of changing one belief on other related beliefs (e.g., Dinauer & Fink, 2005; Woelfel & Fink, 1980), they argued that bolstering a single attitude should also have the effect of bolstering-related attitudes among individuals motivated to preserve internal consistency among the related attitudes.

Parker and her colleagues (2012) tested the effects of inoculation on cross-protection in the context of two health-related attitudes particularly relevant to young adults. In addition to research demonstrating interrelationships among attitudes (e.g., Dinauer & Fink, 2005; Woelfel & Fink, 1980), they relied on the argument of Krcmar and Greene (2000), who contended that risky sex and excessive drinking combine with other risky behaviors to form a group of risk-taking behaviors. Half of the participants (i.e., inoculation group) in Parker et al.'s (2012) study received an inoculation message bolstering their attitudes toward condom use and half did not receive any message (i.e., control group). Both the inoculation and control groups were subsequently exposed to two messages attacking their attitudes toward unprotected sex and binge drinking (the related but untreated attitude). Participants who received the inoculation message about unprotected sex reported greater counterarguing and stronger anti-binge-drinking attitudes than the control group after reading the message attacking their attitude against binge drinking. The results of Parker et al.'s (2012) research offer initial evidence that inoculation can promote cross-protection.

Hypotheses

Although Parker et al.'s (2012) study makes a valuable contribution to inoculation research by demonstrating the possibility of cross-protection, much remains to be learned. It is critical to establish the effects of cross-protection on more than a single topic and explicitly test possible explanations for this phenomenon. In this project, cross-protection is examined in the context of four related health issues originally studied by McGuire (1961a, 1961b), McGuire and Papageorgis (1961): getting a yearly chest X-ray to detect tuberculosis, the benefits of penicillin to humans, brushing one's teeth after every meal, and visiting one's doctor each year for a routine check-up. Whereas cultural truisms may have changed over the last 50 years, each of these topics is important because it relates to more general attitudes regarding physiological well-being. Getting a chest X-ray, tooth-brushing, and receiving a yearly check-up are all specific behaviors that might be accomplished to prevent or mitigate a health threat, ranging from cavities to tuberculosis. Although penicillin is not a behavior, it is intimately linked with health. Indeed, the primary purpose of penicillin among humans is to respond to an infection caused by bacteria. Further, using these topics (and corresponding study materials) originally developed by McGuire makes it possible to test ideas about cross-protection in the context of original inoculation research. Accordingly, the results of this project will be directly comparable with McGuire's (McGuire, 1961a, 1961b; McGuire & Papageorgis, 1961) seminal inoculation studies.

To test the effects of inoculation on cross-protection, it is important first to demonstrate that an inoculation induction confers resistance against attacks on a target attitude. The merit of getting a chest X-ray to promote early detection of tuberculosis was selected as the target issue. Participants exposed to the inoculation message addressing the merit of X-rays are predicted to perceive greater levels of threat and be more likely to counterargue and less likely to change their attitudes in responses to a counter-attitudinal attack:

> Hypothesis 1: Compared to participants not receiving an inoculation message, participants who receive an inoculation message addressing the use of X-rays for detecting tuberculosis (a) perceive greater levels of threat, (b) are more likely to counterargue, and (c) experience less negative attitude change in response to a message attacking the use of X-rays for detecting tuberculosis.

A second set of hypotheses addresses whether or not inoculation confers cross-protection for related attitudes. If inoculating a target attitude offers protection for related attitudes, as previously argued in the present investigation, then the inoculation message addressing the target topic should also make individuals' attitudes toward related topics more resistant to attack (Parker et al., 2012). Beyond this general outcome, cross-protection should also influence the mechanisms thought to bring about resistance. In particular, an inoculation message should make participants feel that their attitudes toward the related issues might be threatened. Parker et al.'s (2012) study did not evaluate the role of threat. Additionally, an inoculation message about a target topic should make individuals more likely to

counterargue when their attitudes toward related topics are attacked. In sum, it is expected that an inoculation message addressing a target topic makes individuals feel that their attitudes toward related (but untreated) topics might be threatened, makes them more likely to counterargue in response to the attack, and makes their related attitudes more resistant to a counter-attitudinal attack. The following hypotheses are proposed to test the effects of an inoculation message addressing a target topic on threat, counterarguing, and attitude change for three related topics:

> Hypothesis 2: Compared to participants not receiving an inoculation message, participants who receive an inoculation message addressing the use of X-rays for detecting tuberculosis report greater perceived threat to their attitudes about (a) the use of penicillin, (b) frequent tooth brushing, and (c) getting a routine medical check-up.
>
> Hypothesis 3: Compared to participants not receiving an inoculation message, participants who receive an inoculation message addressing the use of X-rays for detecting tuberculosis are more likely to counterargue in response to messages attacking the benefits of (a) penicillin, (b) frequent tooth brushing, and (c) getting a routine medical check-up.
>
> Hypothesis 4: Compared to participants not receiving an inoculation message, participants who receive an inoculation message addressing the use of X-rays for detecting tuberculosis report less (negative) attitude change in response to messages attacking the benefits of (a) penicillin, (b) frequent tooth brushing, and (c) getting a routine medical check-up.

Whereas the previous hypotheses focused on *whether* cross-protection occurs, a third set of hypotheses focuses on *how* cross-protection may occur. Toward that end, two complementary explanations for cross-protection are proposed: First, following Parker et al.'s (2012) argument, which was addressed previously, cross-protection may result from the desire to keep one's attitude toward the target issue intact. A desire to maintain cognitive consistency requires that any changes in related attitudes be met with changes in the target attitude. Protecting the target attitude thus necessitates also protecting related attitudes. As such, one's perceived threat and counterarguing specific to the target attitude could serve as the basis for the cross-protection of related attitudes. Threat regarding a target attitude may directly motivate the protection of the related attitudes, whereas the refutational content of an inoculation message directed at a target attitude may contribute to the defense of the related attitudes. To test this notion, perceived threat and counterarguing regarding the target attitude are hypothesized to predict resistance to attacks on attitudes about each of the three related topics. If threat and counterarguing related to the target attitude serve as the basis for cross-protection, then participants' levels of threat and counterarguing directed at the target issue should explain their resistance to attacks on related attitudes:

> Hypothesis 5a: Cross-protection in attitudinal inoculation results from perceptions of threat and counterarguing related to the target attitude. Perceptions of threat

> and counterarguing regarding the target (i.e., treated) attitude are inversely associated with attitude change resulting from an attack on an untreated attitude.

Beyond the potential influence of an inoculation message on threat and counterarguing related to the target attitude, a second and potentially complementary explanation for cross-protection is that an inoculation message directly motivates people to defend related attitudes. This explanation is possible in addition to, or instead of, the desire to maintain attitudinal consistency. In forewarning individuals of an attack on a target attitude, an inoculation message could possibly play a role in heightening individuals' beliefs that related attitudes might also be threatened. This notion is consistent with one of the original arguments made by Papageorgis and McGuire (1961) for the blanket of protection. Although they were not addressing different topics, they claimed that inoculation may serve to make individuals acutely aware that an attitude is vulnerable to attack. This perceived threat may extend beyond one's attitude about the target topic to attitudes about related topics. Thus, it is possible that the realization of potential threat to related attitudes may drive the process of cross-protection.

Similarly, the refutational preemption portion of an inoculation message may serve as a form of practice in defending one's attitudes (Ivanov, 2012; Wyer, 1974). The contribution of the counterarguing exercise included in an inoculation message addressing a target attitude to cross-protection may not (or may only partially) rest in the *content* of the counterarguments, but rather in the *activity*. It may be that by partaking in the defensive activity of counterarguing in regard to the target attitude, individuals acquire demonstrably greater skill in defending their attitudes in general, which makes them better equipped to defend against attacks on related attitudes. Following a second argument made by Papageorgis and McGuire (1961) regarding the blanket of protection, this skill acquired through practice may lead people to find attacks on related attitudes less impressive and lead to greater resistance. The preceding discussion suggests that, above and beyond the influence of perceived threat and counterarguing related to the target topic, perceived threat, and counterarguing specific to each of the three related (but untreated) topics are hypothesized to predict resistance to attacks on attitudes toward each respective topic:

> Hypothesis 5b: Cross-protection in attitudinal inoculation results from perceptions of threat and counterarguing related to the non-treated attitude (that is attacked). Perceptions of threat and counterarguing regarding the untreated attitude are inversely associated with attitude change resulting from an attack on an untreated attitude.

Method

A three-phase experiment was conducted over the course of approximately four weeks to test the hypotheses and evaluate the degree to which inoculation offers cross-protection for three related but untreated attitudes.

Participants

Participants were recruited from undergraduate courses at a large university and received extra-credit for their participation. A total of 118 participants fully completed the experiment and had their data included in the analyses. The mean age of participants was 20.84 years (SD = 2.26; range 19–38) and 71% were females. The majority of participants were White (87%); the remaining participants were African-American (8%), Asian American (4%), or Native American (1%).

Design and Procedure

A 2 (inoculation condition) × 4 (counter-attitudinal attack topic) mixed design was used in this study. The experiment involved three distinct phases that were conducted over the course of four weeks. In the first phase, demographic information was collected and participants were asked to report their attitudes toward the four topics that were later (in phase three) attacked: getting a yearly chest X-ray to detect tuberculosis, the benefits of penicillin to humankind, brushing one's teeth after every meal, and visiting one's doctor each year for a routine check-up. A total of 148 participants completed the first phase.

In the second phase, which was conducted approximately two weeks later, participants were randomly assigned to the inoculation or no-message control condition. Participants in the inoculation condition read a message warning that their attitude toward the target topic (i.e., the merits of yearly X-rays for detecting tuberculosis) could come under attack and offering a refutational preemption to help them defend their beliefs. In both conditions, participants completed a measure of threat for each of the four topics. A total of 141 participants fully completed the second phase of the study.

In the third phase, all participants read a series of four separate messages attacking their attitude toward each of the four topics. Each attack message addressed a single topic. The attack messages were presented to participants in one of three different orders; each of the three message configurations began with the attack message regarding the target topic (i.e., merits of X-rays for detecting tuberculosis). Message order was included as a control variable in the analyses. After each attack message, participants completed a counterarguing measure and reported their attitude toward the topic addressed in the attack. Approximately two weeks elapsed between the inoculation induction in the second phase and the counter-attitudinal attacks in the third phase. Although 137 participants completed the third phase of the study, 19 participants who initially reported a strongly negative attitude (i.e., a mean of 5 or less on a 15-point scale) toward the target topic involving the merits of X-rays for detecting tuberculosis were excluded from the study. A scope condition for inoculation theory is that it is effective only among individuals whose attitudes are in agreement with the position advocated in the inoculation message (Compton & Pfau, 2005). As such, the final sample was limited

to the 118 participants who had positive or neutral attitudes toward the target topic.[1] The power to detect a medium effect (f = .25) using an F-test to compare two groups with a total sample size of 118 is .77.

Materials

The inoculation message, which was developed by McGuire (1961a, 1961b), focused solely on the target topic involving the use of X-rays for detecting tuberculosis. One minor change was made to McGuire's original inoculation message: the pronouns were updated to be consistent with contemporary standards (e.g., "he or she" as opposed to "he"). The inoculation message consisted of 21 sentences and a total of 601 words, and contained a threat followed by a refutational preemption. The first paragraph made it clear that, despite widespread agreement that an annual X-ray is the most effective means for the early detection of tuberculosis, participants could come into contact with influential arguments to the contrary. The remainder of the inoculation message consisted of the refutational preemption; several arguments against the use of X-rays to detect tuberculosis were identified and refuted.

The four attack messages developed by McGuire (1961a, 1961b) were used in this study. Each attack message addressed one of the four topics and contained two arguments against the topic. The attack message regarding yearly X-rays for detecting tuberculosis, for example, outlined the danger associated with repeated X-rays and advocated not undergoing yearly X-rays for the purpose of detecting diseases such as tuberculosis. Each of the four attack messages contained factual information including statistics and/or credible sources. The four attack messages ranged between 482 and 655 words (M = 551.50, SD = 81.81).

Measures

Attitudes. Attitudes toward the four topics were evaluated during the first and third phases of the study. Following prior inoculation research (e.g., Ivanov et al., 2013; Pfau et al., 1997), participants rated each of the four topics using seven semantic differential items (e.g., good/bad, negative/positive, unfavorable/favorable, etc.). All ratings were made using 15-point scales with larger numbers reflecting a more positive attitude. Mean scores were computed for participants' attitudes toward getting a yearly chest X-ray to detect tuberculosis (phase one: M = 9.08, SD = 2.39, α = .91; phase three: M = 8.46, SD = 3.76, α = .98; Δ_M = –.62, Δ_{SD} = 3.72), the benefits of penicillin to humankind (phase one: M = 12.33, SD = 2.33, α = .97; phase three: M = 11.20, SD = 2.79, α = .98; Δ_M = −1.14, Δ_{SD} = 2.81), brushing one's teeth after every meal (phase one: M = 12.29, SD = 2.47, α = .95; phase three: M = 11.54, SD = 2.88, α = .97; Δ_M = –.75, Δ_{SD} = 3.17), and visiting one's doctor each year for a routine check-up (phase one: M = 11.97, SD = 2.47, α = .91; phase three: M = 11.05, SD = 3.04, α = .96; Δ_M = –.92, Δ_{SD} = 3.11).

Counterarguing. Counterarguing in response to the attack messages in phase three was evaluated with a single-item measure (Miller et al., 2013). After reading the attack message targeting each respective topic, participants were asked to report the degree to which they counterargued against the attack message on a 7-point scale with the anchors *I accepted a lot of the arguments offered* (1) and *I thought of a lot of arguments against [the arguments offered]* (7). The mean counterarguing scores for the four topics were as follows: getting a yearly chest X-ray to detect tuberculosis (M = 3.30, SD = 1.37), the benefits of penicillin to humankind (M = 3.34, SD = 1.17), brushing one's teeth after every meal (M = 3.48, SD = 1.44), and visiting one's doctor each year for a routine check-up (M = 3.25, SD = 1.32). A single-item measure was used in this study to mitigate participant fatigue, given that participants were asked to report on four topics. This measure has been shown to be correlated with the results of open-ended counterarguing measures used in prior inoculation research (Miller et al., 2013).

Threat. Threat was evaluated in the second phase. As with the measure of attitudes, participants completed the same threat measure for each of the four topics. The threat measure, which has been widely used in prior inoculation research (e.g., Ivanov et al., 2013; Pfau et al., 1997), consisted of six semantic differential items (e.g., not dangerous/dangerous, not harmful/harmful) addressing the degree to which participants felt that they might come into contact with arguments that could cause them to re-think their position on the topic. All ratings were made on 7-point scales with larger numbers reflecting greater levels of perceived threat. Mean scores were computed for participants' perceived threat related to getting a yearly chest X-ray to detect tuberculosis (M = 3.42, SD = 1.38, α = .95), the benefits of penicillin to humankind (M = 3.32, SD = 1.50, α = .97), brushing one's teeth after every meal (M = 2.64, SD = 1.40, α = .97), and visiting one's doctor each year for a routine check-up (M = 2.88, SD = 1.42, α = .95).

Results

Preliminary Analyses

Two sets of preliminary analyses were conducted to provide a foundation for testing the effects of inoculation on cross-protection. Analyses in the first set were conducted to show that the inoculation induction was effective in promoting resistance to attacks on participants' attitudes toward the target topic. Hypothesis 1 predicted that inoculated participants would (1) feel greater threat, (2) be more likely to counterargue, and (3) experience less negative attitude change after an attack on their attitude about the merits of X-rays than participants in the control condition. Because attitudes were measured before the inoculation message and after the attack, consistent with McGuire's studies (e.g., Papageorgis & McGuire, 1961), a change score was first computed by subtracting the measure of attitudes toward X-rays in the third phase from attitudes toward the topic in the first phase. This change score reflects the degree to which participants' attitudes were influenced by the

counter-attitudinal attack; smaller values indicate that participants were less influenced by the attack.

Participants who received the inoculation message (M = 3.78, SD = 1.40) reported feeling significantly more likely that their attitudes regarding yearly chest X-rays could be threatened than participants in the control condition (M = 2.89, SD = 1.15), $F(1, 114) = 10.63$, $p < .01$, $\eta^2 = .08$. Participants in the inoculation condition were also more likely to counterargue (M = 3.57, SD = 1.38) in response to the attack on their attitude toward getting a yearly chest X-ray than participants in the control condition (M = 2.96, SD = 1.29), $F(1, 114) = 6.85$, $p = .01$, $\eta^2 = .06$. Finally, participants in the inoculation condition (M = –.16, SD = 3.77) reported less attitude change than did participants in the control condition (M = 1.56, SD = 3.44), $F(1, 114) = 7.87$, $p = .01$, $\eta^2 = .06$. These results support Hypotheses 1a, 1b, and 1c and demonstrate that the inoculation induction was effective in conferring resistance against attacks involving the target topic.

Analyses in the second set were conducted to demonstrate that participants' attitudes toward the target topic were associated with their attitudes toward the three other topics. A precondition for cross-protection is that the target attitude is related to the other attitudes being protected (Parker et al., 2012). Relatedness was established by evaluating the zero-order correlations and a potential shared domain. The zero-order correlations for participants' attitudes regarding the four topics during the first phase of the study appear in Table 1. The correlations between participants' attitude toward getting a yearly chest X-ray and their attitudes toward the three other topics are all statistically significant. Additionally, as previously discussed, all four topics have direct implications for physiological well-being. Taken as a whole, the results of the preceding sets of preliminary analyses demonstrate that the conditions necessary for a test examining the effects of inoculation on cross-protection have been met.

Testing the Potential for Inoculation to Confer Cross-protection

Hypotheses 2, 3, and 4 made predictions about the effects of inoculation on cross-protection. If cross-protection occurs, then inoculating attitudes toward a target topic should result in increased perceptions that one's attitudes toward related issues may

Table 1 Zero-order correlations among participants attitudes about the four topics during phase one.

	1	2	3	4
Getting a yearly chest X-ray to detect tuberculosis				
Benefits of penicillin	.50*			
Brushing one's teeth after every meal	.49*	.51*		
Visiting one's doctor each year for a routine check-up	.46*	.47*	.32*	

*$p < .05$

also be attacked (Hypothesis 2) as well as make one more likely to counterargue (Hypothesis 3) and produce less negative attitude change (Hypothesis 4) in response to attacks on those related attitudes. These three hypotheses were tested by conducting a series of one-way analysis of covariances with the attack message order serving as the control variable (see Table 2). Again, change scores between phase one and phase three were used in assessing participants' attitudes; smaller values indicate that participants' attitudes were more resistant to the attack in phase three.

The results support Hypotheses 2a, 3a, and 4a (see Table 2). Participants who received the inoculation message about getting a yearly X-ray reported feeling more threatened that their attitudes toward the benefits of penicillin would be attacked and were more likely to counterargue and had less negative attitude change in response to the message attacking the benefits of penicillin. The results offer mixed support for Hypotheses 2b, 3b, and 4b (see Table 2). Although participants in the inoculation condition reported greater perceptions of threat that their attitudes toward tooth-brushing would be attacked, the difference in counterarguing between the two groups was only marginally significant (p = .055) and there was no difference in attitude change toward tooth-brushing following the attack. The results support Hypotheses 2c, 3c, and 4c (see Table 2). Participants in the inoculation condition reported

Table 2 Testing the cross-protection conferred by inoculating attitudes toward X-rays for detecting tuberculosis on perceived threat, counterarguing, and attitudes regarding three related topics.

Dependent variable	Inoculation condition *M* (SD)	Control condition *M* (SD)	*F*-value
Perceived threat: benefits of penicillin	3.68 (1.54)	2.79 (1.28)	$F(1, 114) = 10.15$, $p < .01$, $\eta^2 = .08$
Perceived threat: tooth-brushing	2.89 (1.47)	2.31 (1.24)	$F(1, 114) = 6.50$, $p = .01$, $\eta^2 = .05$
Perceived threat: visiting one's doctor	3.29 (1.46)	2.34 (1.16)	$F(1, 114) = 12.61$, $p = .01$, $\eta^2 = .10$
Counterarguing: benefits of penicillin	3.64 (1.19)	2.94 (1.04)	$F(1, 114) = 10.33$, $p < .01$, $\eta^2 = .08$
Counterarguing tooth-brushing	3.70 (1.37)	3.20 (1.54)	$F(1, 114) = 3.75$, $p = .055$, $\eta^2 = .03$
Counterarguing: visiting one's doctor	3.51 (1.34)	2.94 (1.24)	$F(1, 114) = 7.25$, $p = .01$, $\eta^2 = .06$
Attitude change: benefits of penicillin	.56 (2.60)	1.90 (2.95)	$F(1, 114) = 9.35$, $p < .01$, $\eta^2 = .07$
Attitude change: tooth-brushing	.64 (2.92)	.99 (3.48)	$F(1, 114) = 1.64$, $p = .20$, $\eta^2 = .01$
Attitude change: visiting one's doctor	.38 (2.99)	1.69 (3.16)	$F(1, 114) = 5.09$, $p = .03$, $\eta^2 = .04$

Note: Attitude change scores reflect the change in participants' attitudes between phase one (prior to inoculation) and phase three (postattack); larger scores indicate that participants were more influenced by the counter-attitudinal attack (and, thus, were less resistant). Attack message order was included as a covariate in the analyses.

perceiving a greater threat that their attitude toward visiting their doctor for a yearly check-up would be attacked, were more likely to counterargue in response to the attack, and experienced less attitude change postattack than participants in the control condition. Overall, the results and pattern of means offer some evidence consistent with the notion that inoculation can confer cross-protection for related attitudes.

Testing Two Explanations for Cross-protection

A final goal of this study was to evaluate possible explanations about why cross-protection occurs. Hypothesis 5a predicted that cross-protection results from perceptions of threat and counterarguing generated in response to the target topic addressed in the inoculation message. Hypothesis 5b predicted that, above and beyond the influence of threat and counterarguing related to the target topic, cross-protection is caused by perceptions of threat and counterarguing unique to the topic being attacked. These two hypotheses were evaluated simultaneously using a series of three regression models tested among those participants who received the inoculation message about X-rays (n = 67). Because cross-protection requires having been exposed to an inoculation message, the regression models were limited to participants in the inoculation condition. Each model had the same structure but was tailored to one of the three topics examined in the study to evaluate cross-protection. In all three models, two dummy-coded variables representing the three different orders for the attack messages were included in the first block to control for message order. The second and third blocks included perceptions of threat and counterarguing in response to the inoculation message (addressing the merits of X-rays to detect tuberculosis). Perceived threat and counterarguing specific to the topic serving as the outcome variable were entered in the fourth and fifth blocks. The outcome variable for each of the three models consisted of attitude change regarding one of the three topics used to evaluate cross-protection (e.g., change in attitude toward the benefits of penicillin).

The results of the three models are reported in Table 3. Across the three models, the results are generally consistent with Hypothesis 5b. Adding the topic-specific measure of counterarguing resulted in a significant increase in the variance explained in attitude change for all three topics. Topic-specific threat, however, was not a significant predictor of attitude change in any of the three models.

The results failed to support Hypothesis 5a. With one exception, perceived threat, and counterarguing toward the target topic involving X-rays to prevent tuberculosis did not predict attitude change for any of the three other topics. Although counterarguing in response to the attack on participants' attitudes toward X-rays was associated with changes in participants' attitudes toward yearly doctor visits, this relationship was in the opposite direction of what was expected.

Table 3 Results of the three regression models testing explanations for cross-protection.

	Model 1: attitude toward penicillin			Model 2: attitude toward tooth-brushing			Model 3: attitude toward doctor visit		
	β	T	ΔR^2	B	t	ΔR^2	β	t	ΔR^2
Block 1. Attack message order			.14*						
Dummy variable: order 2	−.27	−1.95							
Dummy variable: order 3	.15	1.12							
Block 2. Perceived threat: X-ray	−.03	−0.28	.001						
Block 3. Counterarguing: X-ray	.15	1.22	.02						
Block 4. Perceived threat: Penicillin	−.01	−0.06	<.001						
Block 5. Counterarguing: Penicillin	−.25*	−2.03	.05*						
Block 1. Attack message order						.12*			
Dummy variable: order 2				−.35*	−2.50				
Dummy variable: order 3				.01	0.06				
Block 2. Perceived threat: X-ray				−.01	−0.09	<.001			
Block 3. Counterarguing: X-ray				−.02	−0.14	<.001			
Block 4. Perceived threat: tooth-brushing				.24	1.91	.05			
Block 5. Counterarguing: tooth-brushing				−.49*	−4.74	.23*			
Block 1. Attack message order									.05
Dummy variable: order 2							.03	0.18	
Dummy variable: order 3							.24	1.63	
Block 2. Perceived threat: X-ray							.03	0.27	.001
Block 3. Counterarguing: X-ray							.30*	2.46	.08*
Block 4. Perceived threat: doctor visit							.23	1.34	.03
Block 5. Counterarguing: doctor visit							−.28*	−2.32	.07*

Note: All three models were tested among participants who received the X-ray inoculation message. The results for each block are reported when that block was added to the model. The outcome variable for all three models reflects the change in participants attitudes between phase one (prior to inoculation) and phase three (postattack); larger scores indicate that participants were more influenced by the counter-attitudinal attack.

*$p < .05$.

Discussion

The purpose of this project was to examine the blanket of protection conferred by inoculation. The results provide evidence that inoculation can confer resistance against attacks on related but untreated attitudes and offer insights about the mechanisms proposed to contribute to cross-protection. These findings and their implications for research on inoculation theory will be discussed in the following paragraphs.

Inoculation and Cross-protection

Consistent with McGuire's original inoculation studies (McGuire, 1961a, 1961b; McGuire & Papageorgis, 1961), the inoculation message addressing the target topic regarding the merits of X-rays was effective in promoting resistance to an attack message. Although over half a century has passed, the results of this study replicate McGuire's findings using his original cultural truisms and study materials and underscore the robustness of inoculation as a procedure for promoting resistance. Beyond replicating McGuire's work, this project also extends our knowledge of inoculation theory by demonstrating that the blanket of protection applies to related, but untreated, attitudes. Relative to participants in the control condition, participants who received the inoculation message addressing the target topic involving the merits of X-rays to detect tuberculosis reported feeling significantly greater levels of threat that their attitudes toward the three untreated topics could be attacked. Participants in the inoculation condition also reported being more likely to counterargue in response to the attack message for two of the three related, but untreated, topics—and the difference between the inoculation and control group was marginally significant for the third topic ($p = .055$). Finally, inoculated participants were more resistant to a counter-attitudinal attack message for two of the three topics. Taken as a whole, these results offer some evidence to suggest that an inoculation message addressing a target topic can confer cross-protection of attitudes toward related topics.

The results of this study are consistent with Parker et al.'s (2012) initial study of cross-protection. Parker and colleagues showed that an inoculation message addressing unprotected sex also served to protect attitudes against binge drinking. Yet, the results of this study also extend their work by showing the potential breadth of cross-protection. The inoculation message served to protect attitudes for two of the three topics examined in this study. Perhaps more important, this project also formally investigated two potential explanations for cross-protection. The results suggest that cross-protection does not result from a motivation for consistency and desire to maintain one's attitude toward the target topic, as suggested by Parker et al. (2012). Threat and counterarguing related to the merits of X-rays did not encourage greater resistance to attacks on the other three untreated attitudes. Instead, the regression models showed that participants' counterarguing in response to attacks on their untreated attitudes was consistently associated with resistance.

The results from this study offer evidence that inoculation confers cross-protection by providing practice in refuting counterarguments and protecting one's attitude—an idea originally forwarded by Papageorgis and McGuire (1961) in considering the blanket of protection. The purpose of inoculation, after all, is not only to motivate individuals to shore up attitudinal defenses and offer material that may be used in defense of a challenged attitude, but also to provide individuals with guided practice (or increased skill) regarding how to counterargue against impending challenges (Ivanov, 2012; Wyer, 1974). The results of this study suggest that guided practice may be, at least in part, responsible for the effectiveness of inoculation in attitudinal cross-protection. Although a fair number of studies have examined various mechanisms potentially responsible for bringing about resistance in inoculation theory (for reviews, see Compton, 2013; Compton & Pfau, 2005), this project offers compelling evidence for the primary role played by counterarguing.

In discussing the results of this project, it is also important to consider those hypotheses that were not supported. Threat did not explain cross-protection. Participants' perceptions that the untreated attitude would be attacked was not a significant predictor in any of the regression models. In this sense, the results of this study are consistent with Banas and Rains's (2010) meta-analysis of inoculation research in which they found that the magnitude of threat generated by inoculation inductions was unrelated to the amount of resistance these messages produced. It may be that the primary effect of threat on resistance is indirect; through encouraging counterarguing, threat may promote resistance.

Additionally, the results from this study suggest that attitude consistency is not a primary mechanism responsible for cross-protection. Threat and counterarguing regarding the target attitude did not predict resistance to attacks on any of the three related attitudes. Despite these findings, this explanation for cross-protection should not be completely abandoned. As Dinauer and Fink (2005) showed and Parker and colleagues (2012) argued, the ability to exert indirect influence on attitudes is dependent on the spatial closeness among the attitudes. The related attitudes in this study were moderately correlated. Whether attitude consistency would be a more effective explanation for spatially closer (i.e., greater levels of correlation) attitudes in inoculation-generated cross-protection remains an empirical question worthy of investigation.

The results from this study also have practical implications for incorporating inoculation messages in communication campaigns (Compton & Ivanov, 2013; Ivanov, 2012; Pfau, 1995). If inoculation can protect related, but untreated, attitudes from a counter-attitudinal attack, then inoculation offers a potentially robust strategy for promoting resistance. In commercial, health, and political campaigns, message designers could effectively protect a target audience's attitudes about a range of related topics with a single inoculation messages addressing a focal attitude. In targeting attitudes about binge drinking, for example, campaign designers may make an audience's attitudes about a host of related risky behaviors more resistant to influence. This is of particular importance because alcohol users are more likely to engage in a variety of other risky behaviors, such as unprotected sex or ineffective

condom use (e.g., The Henry J. Kaiser Family Foundation, 2002). If campaigns or interventions may be designed to target one risky behavior, but provide protection for untreated attitudes, inoculation could be an effective means of strengthening efforts to reduce risky behaviors without the need for the development of complicated messaging addressing multiple health risks. Although future research is necessary to replicate and continue exploring the potential of inoculation messages to confer cross-protection, such a possibility has a great deal of utility for campaign designers.

Limitations and Directions for Future Research

In evaluating the results of this study, a few limitations warrant consideration. Because only participants in the inoculation condition were included in testing the regression models, the sample sizes for those three tests are somewhat small. Yet, for cross-protection to occur, individuals must first receive an inoculation message. It was essential to limit the regression models to those participants in the inoculation condition. The significant relationships between counterarguing and attitude change across the three models suggests that this was not a major limitation. Additionally, the four message topics examined in this study were identified as cultural truisms over 50 years ago. Although examining these topics made it possible to test our ideas using established inoculation and attack messages and allowed us to directly compare our findings with McGuire's original works, these topics may not be representative of cultural truisms today. It remains to be seen whether the results of this study can be replicated with beliefs that represent more contemporary health-related behaviors or beliefs that are uncontested.

The results of this study also suggest several directions for future research. In addition to attempting to replicate cross-protection using different message topics, it would be valuable to examine the limits of the blanket of protection as well as to further examine its underlying mechanisms. As can be seen in Table 1, attitudes toward the four topics in this study were moderately related to the target topic. It seems possible that the effects of cross-protection might increase or decrease among attitudes that are more or less closely related to the target attitude. Re-assessing whether attitude consistency plays a role in cross-protection by introducing greater numbers of attitudes that differ in their level of relatedness to the target attitude, both in regard to correlation (i.e., high, moderate, low, no significant correlation) and domain (i.e., closely related, moderately related, unrelated), would be worthwhile. Including a test involving attitudes that are completely unrelated to the target attitude would be particularly useful. This approach could provide a nuanced test not only of attitude consistency as an explanatory mechanism of cross-protection, but also the role played by counterarguing. If counterarguing, potentially through skill rehearsal, is the sole contributor to cross-protection, then would it matter whether the attitudes are related (in terms of domain and the magnitude of the correlation) at all? Stated differently, could cross-protection extend to any attitude, rather than just related ones?

In addition, it would be worthwhile to examine how inoculation-motivated skill rehearsal impacts resistance. It could do so by increasing the number of counterarguments generated, which certainly may be the case as our study shows via the results of comparing the inoculation and control conditions. Yet, this rehearsal provided by the inoculation message may also boost one's perceived self-efficacy, attitude accessibility, attitude confidence (certainty or strength), and/or the quality of the generated counterarguments. Although it was beyond the scope of the present study to examine these variables, we know from the inoculation literature that attitude certainty (confidence or strength; Pfau et al., 2005), accessibility (Pfau et al., 2003), self-efficacy (Pfau et al., 2009), and counterarguing quality (Banas & Bessarabova, 2009) could be bolstered with an inoculation message and consequently impact resistance. As a result, we can speculate that this process may take place in the cross-protection of related attitudes as well. Future research should further investigate this possibility.

Conclusion

Despite decades of research examining inoculation, there is still much to be learned about this grandparent theory of resistance. By examining the blanket of protection, this project sought to advance our understanding of the limits and operating mechanisms of inoculation theory. The results offer evidence that an inoculation message addressing a target attitude can confer resistance against attacks on related, but untreated, attitudes. Moreover, the findings indicate that counterarguing plays a central role in the process of cross-protection. Through additional research it will be possible to develop a complete understanding of cross-protection and, more broadly, the nuances of inoculation theory.

Acknowledgment

The authors thank Professor Floyd and the three anonymous reviewers for their feedback.

Disclosure statement

No potential conflict of interest was reported by the authors.

Note

[1] We also conducted the analyses using the full sample of 137 participants who completed all three phases and the results were substantively equivalent with those reported in this manuscript.

References

Banas, J. A., & Bessarabova, E. (2009, November). *The influence of counterarguing on the inoculation process*. Paper presented at the Annual Meeting of the National Communication Association, Chicago, IL.

Banas, J. A., & Miller, G. (2013). Inducing resistance to conspiracy theory propaganda: Testing inoculation and meta-inoculation strategies. *Human Communication Research*, *40*, 1–24. doi:10.1111/hcre.12000

Banas, J. A., & Rains, S. A. (2010). A meta-analysis of research on inoculation theory. *Communication Monographs*, *77*, 281–311. doi:10.1080/03637751003758193

Compton, J. (2013). Inoculation theory. In J. P. Dillard & L. Shen (Eds.), *The Sage handbook of persuasion: Developments in theory and practice* (2nd ed., pp. 220–236). Thousand Oaks, CA: Sage.

Compton, J., & Ivanov, B. (2013). Vaccinating voters: Surveying political campaign inoculation scholarship. In E.L. Cohen (Ed.), *Communication yearbook 37* (pp. 250–283). New York, NY: Routledge.

Compton, J., & Pfau, M. (2008). Inoculating against pro-plagiarism justifications: Rational and affective strategies. *Journal of Applied Communication Research*, *36*, 98–119. doi:10.1080/00909880701799329

Compton, J. A., & Pfau, M. (2005). Inoculation theory of resistance to influence at maturity: Recent progress in theory development and application and suggestions for future research. In P. J. Kalbfleisch (Ed.), *Communication yearbook 29* (pp. 97–145). New York, NY: Routledge.

Dinauer, L. D., & Fink, E. L. (2005). Interattitude structure and attitude dynamics: A comparison of the hierarchical and Galileo spatial-linkage models. *Human Communication Research*, *31*, 1–32. doi:10.1111/j.1468-2958.2005.tb00863

Eagly, A. H., & Chaiken, S. (1993). *The psychology of attitudes*. Orlando, FL: Harcourt Brace Jovanovich.

Holt, L. E. (1970). Resistance to persuasion on explicit beliefs as a function of commitment to and desirability of logically related beliefs. *Journal of Personality and Social Psychology*, *16*, 583–591. doi:10.1037/h0030060

Hunter, J. E., Levine, R. L., & Sayers, S. E. (1976). Attitude change in hierarchical belief systems and its relationships to persuasibility, dogmatism, and rigidity. *Human Communication Research*, *3*, 1–29. doi:10.1111/j.1468-2958.1976.tb00501

Ivanov, B. (2012). Designing inoculation messages for health communication campaigns. In H. Cho (Ed.), *Health communication message design: Theory and practice* (pp. 73–93). Thousand Oaks, CA: Sage.

Ivanov, B., Pfau, M., & Parker, K. A. (2009). Can inoculation withstand multiple attacks? An examination of the effectiveness of the inoculation strategy compared to the supportive and restoration strategies. *Communication Research*, *36*, 655–676. doi:10.1177/0093650209338909

Ivanov, B., Parker, K. A., Dillingham, L. L., Petrun, E. L., Grant, L. F., & Geegan, S. (2013). Enhancing inoculation: Examining the relationships among attack certainty, threat and resistance. *International Journal of Neuroscience and Behavioral Science*, *12*, 13–23. doi:10.13189/ijnbs.2013.010201

Ivanov, B., Parker, K. A., Miller, C. H., & Pfau, M. (2012). Culture as a moderator of inoculation success. *Global Studies Journal*, *4*(3), 1–22.

Krcmar, M., & Greene, K. (2000). Connections between violent television exposure and adolescent risk taking. *Media Psychology*, *2*, 195–217.

McGuire, W. J. (1961a). The effectiveness of supportive and refutational defenses in immunizing and restoring beliefs against persuasion. *Sociometry*, *24*, 184–197. doi:10.2307/2786067

McGuire, W. J. (1961b). Resistance to persuasion conferred by active and passive prior refutation of the same and alternative counterarguments. *Journal of Abnormal and Social Psychology*, *63*, 326–332. doi:10.1037/h0048344

McGuire, W. J. (1964). Inducing resistance to persuasion: Some contemporary approaches. In L. Berkowitz (Ed.), *Advances in experimental social psychology* (Vol. 1, pp. 191–229). New York, NY: Academic Press.

McGuire, W. J., & Papageorgis, D. (1961). The relative efficacy of various types of prior belief-defense in producing immunity against persuasion. *Journal of Abnormal and Social Psychology*, *62*, 327–337.

Miller, C., Ivanov, B., Sims, J. D., Compton, J., Harrison, K. J., Parker, K. A., …Averbeck, J. M. (2013). Boosting the potency of resistance: Combining the motivational forces of inoculation

and psychological reactance. *Human Communication Research*, *39*, 127–155. doi:10.1111/j.1468-2958.2012.01438.x

Nelson, C. E. (1968). Anchoring to accepted values as a technique for immunizing beliefs against persuasion. *Journal of Personality and Social Psychology*, *9*, 329–334. doi:10.1037/h0021255

Papageorgis, D., & McGuire, W. J. (1961). The generality of immunity to persuasion produced by pre-exposure to weakened counterarguments. *Journal of Abnormal and Social Psychology*, *62*, 475–481. doi:10.1037/h0048430

Parker, K. A., Ivanov, B., & Compton, J. (2012). Inoculation's efficacy with young adults' risky behaviors: Can inoculation confer cross-protection over related but untreated issues? *Health Communication*, *27*, 223–233. doi:10.1080/10410236.2011.575541

Pfau, M. (1995). Designing messages for behavioral inoculation. In E. Maibach & R.L. Parrott (Eds.), *Designing health messages: Approaches from communication theory and public health practice* (pp. 99–113). Thousand Oaks, CA: Sage.

Pfau, M. (1997). Inoculation model of resistance to influence. In G. A. Barnett & F. J. Boster (Eds.), *Progress in communication sciences: Advances in persuasion* (Vol. 13, pp. 133–171). Greenwich, CT: Albex.

Pfau, M., Ivanov, B., Houston, B., Haigh, M., Sims, J., Gilchrist, E., …Richert, N. (2005). Inoculation and mental processing: The instrumental role of associative networks in the process of resistance to counterattitudinal influence. *Communication Monographs*, *72*, 414–441. doi:10.1080/03637750500322578

Pfau, M., Kenski, H. C., Nitz, M., & Sorenson, J. (1990). Efficacy of inoculation strategies in promoting resistance to political attack messages: Application to direct mail. *Communication Monographs*, *57*, 25–43. doi:10.1080/03637759009376183

Pfau, M., Roskos-Ewoldsen, D., Wood, M., Yin, S., Cho, J., Lu, K. H., & Shen, L. (2003). Attitude accessibility as an alternative explanation for how inoculation confers resistance. *Communication Monographs*, *70*, 39–51. doi:10.1080/715114663

Pfau, M., Semmler, S. M., Deatrick, L., Ason, A., Nisbett, G., Lane, L., …Banas, J. (2009). Nuances about the role and impact of affect in inoculation. *Communication Monographs*, *76*, 73–98. doi:10.1080/03637750802378807

Pfau, M., Tusing, K. J., Koerner, A. F., Lee, W., Godbold, L. C., Penaloza, L. J., …Hong, Y. (1997). Enriching the inoculation construct: The role of critical components in the process of resistance. *Human Communication Research*, *24*, 187–215. doi:10.1111/j.1468-2958.1997.tb00413.x

Poole, M. S., & Hunter, J. E. (1979). Change in hierarchically organized attitudes. In D. Nimmo (Ed.), *Communication yearbook 3* (pp. 157–176). New Brunswick, NJ: Transaction Books.

Sutton, C. H. (2011). *Inoculating against jealousy: Attempting to preemptively reduce the jealousy experience and improve jealousy expression* (Unpublished master's thesis). University of Georgia, Athens, GA.

Wan, H.-H., & Pfau, M. (2004). The relative effectiveness of inoculation, bolstering, and combined approaches in crisis communication. *Journal of Public Relations Research*, *16*, 301–328. doi:10.1207/s1532754xjprr1603_4

Woelfel, J., & Fink, E. L. (1980). *The measurement of communication processes: Galileo theory and method*. New York, NY: Academic Press.

Wyer, R. S., Jr. (1974). *Cognitive organization and change: An information processing approach*. New York, NY: Wiley.