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How Neuroticism Affects Responses to Anti-Smoking Messages

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The effect of trait neuroticism on college students’ (n = 200) responses to anti-smoking public service announcements (PSAs) was examined using a 2 (neuroticism: high vs. low) × 3 (message type: personal testimony, secondhand smoke, and informative) × 3 (message: nested within message type) design. We hypothesized that those high in neuroticism would be avoidant toward anti-smoking messages, have quicker and stronger negative reactions and perceive the messages as more biased and less involving. As hypothesized, those high in neuroticism were more likely to want to avoid thinking about smoking as a function of viewing the messages and more likely to see messages as biased; however, neuroticism did not affect judgments of message involvement. Tobacco use and gender also affected message bias and avoidance. Those scoring high in neuroticism also responded quicker to negative emotion assessments to messages. Implications for the importance of neuroticism in message design and message processing research are discussed.

Researchers have conducted numerous studies concerning the effectiveness of health-related messages and have devoted considerable attention to key individual differences and message features. Health messages are often created based on the risk factors that contribute to negative health behaviors, such as personality traits like sensation seeking (Stephenson & Palmgreen, 2001). Research on smoking behavior has demonstrated that the personality trait of neuroticism is an indicator and potential contributing factor for engaging in smoking behavior. As one example, Terracciano and Costa (2004) found smokers scored higher on the personality factor of neuroticism than non-smokers. Gilbert (1995) found that among a variety of personality traits, trait neuroticism was the most reliable measure for predicting smoking status. Also, neurotics tend to have maladaptive responses to information they view as threatening (Costa & McRae, 1987) and, given the demonstrated relationship between neuroticism and smoking behavior, an examination of the effects of neuroticism on perceptions of anti-smoking messages is a needed first step toward the eventual creation of health messages targeted to this population.

TRAIT NEUROTICISM

Neuroticism can be defined as an enduring tendency to experience negative emotional states. Neurotic individuals often respond poorly to environmental stressors and are more likely to interpret non-threatening situations as threatening and to perceive minor frustrations as quite difficult (see Matthews, Deary, & Whiteman, 2003). In general, neuroticism is often defined as worry prone, emotionally unstable, and insecure (Elliot & Thrash, 2002). Importantly, neuroticism is considered one of the three critical dimensions of personality (neuroticism, extraversion, and psychoticism; Eysenck & Eysenck, 1985). Further evidence of the importance of neuroticism is its inclusion in what is colloquially known as the “Big Five” personality traits (neuroticism, extraversion, openness, agreeableness,
and conscientiousness). Neuroticism is a basic and fundamental dimension of normal personality, rather than an abnormal personality trait found only in clinical populations (Costa & McRae, 1987). Prior research demonstrates that individual differences in neuroticism are present in child and adult populations and are stable over the passage of time (Kendler, Kuhn, & Prescott, 2004). Research also demonstrates a gender effect, finding that women typically score higher on trait neuroticism than do men (Kendler et al., 2004).

Although neuroticism is a dimension of normal personality, when individuals score high in neuroticism they often have maladaptive responses, especially to emotional stimuli. A high level of neuroticism is the result of individuals having a low activation threshold of the limbic system, which is responsible for emotion production (Rusting & Larsen, 1997). High neurotics have a greater autonomic activation leading to greater excitability and emotional responsiveness than those low in neuroticism. One such response experienced more frequently by highly neurotic individuals is the “fight or flight response,” characterized by emotional reactions such as fear, anxiety, anger, and distress (Rusting & Larsen, 1997). When investigating stress, Gunthert, Cohen, and Armeli (1999) found individuals who scored high on neuroticism reported experiencing more internal stressors throughout the day and reacted with more distress. Due to this continual experience of negative emotions and intensified distress (as compared to those low on neuroticism), there is no surprise that those scoring high in neuroticism experienced more panic attacks and greater reactivity to stressors (Goodwin & Hamilton, 2002). Investigating individuals’ reactions to task-induced stress, Matthews and colleagues (2006) found that high neurotics tended to experience more negative moods as well as more sustained negative moods.

Individuals scoring high in neuroticism are more likely to suffer from coronary heart disease (Denollet, 1998), to smoke cigarettes, and to suffer from alcoholism than those scoring low in neuroticism (Terracciano & Costa, 2004). Goodwin and Hamilton (2002) found neuroticism was an independent indicator of the co-occurrence of panic attacks and cigarette smoking; the association between neuroticism and cigarette smoking remained even when controlling for socioeconomic status, demographic characteristics, and comorbid mental disorders. They report that a single increase in one’s level of neuroticism quadruples the likelihood of the co-occurrence of panic attacks and cigarette smoking. Scholars suggest individuals high in neuroticism may turn to smoking as a way to reduce tension and anxiety (Terracciano & Costa, 2004). These findings concerning the characterization and nature of high neurotics suggest several implications for their responses to anti-smoking messages. In the present study, we examine how trait neuroticism affects emotional and cognitive responses to anti-smoking messages.

EMOTIONAL RESPONSES TO ANTI-SMOKING MESSAGES

As already summarized, prior research has found high neurotics to experience stronger and more frequent negative emotions plus a greater reactivity to stressors (Costa & McRae, 1987; Goodwin & Hamilton, 2002). Often, health messages strive to affect behavior and attitudes through emotions. For example, a personal testimony message that shows a mourning husband who lost his wife to second-hand smoke may evoke sadness, a message where one sees the noxious chemicals in cigarettes may evoke feelings of anger, and a message showing teens’ aversion to people who smell like cigarette smoke may evoke feelings of disgust. We examined three negative emotions that participants may associate with the anti-smoking messages: sad, nervous, and angry. Such negative emotional reactions are often associated with health-related messages. Prior work suggests that feeling sad and/or nervous is a productive negative emotion to health messages, as these emotions typically elicit some kind of positive support or judgments of message effectiveness (Kang & Cappella, 2008). In contrast, audiences often perceive messages that evoke feelings of anger as ineffective. Moreover, feelings of anger can evoke counter-reactions, producing more negative feelings toward a topic or message than was originally felt prior to viewing the message (Dillard, Plotnik, Godbold, Friemuth, & Edgar, 1996). We hypothesize that those higher in trait neuroticism should be more likely to experience negative emotions as a function of message exposure, given their predisposition to experience negative emotions (Matthews et al., 2003):

H1: Individuals scoring high in neuroticism will be more likely to report feeling a negative emotion in response to anti-smoking messages than will those scoring low in neuroticism.

In addition to being more likely to report feeling a negative emotion, we argue that those scoring high in neuroticism should have more accessible emotions toward the message than those low in neuroticism. When using the term accessibility, we refer to the ease with which the feeling is activated from memory. Information that is more accessible in memory is more likely to affect behavior than is information that is less accessible (see, e.g., Fazio & Olson, 2003). Accessible feelings not only encourage us to reinforce our existing attitudes (e.g., smoking is bad) but also color our memory of messages (e.g., it was a bad message) and our ease in retrieving the content of the message (Arpan, Rhodes & Roskos-Ewoldsen, 2007). Because individuals scoring high in neuroticism experience negative emotions more frequently and have a heightened awareness of their experience of negative emotion (Bolger & Schilling, 1991), these individuals should be more aware of any negative emotions associated with the anti-smoking messages. Thus, these emotions should be more accessible.
Accessibility is measured by the use of reaction-time tasks where more accessible attitudes, stereotypes, emotions, etc. are responded to more quickly than are those that are less accessible. Therefore, we hypothesize that those high in trait neuroticism will respond more quickly when asked whether they experienced feeling angry, sad, or nervous as a function of viewing an anti-smoking public service announcement (PSA) than will those who score low in trait neuroticism:

H2: Individuals scoring high in neuroticism will respond more rapidly to negative emotions than will those scoring low in neuroticism.

COGNITIVE RESPONSES TO MESSAGES

Persuasion theorists commonly assume that a persuasive message must elicit a level of cognitive attention (Petty & Cacioppo, 1986). Stephenson and Palmgreen (2001, p. 51) offer a useful definition of cognitive response when they suggest it is considered to occur “when individuals are motivated to think, consider, or scrutinize a message.” Researchers have found such cognitive responses are necessary for a message to reinforce or uphold current attitudes, to evoke evaluative processes to understand the messages, or for participants to consider the message arguments, and thus be involved in the message that is being presented (see, e.g., Stephenson & Palmgreen, 2001). While a myriad of cognitive responses to messages might be studied, including message attention, retention, recall, cognitive elaboration, etc., we examine involvement, message avoidance, and perceptions of bias, as these are three aspects of message processing that theoretically should be linked to neuroticism. Like Slater, Goodall, and Hayes (2009), we recognize that most assessments of cognitive responses to messages are related. For example, attention and involvement likely correlate positively, as would elaboration and recall. However, our purpose here is not to theoretically articulate the nuanced differences among indicators of cognitive response, but rather our purpose is to explore how neuroticism might differentially affect cognitive responses to messages that theoretically should be linked to neuroticism.

Message involvement. Message involvement examines the degree to which individuals carefully engage with the message by focusing and concentrating on the message. Neurotic individuals are often over stimulated by stressful or threatening information increasing their excitability level (Bolger & Schilling, 1991). Such excitability responses can lead to higher levels of worry and self-concern, preventing neurotic individuals from being able to concentrate on the information presented and the current task (Eysenck & Eysenck, 1985). Such findings suggest that those high in neuroticism may have more difficulty cognitively engaging anti-smoking messages. Moreover, those high in trait neuroticism have been shown to be more avoidant of negative information (Elliot & Thrash, 2002). Therefore, when these individuals are presented with anti-smoking messages that picture the adverse effects of smoking, they should be less motivated to be involved with the message than those low in trait neuroticism:

H3: Individuals higher in neuroticism will report lower message involvement than will individuals lower in neuroticism.

Not only do we argue that neurotic individuals are less likely to be involved with a message, but also the literature suggests that their subsequent thoughts and behaviors related to the message are likely to be maladaptive or defensive. We focus on two such maladaptive responses: avoidance and perceptions that the message is biased.

Avoidance. While perceptions of message bias and involvement have received a great deal of attention in the literature, examining the desire to avoid thinking about a message and/or the central argument of a message (e.g., smoking is bad for you) has been limited. Avoidance has previously been characterized as a function of cognitive response or message processing (Niederdeppe, 2005). We conceptualize avoidance as a desire to block thoughts about the bad parts of smoking or, in other words, to “not think” about how smoking can be bad. Avoidance as conceptualized here has received little investigation apart from its inclusion as part of general cognitive processing. By separating this construct from message involvement, we endeavor to determine how particular PSAs directly affect individuals’ thinking about the antismoking message specifically.

Niederdeppe (2005) measured adolescent avoidance toward anti-smoking PSAs by asking respondents if the message made them think about whether or not they should smoke. He found that the majority of message processing (i.e., thinking about whether or not one should smoke) occurred among participants who had a positive or favorable reaction to the anti-smoking PSAs. Based on the neuroticism literature reviewed earlier, we argue that those scoring higher in neuroticism will be more likely to avoid thinking about anti-smoking messages because of the negative feelings such thoughts would evoke. Indeed, Rothman, Haddock, and Schwarz (2001) review studies finding highly neurotic individuals are predisposed to react to threatening information by dissociating themselves from the information. They also found that neurotic individuals try to minimize the link between their behavior and the health outcome. Thus:

H4: Individuals high in neuroticism will score higher on message avoidance than those low in neuroticism.

Message bias. Finally, the literature on neurotic personalities also suggests that those high in neuroticism may be more likely to view anti-smoking messages as biased. When researching individuals’ reactions to fear appeal messages, like the messages used here, Witte and Allen...
(2000) found that individuals could employ a fear control response by employing internal, mental devices as a defensive or resistant response to a message. These responses include issue derogation, message minimization, and perceived manipulation, which are all related to perceived message bias (Witte & Allen, 2000). We investigate participants’ responses to anti-smoking messages with regard to their perception that the message was being manipulative, distorted, or untruthful (Witte, 1994).

Perception that a message is biased is a way a neurotic individual can dissociate from the message as a means of protection from threatening information. Since individuals scoring high in neuroticism are sensitive to and predisposed to try to minimize the link between themselves and the health outcome (Rothman et al., 2001), they may minimize the threat of the message by perceiving the message as untruthful, overstated, or misrepresented. Thus:

H5: Individuals scoring high on neuroticism are more likely to perceive anti-smoking messages as high in message bias than those low in neuroticism.

In summary, we suggest individuals high in neuroticism will have maladaptive responses to anti-smoking messages. Specifically, they will be more likely to experience negative emotions in response to anti-smoking messages (H1) and be quicker to identify these negative emotions (H2) than those who score low on neuroticism. Neurotics see the world as more threatening and are more disposed to avoid thinking about it. Therefore, we propose they should be less involved with anti-smoking messages (H3), would rather avoid the message (H4), or perceive the message as biased (H5) as ways to cope with the negative feelings evoked by threat.

METHOD

Design and Participants

Two hundred college students from a large southeastern university participated, either to fulfill a research participation requirement or to receive extra credit for an undergraduate course. Participants’ ages ranged from 18 to 31 years (M = 19.93, SD = 1.82). The sample was predominantly White (81%), with 9% indicating African American and 10% not reporting race/ethnicity. Participants were recruited from a research pool that includes a wide range of majors across the university.

The design was a 2 (neuroticism: high vs. low) × 3 (message type: personal testimony, secondhand smoke, and informative) × 3 (message: nested within message type) × 3 (message order) repeated-measures design with neuroticism, message, and order between subjects and message type within subjects. Neuroticism was measured while participants were randomly assigned to the order they viewed the three message types and randomly assigned to which of the three messages within each type they viewed. Thus, each participant viewed three messages (one message from each of the three message types).

Independent Variables

Neuroticism. Neuroticism was assessed using the 6-item neuroticism scale from the revised Eysenck Personality Questionnaire abbreviated form (EPQR–A) (Francis, Brown, & Philipchalk, 1992). The scale consisted of the following items: “Would you call yourself a nervous person?” “Does your mood often go up and down?” “Are you a worrier?” “Do you often feel fed up?” “Are you anxious very often?” “Do you often feel lonely?” Each item is scored with yes = 1 and no = 0 and summed.

The EPQR–A is a significant predictor of negative affect susceptibility (Rusting & Larsen, 1997). Although the internal consistency reliability of the EPQR–A is lower than the original EPQR because of fewer items, the neuroticism portion of the scale has recorded alpha coefficients ranging from 0.70 to 0.77 (see, e.g., Francis et al., 1992). These internal consistency scores were deemed satisfactory, given that the EPQR–A neuroticism scale consists of only six items. Francis and colleagues (1992) demonstrated that the neuroticism scale of the abbreviated version had concurrent validity with the original version of the EPQR ranging from .92 to .94. The abbreviated version was selected as a parsimonious measure was needed given the study has multiple measures and multiple messages. Neuroticism items were coded so higher numbers indicate more neuroticism. The six items for neuroticism were adequate in terms of internal consistency reliability (α = .75) and consistent with reliabilities reported in prior research. The scale was formed by summing the scores for the six items; the range was 0 to 6 (MD = 3, SD = .40). Following prior work (see, e.g., Bolger & Schilling, 1991), a median split was used to represent individuals as scoring low or high in neuroticism.

Gender. Gender was included as a factor as most neuroticism studies with general population samples find females score significantly higher on neuroticism than males (see, e.g., Kendler et al., 2004). The sample was 53% female (106 females and 94 males).

Message type. As prior researchers have noted, it is difficult to cleanly categorize anti-smoking messages, as a

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1Research concerning neuroticism can be divided into two areas: (1) tests of clinical populations and (2) tests of nonclinical populations. Since neuroticism is considered to be a dimension of normal personality rather than a personality disorder, it is represented by a normal distribution. The extreme ends of this distribution (i.e., greater than two standard deviations from the mean) are considered abnormal. Yet the majority of personality research outside of the clinical psychology setting is based on the normal distribution of neuroticism. Thus, “high” and “low” scores on neuroticism in these texts refer to those scores within the normal limits (i.e., within the normal distribution).
given message might include more than one theme (e.g., an
informative message that also is an industry attack message)
and messages use a variety of ad characteristics. Because
we wanted to include a range of messages to enhance gen-
eralizability, we selected messages to use in the present
study based on pilot data collected with college students
\((n = 170)\) and younger adolescents \((n = 280)\) on a wide array
of PSAs.

Pilot work suggested participants reacted most favorably
(e.g., found the messages informative, effective) to personal
testimony (PT) messages from former or current smokers
relating how tobacco use had significant effects on their
lives. In addition, messages were selected to represent an
informative (IN) approach, characterized by an emphasis
on the harmful consequences of smoking without evoking
sympathy for a message character. Informative (IN) mes-
gages were found to be equally effective as PT on many
pilot measures but were viewed as more biased. Finally,
secondhand smoke (SH) messages focus on the detrimen-
tal effects of secondhand smoke and were perceived as
less effective and more biased in comparison to almost
all other message types. Thus, these three message types
afford a broad examination of message categories. In total,
nine anti-smoking PSAs were selected: three representing
each category. All nine messages had a threat-to-health
component because they addressed negative consequences
associated with risky behavior. In a content analysis, inde-
pendent coders unanimously agreed on the correct category
for each message selected (Rhodes, Roskos-Ewoldsen, Eno,
& Monahan, 2009). Finally, to test H1 and H2, each message
was perceived to evoke an emotional reaction by indepen-
dent coders. The appendix presents brief synopses of the
nine messages selected.

Covariates

Smoking status. Given the messages are designed
as anti-smoking or smoking prevention messages, smok-
ing behavior was used as a covariate in analyses. Current
tobacco use was measured by three items from the CDC
Global Youth Tobacco Survey (CDC, 2009). Participants
were asked, “Have you ever smoked a cigarette, even one
or two puffs?” with a yes/no response option. The next
two items gauged how many days in the past month the
participant had smoked, and how many cigarettes the par-
ticipant typically smoked each day in the past month. The
measures of smoking behavior did not approximate a nor-
mal distribution, even when combining the three measures
and transforming the resulting variable. Prior work suggests
that “smokers” could be broken down into further categories;
they are considered to be only weakly engaged in smoking
behavior if they have ever experimented with smoking and
are considered as highly engaged in smoking behavior if
they have smoked over 100 cigarettes or 5 packs (Gilpin,
White, & Pierce 2005). Following their measurement and
after a close examination of the data, the best representation
was to create three levels of smoking behavior: non-smokers
\((43\%)\), experimenters \((34\%)\), and smokers \((22.5\%)\) to use as a
covariate.

Dependent Variables

Dependent measures were measured on 1 (strongly disagree)
to 5 (strongly agree) Likert scales unless otherwise noted.

Message involvement and message avoidance.

Four items \((n = 4)\) were modified from the Involvement
Scale created by Cegala (1981; e.g., “My mind kept wander-
ing as I watched the ad,” “While watching the ad, thoughts
of other things kept popping in my head”). Four additional
items were created to emphasize involvement with the argu-
ment of the message (e.g., “I concentrated on the ad’s
argument” and “I focused on the ad’s argument”). Avoidance
was measured with items created by the co-authors to assess
a desire to avoid thinking about the message (e.g., “Watching
this ad made me really think about the bad parts of smoking
[RJ]” and “When watching this ad, I did not want to think
about the bad parts of smoking”).

As message involvement and avoidance could conceiv-
ably be significantly related where one is simply the opposite
of the other, the items for message involvement and avoid-
ance were examined in exploratory factor analyses (principal
components analysis with a Varimax rotation) for each of
the three PSA types. Three of the involvement items were
recoded such that higher numbers reflect more involvement
with the message (e.g., “I didn’t pay attention to the ad’s
argument,” “My mind kept wandering as I watched the ad,”
and “While watching the ad, thoughts of other things kept
popping up in my head”). All three factor analyses (one for
each message type) found the avoidance items formed one
factor and the message involvement items loaded together
on a separate factor as expected with no substantive cross-
loadings \((\text{loadings} > .35)\). Scales for message involvement
were created by summing the eight items and dividing by
the total number of items \((\text{PT} \ \alpha = .84, \ \text{SH} \ \alpha = .89, \ \text{IN} \ \alpha = .83)\).

The avoidance items did not correlate significantly for
any of the PSAs. Given that we want to assess a ten-
dency to react to a message by avoiding thinking about
the message, we elected to utilize “when watching this
ad, I did not want to think about smoking” to represent
avoidance. The avoidance item and involvement factor were
not significantly correlated for any of the PSAs \((\text{PT} = .01,
\text{SH} = .07, \ \text{IN} = .10, \ n = 200, \ ns)\). Thus, empirically the
measures of message involvement and avoidance appear to
assess different constructs.

Message bias. Witte’s (1994) 9-item measure was
used to assess biased message perception. This scale was
validated through a content analysis of cognitive responses
(Witte, 1991). Sample items include “The message was
overstated, exaggerated, distorted, and manipulative.” Prior confirmatory factor analysis work with this scale (e.g., Shen, Monahan, Rhodes, & Roskos-Ewoldsen, 2009) found the 9 items best fit a 1-factor model with good Cronbach alpha reliabilities (ranging from .86 to .89). A confirmatory factor analysis of the bias items confirmed that the data best fit a 1-factor model. The same factor structure was obtained across message types, with minimal variations in factor loadings. Cronbach alpha reliabilities for the scale by message type were .87 for PT, .87 for SH, and .81 for IN message types respectively. To create the message bias scale, items were summed and divided by the total number. Message bias was not significantly related to avoidance; however, bias was negatively related to message involvement (range across PSA types –.28 to –.46, \( p < .001 \)).

As shown later, message bias and involvement are differentially affected by the independent variables; however, as they are correlated, multivariate analyses are utilized for those analyses.

**Emotional reaction and accessibility.** The three emotions that served as dependent variables were angry, nervous, and sad. Emotional accessibility was measured using established reaction time procedures (e.g., Arpan et al., 2007) employing MediaLab to measure how quickly (in milliseconds) participants responded yes or no to indicate whether they felt or did not feel the emotion while watching the previous anti-smoking message. Each emotion appeared by itself on the screen. The yes/no responses serve as the measure of emotional reaction and the reaction time serves as the measure of emotion accessibility. For each PSA, participants began with six practice items to familiarize themselves with the judgment task and process. Subsequently, they responded to the block of critical items; this block had the critical items (angry, nervous, and sad) and six filter items presented randomly for each anti-smoking message. Indicating that one felt the emotion while watching the PSA was coded as “+1” and no was coded as “–1.” Reaction times were transformed to Z-scores and an inverse transformation was used to reduce the skewed distribution of the emotional accessibility (reaction time) items; thus, higher scores indicate quicker reaction times and thus greater emotional accessibility.

**Procedures**

Participants signed up for the study at a time convenient for them. Ten individuals could participate at a time. Participants first completed an informed consent process. Next, each participant was assigned to a computer with headphones. A research assistant began the MediaLab program and instructed the participant to put the headsets on. All instructions and measures were viewed on the computer screen as well as being heard through the headset. MediaLab was used to randomly assign participants to the order they viewed the three message types and the message within each message type condition. Participants first completed measures covered in another paper. They then completed items about their neuroticism and their current smoking behavior. Participants then viewed the messages and completed the dependent measures after viewing each message. Subsequently, participants were debriefed and thanked for participating. Participation took an average of 20 to 30 minutes.

**RESULTS**

To test the proposed hypotheses, a 2 (gender) × 2 (neuroticism: high vs. low) × 3 (message type: personal testimony, secondhand smoke, and informative) × 3 (message: nested within message type) repeated measures analysis of covariance was used. We include the factors of gender and message type to assess for any potential interactions with neuroticism. Message was not a significant variable for any analyses and thus is not reported in the following. The effects of gender, current smoking behavior, message type, and message (nested within message type) are reported here when significant.

**Emotional Responses to the Messages**

H1 states that those scoring high in neuroticism will be more likely to report having felt negative emotions when watching the PSAs than will those scoring low in neuroticism. The dependent measures are the yes/no responses for I felt angry, nervous, and sad for each of the three message types. Smoking behavior was a significant covariate for feeling nervous, \( F(2, 192) = 3.55, p = .03, \eta^2 = .04 \), such that experimenters and smokers were more nervous than were non-smokers. Smoking behavior did not interact with message type or neuroticism to affect the dependent measures.

The multivariate main effect for message type was significant, Wilks’ \( \Lambda = .73, F(6, 187) = 11.58, p < .001, \eta^2 = .27 \). As shown in Table 1, SH messages evoked the most angry “yes” responses followed by PT and then IN. Also, SH messages evoked more nervous “yes” responses than did the other two message types. Finally, PT messages evoked more “yes” responses to sad than the other two message types. Message type did not interact with any other variable, Thus, secondhand smoke messages evoked more angry and nervous responses whereas personal testimony evoked more sad responses.

The multivariate main effect for neuroticism was significant, Wilks’ \( \Lambda = .94, F(3, 190) = 4.28, p < .01, \eta^2 = .06 \). The univariate effects for angry, \( F(1, 192) = 5.02, p = .03, \eta^2 = .03 \), nervous, \( F(1, 192) = 5.26, p = .02, \eta^2 = .03 \), and
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Accessibility for emotional response. H2 states that those scoring higher in neuroticism should respond more quickly to negative emotions than those low in neuroticism. The same analysis for H1 was used with the accessibility of the emotional responses serving as the dependent measure. Age was a significant covariate, Wilks’ $\Lambda = .85, F(3, 191) = 11.54, p < .001, \eta_p^2 = .15$.

The multivariate main effect for neuroticism was significant, Wilks’ $\Lambda = .94, F(3, 191) = 3.37, p < .05, \eta_p^2 = .06$. The univariate effects for angry, $F(1, 193) = 5.93, p = .02, \eta_p^2 = .03$, nervous, $F(1, 193) = 5.50, p = .02, \eta_p^2 = .03$, and sad, $F(1, 193) = 4.68, p = .03, \eta_p^2 = .02$, were all significant. As shown in Table 2, those scoring high in neuroticism had significantly faster reaction times than did those low in neuroticism, supporting H2.

Cognitive Responses to Messages

Hypotheses 3, 4, and 5 were tested using the same design already described, with involvement, avoidance, and bias as the dependent measures. Multivariate effects are reported here, and under each hypothesis, the relevant univariate effects are reported. The multivariate main effect for neuroticism was significant, Wilks’ $\Lambda = .84, F(3, 195) = 12.38, p < .001, \eta_p^2 = .16$. Smoking behavior was a significant covariate, Wilks’ $\Lambda = .93, F(6, 384) = 2.36, p = .03, \eta_p^2 = .06$.

Message involvement. H3 states that individuals scoring higher on neuroticism will report being less involved with the anti-smoking messages than will those scoring lower on neuroticism. A univariate main effect for message type was found, $F(1, 197) = 8.22, p = .005, \eta_p^2 = .04$, such that individuals were more involved when viewing personal testimony messages than any other message type (see Table 1). The two other message types did not differ significantly from each other. Neuroticism was not a significant predictor for message involvement, $F(1, 197) < 1, ns$; thus, H3 is not supported.

Avoidance. H4 states that those scoring high on neuroticism will be more likely to report that they did not want to think about smoking as a function of watching the anti-smoking PSAs as compared to those scoring low on neuroticism. A univariate main effect for neuroticism was significant, $F(1, 197) = 32.30, p < .001, \eta_p^2 = .14$, such that those scoring high in neuroticism ($M = 3.45, SE = .09$) were more avoidant than those scoring low in neuroticism ($M = 2.67, SE = .08$), supporting H4.

Finally, a neuroticism $\times$ message type interaction was obtained, $F(1, 197) = 5.69, p = .02, \eta_p^2 = .03$. As shown in Table 3, those scoring low in neuroticism responded similarly to all three message types, whereas those scoring high in neuroticism were more avoidant for personal testimony messages than the other two message types. H4 is supported because those high in neuroticism were significantly more

### Table 1
Message Type as a Function of Attention, Avoidance, Bias, and Emotional Responses

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<th>PT</th>
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<tbody>
<tr>
<td>Attention*</td>
<td>3.76&lt;sup&gt;b&lt;/sup&gt;</td>
<td>3.50&lt;sup&gt;a&lt;/sup&gt;</td>
<td>3.60&lt;sup&gt;b&lt;/sup&gt;</td>
</tr>
<tr>
<td>(0.63)</td>
<td>(0.75)</td>
<td>(0.74)</td>
<td></td>
</tr>
<tr>
<td>Avoidance*</td>
<td>3.03</td>
<td>2.96</td>
<td>2.92</td>
</tr>
<tr>
<td>(1.21)</td>
<td>(1.05)</td>
<td>(1.20)</td>
<td></td>
</tr>
<tr>
<td>Bias**</td>
<td>2.41&lt;sup&gt;ab&lt;/sup&gt;</td>
<td>2.57&lt;sup&gt;a&lt;/sup&gt;</td>
<td>2.51</td>
</tr>
<tr>
<td>(0.68)</td>
<td>(0.70)</td>
<td>(0.77)</td>
<td></td>
</tr>
<tr>
<td>Emotion (yes/no)**</td>
<td>- .47&lt;sup&gt;a&lt;/sup&gt;</td>
<td>- .17&lt;sup&gt;a&lt;/sup&gt;</td>
<td>- .67&lt;sup&gt;a&lt;/sup&gt;</td>
</tr>
<tr>
<td>Angry</td>
<td>(0.06)</td>
<td>(0.07)</td>
<td>(0.05)</td>
</tr>
<tr>
<td>Nervous</td>
<td>- .74&lt;sup&gt;a&lt;/sup&gt;</td>
<td>- .45&lt;sup&gt;ab&lt;/sup&gt;</td>
<td>- .75&lt;sup&gt;b&lt;/sup&gt;</td>
</tr>
<tr>
<td>(0.05)</td>
<td>(0.06)</td>
<td>(0.05)</td>
<td></td>
</tr>
<tr>
<td>Sad</td>
<td>.21&lt;sup&gt;ab&lt;/sup&gt;</td>
<td>- .44&lt;sup&gt;a&lt;/sup&gt;</td>
<td>- .35&lt;sup&gt;b&lt;/sup&gt;</td>
</tr>
<tr>
<td>(0.07)</td>
<td>(0.07)</td>
<td>(0.07)</td>
<td></td>
</tr>
</tbody>
</table>

Note. Emotional accessibility (reaction times) are presented in milliseconds ($Z$-score transformations). Superscripts denote significant differences between message types ($p < .05$). Asterisk indicates standard deviations are presented in parentheses. Double asterisk indicates standard errors reported in parentheses. For the emotions felt in reaction to messages, yes is scored as +1 and no is scored as −1. N for cognitive measures = 200, N for emotion measures = 199.

### Table 2
Emotional Reactions as a Function of Neuroticism

<table>
<thead>
<tr>
<th>Level of Neuroticism</th>
<th>Emotion Type</th>
<th></th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>Angry</td>
<td>Nervous</td>
</tr>
<tr>
<td>Low</td>
<td>-.32</td>
<td>-.53</td>
</tr>
<tr>
<td></td>
<td>(.07)</td>
<td>(.05)</td>
</tr>
<tr>
<td>High</td>
<td>-.54</td>
<td>-.71</td>
</tr>
<tr>
<td></td>
<td>(.07)</td>
<td>(.06)</td>
</tr>
<tr>
<td></td>
<td>Emotional reaction (yes/no)*</td>
<td></td>
</tr>
<tr>
<td>Low</td>
<td>-.11</td>
<td>-.10</td>
</tr>
<tr>
<td></td>
<td>(.07)</td>
<td>(.06)</td>
</tr>
<tr>
<td>High</td>
<td>.15</td>
<td>.12</td>
</tr>
<tr>
<td></td>
<td>(.08)</td>
<td>(.07)</td>
</tr>
</tbody>
</table>

Note. Standard errors are presented in parentheses. All comparisons of low/high neuroticism are significant. Asterisk indicates that Yes is scored as a +1 and No is scored as a −1. Double asterisk indicates reaction times are standardized using $Z$-scores and recorded in milliseconds. N for those low in neuroticism for these analyses = 111; for those high in neuroticism $N = 88$.

sad, $F(1, 192) = 10.93, p < .001, \eta_p^2 = .06$, were all significant. Unexpectedly, those scoring high in neuroticism were less likely to say “yes” than were those scoring low in neuroticism; thus, H1 is not supported (see Table 2).<sup>2</sup>

<sup>2</sup>Given that the dependent variable (emotion) and the independent variable were both dichotomized, these data also were examined in a series of $\chi^2$ analyses. These analyses confirmed the findings of the repeated measures analyses that those high in neuroticism responded “no” more often to each emotion than did those low in neuroticism.
likely to want to avoid the message as compared to those low in neuroticism for all message types.

**Message bias.** H5 states that those who scoring higher on neuroticism will be more likely to perceive anti-smoking PSAs as biased as compared to those scoring low on neuroticism. Smoking was a significant covariate for message bias \( F(1, 197) = 11.45, p = .001, \eta^2 = .06 \). Non-smokers (\( M = 2.36, SE = .06 \)) saw messages as less biased than did experimenters (\( M = 2.57, SE = .07 \)) and current smokers (\( M = 2.68, SE = .08 \)). In addition, a univariate effect for gender was obtained for message bias \( F(1, 195) = 11.63, p = .001, \eta^2 = .06 \) such that males (\( M = 2.64, SE = .06 \)) saw messages as more biased than did females (\( M = 2.38, SE = .05 \)). A message type effect was also obtained, \( F(1, 197) = 4.08, p = .05, \eta^2 = .02 \), such that SH messages were rated as more biased than PT messages whereas neither SH nor PT messages were different from IN messages (see Table 1).

The main effect for neuroticism was significant, \( F(1, 197) = 4.63, p = .03, \eta^2 = .02 \). Those scoring high in neuroticism (\( M = 2.60, SE = .06 \)) viewed the messages as more biased than did those scoring low in neuroticism (\( M = 2.43, SE = .05 \)). H5 was supported.

**Post Hoc Analyses**

The effect of neuroticism for type of emotional response and accessibility of emotional responses were both significant, yet while the emotion accessibility data were consistent with H2, the finding for type of emotional response was in the opposite direction predicted by H1. Therefore, we assessed if the type of emotion response \( \times \) emotion accessibility interaction term was significantly affected by neuroticism. By looking at the interaction, we endeavor to uncover if participants were systematically quicker at identifying whether they felt an emotion or not, and whether neuroticism affected this relationship. The type of response (yes vs. no) \( \times \) accessibility interaction term for each message type was the dependent variable in a repeated-measures design of covariance with effects of smoking and age covaried out. Neuroticism was significant for the angry, \( F(1, 192) = 4.94, p = .03, \eta^2 = .03 \) and the sad interaction terms, \( F(1, 192) = 4.54, p = .03, \eta^2 = .02 \). Examining emotional accessibility split by emotional response (yes vs. no), neuroticism (high vs. low), and message type (PT, SH, IN) found the same pattern across all comparisons (see Table 4). Emotional accessibility of those low in neuroticism did not differ as a function of whether they responded “yes” or “no,” while those high in neuroticism responded faster to “no” and slower to “yes” for angry and sad judgments across all three message types.\(^3\)

---

**TABLE 3**

Message Attention, Avoidance, and Bias as a Function of Neuroticism and Message Type

<table>
<thead>
<tr>
<th>Level of Neuroticism</th>
<th>PT</th>
<th>SH</th>
<th>IN</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Low</td>
<td>3.78(^{ab})</td>
<td>3.43(^a)</td>
<td>3.58(^b)</td>
</tr>
<tr>
<td></td>
<td>(.59)</td>
<td>(.77)</td>
<td>(.76)</td>
</tr>
<tr>
<td>High</td>
<td>3.74</td>
<td>3.58</td>
<td>3.63</td>
</tr>
<tr>
<td></td>
<td>(.67)</td>
<td>(.72)</td>
<td>(.71)</td>
</tr>
<tr>
<td>Low</td>
<td>2.62(^*)</td>
<td>2.78(^*)</td>
<td>2.63(^*)</td>
</tr>
<tr>
<td></td>
<td>(1.09)</td>
<td>(1.09)</td>
<td>(1.13)</td>
</tr>
<tr>
<td>High</td>
<td>3.56(^{ab*})</td>
<td>3.19(^{ab*})</td>
<td>3.28(^{ab*})</td>
</tr>
<tr>
<td></td>
<td>(1.14)</td>
<td>(1.08)</td>
<td>(1.18)</td>
</tr>
<tr>
<td>Low</td>
<td>2.31(^{ab*})</td>
<td>2.47(^{ab*})</td>
<td>2.46(^b)</td>
</tr>
<tr>
<td></td>
<td>(.60)</td>
<td>(.65)</td>
<td>(.80)</td>
</tr>
<tr>
<td>High</td>
<td>2.55(^*)</td>
<td>2.69(^*)</td>
<td>2.58</td>
</tr>
<tr>
<td></td>
<td>(.75)</td>
<td>(.75)</td>
<td>(.72)</td>
</tr>
</tbody>
</table>

**Note.** Superscripts denote significant differences between message types, whereas asterisks denote significant differences within message type \( p < .05 \), \( N = 112 \) (low), 88 (high).

---

**TABLE 4**

Emotional Accessibility as a Function of Emotional Response, Neuroticism, and Message Type

<table>
<thead>
<tr>
<th>Level of Neuroticism</th>
<th>Angry</th>
<th>Sad</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>Yes</td>
<td>No</td>
</tr>
<tr>
<td>Low</td>
<td>-.21</td>
<td>-.08(^*)</td>
</tr>
<tr>
<td>High</td>
<td>-.25</td>
<td>.27(^*)</td>
</tr>
<tr>
<td>Low</td>
<td>-.12</td>
<td>-.03(^*)</td>
</tr>
<tr>
<td>High</td>
<td>-.16</td>
<td>.26(^*)</td>
</tr>
<tr>
<td>Low</td>
<td>-.44</td>
<td>.00(^*)</td>
</tr>
<tr>
<td>High</td>
<td>-.45</td>
<td>.20(^*)</td>
</tr>
</tbody>
</table>

**Note.** Asterisks denote significant differences within emotional response (yes and no). Yes is scored as a +1 and No is scored as a –1. Reaction times are standardized using Z-scores and recorded in milliseconds. \( N = 112 \) (low), 88 (high).

---

\(^3\)Prior work suggests that women score higher in neuroticism than males (Costa, Terracciano, & McRae, 2001). Consistent with prior work, gender and neuroticism were related, \( t(198) = 3.36, p < .001 \), such that females (\( M = 2.64, SD = 1.91 \)) scored higher on neuroticism than did males (\( M = 1.75, SD = 1.80 \)). However, gender did not interact with neuroticism for any of the analyses. Prior work also suggests neurotics are more likely to be smokers. A 3 (smoking status: nonsmoker vs. experimenter vs. smoker) \( \times \) 2 (neuroticism: high vs. low) chi-squared test was used to examine this relationship; it was not significant, \( \chi^2 \) (2) = 1.85, ns. We also examined the dependent variables to assess whether smoking status and neuroticism interacted to affect the outcomes; no significant interaction effects were obtained.
DISCUSSION

Individuals scoring high in neuroticism reported being more avoidant and perceived anti-smoking messages as more biased than did those low in neuroticism. Those high in neuroticism also were more likely to indicate they did not feel negative emotions while watching the messages and responded more quickly with a “no” response to negative emotions than did those low in neuroticism. This pattern of results suggests those high in trait neuroticism evidenced an avoidant reaction to anti-smoking messages.

Neuroticism and Anti-Smoking Messages

Individuals scoring high in neuroticism perceived the messages to be more biased than did individuals scoring low in neuroticism. Smoking status was also a factor, with non-smokers viewing the messages as less biased than both experimenters and current smokers. Both responses could be the result of a defensive response. Individuals may perceive anti-smoking messages as biased in an effort to separate oneself from either threatening information (for those high in neuroticism) or current, negative behavior (for experimenters and current smokers).

That those scoring high in neuroticism were significantly more likely to report a desire to avoid thinking about the bad parts of smoking for all three message types is one of the more interesting findings because this response could be characterized as a traditional neurotic reaction to the message. Moreover, neuroticism accounted for a substantive portion of the variance (14%) in the avoidance response. While this is the first study we know of to empirically demonstrate that neurotics report trying to avoid thinking about smoking as a function of message exposure, the avoidance response is consistent with prior literature demonstrating neurotics are more avoidant of negative information (Elliot & Thrash, 2002).

The theory of psychological reactance (Brehm & Brehm, 1981) postulates that when individuals are presented with threatening information (e.g., threat to freedom) such as anti-smoking messages, one response may be to exercise another freedom, such as avoiding the message. Messages that attempt to change behavior or beliefs may be perceived as threats to freedom and more likely to induce reactance and defensive message processing. According to reactance theory, messages have these effects because individuals generate more negative cognitive responses (e.g., counter-argument, derogation of message and source, etc.) toward the message (Dillard & Shen, 2005). Reactant responses may be particularly characteristic of individuals high in neuroticism as they are more likely to view information as threatening and therefore may be more reactant to emotional appeals. This avoidance reaction may be exacerbated by the co-occurrence of neuroticism and smoking behavior increasing the threat of the message and subsequently inducing an avoidant response to the message. Future research might investigate the degree to which trait reactance and neuroticism correlate.

A desire to avoid thinking about a message can have unintended consequences. Thought suppression is considered to be the desire or attempt to not think about a specific object (Wegner, 1989). When a threatening or stressful event takes place, individuals attempt to exert mental control to avoid unpleasant thoughts. This attempt requires a conscious effort by the individual, which tends to have a paradoxical effect increasing preoccupation with the topic they are trying to suppress (Wegner, 1989). Therefore, the initial desire to avoid messages about the bad parts of smoking may fuel the thought process and create prolonged bad feelings that then need to be suppressed. Such an interpretation is supported by research demonstrating those high in neuroticism experience more sustained negative moods (Mathews et al., 2006) and are predisposed to obsessively think about threatening information (Rothman et al., 2001). Thus, we speculate that by trying to avoid messages about smoking, neurotic individuals ultimately may increase their anxious reactions to such messages.

Trait neuroticism also interacted with message type such that those scoring low in neuroticism responded similarly to all message types, but those scoring high in neuroticism were more avoidant of personal testimony messages than any other message type. Personal testimony messages were also perceived as least biased and evoked the most “yes” responses to the sadness emotion. Thus, it may be that neurotics found the personal testimony messages to be the most difficult to avoid thinking about as these messages were narratives evoking emotions that were difficult for them to discount. Yet we urge readers to interpret any findings as a function of message type with caution. As one reviewer commented, personal testimony is a message format whereas secondhand smoke is a message content, and therefore messages can conceivably be both a personal testimony message and a secondhand smoke message. Consequently, future research is needed to draw any strong inferences that personal testimony messages are the ones that would be least likely to work with those scoring high in neuroticism.

Neuroticism and Emotional Responses to Messages

We assessed both the type and accessibility of emotional reactions to the anti-smoking PSAs. Individuals high in neuroticism responded more quickly to indicate whether they felt an emotion or not as a function of message exposure, suggesting that their negative emotional reactions were more accessible, as predicted. Thus, their negative feelings of anger, nervousness, and sadness were more easily activated from memory than for those low in neuroticism. This is important because feelings, attitudes, and stereotypes that...
are more accessible in memory are more likely to affect behavior and recall of messages. A second important finding was that those scoring high in neuroticism were less likely to report experiencing the three negative emotions (angry, nervous, and sad), counter to prediction and counter to a robust literature indicating those high in trait neuroticism are more susceptible to experiencing negative affect (Rusting & Larsen, 1997). How can we make sense of the findings that those higher in trait neuroticism were faster at making assessments about their emotions but were more likely to report not feeling the negative emotion?

Post hoc analyses found that accessibility to the three negative emotions did not differ significantly for those low in neuroticism, while those high in neuroticism were significantly quicker at responding “no” than “yes” for all emotions. Thus, individuals scoring high in neuroticism were more likely to report not feeling an emotion and did so quicker. Since, as prior literature suggests, those scoring high in neuroticism think about their emotions more often, these responses should be more readily available allowing a quicker response. Combining this finding with data indicating those high in neuroticism found messages to be more biased and that they had a significantly stronger desire to avoid thinking about the message content suggests that the “no” response may be another indicator of message avoidance. Individuals perceive the message as biased, indicate they do not feel the concomitant emotion, and indicate a desire to avoid thinking about the message. Such an avoidant response is consistent with the characterization of neurotic individuals as trying to disassociate from threatening information to minimize the connection between their behavior and the health outcome (Rothman et al., 2001).

Message Design Challenge

That neurotics wish to avoid thinking about anti-smoking messages creates challenges for message designers, especially since prior research suggests that neurotics are more likely to smoke cigarettes. This is the first study to examine how those high in trait neuroticism respond to health messages and, as such, there is a significant gap in the literature and a paucity of data suggesting what message types would work with those high in trait neuroticism. Future research is needed to systematically examine how individuals who are high in trait neuroticism respond both affectively and cognitively to an array of message types and features. Moreover, longitudinal data are needed to not only assess initial reactions to such messages but also to establish whether, over time, those high in trait neuroticism continue their initial avoidant reaction.

As noted previously, research finds neurotics have maladaptive responses to threatening information (Gunthert et al., 1999). In the present study, all nine messages had a threat-to-health component since they address negative consequences associated with risky behavior. Those scoring high in neuroticism were significantly more likely to want to avoid thinking about smoking as a function of message exposure and viewed these messages as more biased. Thus, we speculate that message designers may want to focus on benefits or positive outcomes associated with not smoking rather than on the threat to health aspect. Considering our results in conjunction with the larger work concerning neuroticism, we speculate that messages highlighting the potential benefits of not smoking may result in less message avoidance and perceptions of message bias by neurotics. For example, a reformed smoker could share the long-term benefits experienced by quitting smoking (e.g., having more energy to play with their kids, better lung function leads to a more active lifestyle, overall better quality of life). While the current study was not designed to examine messages that promoted the benefits associated with not smoking, we believe this is an area ripe for future research with neurotics.

Also, investigation into the potential link between level of neuroticism and message sensation value (MSV) should be examined. The messages included in this study were all coded as relatively high in MSV. It may be beneficial to study in the future as those scoring high in neuroticism may respond more positively to messages low in MSV because such messages may have less strong negative affect and thus be seen as potentially less “threatening.” Previous research has also found that individuals high in neuroticism are more likely to watch television for companionship means and more likely to pay attention to non-violent information in the news as a means for maintaining control of their environment (Kremar, 2009). Since neurotics focus on nonviolent information on television news, which are traditionally high in MSV, these individuals may respond similarly to health messages low in MSV.

Limitations and Future Research

Message avoidance was measured using a single item as those items that were used to measure avoidance did not correlate. Considering the current findings, future research should expand the measurement and assess more aspects of message avoidance. Another limitation was the use of a nonrandom sample of college students. College students, especially in the South, are an important group for anti-smoking studies; however, these data reflect the responses of well-educated, primarily Caucasian young adults. Thus findings may not generalize to other populations.

Third, though we only considered one health topic, smoking behavior, previous research points to the influence of a high level of neuroticism on a variety of hazardous health behaviors. For example, substance abusers (e.g., alcohol, cocaine, sedative hypnotics) scoring high on neuroticism are more likely to attempt suicide and relapse after being discharged from a substance abuse treatment center (Fisher, Elias, & Ritz, 1998; O’Boyle & Brandon, 1998). Individuals high in neuroticism were also more likely to suffer from
alcoholism (Terracciano & Costa, 2004). Future research should use messages on a variety of health issues to determine the generalizability of our findings to messages concerning these other health behaviors.

We examined three specific, different messages within each message type and carefully chose message types that evoked different reactions from the target population. That trait neuroticism affected perceptions of all three message types enhances the generalizability of our findings; however, these results should be extended to examine other message types. Considering the maladaptive response of individuals high in neuroticism, it is therefore possible that these individuals may also have maladaptive responses to other forms of messages as well.

CONCLUSIONS

Trait neuroticism predicted responses to anti-smoking public service announcements such that individuals scoring higher in neuroticism were more likely to want to avoid thinking about the message and more likely to perceive the anti-smoking PSAs as biased. Neuroticism also affected individuals’ emotional responses to the messages with those high in neuroticism saying that they did not experience the negative emotions and responding more quickly, especially when responding “no,” than did those low in neuroticism. These findings demonstrate the need for message designers to tailor messages more specifically to individuals predisposed to engage in the focal behavior (e.g., smoking) and who may have maladaptive responses to traditional persuasive health messages. Broader investigation of the affect of neuroticism on various other forms and topics of health-related messages should be considered.

REFERENCES


APPENDIX: SYNOPSES OF PUBLIC SERVICE ANNOUNCEMENTS (PSAs)

Personal Testimony PSAs

Pam Laffin. A woman states that she started smoking as a young person and got hooked. She also got asthma, bronchitis, and emphysema. She still did not quit. She did not quit until she had to have a lung removed. She was 24 when all of this happened. Now 26, she tells the viewer that she will be on medication for the rest of her life. The medication gives her a “fat face” and a hump on her neck. In the end, she says she started smoking to look older. She then adds, “and I’m sorry to say, it worked.” This ad starts with her going up an escalator. It progresses by giving a photographic account of her life from healthy and young to older and smoking and finishes with her talking to the camera. This 30-second PSA was produced for the Massachusetts Department of Public Health and intended for a target audience of youths and young adults.

Voice box Debi. Debi is an older smoker. She talks through a voice box because there is a hole in her trachea, a complication from her years of smoking. Near the end of the message, she smokes and the cigarette smoke is released through her trachea.

Real. A Canadian message designed by teenage girls. Several girls tell the age at which they started smoking—all at age 10. They point out how hard it is to quit. They also note that the cigarette companies really target the younger market. The main message is that they wish they had never started.

Secondhand Smoke PSAs

Victim wife. The PSA focuses on an older man. He talks about how his wife always bugged him to quit smoking. She told him it was bad for him and made the drapes smell, and she even threatened to stop kissing him if he did not stop. He did not quit because it was his lungs and life. He then explains that he was wrong—instead of losing his life, his wife lost hers. The message “Secondhand smoke kills 53,000 people every year” is shown. The message ends with the man saying that his wife was his life. He is obviously very upset and starts to cry. This 30-second PSA was produced for the California Department of Health Services.

SUV. A four-person African American family is riding in their SUV. Two kids (teen boy and a younger girl) are in the back listening to headphones and sleeping. The mother is in the passenger seat; the father is driving. The son makes a face and says, “Whoa, whoa—something’s funky.” An announcer states, “Passing gas can be deadly.” The mom scolds her husband with “Oohhh, oohhh—honey! Not in the car.” The announcer talks about how gases are poisonous. “Kids shouldn’t be exposed to secondhand smoke.”

Dad is driving with a steady stream of cigarette smoke in front of him. He puts out the cigarette and looks shamed. The announcer says, “Don’t pass gas; take it outside.” The last screen displays the web address don'tpassgas.com and a phone number. This 30-second PSA was produced for the California Department of Health Services.

Crawling dolls. The number 135 in red-orange is shown. Then, a mechanical baby is crawling and crying on a sidewalk in a large city. The cries and mechanical dolls multiply to hundreds as we see a man putting them on the street. A baby then falls over, and the message on the bottom is exposed: “How do infants avoid secondhand smoke? . . . At some point they begin to crawl.” We then zoom out to see the hundreds of mechanical babies with about five or six people standing among them. The screen says, “Knowledge is contagious.” We can still hear the mechanical babies. The last screen says, “Infect Truth.” This 30-second PSA was produced for the American Legacy Foundation.

Informative PSAs

Singing cowboy. This is a Truth ad that shows a White cowboy singing with a guitar in the middle of Times Square in New York. The man is singing about the dangers of smoking through a voice box because he no longer has his own vocal cords from smoking.

Cinema. This ad is set up to seem like a movie trailer with the tobacco industry people being the producers. It describes the harm brought by tobacco: “heart stopping, positively addictive, 3 million deaths a year.”

Poison. This ad shows various White people (male, female, and a baby) drinking different poisonous chemicals (e.g., cyanide) from chemistry jars. At the end, the ad states that all of those chemicals are in cigarettes.