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Are young adults fear appeal effectiveness ratings explained by fear arousal, perceived threat and perceived efficacy?

Abstract

In a focus group setting, we examined how young adults responded to six fear appeal Public Service Announcements. We tested whether the young adults' ratings of Public Service Announcements' effectiveness were explained by the variables identified in the fear appeals literature: fear (i.e., graphic content and fear arousal), perceived threat (i.e., perceived likelihood of consequences and perceived severity of consequences) and perceived efficacy (i.e., perceived self-efficacy and perceived response-efficacy). We found that a model including all predictors explained over 70% of the variation in effectiveness ratings with four of the predictors having statistically significant beta coefficients. In addition, the most influential predictor of effectiveness was the level of fear aroused by the Public Service Announcement. We also found that males and females responded differently. While fear arousal was clearly the most influential predictor of effectiveness ratings by each gender, males' effectiveness ratings were also significantly influenced by the level of graphic content in the Public Service Announcement and females' effectiveness ratings were also significantly influenced by their perception of the likelihood of the consequences of the threat. We use these and other findings to draw conclusions about the design of effective fear appeals to young adults.

Keywords: fear appeal, fear arousal, perceived threat, perceived efficacy.

Introduction

In April 2009, the New York City department of health, as a part of their anti-smoking campaign, supplied a public service announcement (PSA) to the local television stations which showed a 3-year-old boy abandoned by his mother in a train station. The boy starts to cry and the caption reads "If this is how your child feels after losing you for a minute, just imagine if they lost you for life." The public outcry over this "separation" commercial was very quick (Schapiro and Hutchinson, 2009). The reaction in New York paralleled the outcry in Australia, where the PSA was originally produced and shown. The response led to the removal of the PSA as part of the anti-smoking campaign on April 15, 2009 in New York (New York City Department of Health and Mental Hygiene, 2009) as well as Australia (Byrnes, 2009).

The anti-smoking PSA is an excellent example of the continuing use of fear appeals in advertising. Fear appeals are commonly used in PSAs against drug use, drinking and driving, unsafe sexual practices, and unsafe/distracted driving. Yet, a long stream of fear appeals research in various disciplines has provided mixed evidence on the effectiveness of fear appeals (Ruiter et al., 2001). With young adults, the ability of fear appeals to change intentions and behavior is particularly questionable. There have been several research studies which indicate that young adults recognize when fear appeal PSAs are "trying to scare us into not taking drugs or not smoking" but find the message irrelevant to them personally (Cohn, 1998, Hastings and MacFadyen, 2002; Hastings et al., 2004) or doubt the consequences would happen to them (Kempf and Harmon, 2006). In Great Britain, during the 1990s, there were a number of research projects completed to help develop HIV/AIDS campaigns. In research conducted with Scottish teenagers, it was found that they recognized the advertising was intended to frighten "people in general" or "others", but they did not identify with it. The teenagers felt that shock approaches would work for others but not for "me" (Hastings et al., 1990). MacAskill et al. (1993) found that their respondents (smokers of all ages) can describe a hard-hitting ad as good while claiming that it fails to scare them personally.

While a number of models have been advanced to explain the effectiveness of fear appeals, it is unclear whether such models apply well to young adults. For example, one of the most recent models, Witte's (1992) Extended Parallel Process Model (EPPM), argues that when a person perceives a threat, fear is aroused. If the fear arousal is sufficiently high, the person evaluates the efficacy of the response proposed in the appeal. The person then chooses whether to control the danger (e.g., by adopting the proposed response) or to control the fear (e.g., by denying the message). Given prior research with young adults, there is little clarity about how this group perceives threats, reacts to fear arousal, and perceives the efficacy of proposed responses. Our study examines these factors. We test whether these variables predict young adults ratings' of the effectiveness of fear appeals, and we examine how young adults respond to low, moderate, and high levels of threat.

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1. Literature review

A fear appeal is a persuasive communication attempting to arouse fear, promoting precautionary motivation and self-protective action (Rogers, 1983; Rogers and Deckner, 1975). A fear appeal attempts to arouse fear by presenting a threat (e.g., "serious painful injury") to which the recipient is susceptible (e.g., "car accident") and which is severe (e.g., "people die from car accidents"). This prompts a search for "safety conditions" by recommending specific action (e.g., "by not texting and driving, you are less likely to have an accident"). Such action may be presented as effective in neutralizing the threat (e.g., "don't text and drive") and easy to execute ("drive safely"). PSAs often employ fear appeals because they "... motive attitude, intention and behavior changes – especially fear appeals accompanied by high-efficacy messages" (Witte and Allen, 2000, p. 605).

Fear appeal research has examined the structure of fear appeals (Eagly and Chaiken, 1993; Witte, 1992). In their meta-analysis of public health fear appeals studies, Witte and Allen (2000) note that the literature has identified the three key independent variables discussed below: fear, perceived threat, and perceived efficacy.

1.1. Fear. Fear arousal is an unpleasant emotional state triggered by the perception of threatening stimuli. It is assumed that such states involve physiological arousal and motivate cognitive, affective and behavioral responses directed towards alleviation of threat and reduction or elimination of fear (Dijker et al., 1997, Frijda, 1986). Studies have examined the relationship between the amount of fear evoked and attitude or behavior change. Several have found that the more fear, the more effect (Baron et al., 1994; Boster and Mongeau, 1984; Higbee, 1969; LaTour and Pitts, 1989; Millar and Miller, 1998; Rotfeld, 1988). Other studies have found that moderate levels of fear perform better, producing an inverted-U-shaped model (Keller, 1999; Krisher et al., 1973; Quinn et al., 1992). O'Keefe (1990) indicates that messages that can induce greater fear are more likely to enhance the effectiveness of the message than weak levels of fear; however, high levels of fear are often difficult to achieve because fear resides within the receiver of the message rather than the sender. Witte and Allen's (2000) meta-analysis of public health fear appeals concluded that the preponderance of evidence supports a linear model of fear arousal – the more fear, the grater the persuasion – and that there is no evidence to support the U-shaped model of fear.

1.2. Perceived threat. Perceived threat is composed of two dimensions: perceived susceptibility to the threat (i.e., the degree to which one feels at risk for experiencing the threat) and perceived severity of the threat (i.e., the magnitude of harm expected from the threat) (Witte and Allen, 2000).

Several studies examined how individuals react when faced with threatening stimuli (Arthur and Quester, 2004; Roser and Thompson, 1995; Stuteville, 1970). People can respond to this level of threat with either adaptive behavior or maladaptive behavior. In other words, they either reject the behavior or habit or reject the message. Stuteville (1970) found three ways to deal with fear. The first is to deny the message. The second is an unconscious response where people feel that they are not going to experience any adverse effects of the behavior or that they are the exception to the rule. The third response may be to laugh at the message thereby diffusing its importance.

1.3. Perceived efficacy. Perceived efficacy is also composed of two dimensions: perceived self-efficacy (i.e., people's beliefs about their capabilities to produce effects (Bandura, 1994)) and perceived response efficacy (i.e. one's beliefs about whether the recommended response works in averting the threat) (Witte and Allen, 2000). Studies indicate that self-efficacy can moderate the effect of fear on attitude and behavior change (Anderson, 2000; Girandola, 2000; Ruiter et al., 2001; Smith, 1997; Snipes et al., 1999). High levels of fear should be the most effective at motivating changes in behavior, providing that the proposed coping response to the threat is feasible and within the consumer's ability (Blumberg, 2000; de Turck et al., 1992; Donovan, 1991; Snipes et al., 1999; Witte et al., 1998).

1.4. The relationship between fear, perceived threat, and perceived efficacy. According to the EPPM, three effects of fear are possible: (1) a null effect in which the threat is ignored, (2) an intended result or a disposition to control the danger perceived, or (3) an unintended result where the person will attempt to control the fear. The danger will be controlled by changing behavior or the person will control the fear through use of denial, counter-arguing or defiance. People are more likely to engage in fear control when they feel they lack self-efficacy. For this reason, fear appeals are expected to work best when coupled with messages that build self-efficacy.

1.5. Application of literature to young adults. Villani (2001) completed a review of research between 1990-2000 on the impact of media on children and adolescents. Her conclusions stated that "the primary effects of media exposure are increased violent and aggressive behavior, increased high-risk behaviors, including alcohol and tobacco

use, and accelerated onset of sexual activity." This research suggests that fear appeals may not be effective with young adults who grew up during the period reviewed by Villani.

Similarly, young adults who have been exposed to graphic and violent images in the video games, movies, and television may be desensitized to the kinds of images often used in fear appeals. For example, in a study involving college students, Kempf and Harmon (2006) examined the impact of cigarette package warning labels. The study examined the effectiveness of Canadian style warning labels (new) versus American style warning labels (old). Canadian warning labels were larger and contained messages accompanied by graphic images. They conclude that the size, location and messages in the warning label may account for a majority of the superior performance of the new labels over the old, rather than the graphical element of the warning label.

Prior research also suggests that young adults may not view all threats in the same way. For example, some studies have found that the impact of the behavior on social interactions may be more threatening than physical harm. For example, Ho (1998) found the social aspects of anti-smoking ads were more effective. In another study of anti-smoking ads, social approval messages were more effective with teenagers. Ads concentrating on bad breath and stained teeth tested higher than ads about cancer (Uusitalo and Niemela-Nyrhinen, 2008).

Fear appeal studies have also found that young adults may respond in ways other than those advocated in the appeal. Miller and Rollnick (1991) theorized that when people are faced with the necessity to change their behavior, they feel that their personal freedom is threatened. This makes the behavior more attractive to them than before. In a comprehensive study (Wechsler et al., 2003) of colleges that had social marketing campaigns to try to reduce heavy drinking, no significant decrease in drinking was found. In fact, a pattern of increased drinking emerged.

Given this literature, our study examines the research question:

R1: Do fear, perceived threat, and perceived efficacy predict young adults' ratings of the effectiveness of fear appeals?

2. Methodology

We tested the effectiveness of six fear appeal PSAs with focus groups of young adults. The PSAs used in the focus groups were representative of a broad range of fear appeals available on state and federal government websites, YouTube, and other websites identified through the use of web search tools such as Google. In selecting the PSAs for this study, we searched for fear appeals that were either targeted at young adults or were related to issues that affect the lives of young adults. We selected PSAs related to four social issues: drug abuse, smoking, HIV testing, and distracted driving. Each PSA was produced by a government agency, ranging from local city governments (Los Angeles Department of Transportation) to Federal government agencies (Office of National Drug Control, Partnership for a Drug-free America). For purposes of this paper, we identified the six PSAs as: brain on drugs; smoking effects on baby; damage from smoking; HIV testing; distracted driving (serious); and distracted driving (funny). The distracted driving and HIV testing PSAs were targeted at young adults while the drug abuse and smoking PSAs were targeted at general audiences.

The focus groups were convened on the campus of a public university in the southeastern United States. Students were solicited through business classes and asked to voluntarily participate in the focus groups. No compensation was offered to the students for their participation.

Two focus groups were held in which the participants watched all six PSAs. Immediately after watching each PSA, each participant rated the PSA on seven dimensions using seven-point Likert scales. The participants were asked six questions based on the fear appeal literature and the Extended Parallel Process Model (EPPM) with two questions relating to fear (graphic content and fear arousal), two questions relating to perceived threat (perceived likelihood of consequences and perceived severity of consequences), and perceived efficacy (perceived self-efficacy and perceived response efficacy). The final question asked the participants to rate the effectiveness of the appeal in convincing people to change their behavior.

After viewing the first PSA, the participants were asked to provide demographic data including age, gender, marital status, and whether participant had children. Because the participants were enrolled in college and had to be 25 years of age or younger, we expected that most of the participants would be single and would not have children. We gathered the demographic data to determine if our assumptions were correct.

3. Results

A total of 30 young adults participated in the focus groups. Because each participant viewed all six fear appeal PSAs, this process resulted in a total of 180 observations. We pooled together all observations and analyzed the data in a multiple regression.

The demographics of the focus group participants are reported in Table 1.

Table 1. Focus group participants descriptive statistics

Age (mean)	22.6 years
Gender:	
# of males	18
# of females	12
Marital status:	
# single	28
# married	2
Children:	
# without children	29
# with children	1

3.1. Multiple regression results. We first examined how well the variables identified in the fear appeals literature and in the Extended Parallel Process Model explained the effectiveness of the fear appeal PSAs in our study. By pooling together the data from all six PSAs and all participants, we had a total of 180 observations in the multiple regression analysis. The regression included six independent (predictor) variables:

- Amount of graphic or vivid content in the PSA.
- Amount of fear aroused by the consequences of engaging in the behavior.
- Likelihood of the consequences if a person engaged in the behavior.
- Severity of the consequences if a person engaged in the behavior.
- Ability of a person to change behavior (self-efficacy).
- Effectiveness of a change in behavior in reducing the threat (response-efficacy).

The dependent variable was the PSA's effectiveness in convincing people to change their behaviors. The endpoints for the Likert scales used for each variable were:

- Graphic content: 1 = not at all graphic/vivid; 7 = very graphic/vivid.
- Fear aroused: 1 = not at all; 7 = very much.
- Likelihood of consequences: 1 = not at all likely; 7 = very likely.
- Severity of consequences: 1 = not at all severe; 7 = very severe.
- Ability to change behaviors: 1 = very easy; 7 = very difficult.
- Effectiveness of a change in behavior: 1 = not very effective; 7 = very effective.
- Effectiveness of PSA: 1 = not very effective; 7 = very effective.

The self-efficacy variable (ability to change behaviors) was reversed scored in order to reflect the lowest self-efficacy when the behavior change was very difficult and the highest self-efficacy when the behavior change was very easy.

The regression model with all predictor variables entered was significant ($F_{6, 173} = 71.765$, $p < .001$) with an Adjusted R Square of .703. The Standardized Beta Coefficient and the significance of each predictor variable are reported in Table 2.

Table 2. Predictor variables: standardized beta coefficients and significance model includes all fear appeal variables

Predictor	Std. beta	Significance
Graphic content	.198	p < .002
Fear aroused	.601	p < .001
Perceived likelihood of consequences	.145	p < .012
Perceived severity of consequences	.021	p < .712
Perceived self-efficacy	.085	p < .060
Perceived response-efficacy	.053	p < .311

Because we were interested in the relative impacts of the predictor variables on fear appeal effectiveness, we also checked the model for multicollinearity. In the multiple regression analysis, we requested collinearity statistics including the tolerance and the variance inflation factor (VIF) of each predictor variable. Tolerance values are measures of correlation between the predictor variables and can vary between 0 and 1. The closer to zero the tolerance value is for a predictor, the stronger the relationship between that predictor and other predictors. The VIF is the inverse of tolerance. According to Stevens (2002), if the VIF exceeds 10 (or tolerance falls below .10), there is cause for concern and steps should be taken to combat mulitcollinearity. The VIFs for the predictors in our model varied from a low of 1.212 to a high of 2.415, which indicates that multicollinearity is not a problem. Therefore, we can draw inferences about the relative contributions of each predictor to the success of the model.

Three of the predictors (graphic content, fear aroused, and perceived likelihood of consequences) were significant at the .05 level and an additional predictor (perceived self-efficacy) was significant at the .10 level. Based on the standardized beta coefficients, the predictor

with the strongest influence on the PSA's effectiveness clearly was the amount of fear aroused by the PSA.

To examine whether males and females responded differently to the fear appeals, we ran a multiple regression analysis with gender as an additional predictor variable. This regression model also was significant ($F_{7, 172} = 63.353$, $p < .001$) with an Adjusted R Square of .709. The Standardized Beta Coefficient and the significance of each predictor variable are reported in Table 3.

Table 3. Predictor variables: standardized beta coefficients and significance model includes all fear appeal variables and gender

Predictor	Std. beta	Significance
Graphic content	.176	p < .006
Fear aroused	.613	p < .001
Perceived likelihood of consequences	.153	p < .008
Perceived severity of consequences	.027	p < .630
Perceived self-efficacy	.083	p < .063
Perceived response-efficacy	.047	p < .364
Gender	.086	p < .037

Because gender was significant in this model, we ran two additional regression analyses, one using only observations from male participants and one using only observations from female participants. The model based on observations from male participants was significant ($F_{6, 101} = 30.189$, $p < .001$) with an Adjusted R Square of .621, and the model based on observations from female participants also was significant ($F_{6, 65} = 56.395$, $p < .001$) with an Adjusted R Square of .824. The beta coefficients and the significance of each predictor variable in the models are reported in Tables 4 and 5. We also tested each model for multicollinearity by examining the tolerance values for the predictor variables in each model. For the male participant model the VIFs ranged from a low of 1.223 to a high of 1.930, and for the female participant model, the VIFs ranged from a low of 1.555 to a high of 5.249. Based on those values, it does not appear that multicollinearity is a problem in either model.

Table 4. Predictor variables: standardized beta coefficients and significance model includes all fear appeal variables observations from male participants only

Predictor	Std. beta	Significance
Graphic content	.219	p < .009
Fear aroused	.554	p < .001
Perceived likelihood of consequences	.129	p < .113
Perceived severity of consequences	.037	p < .626
Perceived self-efficacy	.096	p < .149
Perceived response-efficacy	.096	p < .181

Table 5. Predictor variables: standardized beta coefficients and significance model includes all fear appeal variables observations from female participants only

Predictor	Std. beta	Significance
Graphic content	.025	p < .830
Fear aroused	.798	p < .001
Perceived likelihood of consequences	.216	p < .009
Perceived severity of consequences	-.008	p < .923
Perceived self-efficacy	.050	p < .428
Perceived response-efficacy	-.048	p < .511

In each model, fear arousal had the greatest influence on PSA effectiveness. Each model included only one other statistically significant predictor. For males the graphic content of the model was significant, but for females the perceived likelihood of consequences was significant.

3.2. ANOVA results. We examined differences in the effectiveness of the six PSA using an ANOVA and pairwise comparisons (with Bonferroni adjustment for multiple comparisons). Based on the significant differences in the pairwise comparisons, we classified the PSAs into four effectiveness categories (see Table 6).

Table 6. PSAs categorized by statistically significant differences in effectiveness

Highly effective PSAs	Damage from smoking
Moderately effective PSAs	Brain on drugs Distracted driving (serious)
Somewhat effective PSAs	Smoking effects on baby Distracted driving (funny)
Least effective PSAs	HIV testing

The mean effectiveness ratings ranged from 3.310 (on a scale of 1 to 7) for the HIV testing PSA to 5.858 for the damage from smoking PSA. Of the three most effective PSAs, only the distracted driving (serious) PSA was targeted specifically at young adults. The young adults in our study appeared to respond well to PSAs targeted at more general audiences. In addition, the subject matter of the PSA appeared to have little impact on effectiveness. Of the two anti-smoking PSAs, one was highly effective and the other was only somewhat effective. Of the two distracted driving PSAs, one was moderately effective, and the other was somewhat effective.

To better understand the differences in effectiveness, we used ANOVAs and pairwise comparisons (with Bonferroni adjustment for multiple comparisons) to examine differences between the PSAs on the four variables that were significant in the multiple regression analyses. Those variables were graphic content, fear aroused, perceived likelihood of consequences, and perceived self-efficacy. Based on the significant differences in the pairwise comparisons, we classified the PSAs into categories for each of those variables (see Table 7).

Table 7. PSAs categorized by statistically significant differences

	Graphic content	Fear aroused	Consequences	Self-efficacy
High	Damage from smoking	Damage from smoking	Damage from smoking Brain on drugs	HIV testing Distracted driving (serious) Distracted driving (funny)
Moderate	Brain on drugs Distracted driving (serious) Smoking effects on baby	Brain on drugs Distracted driving (serious) Smoking effects on baby	Distracted driving (serious) Smoking effects on baby Distracted driving (funny)	Damage from smoking Brain on drugs Smoking effects on baby
Low	Distracted driving (funny) HIV testing	Distracted driving (funny) HIV testing	HIV testing	

With the exception of self-efficacy, the PSAs fall into categories that were very similar to the groupings of PSAs based on effectiveness. It is not surprising to see different rankings on the self-efficacy variable because it is much easier for a person to get tested for HIV and to avoid distracting driving behaviors than it is for a person to quit smoking or stop using drugs.

Discussion and conclusions

The young adults in our study responded quite differently to the six fear appeal PSAs. The driving factor in their responses was the amount of fear aroused by each PSA. The standardized beta coefficient for the fear arousal variable was much larger than the coefficient of any other predictor (.601 compared to the next highest coefficient of .198 for graphic content). Similarly, there was a large difference in the mean level of fear aroused by the most effective PSA (6.300 on a scale from 1 to 7) than the least effective PSA (3.767). This suggests that appeals must arouse high levels of fear in order to be effective with this age group. The other predictors with standardized beta coefficients significant at the .05 level were graphic content and perceived likelihood of consequences; perceived self-efficacy was significant at the .10 level. Thus, elements of all the variables in the EPPM (fear, perceived threat, and perceived efficacy) appear to be relevant to the design of effective fear appeals to young adults. However, our results argue that the strongest emphasis in fear appeal design must be placed on the appeal's ability to raise significant amounts of fear in young adults.

Our findings varied somewhat by gender. While fear arousal was the most significant predictor of fear appeal effectiveness for both males and females, graphic content was also a significant predictor of the effectiveness ratings by males and perceived likelihood of consequences was a significant predictor for females. This suggests that PSAs targeting females should stress their susceptibility to the threat while PSAs targeting males should include strong visual elements.

We also observed that PSAs targeted at young adults were not necessarily more effective than PSAs targeted at more general audiences. Appeals that were designed for all age groups were among the most effective PSAs according to young adults in

our study. In addition, young adults responded differently to two PSAs addressing the same issue. In the case of the two anti-smoking PSAs, the more graphic PSA focusing on damage to a person's aorta was rated as much more effective than the less graphic PSA stressing the effects of smoking on a baby. While the two appeals were rated significantly differently on graphic content and fear arousal, they were also rated differently on perceived likelihood of the consequences. This may be an indication that the young adults did not relate as well to the message about effects on a baby or did not find the message as personally relevant as the other message. In the case of the two distracted driving PSAs, the more serious and more graphic PSA was also rated as more effective than the funnier, less graphic PSA. Interestingly, those two appeals did not differ in terms of perceived likelihood of consequences. This finding suggests that even when young adults perceive their susceptibility to a particular threat, they may respond differently to two appeals relating to that threat because their response to each appeal is driven primarily by fear.

Overall, our findings provide insights useful to fear appeal designers as they develop messages aimed at young adults. In addition, our study contributes to the fear appeals literature by examining the relative impact of previously-identified variables on the responses of young adults to fear appeals.

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