EFFECTS OF FEAR APPEAL MESSAGE REPETITION ON PERCEIVED THREAT, PERCEIVED EFFICACY, AND BEHAVIORAL INTENTION IN THE EXTENDED PARALLEL PROCESS MODEL

By

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**ABSTRACT**

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Using the Extended Parallel Process Model (EPPM), the current study examined the effect of moderately repeated exposure (three times) of a fear appeal message on the EPPM variables, behavioral intentions for the recommended behaviors in the message, and the proportions of systematic and message related thoughts. The results showed that increasing exposure to a fear appeal message about preventing melanoma significantly increased the perceived threat in terms of susceptibility, three perceived efficacy variables (response efficacy, self-efficacy, and efficacy), and behavioral intention to check skin regularly in the future. Further, the increasing exposure significantly decreased the proportions of both systematic and message related thoughts. The findings also demonstrated that the EPPM is likely to be operative after three exposures.

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**Introduction**

Fear appeal messages are persuasive messages that arouse fear and have been widely used in many public health campaigns such as condom usage to prevent HIV/AIDS (LaTour & Pitts, 1989; Murray-Johonson et al., 2001; Witte, 1994), reduction of alcohol usage (Moscato et al., 2001), and smoking cessation (Rogers & Deckner, 1975), among other topics. It is likely that some people are repeatedly exposed to the same fear appeal messages in health campaigns.

There have been several models and theories about fear appeal messages since the 1950's: the Fear-as-acquired-drive Model (Janis, 1967), the Nonmonotonic Model (McGuire, 1968, 1969), the Parallel Process Model (Leventhal, 1970), the Protection Motivation Theory (Rogers, 1975, 1983), the Threat Control (Beck & Frankel, 1981), the Subjective Expected Utility Model (Sutton, 1982), and the Extended Parallel Process Model (EPPM) (Witte, 1992, 1994). These models and theories explain and predict the effectiveness of fear appeal messages when received once. None of these models or theories, however, has been used to study the impact of repeated exposure to fear appeal messages.

The present study will investigate the impact of repeated exposure to fear appeal messages using the EPPM. In accordance with the EPPM, fear appeal messages should induce perceived threat, which includes perceived susceptibility and perceived severity, and perceived efficacy, which includes perceived self-efficacy and perceived response efficacy. The result of provision of the fear appeal message may result in a danger or fear control process. The effectiveness of the perceived threat, however, may not be stable. According to Witte (1994), the less threatening the message is perceived to be, the more defensive avoidance and message minimization is likely to occur. While the strength of the actual threat message does not change during repeated exposure, message receivers' perceptions of threat and efficacy may change.

The purpose of this study is to investigate the impact of repeated exposure to the same fear appeal message about melanoma on perceived threat including perceived susceptibility and perceived severity, perceived efficacy including perceived self-efficacy and perceived response efficacy, and intent to perform the recommended behavior. The repeated exposure might decrease perceived threat and behavioral intention, but it might have less influence on perceived efficacy. As the heuristic-systematic model (HSM) (Chaiken, 1987) suggests, people can process messages heuristically and systematically. The impact of repetition on fear appeal messages might be due to the decrease of total thoughts and proportion of systematic thoughts generated during repetition. To provide the background for the study, the health problem of melanoma for college students and PSAs will be overviewed, the literature about the EPPM and repeated exposure to fear appeal messages, respectively, will be reviewed. From the literature review, the research questions and hypotheses will be presented. Then, the methods, results, and discussion will follow.

**Literature Review**

**Skin Cancer and College Students**

Melanoma and non-melanoma skin cancer are the most common types of cancer in Caucasian populations (Diepgen & Mahler, 2002, p. 146). Although most types of skin cancer are curable, melanoma is the deadliest form. It can be a fatal disease if not treated early. Since 2004, its incidence rate among Caucasian Americans has increased by almost 3% per year. In 2012, about 76,250 persons in the United States will be diagnosed with melanoma, and 9,180 persons will die from this disease (American Cancer Society, 2012). Melanoma is the most common cancer among females ages 20 to 29 in the United States and second most common cancer among young people ages 20 to 29 (Howlader et al., 2011). Hence, college students have a higher risk of developing melanoma.

Getting sunburns and using tanning booths are the main causes for developing melanoma, but family history and personal sun sensitivity also contribute to contracting the cancer (American Cancer Society, 2012). Using sunlamps and tanning booths increases the risk of skin cancer especially for young people under age 30. (National Cancer Institute, 2011). Thus, college students should decrease sun exposure and UV light exposure to prevent melanoma.

**Online PSAs**

"Public service announcements (PSAs) are designed to inform or induce certain behaviors in specific audiences, generally for noncommercial profit using mass media-approaches'' (Bator & Cialdini, 2000, p. 527). Although newspapers, magazines, radio, and television have usually been used as channels for PSAs, the Internet has become a new channel for PSAs in this new media age.

In the United States, the number of Internet users reached 245 million in 2011. That means 80% of Americans are Internet users (World Bank, 2012). A typical college student uses the Internet 100 minutes per day (Anderson, 2001). College students spend a lot of time on social networking websites, like Facebook, MySpace, and LinkedIn. For example, in 2006, Facebook was used at over 2,000 United States colleges (Cassidy, 2006). As a result, online PSAs have a strong likelihood to reach college students and are easily shared among them via social networking websites.

**The Extended Parallel Process Model**

According to the EPPM, fear appeal messages should induce perceived threat (susceptibility and severity) and perceived efficacy (self-efficacy and response efficacy). Susceptibility refers to one's belief or perception that the threat affects them personally (e.g. a college student might think that he or she is likely to engage in sun exposure or using tanning beds), whereas severity refers to the perception of the seriousness or significance of the threat (e.g. sun or UV light exposure is bad for my health and even causes death). Response efficacy is the effectiveness of the recommended response, which can reduce the threat (e.g. avoiding UV light exposure or less sun exposure is less harmful), whereas self-efficacy means a person's ability to perform that recommended response (e.g. I can reduce the number of times I use tanning beds) (Witte, 1992, 1994). Then the processing of messages may result in a danger or fear control process. When both perceived threat and perceived efficacy are high, message receivers are predicted to cognitively manage the threat and employ recommended responses to avert the threat. This is a danger control process. Alternatively, when perceived threat is high but perceived efficacy is low, fear control processes are predicted to dominate. Fear control processes mean that individuals will emotionally deal with the threat and not perform the

recommended responses. They might exhibit maladaptive behaviors and avoid relative information about the threat. Furthermore, if perceived threat is not high enough, no message processing will occur (Witte, 1992). Hence, if the repetition of fear appeal messages reduces perceived threat to a low level, people might not process the messages during the repeated exposure. While the level of perceived efficacy decides the nature of the reaction, the level of perceived threat indicates the degree of reaction to the fear appeal messages (Witte, 1992). Thus, the less threatening the threat, the more defensive avoidance and message minimization is likely to occur (Witte, 1994), which means the individuals are likely to resist the message, try to deny or minimize the threat, and have little intention to engage the recommended behavior.

Witte and Allen's (2000) meta-analysis of fear appeals indicated that perceptions of both threat and efficacy as a result of the provision of a message had positive relationships with attitude, intention, and behavior changes across studies. There were interactions between threat and efficacy due to fear appeal messages as well. The combinations were 2 × 2 (Threat [high, low] × Efficacy [high, low]). The high threat – high efficacy (HTHE) messages had the highest persuasive effect compared to the high threat – low efficacy (HTLE) and the low threat – high efficacy (LTHE) messages. Additionally, HTLE and LTHE messages did not have a significant difference from each other. The low threat – low efficacy (LTLE) messages had the lowest persuasive effect among the four groups. The effectiveness of high threat – no efficacy messages and high efficacy – no threat messages was also examined by Gore and Bracken (2005). They found that when individuals, who initially held danger control processes, received a high-threat and no-efficacy message, shifted to fear control processes. This result was consistent with the prediction made by the EPPM, which suggests that when the perceived threat starts to outweigh the perceived efficacy, the individuals will shift from danger control to fear control (Witte,

1992). Alternatively, they also found that if the individuals receive a no-threat and high-efficacy message, the message did not influence them, which is not predicted by the EPPM. Thus, there is clear evidence to indicate that different levels of perceived threat and perceived efficacy influence the effectiveness of fear appeal messages.

Literally, the levels of threat and efficacy in a fear appeal message should be stable after the message is designed. The levels of threat and efficacy in response to the message, however, depend on the receiver's perceptions. After exposure to a fear appeal message once, an individual may perceive high levels of both threat and efficacy. Nevertheless, repeated exposure may alter the former perceptions, because the cognitive processes the receiver employs during the repetition may be different from the processes he or she engages in during the first exposure. According to the HSM (Chaiken, 1987), people process messages heuristically and systematically. Systematic processing refers to an analytic and comprehensive analysis of a message and requires both cognitive ability and capacity; however, heuristic processing is mainly based on heuristic cues (e.g. the source of message, message length) and has minimal cognitive demands (Chen & Chaiken, 1999). When exposed to the fear appeal message the first time, the receiver is more likely to engage in systematic processing. As the receiver's familiarity with the same fear appeal message increases during the repetition, the proportion of systematic to heuristic thoughts may decrease. Therefore, in health campaigns, the effectiveness of fear appeal messages, which are designed by using the EPPM, may change after repeated exposure.

Generally, the EPPM is widely employed in health message designs and health campaigns. The topics include HIV/AIDS prevention (Murray-Johnson et al., 2001), hearing protection (Kotowski, Johnstone, Smith, & Pritt, 2011; Smith et al., 2008), teen pregnancy prevention (Witte, 1997), reduction of alcohol usage (Wolburg, 2001; Moscato et al., 2001;

Zisserson, Palfai, & Saitz, 2007), among other topics. Many campaigns produce TV or radio advertisements, which repeatedly play through mass media. Hence, there is a high likelihood that individuals will be repeatedly exposed to the same fear appeal message in a health campaign. For instance, Biener, Ji, Gilpin, and Albers (2004) studied eight anti-smoking advertisements, four of which used fear appeals, in the Massachusetts anti-smoking media campaign. They found that, "on average, each ad reached 91% of the television audience 12.7 times" (p. 262). Thus, it is necessary to review some research about responses to the repetition of messages, especially fear appeal messages.

**Repeated Exposure to Messages**

In the 1960's, Zajonc's (1968) research posited that the mere repeated exposure to a stimulus object enhanced the individual's attitude toward it. The stimuli in the research, however, were words, Chinese characters, or pictures, rather than messages, which can induce cognitive thinking.

The results of subsequent research on message repetition have been inconsistent. Pervious research (Cacioppo & Petty, 1989; Garcia-Marques & Mackie, 2001) has investigated the impact of message repetition on both strong and weak messages. While the strong argument is more likely to produce attitude change, the weak argument is not. The messages in Cacioppo and Petty (1989) were about instituting senior comprehensive exams. The participants were asked to list their thoughts in 2.5 minutes after each exposure, and mark their thought as favorable, unfavorable, or neutral/irrelevant. They found that repeated exposure increased the opportunity to scrutinize the arguments, which enhanced message elaboration. As a result, strong arguments caused more favorable attitudes and agreements than did weak arguments after three exposures. The effectiveness of the strong persuasive messages was more pronounced after

moderate repetition (three exposures). On the contrary, Garcia-Marques and Mackie (2001) found that unfamiliar situations induce analytic (systematic) processing, but that familiar situations lead to non-analytic (heuristic) processing of the information. They found that even one repeated exposure of a strong message can lead to non-analytic processing and decrease favorable attitude toward the argument.

Fear appeal messages, however, cannot be simply classified as either strong or weak messages. Both strong and weak messages in pervious studies were rational arguments about a certain topic, and were not emotionally arousing. When processing these messages, the receivers did not need to respond to their emotions. In contrast, the main feature of fear appeal messages is emotional arousal. This type of message is designed to scare message receivers by describing terrible things which can happen to them if they do not employ the recommended behaviors (Witte, 1992). During message processing, the receiver responds to either danger or fear. Thus, fear appeal messages cannot be simply classified as either strong or weak argument messages. Responses to the repetition of fear appeal messages needs further study.

Previous research (Horowitz, 1969; Skilbeck, Tulips & Ley, 1977) about fear appeal message repetition has found that increasing the number of exposures did not affect attitudes, and a single exposure was more effective in behavioral compliance than multiple exposures. Another previous study (Kirscht & Heafner, 1973) also examined the different effects of repeated exposure to fear appeal messages with varying threat levels. The study found that the effectiveness in changing behavior of a high threat film was better than a low threat film when only shown once. The low threat film was more effective in producing changes when shown twice; and there was no difference in such effectiveness between the high and low threat films when shown three times. Although susceptibility, severity, self-efficacy, and response efficacy

were not separately examined in pervious studies, all three studies (Horowitz, 1969; Kirscht & Heafner, 1973; Skilbeck et al., 1977) found that the effectiveness of high threat messages declined or did not change after repetition. In accordance with the EPPM, the level of perceived efficacy decides the nature of the reaction, and the level of perceived threat decides the degree of the reaction to the fear appeal messages (Witte, 1992). In conclusion, the declined effectiveness of fear appeal messages during repetition in previous studies (Horowitz, 1969; Kirscht & Heafner, 1973; Skilbeck et al., 1977) may be due to decreasing perceived threat after the repeated exposure. Hence, the following hypotheses and a research question are advanced:

H1: Increasing exposure to a fear appeal message will decrease perceived threat.

H1a: Increasing exposure to a fear appeal message will decrease perceived susceptibility.

H1b: Increasing exposure to a fear appeal message will decrease perceived severity.

H2: Increasing exposure to a fear appeal message will decrease the behavioral intention to engage in the recommended behavior.

H3: Increasing exposure to a fear appeal message will decrease the proportion of systematic thoughts.

RQ1: What is the relationship between increasing exposure to a fear appeal message and the proportion of message related thoughts?

The impact of repeated exposure on perceived efficacy, however, has been rarely studied. Although Kirscht and Heafner (1973) found that high threat films were more likely to strengthen perceived efficacy in recommended actions than low threat films, they did not investigate the impact of repetition on perceived response efficacy or self-efficacy. Hence, the following research question is advanced:

RQ2: How will increasing exposure to a fear appeal message affect perceived efficacy?

**Method**

**Participants and Procedure**

  The experiment was a post-test only control group design. Approval for the questionnaire was obtained from the Institutional Research Board. 217 participants who were from the Michigan State University Communication Participation Pool were randomly assigned into two groups. One group (the control group) of 63 participants answered the questionnaire without seeing the stimulus message, and the other group that began with 154 participants was exposed to the same fear appeal video about Melanoma three times in one week. During the experiment, 154 participants completed Exposure 1; 121 participants completed both Exposure 1 and 2; and 98 participants completed all three exposures[1]. Prior to Exposure 1, the participants were asked to fill out an outcome involvement scale on the topic of melanoma (Cho & Boster, 2005). After each exposure, the participants were asked to list the thoughts they had during message exposure, and they filled out a questionnaire based on The Risk Behavior Diagnosis Scale (The RDBS) (Witte, Meyer, & Martell, 2001), about perceived susceptibility, perceived severity, perceived self-efficacy, perceived response efficacy, behavioral intention, previous behaviors and demographic information. In order to reduce possible order effects, the order of questions was altered each time.

  In the control group, 63 participants (51 women and 12 men) had a mean age of 19.81 years ($SD = 1.45$). The ethnic categories were 82.5% Caucasian ($N = 52$), 6.3% African American ($N = 4$), 4.8% Asian/Pacific Islander ($N = 3$), 1.6% Latino ($N = 1$), and 1.6% other ($N = 1$) while 3.2% of the participants ($N = 2$) chose not to reveal their ethnicity. Their mean involvement with melanoma was 4.65 ($SD = 1.15$). In the experiment group, 98 participants (61 women and 37 men) with a mean age of 20.14 years ($SD = 1.39$) completed all 3 exposures. The

ethnic categories were 76.5% Caucasian ($N = 75$), 8.2% African American ($N = 8$), 5.1%

Asian/Pacific Islander ($N = 5$), 1.6% Multiracial ($N = 1$) and 2.0% other ($N = 2$) while 7.1% of

the participants ($N = 7$) chose not to reveal their ethnicity. Their mean involvement with

melanoma was 4.57 ($SD = 1.11$). The independent-sample t-test revealed that there was no

significant difference between the control group and the experiment group on age and outcome

involvement with melanoma.

**Stimulus Message**

The video clip showed in the experiment is titled "Dear 16-year-old Me." It was made by

the David Cornfield Melanoma Fund (DCMF), which was established in 2007 in Canada and is

devoted to saving lives from melanoma (http://dcmf.ca/us). This video has received more than

five million hits and 31 thousand "likes." This 5-minute PSA delineates the symptoms of

melanoma and advocates various different actions, including staying away from tanning beds,

using sunscreen, checking skin regularly, and forwarding the video to viewers' friends and

family members.

**Measures**

All measures used a 7-point Likert scale (1 = *strongly disagree* and 7 = *strongly agree*).

The outcome involvement scale employed prior to message exposure examined the participants'

outcome involvement with melanoma. This scale included five items and was adapted Cho and

Boster (2005). The EPPM questionnaire based on the RDBS was a combination of perceived

threat of melanoma (i.e., susceptibility and severity), perceived efficacy of using sunscreen and

staying away from tanning beds (i.e., self-efficacy and response efficacy), behavioral intention to

enact the recommended behaviors (i.e., using sunscreen, staying away from tanning bed,

checking skin regularly, and forwarding this messages to others), previous behaviors and

demographic information. Susceptibility was measured by three items: I am at risk for developing melanoma; it is possible that I will develop melanoma; and I am susceptible to developing melanoma. The items in severity scale were: melanoma is a serious skin cancer; melanoma is harmful; and melanoma is a severe threat. The response efficacy and self-efficacy scale each included six items, which were about both using sunscreen and avoiding tanning beds (see alpha for each scale by exposure in Table 1). The items about behavioral intentions asked about whether or not the participants intended to employ the recommended behaviors (i.e. using sunscreen, avoiding tanning beds, checking skin regularly, and forwarding the message) in the future. Questions about previous behaviors included a history of sunburns, using sunscreen, using tanning beds, and checking skin regularly. The demographic information consisted of the participant's age, sex, and ethnicity. The specific items in the measures can be found in Appendix A and B.

**Coding Open-Ended Data**

Two independently trained coders coded all listed thoughts as systematic, heuristic, negative emotion, positive emotion, or other message irrelevant thoughts. Systematic thoughts were about the content of the message in the video clip; heuristic thoughts were about non-content aspects of the message such as source perceptions and production quality of the video, among others. A large number of emotions were reported, thus both positive and negative emotions were coded. Previous research (Slovic, Finucane, Peters, & MacGregor, 2004, 2006) has found that people employ both cognitive and affective information processing, which supported coding for emotions. Negative emotions recorded by participants included fear, and nervousness, among others. Positive emotions included happiness, and relief, among others. All other thoughts were coded as irrelevant thoughts. The unit of measurement is a single thought the

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participants generated. Two researchers independently coded 37% ($N = 750$, Total $N = 2,002$) of the participants' listed thoughts using the coding scheme to establish reliability. Cohen's Kappa (Cohen, 1960) for this round of coding was 0.70. Then, two coders resolved the inconsistencies and coded another 20 % ($N = 410$) listed thoughts. The Cohen's Kappa for this round of coding increased to 0.80.

**Pretest**

In order to guarantee the experimental message was perceived as high-threat and high-efficacy, a pretest was conducted.

Thirty undergraduates (18 men and 12 women) with a mean age of 22.4 years ($SD = 2.044$) from a Telecommunication undergraduate class at Michigan State University participated in the pretest. The ethnic categories were 66.7% Caucasian ($N = 20$), 13.3% Asian ($N = 4$), 10% African American ($N = 3$), and 6.6% Multiracial ($N = 2$) (one answer was missing). Prior to viewing the video, the participants were asked to fill out the outcome involvement scale (Cho & Boster, 2005) for the category of melanoma. After watching it, they were asked to list the thoughts they had during message exposure and to fill out an EPPM questionnaire about melanoma adapted from the Risk Behavior Diagnosis Scale (RDBS) (Witte, Meyer, & Martell, 2001).

The results showed that the participants had a moderate level of outcome involvement ($\alpha = .825$, $M = 4.25$, $SD = 1.25$), which was not significantly above 4, the mid point of the scale ($t$ (29) $= 1.11$, $p = .28$). Three persons indicated that they had watched this video once before and one person indicated that he had watched it twice before. For the rest 26 participants who watched the video for the first time, the perceived threat was significantly higher than the mid point of the scale ($\alpha = .85$, $M = 6.26$, $SD = 0.76$ for perceived severity, $\alpha = .89$, $M = 4.37$, $SD =$

1.43 for perceived susceptibility, $M = 5.31$ of total perceived threat, $SD = 0.87$, $t (25) = 7.694$, $p$

$< .001$). Perceived efficacy was significantly higher than the mid point of the scale as well ($α =$

$.84$, $M = 5.58$, $SD = 0.98$ for response efficacy, $α = .87$, $M = 5.92$, $SD = 0.87$ for self efficacy, $M$

$= 5.75$ for total efficacy, $SD = 0.85$, $t (25) = 10.532$, $p < .001$). Thus, the pre-test indicates that

for this population, the video is perceived to be a high threat and high efficacy fear appeal

message.

**Results**

**Threat**

Hypothesis 1 predicted that increasing exposure to a fear appeal message would decrease perceived threat, which included susceptibility (H1a) and severity (H1b).

In order to determine whether the video had an effect on the threat variables, a series of independent sample t-tests were run on the differences between threat variables rated by the control group and the experimental group after Exposure 1. The results showed that participants in Exposure 1 had significantly higher severity ($\alpha = .78$, $M = 6.30$, $SD = 0.82$) than those in the control group ($\alpha = .76$, $M = 5.81$, $SD = 0.99$), $t(110.25) = -3.21$, $p = .001$ (one-tailed), $\eta^2 = .09$. Threat in Exposure 1 ($\alpha = .77$, $M = 5.59$, $SD = 0.94$) was also significantly higher than in the control group ($\alpha = .79$, $M = 5.28$, $SD = 1.03$), $t(154) = -1.89$, $p = .03$ (one-tailed), $\eta^2 = .02$. However, the stimulus message had no significant effect on susceptibility between the control group and Exposure 1 (see Table 2). Therefore the threat component of severity is the causal agent in the difference in threat between the control group and those in Exposure 1.

A repeated measure ANOVA was used to examine the effect of number of exposures on perceived susceptibility, perceived severity, and perceived threat. The results revealed a significant effect for repeated exposure on susceptibility, $F(1.81, 166.87) = 3.322$, $p = .043$, partial $\eta^2 = .04$, and threat, $F(1.74, 147.96) = 4.79$, $p = .013$, partial $\eta^2 = .05$, but not on severity, $F(2, 178) = 2.17$, $p = .12$, partial $\eta^2 = .02$. However, the means increased for all three variables as exposures increased, which was opposite to the predictions (See Table 3 for all means and standard deviations).

Paired-samples t-tests were employed to compare the 3 exposures on susceptibility and

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threat. The results demonstrated that Exposure 3 had a higher susceptibility ($\alpha$ = .95, $M$ = 5.10, $SD$ = 1.65) than both Exposure 1 ($\alpha$ = .92, $M$ = 4.84, $SD$ = 1.60) and Exposure 2 ($\alpha$ = .93, $M$ = 4.93, $SD$ = 1.52), which had no significant difference from each other. Threat had the same pattern as susceptibility in the three exposures. Threat in Exposure 3 ($\alpha$ = .79, $M$ = 5.81, $SD$ = 0.96) was significantly higher than in both Exposure 1 ($\alpha$ = .77, $M$ = 5.59, $SD$ = 0.95) and Exposure 2 ($\alpha$ = .80, $M$ = 5.66, $SD$ = 0.94), which were not significantly different. Therefore, the increasing exposure to the fear appeal message significantly increased both perceived threat and perceived susceptibility, which was opposite to the prediction made by H1 and H1b. This shows that susceptibility is the causal agent in the threat component here. The data were inconsistent with H1 and H1b. For perceived severity, although it did not change significantly during three exposures, it had an increasing trend from Exposure 1 ($\alpha$ = .78, $M$ = 6.26, $SD$ = 0.83) to Exposure 3 ($\alpha$ = .83, $M$ = 6.42, $SD$ = 0.82). Thus, the data were also inconsistent with H1a.

**Efficacy**

Research question 2 asked about the effect of moderately repeated exposure (three times) to a fear appeal message on perceived efficacy. The results of an independent-sample t-test (one-tailed) showed that, compared to the control group, the video significantly increased all three perceived efficacy variables (i.e. response efficacy, self-efficacy, and efficacy) in Exposure 1 (see Table 2).

A repeated measure ANOVA was used to examine the effect of the number of exposures on perceived response efficacy, perceived self-efficacy, and perceived efficacy. The results revealed a significant effect for repeated exposure on response efficacy, $F$ (1.77, 159.21) = 10.41, $p < .001$, partial $\eta^2$ = .10, self-efficacy, $F$ (1.71, 152.09) = 4.36, $p = 0.2$, partial $\eta^2$ = .05, and efficacy, $F$ (1.82, 154.27) = 8.62, $p = < .001$, partial $\eta^2$ = .09. Paired-samples t-tests were

employed to compare the effects of three exposures on the efficacy variables. Response efficacy significantly increased in each exposure (Exp. 1: $\alpha = .79$, $M = 5.87$, $SD = 0.87$; Exp. 2: $\alpha = .86$, $M = 6.05$, $SD = 0.87$; and Exp. 3: $\alpha = .91$, $M = 6.20$, $SD = 0.87$). The self-efficacy levels in Exposure 2 ($\alpha = .85$, $M = 6.11$, $SD = 0.89$) and Exposure 3 ($\alpha = .83$, $M = 6.18$, $SD = 0.89$), which showed no difference from each other, were significantly higher than Exposure 1 ($\alpha = .80$, $M = 5.99$, $SD = 0.94$). Similarly, perceived efficacy levels in Exposure 2 ($\alpha = .92$, $M = 6.12$, $SD = 0.79$) and Exposure 3 ($\alpha = .91$, $M = 6.20$, $SD = 0.79$) did not differ from each other, but were significantly higher than in Exposure 1 ($\alpha = .86$, $M = 5.96$, $SD = 0.78$) (See Table 3). Hence, the results indicated that moderately repeated exposure (three times) to the fear appeal message significantly increased perceived response efficacy, perceived self-efficacy, and perceived efficacy.

**Behavioral Intention**

Hypothesis 2 predicted that moderate repeated exposure (three times) to a fear appeal message would decrease behavioral intention to engage in the recommended behavior. An independent-sample t-test (one-tailed) was used to examine the effect of the stimulus message on behavioral intentions from the control group to Exposure 1. The results demonstrated that, compared to the control group, the video significantly increased behavioral intentions on using sunscreen ($t(158) = -3.28$, $p < .001$), avoiding tanning beds ($t(157) = -2.86$, $p < .01$), and checking skin regularly ($t(159) = -2.32$, $p = .01$) (see Table 2).

The results of the repeated measure ANOVA revealed that repeated exposure had a significant effect on the behavioral intention to check skin regularly ($F(1.81, 174.17) = 5.19$, $p = .01$, partial $\eta^2 = .05$), but insignificantly affected the intentions to use sunscreen ($F(1.51, 146.23) = 2.90$, $p = .07$, partial $\eta^2 = .03$), the avoid tanning beds ($F(1.69, 155.41) = 2.19$, $p = .12$, partial

$\eta^2 = .02$), and the forwarding message to friends and family ($F$ (1.85, 175.65) = 1.02, $p = .36$,

partial $\eta^2 = .01$). Paired-samples t-tests were used to examine the difference of the checking skin

intention among three exposures. The results demonstrated that the behavioral intention to check

skin regularly in Exposure 3 ($M = 5.67$, $SD = 1.21$) was significantly higher than in Exposure 1

($M = 5.28$, $SD = 1.54$) and Exposure 2 ($M = 5.41$, $SD = 1.34$), which were not different from

each other (see Table 3). Although repeated exposure to the message did not significantly affect

behavioral intentions on using sunscreen, avoiding tanning beds, and forwarding the message, it

significantly increased the behavioral intention on checking skin regularly. Thus, the data were

inconsistent with H2; however, intentions on all variables increased in Exposure 1 over the

control group.

**Cognitive Responses**

In the experiment group, the participants reported a total of 2,002 thoughts in three

exposures, 1,335 (66.68%) of them were coded as systematic, 361 (18.03%) were heuristic, 212

(10.59%) were negative emotion, 28 (1.40%) were positive emotion, and 66 (3.30%) were

irrelevant. The message relevant thoughts included all thoughts except irrelevant ones ($N =$

1,936, 96.70%).

Hypothesis 3 predicted that moderate repeated exposure (three times) to a fear appeal

message would decrease the proportion of systematic thoughts generated by watching the video.

The results of the repeated measure ANOVA revealed that the proportion of systematic thoughts

was significantly different among three exposures, $F$ (1.84, 178.78) = 7.51, $p = .001$, partial $\eta^2 =$

.07. Results of the paired-samples t-test revealed that the proportion of systematic thoughts in

Exposure 1 ($M = .66$, $SD = .30$) was significantly higher than in Exposure 2 ($M = .56$, $SD = .35$)

and Exposure 3 ($M = .53$, $SD = .37$), which did not differ from each other (see Table 3). Thus, the repeated exposure to the video decreased systematic thoughts. The data were consistent with H3.

Research question 1 asked about the relationship between repeated exposure and the proportion of message related thoughts. As with the proportion of systematic thoughts, the proportion of message related thoughts had the same pattern during three exposures. Results of statistical analyses demonstrated that three exposures significantly affected the proportion of message related thoughts, $F (2, 194) = 6.57$, $p = .002$, partial $\eta^2 = .063$. Exposure 1 had a significantly higher proportion of message related thoughts ($M = .97$, $SD = .06$) than Exposure 2 ($M = .88$, $SD = .30$) and Exposure 3 ($M = .88$, $SD = .30$), which were not significantly different from each other (see Table 3). Therefore, moderate repeated exposure (three times) to the fear appeal message decreased message related thoughts.

**Discussion**

**Major Findings and Implications**

The analyses revealed that moderate repeated (three times) exposure to the fear appeal video about melanoma increased perceived threat in terms of susceptibility, but not severity, and perceived efficacy.

Close examination of threat reveals that the exposures had different effects on perceived susceptibility and perceived severity. For susceptibility, although the first exposure did not have a significantly higher score than the control group, when exposure was repeated three times, susceptibility significantly increased. On the other hand, the first exposure significantly increased severity, but three repeated exposures did not significantly improve it to any further extent. It might be because the level of severity after Exposure 1 was 6.26 ($SD = 0.83$) on the 7-point scale, so there might be a ceiling effect in severity, which made it difficult for repeated exposures to raise the level of this variable further. Compared to the control group Exposure 1 threat significantly increased due to the increase in severity, but after three exposures threat significantly increased due to the increase in susceptibility. Thus, the results showed that it was necessary to examine susceptibility and severity separately.

On the contrary, the changes in the efficacy variables (i.e. response efficacy, self-efficacy, and efficacy) had similar patterns in this study. The three efficacy variables significantly at Exposure 1 compared to the control group. During the three repeated exposures, response efficacy rose significantly after each exposure. For self-efficacy and efficacy, both Exposure 2 and Exposure 3 were at higher levels than the first exposure. The third exposure, however, did not increase self-efficacy and efficacy to a further extent, compared to the second one.

For the behavioral intentions, although the first exposure from control to Exposure 1

significantly improved the intent to use sunscreen and to avoid using tanning beds in the future, repeated exposure did not affect these two intentions further. For the intent to check skin regularly in the future both the first exposure compared to the control group and repeated exposures had significant effects. Furthermore, the level of intent to check skin after the third exposure was also higher than in both Exposure 1 and Exposure 2. Because the intent to check skin had a relatively low level after Exposure 1 as opposed to the other intents, it had more room to increase during the three exposures. Recipients likely had some prior knowledge about using sunscreen or avoiding tanning beds to prevent melanoma, but checking their skin might be a novel recommended response to them.

The statistical analyses on the listed thoughts indicated that the proportion of both systematic thoughts and message related thoughts significantly decreased during three exposures. A question that arises, then, is why did the participants who generated a lower proportion of systematic and message related thoughts during repeated exposures, indicate an increasing level of perceived susceptibility? One reason could be that the participants might have the same thoughts in the second and third exposure as they had in the first one, but they did not report them. Perhaps they only reported the new thoughts they had in each exposure. Another reason could be that even though repeated exposure to the same fear appeal message decreased systematic and message related thoughts, it might have reinforced the original thoughts they had the first time.

The EPPM predicts that people will engage danger control processes when they perceive both high threat and efficacy and efficacy is higher than threat. The results of a Post Hoc test revealed that the levels of perceived threat and perceived efficacy were not different from each other in the control group. It means that people in the control group had no motivation to engage

in danger control processes. In contrast, efficacy was significantly higher than threat in the three exposures and both variables were higher than the mid point in the scale, which would lead to danger control processes (see all means, standard deviations, and t-test results in Table 4). Thus, the EPPM is likely to be operative after three exposures to a health persuasion message.

This study also offers some implications for message development. According to the different results for message outcomes by exposure (see Table 5) and the results of a t-test on the control group and Exposure 1 (see Table 2), this message had a more significant effect on intent to use sunscreen than on avoiding tanning beds and checking skin intentions after the first exposure. Then, another Post Hoc test separated the response efficacy and self-efficacy into two aspects: using sunscreen and using tanning bed (see means and standard deviations in Table 6, and see Alpha for each scale in Table 7). The results of a t-test on the control group and Exposure 1 revealed that the stimulus message significantly increased the response efficacy ($t$ (159) = 2.80, $p$ = .006) and self-efficacy ($t$ (159) = 2.83, $p$ = .005) for using sunscreen, and self-efficacy ($t$ (159) = 3.91, $p$ = .002) for avoiding tanning beds, but not response efficacy for avoiding tanning beds' ($t$ (159) = 0.78, $p$ = .44). This could be due to high response efficacy for avoiding tanning beds already present in the control group ($M$ = 5.73, $SD$ = 1.13). Further, the statistical analyses also demonstrated that response efficacy in Exposure 2 still was not significantly different from the control group ($t$ (159) = 2.20, $p$ = .03), but after Exposure 3, it was significantly improved compared to the control group ($t$ (159) = 2.72, $p$ = .007). These results indicate that three repeated exposures to a fear appeal message can increased a variable which had a relatively high baseline. When designing messages, a fear appeal message could emphasize variables that had a high baseline in the formative research, up to a certain point, to increase message effectiveness.

**Limitations**

There are three main areas of improvement for future examination of repeated exposure to a fear apple message. First, the time interval between each exposure in this study was three days. People have a low likelihood of engaging in the recommended behavior in the message or the maladapted behavior in three days. Thus, in this study personal experiences had few effects on the changes of perceived threat, efficacy, and behavioral intentions in the second and third exposure. Future studies should lengthen the time interval between each exposure to test whether engaging a recommended behavior or a maladapted behavior has an impact on EPPM variables and behavioral intentions during the repeated exposure. Second, future studies should increase the numbers of exposure and investigate their effects on the EPPM variables. Some advertising literature (Moschis & Moore, 1982) has found that increasing advertising exposure decreased people's likelihood of engaging in consumer behaviors. Therefore, it would be beneficial if future studies examined the changing patterns of the EPPM variables under more than three exposures to a fear appeal message. Third, outcome involvement with melanoma was only measured once in the experiment prior to the first exposure. However, the participants' involvement might have changed across exposures. Outcome involvement can influence information processing and could one influence on the changes in the EPPM variables and the behavioral intentions across exposures. Thus, testing the changing pattern of outcome involvement is another factor, which is worth considering in future studies.

**Practical Applications**

This research effort provides a considerable body of knowledge on the application of the EPPM in public health campaigns. Since the EPPM has been widely used in health message designs and health campaigns, the target audience of the health campaign has a high likelihood to

receive a fear appeal message repeatedly. The results of this study showed that the EPPM still works after moderately repeated exposure. After three exposures in one week, people felt more susceptible, and had more efficacy and intent to engage the recommended behavior of checking their skin. The present study also shows that if the susceptibility does not significantly increase after initial exposure, health communication practitioners could increase the number of times exposure occurs to raise the recipients' perceived level of susceptibility.

This research advanced fear appeal research in that previous research measured threat as a single variable instead of one made up of the susceptibility and severity components. Those studies did not use a control group either. The results of this study show that the additions of multiple components of threat and the use of a control group are warranted in future research.

**Conclusion**

The EPPM predicts that fear appeal messages result in either danger control or fear control processes, which depends on their perceived levels of threat and efficacy. This study shows that perceived threat and efficacy have different changing patterns after moderated repeated exposure. However, a high threat and high efficacy fear appeal message is still effective in that it leads to danger control after repeated exposure.

Table 1. Alpha for Each Scale by Exposure

| Variable | Control | Exp. 1 | Exp. 2 | Exp. 3 |
|---|---|---|---|---|
| Susceptibility | .81 | .92 | .93 | .95 |
| Severity | .76 | .78 | .81 | .83 |
| Threat | .79 | .77 | .80 | .79 |
| Response Efficacy | .87 | .79 | .86 | .91 |
| Self Efficacy | .88 | .80 | .85 | .83 |
| Efficacy | .92 | .86 | .92 | .91 |

Note. $N = 98$; Exp. 1 = Exposure 1; Exp. 2 = Exposure 2; Exp. 3 = Exposure 3.

Table 2. Independent T-tests on Control Group and Exposure 1 Differences

| Variable | Control | Exp. 1 | $t$ | $p$ | $\eta^2$ |
|---|---|---|---|---|---|
| Susceptibility | 4.76 (1.43) | 4.84 (1.60) | - 0.28 | .39 | .00 |
| Severity | 5.81 (0.99) | 6.26 (0.83) | -3.21 | .001 | .09 |
| Threat | 5.28 (1.03) | 5.59 (0.95) | -1.89 | .03 | .02 |
| Response Efficacy | 5.55 (1.03) | 5.87 (0.87) | -1.98 | .03 | .02 |
| Self-Efficacy | 5.27 (1.31) | 5.99 (0.94) | -3.47 | < .001 | .11 |
| Efficacy | 5.38 (1.10) | 5.96 (0.78) | -3.29 | < .001 | .10 |
| Using Sunscreen | 4.89 (1.65) | 5.69 (1.42) | -3.28 | < .001 | .06 |
| Avoid Tanning Beds | 4.94 (2.00) | 5.78 (1.74) | -2.86 | < .01 | .05 |
| Checking Skin | 4.68 (1.58) | 5.28 (1.54) | -2.32 | .01 | .03 |

Note. $N = 63$ in the control group; $N = 98$ in Exp. 1; Exp. 1 = Exposure 1.

Table 3. Repeated Measure ANOVA on Three Exposures

| Variable | Exp. 1 | Exp. 2 | Exp. 3 | $F$ | $p$ | Partial $\eta^2$ |
|---|---|---|---|---|---|---|
| Susceptibility | $4.84_a$ (1.60) | $4.93_a$ (1.52) | $5.10_b$ (1.65) | 3.32 | .043 | .035 |
| Severity | $6.26_a$ (0.83) | $6.34_a$ (0.93) | $6.42_a$ (0.82) | 2.17 | .117 | .024 |
| Threat | $5.59_a$ (0.95) | $5.66_a$ (0.94) | $5.81_b$ (0.96) | 4.79 | .013 | .053 |
| Response Efficacy | $5.87_a$ (0.87) | $6.05_b$ (0.87) | $6.20_c$ (0.87) | 10.41 | < .001 | .104 |
| Self-Efficacy | $5.99_a$ (0.94) | $6.11_b$ (0.89) | $6.16_b$ (0.89) | 4.36 | .019 | .047 |
| Efficacy | $5.96_a$ (0.78) | $6.12_b$ (0.79) | $6.20_b$ (0.79) | 8.62 | < .001 | .092 |
| Using Sunscreen | $5.69_a$ (1.42) | $5.93_a$ (1.22) | $5.93_a$ (1.24) | 2.90 | .073 | .029 |
| Avoid Tanning Beds | $5.78_a$ (1.74) | $6.05_a$ (1.49) | $6.05_a$ (1.41) | 2.19 | .124 | .023 |

Table 3 - (Continued)

| | | | | | | |
|---|---|---|---|---|---|---|
| Checking Skin | $5.28_a$ (1.54) | $5.41_a$ (1.34) | $5.67_b$ (1.21) | 5.19 | .008 | .051 |
| Forwarding Message | $5.08_a$ (1.80) | $5.27_a$ (1.57) | $5.24_a$ (1.77) | 1.02 | .357 | .011 |
| Proportion of Systematic Thoughts | $0.66_a$ (0.30) | $0.56_b$ (0.35) | $0.53_b$ (0.37) | 7.51 | .001 | .072 |
| Proportion of Message Related Thoughts | $0.97_a$ (0.06) | $0.88_b$ (0.30) | $0.88_b$ (0.30) | 6.573 | .002 | .063 |

Note. $N = 98$; Exp. 1 = Exposure 1; Exp. 2 = Exposure 2; Exp. 3 = Exposure 3. Subscript a, b, and c indicate significant differences between groups across exposures. Standard deviations are in parentheses.

Table 4. Post Hoc Test of Differences on Threat and Efficacy by Exposure

| | Threat | Efficacy | $t$ | $p$ |
|---|---|---|---|---|
| Control | 5.28 (1.03) | 5.38 (1.10) | 0.53 | 0.60 |
| Exp. 1 | 5.59 (0.95) | 5.96 (0.78) | 2.98 | 0.003 |
| Exp. 2 | 5.66 (0.94) | 6.12 (0.79) | 3.71 | < .001 |
| Exp. 3 | 5.81 (0.96) | 6.20 (0.79) | 3.11 | 0.002 |

Table 5. Behavioral Intentions by Exposure

|  | SUN | BED | SKIN | FORWARD |
|---|---|---|---|---|
| Exp. 0 | 4.89 (1.65) | 4.94 (2.00) | 4.68 (1.58) | - |
| Exp. 1 | 5.69 (1.42) | 5.78 (1.74) | 5.28 (1.54) | 5.08 (1.80) |
| Exp. 2 | 5.93 (1.22) | 6.05 (1.49) | 5.41 (1.34) | 5.27 (1.57) |
| Exp. 3 | 5.93 (1.24) | 6.05 (1.41) | 5.67 (1.21) | 5.24 (1.77) |

Note. Exp. 0 = Control Group; Exp. 1 = Exposure 1; Exp. 2 = Exposure 2; Exp. 3 = Exposure 3. SUN is the intent for using sunscreen. BED is the intent to avoiding tanning beds. SKIN is the intent to checking skin regularly. FORWARD is the intent to forwarding this message to friends and family; and this one is not applicable for the control group. Standard deviations are in parentheses.

Table 6. Response Efficacy and Self-Efficacy for Using Sunscreen and Avoiding Tanning Beds

by Exposure

|  | SUN | | BED | |
|---|---|---|---|---|
|  | RE | SE | RE | SE |
| Exp. 0 | 5.39 (1.13) | 5.46 (1.20) | 5.73 (1.13) | 5.17 (1.68) |
| Exp. 1 | 5.84 (0.90) | 5.95 (0.98) | 5.87 (1.10) | 5.95 (1.40) |
| Exp. 2 | 5.97 (0.98) | 6.01 (0.96) | 6.09 (0.93) | 6.11 (1.22) |
| Exp. 3 | 6.17 (0.96) | 6.18 (1.00) | 6.18 (0.95) | 6.09 (1.25) |

Note. Exp. 0 = Control Group; Exp. 1 = Exposure 1; Exp. 2 = Exposure 2; Exp. 3 = Exposure 3. SUN is the intent for using sunscreen. BED is the intent to avoiding tanning beds. RE is response efficacy. SE is self-efficacy. Standard deviations are in parentheses.

Table 7. Alpha for Using Sunscreen and Avoiding Tanning Beds' Response Efficacy and Self-Efficacy by Exposure

|  | SUN | | BED | |
|---|---|---|---|---|
|  | RE | SE | RE | SE |
| Exp. 0 | .81 | .85 | .80 | .84 |
| Exp. 1 | .64 | .76 | .69 | .89 |
| Exp. 2 | .80 | .79 | .82 | .93 |
| Exp. 3 | .89 | .82 | .85 | .94 |

Note. Exp. 0 = Control Group; Exp. 1 = Exposure 1; Exp. 2 = Exposure 2; Exp. 3 = Exposure 3. SUN is the intent for using sunscreen. BED is the intent to avoiding tanning beds. RE is response efficacy. SE is self-efficacy.

**Footnote**

[1] In the total 98 participants, 82 of them reported that they have never seen this video before. The results of the statistical analyses for both sample sizes ($N = 82$ and $N = 98$) had the same patterns. In order to have a better sample size, the total 98 participants' data were employed in this study.

**APPENDIX**

Outcome Involvement Scale

1. The way that sun safety impacts melanoma is not a major factor in my life. *

   Strongly disagree    1    2    3    4    5    6    7    Strongly Agree

2. All in all, the way that sun safety impacts melanoma is important in my life.

   Strongly disagree    1    2    3    4    5    6    7    Strongly Agree

3. My life would be changed if I focused more on how sun safety impacts risk for

   melanoma.

   Strongly disagree    1    2    3    4    5    6    7    Strongly Agree

4. How sun safety impacts risk for melanoma has little effect on me. *

   Strongly disagree    1    2    3    4    5    6    7    Strongly Agree

5. It is easy for me to think of ways that sun safety impacts my life.

   Strongly disagree    1    2    3    4    5    6    7    Strongly Agree

   *The score will be reversed

EPPM Questionnaire about Melanoma

1. Have you seen this video before?  Yes     No

2. If so, how many times?      _____

3. Please list all thoughts you have when you watch the Video

    1.

    2.

    3.

    4.

    5.

    6.

    7.

    8.

    9.

    10.

4. Please answer the following questions.

    6. I am at risk for developing Melanoma.

       Strongly disagree     1     2     3     4     5     6     7     Strongly Agree

    7. It is possible that I will develop Melanoma.

       Strongly disagree     1     2     3     4     5     6     7     Strongly Agree

    8. I am susceptible to developing Melanoma.

       Strongly disagree     1     2     3     4     5     6     7     Strongly Agree

    9. Melanoma is a serious skin cancer.

       Strongly disagree     1     2     3     4     5     6     7     Strongly Agree

10. Melanoma is harmful.

Strongly disagree    1    2    3    4    5    6    7    Strongly Agree

11. Melanoma is a severe threat.

Strongly disagree    1    2    3    4    5    6    7    Strongly Agree

12. Using sunscreen prevents Melanoma.

Strongly disagree    1    2    3    4    5    6    7    Strongly Agree

13. Staying away from tanning beds prevents Melanoma

Strongly disagree    1    2    3    4    5    6    7    Strongly Agree

14. Using sunscreen works in deterring Melanoma.

Strongly disagree    1    2    3    4    5    6    7    Strongly Agree

15. Staying away from tanning beds works in deterring Melanoma

Strongly disagree    1    2    3    4    5    6    7    Strongly Agree

16. Using sunscreen is an effective way to avoid Melanoma.

Strongly disagree    1    2    3    4    5    6    7    Strongly Agree

17. Staying away from tanning beds is an effective way to avoid Melanoma

Strongly disagree    1    2    3    4    5    6    7    Strongly Agree

18. I am able to use sunscreen to prevent Melanoma.

Strongly disagree    1    2    3    4    5    6    7    Strongly Agree

19. I am able to stay away from tanning beds to prevent Melanoma.

Strongly disagree    1    2    3    4    5    6    7    Strongly Agree

20. It is easy to use sunscreen to prevent Melanoma.

Strongly disagree    1    2    3    4    5    6    7    Strongly Agree

21. It is easy to stay away from tanning beds to prevent Melanoma.

Strongly disagree    1    2    3    4    5    6    7    Strongly Agree

22. I can use sunscreen to prevent Melanoma.

Strongly disagree    1    2    3    4    5    6    7    Strongly Agree

23. I can stay away from tanning beds to prevent Melanoma.

Strongly disagree    1    2    3    4    5    6    7    Strongly Agree

24. I intend to use sunscreen when I am exposed to sun.

Strongly disagree    1    2    3    4    5    6    7    Strongly Agree

25. I intend to avoid using tanning beds.

Strongly disagree    1    2    3    4    5    6    7    Strongly Agree

26. I intend to check my skin regularly.

Strongly disagree    1    2    3    4    5    6    7    Strongly Agree

27. I intend forward this message to my friends or family.

Strongly disagree    1    2    3    4    5    6    7    Strongly Agree

28. I have used sunscreen before.

Strongly disagree    1    2    3    4    5    6    7    Strongly Agree

29. I have used tanning beds before.

Strongly disagree    1    2    3    4    5    6    7    Strongly Agree

30. I have checked my skin regularly before.

Strongly disagree    1    2    3    4    5    6    7    Strongly Agree

31. I have had a sunburn before.

Strongly disagree    1    2    3    4    5    6    7    Strongly Agree

32. Please circle your gender.

   Male            Female

33. What is your age?

   _____Years

34. What is your race? Please check all that apply.

   rather not say

   Caucasian/White

   African American

   Asian/Pacific Islander

   Hispanic

   Latino

   Multiracial (Having parents of more than one race):  Please list: _____

   Other: Please specify: _____


   Thank you for your participation!

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