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Photo Aging, Future Time Perspective and Social Smoking

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Introduction

The Centers for Disease Control (2007) estimates that 45 million adults in the United States smoke cigarettes. Cigarette smoking continues to be the leading preventable cause of disease and death in the United States. Although regular smoking has decreased in the last ten years, the amount of social and light smoking has increased by 20% the last ten years (CDC, 2007). Social smokers, defined as those who smoke more in social situations than alone, comprise a great portion of the 18-24 year old set of smokers (Everett et al., 1999). Furthermore light smokers are more likely to be women than men (Lawrence, Fagan, Backinger, Gibson, & Hartman, 2007). Unfortunately, decreased rates of smoking do not eliminate the very serious consequences that smoking presents—it is clear that no level of cigarette smoking, regular or social, is safe (U.S. Department of Health and Human Services, 2006).

While the majority of regular smokers understand that smoking leads to addiction, serious health problems, and death, social smokers often underestimate these risks (Cummings et al., 2004). It is likely that this misperception could be altered through appropriate education about social and light smoking. Knowledge about smoking has been associated with intention to quit smoking, and thus is an important component of a smoking intervention (Mckee, et al. 2005). Educational interventions based upon this idea have been created and used for current regular smokers; however, few interventions address the educational needs of light smokers and social smokers (Ahluwalia, 2006). Thus, the need for an effective education that targets this group of smokers is demonstrated—especially one that is tailored to the specific group of social smokers. Also indicated is a need for smoking intervention techniques that are effective with women. Though women are more likely to utilize smoking cessation services, they are significantly less likely than men to successfully quit after doing so (Bauld et al., 2009). It is suggested that targeting the beliefs and behaviors specific to this group of smokers is the most effective way to promote cessation

Future-time perspective (FTP), the ability to comprehend that one's current behaviors will affect his or her future self, has been shown to be a determinant in levels of smoking. Young smokers tend to score low on measures of FTP, meaning that present needs are often perceived as more important than future needs. We propose that one's preference in this matter is largely determined by one's ability to imagine the effects of decision consequences on one's future welfare. The construal level theory, proposed by Trope and Liberman (2003) suggests that the ability to imagine the future may be based upon mental representations of future events that are moderated by temporal proximity. Specifically, more salient current needs are represented concretely, while future needs are more likely to be represented abstractly.

Trope and Liberman (2003) also suggest that less information is available about the future, resulting in greater overconfident and less accurate predictions about the future. Thus, if the future consequences of a decision are made: 1) salient and concrete, and 2) the delayed benefit or cost is made sufficiently high, than a person may be willing to forgo present benefits for future benefits. It seems that quitting smoking would be a more attractive option if individuals could vividly and concretely image their futures, such as seeing the changes

in facial appearance (e.g., wrinkling, skin discoloration) that results as a consequence of smoking.

Past studies have found that graphic warnings on cigarette packages are more effective than text based messages in communicating warnings about cigarette smoking (Hammond, Fong, McNeil, Borland, & Cummings, 2006). Graphic depictions are one means to provide smokers with vivid, salient, and concrete consequences of smoking. The researchers aim to examine this concept in the context of smokers' future appearance through a photo-aging process. Smokers will be presented with a graphic depiction of their future appearance if they continue to smoke, as compared with an image of their future self if they quit smoking. The current study suggests that by making future consequences of smoking vivid and salient for smokers, intention to smoke will decrease.

Hypothesis

We expect that participants who receive an educational intervention in conjunction with photo aging (an interactive experience that allows the smoker to see future changes in facial physical appearance) will lead to a decrease in intent to smoke and a decrease in willingness to smoke under certain conditions (such as stress) than an educational intervention without photo aging. Specifically, we expect that young women with a longer future time perspective (greater concern about future health consequences) will show a greater decrease in intent to smoke and a decrease in willingness to smoke under certain conditions than young men.

Methods

Participants

Participants were 110 undergraduate students at Chapman University 39 men and 71 women. Students were ages 18-24 with a mean age of 19. Compensation for participation was either course research credit or a movie ticket.

Questionnaire

Intent to smoke was measured on a 1-7 Likert scale (1 = very weak, 7 = very strong) with the question, *How would you rate your intention to smoke?* Participants also reported the number of cigarettes smoked per week and the number of times they quit for 24 hours in the past year. Willingness to smoke was assessed with six questions such as *How willing are you to smoke in a severely stressful situation, e.g. finals, taxes, etc.?*

In order to measure future time perspective (FTP), levels of time discounting were assessed. Participants were asked to imagine that they were experiencing a scenario that described a state of poor health related to smoking behavior for the last two years, and that this condition would continue for the rest of their lives. They were then asked to compare two treatment options. Option A restored full health and began today, but only continued for a time period of either 1 year, 2 years, or 4 years. Option B restored full health, but the effect of the treatment would be delayed for either 1 year, 2 years, or 8 years. For each combination of treatment (magnitude in years [Option A] and treatment delay in years [Option B]), participants were asked to specify the treatment magnitude in years of the delayed option (Option B) that would make treatments A and B equally attractive. High values of time discounting indicate a shortened FTP, while low values for this measure indicate a lengthened FTP.

Educational Components

Participants were randomized to receive short-term advantages or long-term advantaged of quitting smoking and short-term disadvantages or long-term disadvantages of continuing to smoke regarding health, self-esteem, cost, and lifestyle factors.. An example of short-term advantages was: *If you quit smoking, after 8 hours the carbon monoxide and oxygen levels in your blood will be back to normal.* For long-term advantage, statements were used such as: *Non-smokers are 2 times less likely to die from a heart attack.* Short-term disadvantages were explained with statements such as: *If you continue smoking you will spend about $2,000 a year on cigarettes.* Long-term disadvantages of smoking were illustrated with facts like: *A smoker's lifetime risk for having a stroke is two times more than that of a non-smoker.*

Photo Aging

Half of the participants were randomly assigned to be photo-aged using the APRIL software program, which takes into account age, race, and gender to create an approximation of future aging. In this program, a photo of the young adult's face was aged 35 years to demonstrate the physical effects of smoking (increased wrinkling, discoloration of skin), and compared to an aged photo without the physical effects of smoking. An example is available upon request.

Results

The results of 2 x 2 x 2 ANOVA show that young women who received photo aging and education are less willing to smoke under certain conditions (e.g., stress; $F(1, 103) = 4.741$, $p=.032$) (see Figure 1 for women). These effects were not found for male participants; results are presented in Figure 2.

Furthermore, a 2 x 2 x 2 ANOVA conducted on follow-up questionnaires that were returned six weeks later ($N = 48$) showed a significant decrease in the number of cigarettes smoked on a weekly basis $F(1,44) = 6.41$, $p=.015$. The mean pretest for cigarettes smoked per month was 15 and follow-up test was 8.

Participants were divided into two FTP groups based on a median split, with "low time discounting" representing those with lengthened FTP and "high time discounting" indicating those determined to have shortened FTP. The results of 2 x 2 x 2 x 2 ANOVA show a significant decrease in intention to smoke for women with low time discounting who received photo aging and education $F(1,103) = 9.774$, $p =.003$ (see Figure 3). Results for women with high time discounting are presented in Figure 4. Men did not demonstrate a significant difference across conditions.

Discussion

The result of greatest significance was in young women who had a lengthened FTP. This group was most impacted by the education and photo-aging process in terms of intention to smoke as compared to those who received the education component without the photo-aging. The researchers suggest that the decreased intention to smoke was most pronounced amongst women with a lengthened FTP because the photo-aging process reinforces and encourages an already-present inclination to consider the future. It is suggested that one's FTP may be a personality construct, in which case a process targeting beliefs would not have a strong effect unless those beliefs were at least partially in place already.

The researchers also suggest that women participants were more affected by the photo-aging process than men because of the heightened importance that women tend to place on appearance. Though the effects of photo-aging are not pronounced in men, it appears that this is an effective smoking intervention for women, particularly those with a lengthened FTP. More research is still needed to examine the applicability of photo-aging to reducing intention to smoke in specific populations, with a particular focus on female social smokers.

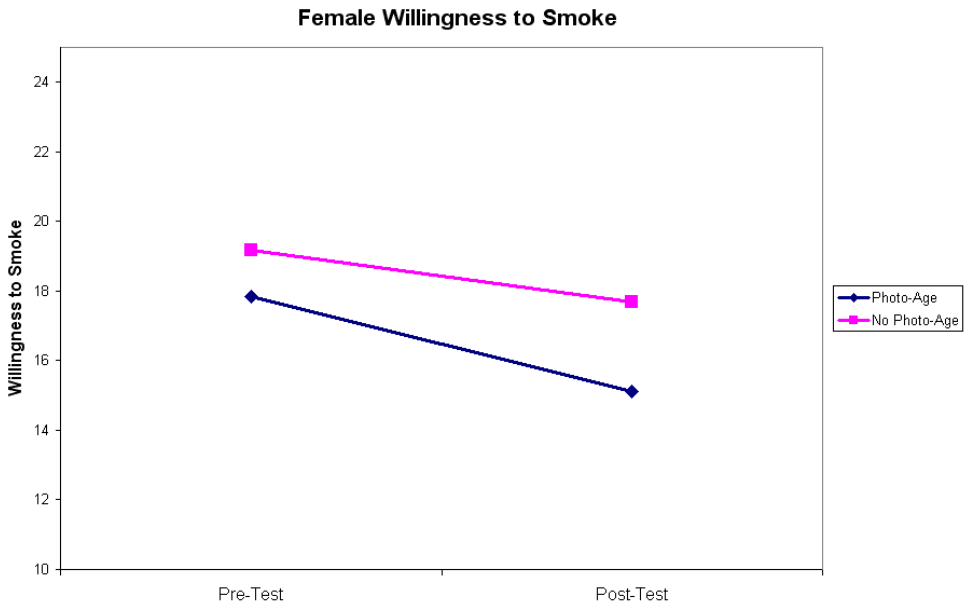

Figure 1

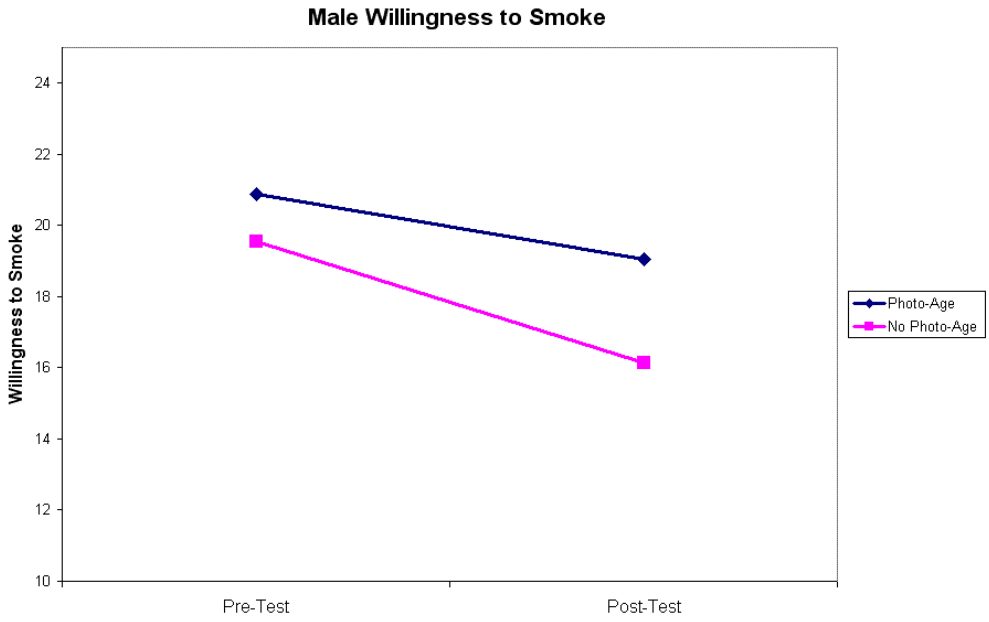

Figure 2

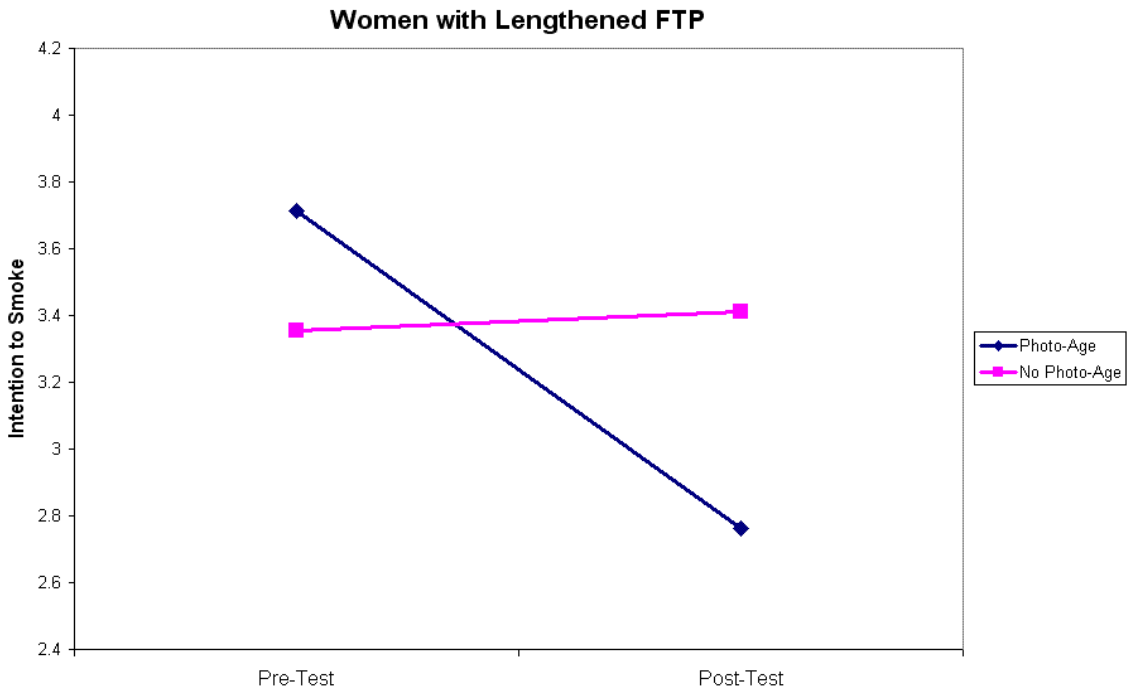

Figure 3

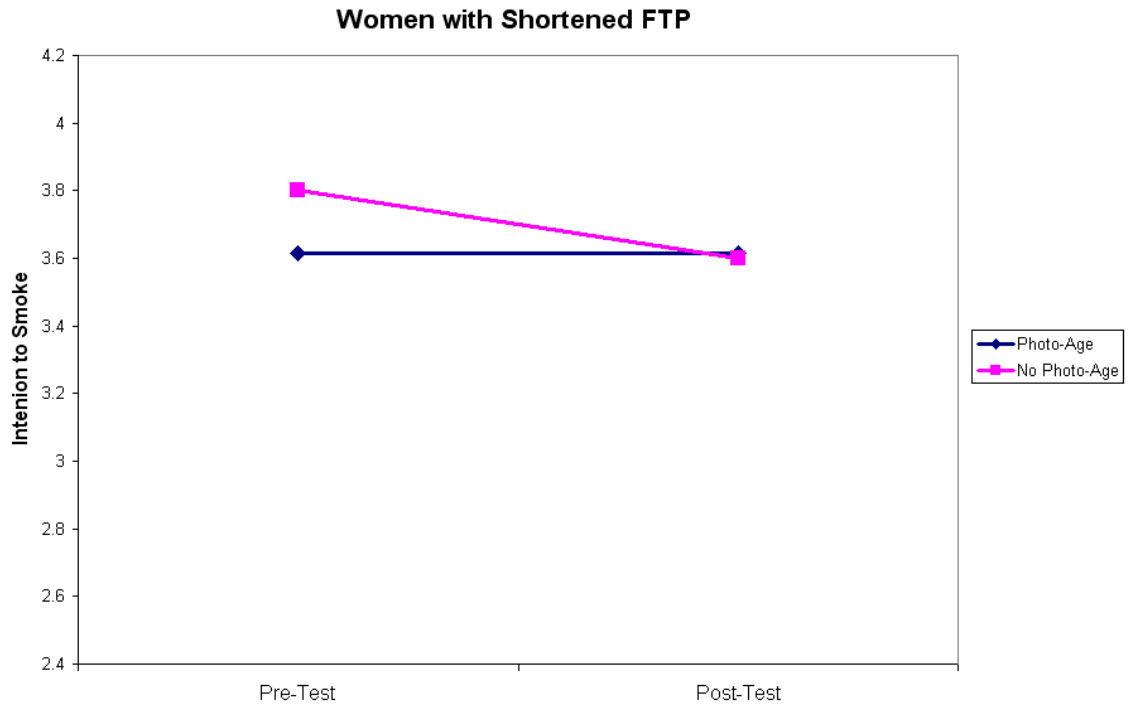

Figure 4

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