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A Randomized Trial of a Dissonance-Induction Intervention to
Decrease Tanning Behaviors among College Females

by

Sari R. Chait

A dissertation submitted in partial fulfillment
of the requirements for the degree of
Doctor of Philosophy
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A Randomized Trial of a Dissonance-Induction Intervention to
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Sari R. Chait

Abstract

Sun exposure is implicated in the majority of skin cancer cases so it is important to identify interventions that successfully decrease young people's tanning behaviors and increase their sun protection behaviors. Research suggests that interventions that focus on the more immediate appearance related effects of tanning, rather than on future health risks, may be more effective in altering UV-related behaviors. Dissonance induction is a strategy that has been used to successfully alter other health-related behaviors. This study sought to determine if a dissonance induction intervention might be similarly successful in changing UV-related behaviors. The study yielded mixed findings. Relative to a healthy lifestyle control condition, the tanning condition resulted in a decrease in intentions to tan indoors and in actual number of hours spent sunbathing. The tanning condition also resulted in an increase in intentions to use sunscreen on the body. However, compared to a psycho-educational control condition, both groups seemed to have been equally successful and unsuccessful on different measures of UV-related behaviors and intentions. The findings of this study suggest that a dissonance induction intervention for tanning may be successful, but that it requires further study. Despite the

mixed findings, this study serves as an important step in the search for successful interventions for decreasing tanning behaviors and increasing sun-protection behaviors.

Introduction

Skin cancer is the most common type of cancer in the United States. It is predicted that by the end of 2008, more than one million people will have been diagnosed with basal and squamous cell carcinomas and an additional 62,480 with melanoma (American Cancer Society, 2008). Research suggests that sun exposure is implicated in more than 80% of all skin cancer cases (Parker, Tong, Bolden, & Wingo, 1997). As such, it is important to identify interventions that successfully decrease people's tanning behaviors, as well as those that increase their use of sun protection behaviors.

Although public health efforts have been employed to increase people's knowledge of the risk of sun exposure, the data indicate that many Americans are still intentionally receiving ultraviolet (UV) exposure, as well as exposing themselves to the sun unintentionally without the use of sun protection (Hoegh, Davis, & Manthe, 1999; Mahler, Kulik, Gerrard, & Gibbons, 2007). Multiple intervention strategies have been employed and examined with the goal of altering people's UV-related behaviors. These include interventions that seek to encourage people to avoid UV exposure (e.g., Gibbons, Gerrard, Lane, Mahler, & Kulik, 2005; Hillhouse & Turrisi, 2002), wear protective clothing (e.g., Pagoto, McChargue, & Fuqua, 2003), avoid the sun during peak hours when UV radiation is strongest (e.g., Castle, Skinner, & Hampson, 1999), and use sunscreen (e.g., Jackson & Aiken, 2006; Mahler, et al., 2007).

Health Effects Focused Interventions

One common approach to altering people's UV-related behaviors is to provide participants with educational information about the detrimental health effects of UV exposure. For example, one study used a health education leaflet to inform female college students of the dangers of UV exposure. Castle et al. (1999) distributed leaflets that contained information regarding identification of one's own skin type, appropriate sun protection factor (SPF) number, appropriate sun exposure, and information regarding melanoma. Although the researchers found that knowledge regarding sunbathing was positively correlated with sun protection behaviors and that the leaflet increased knowledge, they did not find that the leaflet led to an increase in sun protection behaviors. In a more recent study, Clowers-Webb et al. (2006) randomly assigned solid organ transplant recipients to either a standard care group or an intensive education group. Both groups received information about their own risk for developing skin cancer and ways to protect themselves from the harmful effects of UV rays; all participants were also instructed to engage in sun protection behaviors. The intensive group also received written information on these topics at three different time points over the course of nine months. Results indicated that neither intervention significantly increased knowledge, perhaps due to a ceiling effect. Moreover, neither intervention significantly increased sun protection behaviors three months or 10 months post-intervention.

The pattern among these studies suggests that education on health risks alone is not an effective strategy for changing UV-related behaviors. Individuals often place more importance on the short-term, immediate benefits of tanning than they do on the long-term consequences. As such, interventions focusing on variables relevant to the

present, rather than on future health risks, may be more effective (Hillhouse & Turrisi, 2002).

Appearance Based Interventions

Research indicates that many people who engage in intentional UV exposure do so in an attempt to achieve a tan (Hillhouse, Stair, & Adler, 1996; Mahler et al., 2007). It seems that people often seek to achieve the “tan-ideal,” or a smooth, even, darker pigmentation than what is natural. This tan-ideal is often glorified in society, particularly via the media (Hillhouse, Turrisi, & Kastner, 2000; Jackson & Aiken, 2006). It is this pursuit of the tan-ideal that places many young people at greater risk of developing skin cancer, as they focus on feeling more attractive rather than on the long-term health consequences of sun exposure (Hillhouse et al., 1996; Hillhouse, Adler, Drinnon, & Turrisi, 1997; Hillhouse, Turrisi, Holwiski, & McVeigh, 1999; Hillhouse, et al., 2000). Given this finding, many recent interventions have focused on the negative effects UV exposure may have on one’s appearance, including the development of wrinkles, age spots, and uneven pigmentation (e.g., Gibbons et al., 2005; Hillhouse & Turrisi, 2002; Jackson & Aiken, 2006; Mahler, Fitzpatrick, Parker, & Lapin, 1997; Mahler et al., 2007; Pagoto et al., 2003).

Several appearance-based interventions consist primarily of conveying information about the negative effects of tanning on appearance. In one such study, Hillhouse and Turrisi (2002) randomly assigned college females who reported indoor tanning at least monthly to either a no-treatment control group or a workbook intervention that provided information on the detrimental effects that indoor tanning has on one’s appearance. The goal of the intervention was to encourage participants to

completely abstain from indoor tanning or, if not, to encourage them to alter their behaviors in an attempt to decrease the potential negative consequences tanning may have on one's appearance and one's health. Two weeks following study entry, participants who received the workbook were more likely than those in the control condition to report a decrease in intentions to: indoor tan at all in the next year, indoor tan more than 10 times in the next year, maintain a year-round tan, tan in the sun following indoor tanning, and tan without wearing clothing. They also demonstrated an increase in intentions to wear protective goggles while indoor tanning. Two months following study entry, participants who received the workbook were more likely to report fewer visits to an indoor tanning salon than participants in the control condition.

Other appearance-based interventions focus on the use of UV photographs (e.g., Gibbons et al., 2005; Mahler et al., 2007; Pagoto et al., 2003). This type of photography uses a special filter that causes uneven epidermal pigmentation to appear as brown blotches in photographs; uneven skin pigmentation is a negative appearance consequence of UV exposure and is indicative of damage to the skin. In one such study, Mahler et al. (2007) used a photoaging informational video and UV photographs to educate college students about the potentially detrimental appearance-related effects of UV exposure. Participants were randomly assigned to one of four groups: informational video and no photographs, photographs and no informational video, informational video and photographs, or the control condition where participants did not watch the video or have their photographs taken. The photoaging video contained information and images demonstrating how sun exposure and UV radiation in general can lead to photoaging. The video also provided educational information on effective ways of minimizing

photoaging. The UV photographs were facial pictures that highlighted non-uniform skin pigmentation that occurs following chronic sun exposure. Because primary analyses revealed no significant interactions between the two interventions, subsequent analyses were performed in terms of main effects only. Immediately following the interventions, participants who viewed either the video or the photographs demonstrated greater intentions to engage in sun protection and felt more susceptible to photoaging than participants who did not receive the interventions. Follow-up data indicated that participants in the intervention conditions demonstrated a decrease in their intentions to sunbathe, and there was objective evidence of less actual UV exposure several months later.

Another approach used in appearance-based interventions is to focus on altering perceived norms for a tanned appearance. For example, as part of a multicomponent intervention that included a focus on constructs from the Health Belief Model (e.g., self-efficacy and perceived advantages of tanning), Jackson and Aiken (2006) attempted to decrease sunbathing and increase sun protection behaviors by also including a component focused on altering perceived norms regarding a tanned appearance. For this component, women received information about the changing norms for sunbathing over the course of 20 years and viewed images depicting these changes. This segment of the intervention emphasized the change from tanned complexion to paler skin tone among celebrities and models. Results indicated that altering women's perceptions of what is normative concerning tanning led to a decrease in identification of advantages of sunbathing which, in turn, led to a decrease in sunbathing intentions.

The findings from these studies suggest that focusing on the short-term appearance-related effects of UV exposure may be more effective at reducing UV exposure and altering UV-related behaviors than focusing on longer-term health consequences of UV exposure. Specifically, interventions utilizing photoaging education, UV photographs, and manipulations of perceived norms appear to be effective at reducing UV-related behaviors.

Dissonance Induction Interventions

Dissonance induction may be another effective appearance-based strategy for altering UV-related behaviors. Dissonance theory states that when people maintain opposing cognitions, they experience psychological discomfort. This discomfort often leads them to change their cognitions and behaviors in an attempt to restore a sense of consistency (Festinger, 1957). The discomfort associated with dissonance is notably elicited when a person publicly states an opinion that is in clear opposition to the opinion he or she privately maintains. For example, publicly stating that “I am against position X” when privately believing “I am for position X” will result in cognitive dissonance. Altering one’s behaviors and beliefs in order to demonstrate that one concurs with the public statement is theorized to result in an alleviation of the psychological discomfort. Numerous studies have examined the utility of inducing cognitive dissonance in an attempt to modify people’s behaviors (e.g., Killen, 1985; Leake, Friend, & Wadhwa, 1999; Leippe & Eisenstadt, 1994). In a classic study of dissonance induction, Festinger and Carlsmith (1959) had college students fill a tray with spools, empty the tray, refill it, and repeat this cycle for 30 minutes; the task was intended to be boring and futile. Upon finishing, the control group answered questions regarding their level of enjoyment in the

task, while the participants in the other two conditions were offered money to tell the next subject (a confederate) that they enjoyed the study. Following this, they answered the same questions as the control group. Results indicated that when paid one dollar, participants were more likely than the control group to rate the task as enjoyable; being paid a small amount induced dissonance and, to reduce the dissonance, participants altered their beliefs in order to make them more congruent with what they publicly stated. When offered 20 dollars, participants did not rate the task as more enjoyable than the control group since they had greater incentive to publicly contradict their private opinion, thereby reducing dissonance. It is considered important that people feel that their assumption of the counter-attitudinal position was voluntary, since otherwise they may attribute their inconsistent behavior to experiment demands (Leippe & Eisenstadt, 1994).

Cognitive Dissonance Interventions and Health Behaviors

With regard to health behaviors, cognitive dissonance interventions have been studied primarily for their utility in decreasing eating disorder behaviors and in preventing such behaviors in at-risk populations (Becker, Smith, & Ciao, 2006; Mitchell, Mazzeo, Rausch, & Cooke, 2007; Roehrig, Thompson, Brannick, & van den Berg, 2006; Stice, Chase, Stormer, & Appel, 2001; Stice, Mazotti, Weibel, & Agras, 2000; Stice, Presnell, Gau, & Shaw, 2007; Stice, Shaw, Burton, & Wade, 2006; Stice, Trost, & Chase, 2003). In these studies, the interventions seek to alter participants' cognitions and behaviors surrounding the pursuit of the thin-ideal. Societal and cultural pressures often lead people, particularly women, to believe that having a thin body is ideal. In fact, the pressure to achieve this thin-ideal is often so profound that it leads people to engage in harmful behaviors, such as starving oneself or purging following food intake (Stice et al.,

2001). Dissonance induction interventions, such as those created by Stice et al. (2000) use activities such as essay writing and role-playing to encourage people to critique the thin-ideal. By inducing dissonance, these critique exercises may lead people to alter their behaviors, such as by adopting healthy dietary and exercise habits (e.g., Stice et al., 2001). Several studies have been conducted examining the utility of this intervention approach (Stice et al., 2000; 2001; 2003; 2007). For example, Stice et al. (2003) conducted a study comparing a dissonance-based intervention with a healthy weight intervention for adolescent females who endorsed concerns with body image. Participants were randomly assigned to either one of the two intervention groups or to a waitlist control group. The dissonance intervention condition consisted of three sessions in which participants defined and discussed the thin-ideal, wrote a statement about the costs associated with pursuing the thin-ideal, participated in a role-play activity that involved convincing various characters to avoid pursuing the thin-ideal, engaged in a body acceptance exercise, and discussed ways in which they personally could challenge the thin-ideal in their own lives. The healthy weight intervention also consisted of three sessions, which involved discussions of and education regarding healthy dieting, eating disorders, and weight management. Results indicated that, following the dissonance intervention, participants showed a significantly greater decrease in internalization of the thin-ideal than the control group; this finding was apparent at termination and at all subsequent follow-up assessments. Results also indicated that, three months following the dissonance intervention, participants reported a significant decrease in negative affect as compared to the control group. Finally, at termination and at the three-month follow,

participants in the dissonance intervention demonstrated a significant reduction in bulimic symptoms, a finding not observed in the control group.

In another study using dissonance induction, Becker et al. (2006) randomly assigned new college sorority members to either a dissonance intervention or a media advocacy intervention. The dissonance intervention consisted of activities to help participants identify the costs of pursuing the thin ideal; counter-attitudinal activities where participants noted positive mental, physical, and emotional attributes of oneself; role-play activities where participants convinced the facilitator to avoid pursuit of the thin ideal; and an activity to help strategize ways in which participants could resist the thin ideal. The media advocacy intervention consisted of educational videos concerning the role the media plays in maintenance of the thin-ideal (Becker et al., 2006). Findings indicate that, eight months following participation in the interventions, participants in both conditions demonstrated an improvement in bulimic pathology. However, participants in the dissonance group demonstrated an improvement in dietary restraint, whereas the media advocacy condition had no effect on this outcome at follow up. Finally, participants in the dissonance condition demonstrated a greater decrease in thin-ideal internalization at follow-up than did participants in the media advocacy condition.

Mitchell et al. (2007) conducted a study in which female undergraduate students were randomized to a yoga intervention, a dissonance intervention, or a control group that received no treatment. Consistent with previous studies, this study found that, relative to the control group, the dissonance intervention resulted in greater decreases in disordered eating symptomatology, drive for thinness, body dissatisfaction, and alexithymia. In contrast, the yoga intervention did not result in any significant changes in

the outcome variables assessed. This study provides further evidence of the utility of a dissonance-induction intervention for the prevention and treatment of eating disorder symptomatology.

Although the findings regarding dissonance-induction interventions are promising, it is important to note that many of these interventions are multifaceted and include several components, such as psycho-education. Psycho-education alone may result in the same cognitive and behavioral changes as the dissonance induction intervention. To examine this possibility, Roehrig et al. (2006) conducted a dismantling study of the Stice et al. (2000; 2001; 2003) intervention in order to identify the effective components. Undergraduate college females who endorsed some level of body dissatisfaction and internalization of the thin-ideal were randomized to one of two treatment conditions, either the full dissonance intervention, as developed by Stice et al. (2000), or the counterattitudinal advocacy treatment, which consisted solely of the dissonance induction strategy from the full intervention. Findings indicate that both interventions resulted in a decrease in thin-ideal internalization, body dissatisfaction, dieting behaviors, negative affect, and bulimic symptoms. These results suggest that the counterattitudinal advocacy components of the full dissonance intervention play an integral part in eliciting cognitive and behavioral changes.

The utility of inducing cognitive dissonance has also been examined for health-related sexual behavior. Stone, Aronson, Crain, Winslow, and Fried (1994) studied the use of dissonance induction to increase sexually active college students' purchases of condoms. Participants were randomized to either a commitment condition where they created videotaped presentations regarding the importance of safe sex practices, or a no

commitment condition where they created a similarly persuasive message but did not videotape it. Participants were also randomized to either a mindful condition where they were asked to write about situations in the past in which they failed to use condoms, or to an unmindful condition where no such activity took place. The authors hypothesized that the combination of the commitment and the mindful condition would induce dissonance and would result in a greater increase in condom purchases. As expected, participants in the combined condition purchased significantly more condoms than the participants in the other conditions immediately following the intervention.

Recently, the utility of inducing cognitive dissonance for the purposes of increasing intentions to quit smoking has been examined. Simmons and Brandon (2007) randomized college students who self-identified as smokers to a dissonance induction intervention or to one of two control conditions. Participants in the intervention condition were asked to aid in the development of a health promotion video for smoking. As part of this intervention, they were videotaped discussing reasons why high school students should quit smoking, and subsequently watched their own videotapes. One control group was identical to the intervention condition except the participants discussed nutrition rather than smoking; the other control group watched an anti-smoking video and then discussed it with the experimenter. Results indicate that, compared to both control conditions, the dissonance intervention was more effective in increasing immediate motivation to quit smoking. This effect was only found among female participants. These findings suggest the utility of a dissonance induction intervention for smoking cessation among female smokers.

Current Study

A dissonance induction intervention seeking to alter the tan-ideal may be similarly successful in changing UV-related behaviors. The current study sought to examine this possibility by means of inducing dissonance between pursuing the tan-ideal and understanding the negative effects UV exposure may have on one's appearance. If women do in fact tan in an attempt to achieve the tan-ideal (i.e., a perfect, evenly tanned complexion), then an adoption of beliefs regarding the negative effects tanning has on one's appearance should cause cognitive dissonance. In an attempt to decrease the psychological discomfort known to arise from dissonance, it was expected that these women would alter their behaviors. Specifically it was expected that they would plan to decrease UV exposure.

With this in mind, the current study randomly assigned female college students who engaged in tanning behaviors to a dissonance induction intervention focused on tanning (tanning condition), a dissonance induction control condition focused on eating healthy and exercising (healthy lifestyle condition), or a psycho-educational control condition focused on tanning (psycho-educational condition). Participants were led to believe that they were taking part in a focus group for a program under development aimed at improving adolescent females' health and appearance beliefs and attitudes. As part of the focus group in the tanning condition, women verbally shared ways in which tanning negatively affects appearance, they described times in their lives when people promoted the tan-ideal and generated ways they could have challenged that, and they participated in a video-taped role-play activity where they convinced an adolescent female to avoid UV exposure. It was expected that these activities, public expressions of

beliefs presumably discordant with their own, would result in cognitive dissonance, which would in turn lead to a decrease in tanning intentions and behaviors. The healthy lifestyle condition used similar dissonance-inducing procedures but targeted healthy eating and exercise habits. The psycho-educational condition consisted of a PowerPoint presentation on the negative consequences of tanning.

Aims and Hypotheses

The primary aim of the current study was to examine the utility of a dissonance-based intervention for decreasing tanning behaviors and intentions. Specifically, it was hypothesized that:

1. Participants in the tanning condition would demonstrate a decrease in intentions to tan immediately post-intervention relative to a similar dissonance induction intervention targeting eating and exercise.
2. Participants in the tanning condition would demonstrate a decrease in intentions to tan immediately post-intervention relative to a psycho-educational control condition.
3. Participants in the tanning condition would demonstrate a decrease in actual tanning behavior one-month post-intervention relative to a similar dissonance induction intervention targeting eating and exercise.
4. Participants in the tanning condition would demonstrate a decrease in actual tanning behavior one-month post-intervention relative to a psycho-educational control condition.

5. Participants in the tanning condition would demonstrate a decrease in intentions to tan one-month post-intervention relative to a similar dissonance induction intervention targeting eating and exercise.
6. Participants in the tanning condition would demonstrate a decrease in intentions to tan one-month post-intervention relative to a psycho-educational control condition.

The secondary aim of the current study was to examine the utility of a dissonance-based intervention for increasing sunscreen use and intentions. Specifically, it was hypothesized that:

7. Participants in the tanning condition would demonstrate an increase in intentions to wear sunscreen immediately following the intervention relative to a similar dissonance induction intervention targeting eating and exercise.
8. Participants in the tanning condition would demonstrate an increase in intentions to wear sunscreen immediately following the intervention relative to a psycho-educational control condition.
9. Participants in the tanning condition would demonstrate an increase in actual sunscreen use one-month post-intervention relative to a similar dissonance induction intervention targeting eating and exercise.
10. Participants in the tanning condition would demonstrate an increase in actual sunscreen use one-month post-intervention relative to a psycho-educational control condition.

11. Participants in the tanning condition would demonstrate an increase in intentions to wear sunscreen one-month post-intervention relative to a similar dissonance induction intervention targeting eating and exercise.
12. Participants in the tanning condition would demonstrate an increase in intentions to wear sunscreen one-month post-intervention relative to a psycho-educational control condition.

This study also sought to identify a potential mediator of the expected relationship between participation in a dissonance-based intervention and tanning intentions and behavior. Specifically, it was hypothesized that:

13. The effects of the intervention would be mediated by appearance-related reasons for tanning, such that participation in the intervention would lead to a decrease in endorsement of such reasons, which in turn would lead to a decrease in tanning intentions and behavior.

Methods

Participants

Participants were female students recruited from undergraduate psychology courses at the University of South Florida (USF), through the use of Sona, an online recruiting and scheduling program. In exchange for participation in the study, participants received course credit; for participation in the follow-up survey, participants received a \$10.00 gift certificate to Target. Eligibility criteria for the current study were: 1) being between the ages of 18 and 25 years; 2) being female; 3) reporting either indoor or outdoor tanning at least 6 times in the past 12 months; 4) having no personal history of skin cancer; 5) having the ability to read and speak English; 6) not having plans to graduate or transfer at the conclusion of the current semester.

Procedure

The current study was advertised on Sona to all undergraduate psychology students at USF. Interested students were required to answer questions aimed at assessing the eligibility criteria listed above. Eligible students who expressed interest in participating signed up on Sona for a specific timeslot; the timeslots were randomized in equal numbers to the tanning condition, the healthy lifestyle condition, or the psycho-educational condition. This procedure, rather than randomization of individual participants, was conducted in order to form groups of reasonable size able to meet at a common time.

At the study session, but prior to the start of the intervention, all participants were provided with an informed consent form to review. They were instructed to sign the consent form if they understood and were willing to participate in the study. Those who consented to participate were then administered a packet of questionnaires. Participants then received the intervention to which they were assigned. At the conclusion of the intervention meeting, participants in all three groups were administered a second packet of questionnaires. Additionally, one month post-intervention, all participants were asked to complete a final set of questionnaires. This final assessment was web-based and participants received a link to the questionnaire via email. Following the completion of the one-month follow-up questionnaire, all participants were debriefed. To debrief, an explanatory paragraph was mailed to participants with their gift certificate. Those participants who chose not to complete the one-month follow-up were emailed the debriefing information. As part of the debriefing, participants were informed that this was a study aimed at decreasing college students' tanning behaviors and that they were not a part of a focus group for creating programs for adolescent females. Following this explanation, participants were provided with a telephone number that could be used to contact the principal investigator if they had any further questions or concerns.

The baseline questionnaire included measures assessing demographic information, skin type and risk of skin cancer, current tanning behavior, tanning intentions, current sunscreen use, sunscreen use intentions, reasons for tanning, current exercise behaviors, exercise intentions, current dietary habits, dietary intentions, reasons for eating healthy and exercising, and feelings associated with dissonance. At the conclusion of the intervention, participants completed measures assessing feelings

associated with dissonance, tanning intentions, sunscreen use intentions, reasons for tanning, exercise intentions, dietary intentions, and reasons for eating healthy and exercising. Finally, one month following the conclusion of the intervention, participants completed measures assessing current tanning behaviors, tanning intentions, current sunscreen use, sunscreen use intentions, reasons for tanning, current exercise behaviors, and current dietary habits, exercise and dietary intentions, and reasons for eating healthy and exercising.

Prior to implementation of this study, a pilot study was conducted. The tanning condition was run to determine if any changes were necessary. At the conclusion of the intervention sessions, participants were asked open-ended questions aimed at assessing whether they believed the cover story and if any parts of the interventions were particularly difficult or confusing. The assessment measures were also administered as part of the pilot study and, similarly, participants were asked to answer questions aimed at determining if any of the questions were confusing or difficult to answer. Based on the information collected, no changes were considered to be necessary.

Tanning Condition

The tanning condition was modeled after dissonance-based interventions shown to be effective in reducing eating disorder behavior (e.g., Roehrig et al., 2006; Stice et al., 2003) and a previously conducted pilot study of a dissonance induction intervention aimed at decreasing tanning behaviors and increasing sun protection behaviors (M. Roehrig, personal communication, October 1, 2007). It consisted of one session lasting approximately 90 minutes. A script providing complete details of how each session was led is included in Appendix A.

Prior to signing the informed consent, the premise of the study was explained. In order to help engage the participants, they were told that the investigators were creating an intervention aimed at improving the health and appearance beliefs and attitudes of adolescent females. The groups were described as focus groups, aimed at helping the investigator create the necessary materials for the proposed intervention. For the first task, the group was asked to identify what defines the tan-ideal; the group leader asked specific questions aimed at helping the participants to understand what is meant by the tan-ideal. They were then asked to verbally identify ways in which the tan-ideal negatively affects one's appearance. Following this activity, participants were asked to write down two examples from their own life in which they encountered other people promoting the tan-ideal. They were encouraged to recount times when people they know personally encouraged tanning. If this proved too difficult, they were asked to discuss times in which media and other sources in society promoted the tan-ideal. For each example, the participants were asked to write down a response to challenge the other person who was promoting the tan-ideal. Each participant was asked to share one example with the group. Finally, the participants participated in role-play activities where they each took turns trying to convince the group leader, playing the part of different female adolescents, to avoid pursuit of the tan-ideal. These role-plays were video taped. Participants were told that these tapes were for research only and that professional actors would eventually be hired to play the parts that they created. They were encouraged to provide three reasons specifically related to how pursuing the tan-ideal negatively affects one's appearance. Under the premise that the audio needed to be

tested, parts of the tape were played back, so each person saw herself making public statements against the tan-ideal.

Healthy Lifestyle Condition

Participants in this control condition participated in an intervention identical to the tanning condition, except that it targeted healthy eating and exercise. It consisted of one session lasting approximately 90 minutes. A script providing complete details of how each session was led is included in Appendix B.

The premise of the intervention was explained in the same way as in the tanning condition. In order to help engage the participants, they were told that the investigators were creating an intervention aimed at helping adolescent females feel better about their health and well-being. The groups were described as focus groups, aimed at helping the investigator create the necessary materials for the proposed intervention. The first activity was to provide participants with the recommended guidelines for healthy eating and healthy exercise habits. Participants then generated reasons why adolescent females should engage in these behaviors. They discussed barriers to engaging in the behaviors and the consequences of not engaging in them. Participants were then asked to write down two examples from their own life when they had a difficult time maintaining healthy eating and/or exercise habits; they also wrote down ways in which they could have handled each situation differently. Each participant was then asked to share an example with the group. Finally, participants participated in a role play activity where they convinced the group leader, playing the part of different adolescents not engaging in healthy eating and/or exercise habits, to engage in healthier habits. These role-play activities were taped. Participants were told that the tapes were for research only and that

professional actors would eventually be hired to play the parts they created. Finally, under the premise that the audio needed to be tested, parts of the tape were played back so each participant saw herself making public statements about eating healthy and/or exercising.

Psycho-education Condition

Participants in this condition were told that the investigator was testing materials already created for a tanning program. They watched a PowerPoint presentation that focused on the health consequences of UV exposure, appearance-related effects of UV exposure, and included information on ways to protect oneself from such effects. The presentation was based on information appearing on the website of the American Cancer Society (American Cancer Society: Sun Safety, 2008). A script is included in Appendix C.

Measures

Demographic Information. Demographic information was obtained through use of a standard self-report questionnaire. Variables assessed were: date of birth, race, ethnicity, marital status, education, family history of skin cancer, height, and weight.

Skin Type/Risk for Skin Cancer. To assess participants' skin type and objective risk for developing skin cancer, two questions adapted from previous studies were used. Participants rated their skin type on a five-point scale assessing tendency to burn and tan (Branstrom, Ullen, & Brandberg, 2004; Fitzpatrick, 1988), and they rated their untanned skin color on a three-point scale (Weinstock, 1992). Evidence exists indicating that these

measures are highly related to sun sensitivity, a major risk factor for developing skin cancer (Fitzpatrick, 1988; Weinstock, 1992).

Indoor Tanning Behaviors. To assess current indoor tanning behaviors, participants provided an estimate of the number of times they attended tanning salons in the past month. In addition, they answered an item assessing how often they have done so in the past 12 months; this item used a seven-item response scale ranging from “never” to “nearly every day.” These items were adapted from similar items used in previous research (e.g., Hillhouse et al., 1997; Hillhouse & Turrisi, 2002).

Outdoor Tanning Behaviors. To assess current outdoor tanning behaviors, participants answered questions that parallel those used to assess indoor tanning behaviors. In addition, participants also provided an estimate of the average number of hours they spent each time they were outdoor tanning in the past month. These items were adapted from previous studies that have assessed similar variables (e.g., Hillhouse et al., 1997; Jackson & Aiken, 2006).

Indoor Tanning Intentions – Open-Ended. To assess the frequency with which participants intended to indoor tan, a free-response item was used. Participants were asked to provide an estimate of how many times they intend to indoor tan in the next month. This item was adapted from previous studies that have assessed tanning intentions similarly (e.g., Hillhouse et al., 1999).

Indoor Tanning Intentions – Rating Format. Participants were asked to rate how likely they were to indoor tan in the next month. Ratings were made on a seven-point Likert scale, ranging from 0 “definitely will not indoor tan” to 6 “definitely will indoor tan.” Participants were also asked to rate how frequently they intended to indoor tan in

the next 12 months; ratings were made on a 7-point scale, ranging from “never” to “nearly every day.” These two items were found to be highly correlated at each time of assessment ($r = .81$ to $.85$, $p < 0001$). Consequently, they were transformed to a common metric and summed at each time of assessment to create an indoor tanning intentions composite score. All of these items were adapted from previous studies that have examined similar variables (e.g., Hillhouse & Turissi, 2002; Hillhouse et al., 2000).

Outdoor Tanning Intentions – Open-Ended. To assess the frequency with which participants intended to outdoor tan, a free-response item was used. Participants were asked to provide an estimate of how many times they intend to indoor tan in the next month. This item was adapted from previous studies that have assessed tanning intentions similarly (e.g., Hillhouse et al., 1999).

Outdoor Tanning Intentions – Rating Format. Participants were asked to rate how likely they were to outdoor tan in the next month. Ratings were made on a seven-point Likert scale, ranging from 0 “definitely will not outdoor tan” to 6 “definitely will outdoor tan.” Participants were also asked to rate how frequently they intended to outdoor tan in the next 12 months. Ratings were made on a 7-point scale, ranging from “never” to “nearly every day.” These two items were found to be highly correlated at each time of assessment ($r = .41$ to $.51$, $p < 0001$). Consequently, they were transformed to a common metric and summed at each time of assessment to create an outdoor tanning intentions composite score. All of these items were adapted from previous studies that have examined similar variables (e.g., Hillhouse & Turissi, 2002; Hillhouse et al., 2000).

Sunless Tanning Behaviors. To assess current sunless tanning behaviors, participants answered questions that parallel those used to assess indoor and outdoor

tanning behaviors, specifically targeting use of sunless tanning sprays and lotions on the face and body.

Sunless Tanning Intentions. To assess sunless tanning intentions, participants answered questions that parallel those used to assess indoor and outdoor tanning intentions, specifically targeting use of sunless tanning sprays and lotions on the face and body.

Sunscreen Use. To assess current sunscreen use, participants were asked how often they used sunscreen with an SPF of at least 15 on their face when in the sun in the past month. They were asked a similar item assessing sunscreen use on their body. For both items, participants rated the extent to which they used sunscreen on a 5-point scale, ranging from 0 “never” to 4 “always.” These items were adapted from previous research assessing similar items (e.g., Azzarello, Dessureault, & Jacobsen, 2006; Jackson & Aiken, 2000).

Sunscreen Use Intentions. To assess participants’ intentions to use sunscreen in the future, they were asked parallel items to those used to assess sunscreen behaviors, altered in wording to capture intentions. Participants were asked how often they intend to use sun protection on their face in the next month and in the next 12 months. These two items were found to be highly correlated at each time of assessment ($r = .80$ to $.84$, $p < 0001$). Consequently, they were transformed to a common metric and summed at each time of assessment to create face sun protection composite score. Likewise, participants were asked how often they intend to use sun protection on their body in the next month and in the next 12 months. These two items were found to be highly correlated at each time of assessment ($r = .80$ to $.86$, $p < 0001$). Consequently, they were transformed to a

common metric and summed at each time of assessment to create body sun protection intentions composite score.

Reasons for Tanning. To assess participant's reasons for tanning, they completed a 12-item measure assessing appearance-related reasons for tanning adapted from previous research (e.g., Cafri et al., 2006). Participants rated the extent to which they agreed or disagreed with a series of statements on a 5-point Likert scale ranging from 1 "definitely disagree" to 5 "definitely agree." An example includes "I believe that a tanned complexion makes me more attractive." The internal consistency reliability of this scale in the present study appeared to be acceptable ($\alpha = .90$).

Reasons for Eating Healthy and Exercising. To assess reasons for eating healthy and exercising, participants completed an 11-item measure that was adapted from the Reasons for Tanning measure, but assessed beliefs about eating healthy and exercising. The internal consistency reliability of this scale in the current study appeared to be acceptable ($\alpha = .86$).

Current Exercise Behaviors. To assess current exercise habits, participants completed the Godin Leisure-Time Exercise Questionnaire (LSI; Godin, & Shephard, 1985). This measure consists of three questions that assess the average frequency of mild, moderate, and strenuous exercise performed in the last week. For each item, participants also provided an estimate of the average amount of time spent doing each type of exercise. The reliability and validity of the LSI have been found to compare favorably with other self-report measures of exercise (Jacobs, Ainsworth, Hartman, & Leon, 1993).

Exercise Intentions. To assess exercise intentions, participants were asked items that parallel the LSI, but phrased in a way to capture intention to engage in exercise in the next month. Specifically, participants were asked how frequently they intend to engage in mild, moderate, and strenuous exercise in the next month.

Current Dietary Habits. To assess current dietary habits, the Fruits and Vegetables section of the Behavioral Risk Factor Surveillance System (BRFSS; Centers for Disease Control and Prevention [CDC], 2007) was administered. The BRFSS is a system of health surveys administered by the CDC in all 50 states on a monthly basis. The Fruits and Vegetables section consists of six items assessing how frequently participants typically consume various fruits and vegetables. They rated their responses on a 10-point Likert scale, ranging from “never” to “five or more times per day.”

Dietary Intentions. To assess dietary intentions, participants answered questions that assess the frequency with which they intend to eat a variety of fruits and vegetables in the next month. These items were rated on the same 10-point Likert scale used to assess current frequency of consumption of these foods.

Cognitive Dissonance. To assess the affective discomfort that was expected to arise following dissonance induction, participants completed the Dissonance Thermometer (Devine, Tauer, Barron, Elliot, & Vance, 1999; Elliot & Devine, 1994). This 14-item measure asks participants to indicate how they are feeling “right now” on a 7-point Likert scale that ranges from 1 “does not apply at all” to 7 “applies very much.” The discomfort factor of this scale is comprised of three items (uncomfortable, uneasy, and bothered), and previous research suggests that this factor represents the affective consequence of cognitive dissonance (Elliot & Devine, 1994).

Statistical Analyses

Descriptive statistics (e.g., mean and standard deviations) were calculated to characterize participants' demographic characteristics. In order to ensure that random assignment was successful, t-tests and chi-square analyses were conducted to compare participants in the tanning condition and control conditions; specifically, analyses were run to determine if the groups differed in terms of age, race, ethnicity, marital status, education, BMI, beliefs about reasons for tanning (initial assessment), and current tanning behaviors (initial assessment). Variables found to differ significantly ($p < .05$) between groups were included as covariates in all subsequent analyses.

To test the hypotheses, multiple 2x2 repeated measures ANOVAs were performed comparing the tanning condition to the healthy lifestyle condition or the tanning condition to the psycho-education condition. To test hypotheses one, two, seven, and eight, 2 (condition: control or intervention) by 2 (time: baseline or post-intervention) repeated measures ANOVAs were performed, with condition as a between subjects variable and time as a within subjects variable. To test hypotheses three, four, five, six, nine, 10, 11, and 12, 2 (condition: control or intervention) by 2 (time: baseline or 1-month follow-up) repeated measures ANOVAs were performed. Thus, in each case, separate ANOVAs were performed comparing the tanning condition to the eating condition and the tanning condition to the psycho-education condition. Of principle interest in these analyses was the Condition x Time interaction effect. In the case of significant ($p \leq .05$) interaction effects, simple effect analyses were conducted to confirm that the pattern of results was consistent with the study hypotheses. Although no

hypotheses had been offered, similar ANOVAs were performed comparing the eating condition to the psycho-education condition.

To test hypothesis 13, multiple regression analyses were conducted following the procedures described by Baron and Kenny (1986). If it was determined that participation in the tanning condition led to a decrease in intentions to tan, then further analyses were conducted. A residual change regression analysis was conducted to determine if group membership was related to changes in identification of reasons for tanning. Analyses were also conducted to determine if changes in reasons for tanning was related to a decrease in intentions to tan. If all these conditions were met, regression analyses were conducted to determine if reasons for tanning mediated the relationship between group assignment and tanning intentions. Residualized difference scores were used for the reasons for tanning variable in the final regression analysis. If applicable, the above steps were repeated with tanning behavior, sunscreen use intentions, and sunscreen use behaviors as the outcome variables of interest.

Power Analyses

In order to determine the necessary sample size, a power analysis was conducted. Based on prior research (e.g., Stice et al., 2001) suggesting that a medium effect size for a dissonance induction intervention should be expected, it was determined that 60 participants per treatment condition was necessary in order to detect a medium effect size of .50 (Cohen, 1988) with a power of .80 at $p < .05$ (two-tailed). To take into account potential attrition over the one month follow-up period, the current study sought to recruit 260 participants.

Results

Participants

Two-hundred-sixty female students consented to participate in the current study. Because participants' names were released to the investigator only after they signed up to participate on Sona, it is unknown how many participants were eligible but chose not to participate. Of the 260 participants who agreed to participate, three were excluded due to their endorsing having had skin cancer. Consequently the sample size for the analyses comparing pre- and immediately post-intervention outcomes is 257. Of those individuals, 32 participants did not complete the one-month follow-up questionnaire; consequently, the sample size for analyses comparing pre- and one-month-post intervention outcomes is 225. For analyses that examined 12-month intentions to tan or to use sunscreen immediately post-intervention, the sample size is 236 because those measures were added in after data collection began. See Figure 1 for a complete description of study participation rates.

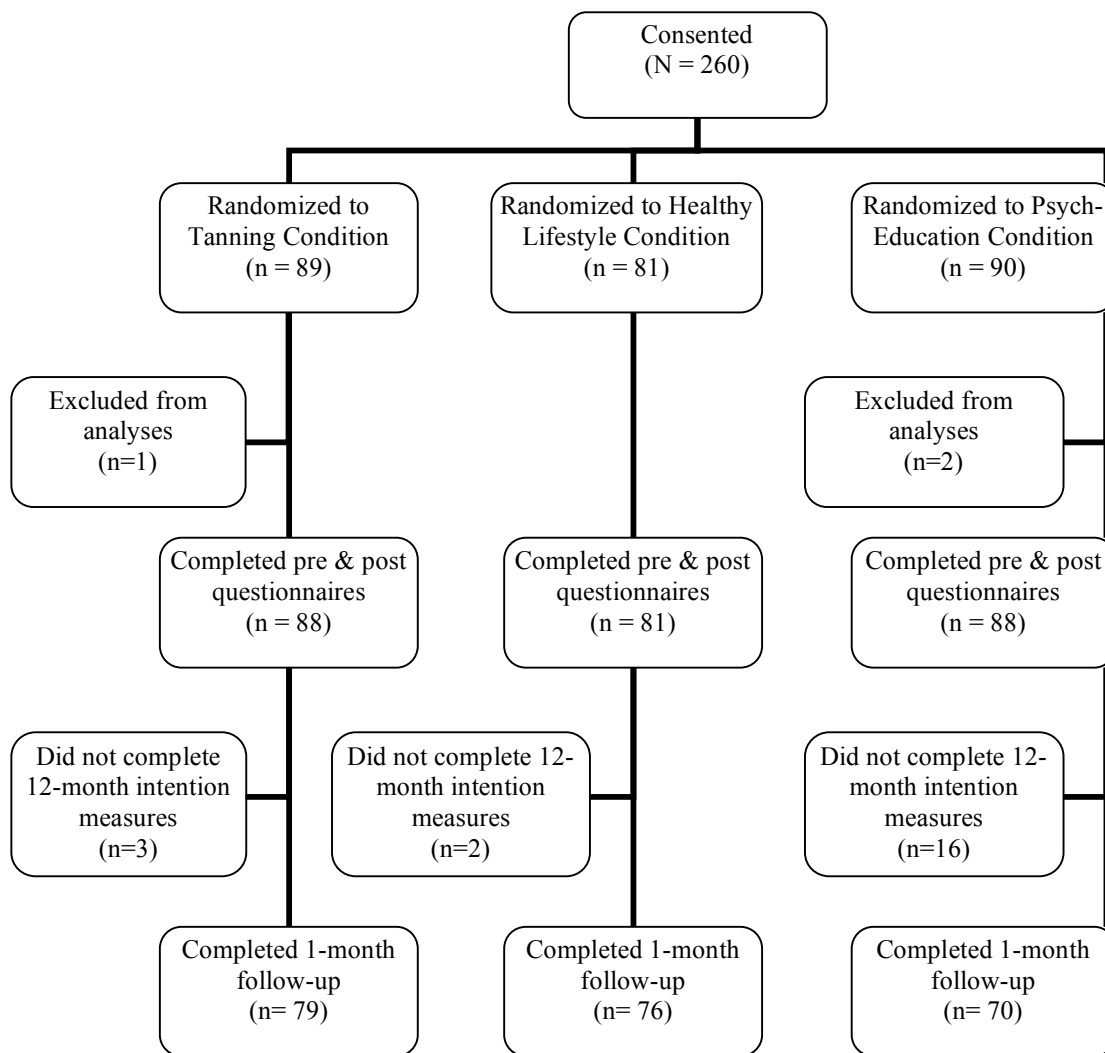


Figure 1. Participation flow chart

A total of 62 groups were run: 20 of the tanning condition, 21 of the healthy lifestyle condition, and 21 of the psycho-education condition. The average number of participants in each group was 4 (range = 2-10; $SD = 2.07$).

Baseline Demographic and Tanning Characteristics

Participants ranged in age from 19 to 25 years ($M = 19.82$; $SD = 1.50$) and had an average body mass index (BMI) of 22.65 ($SD = 3.60$). The majority of participants were

Caucasian (86%), non-Hispanic (90%), never married (98%), and were in their freshman year of college (47%). See Table 1 for complete demographic information.

Table 1
Demographic Variables

	All participants (N=257)	Tanning Condition (n=88)	Healthy Lifestyle Condition (n=81)	Psycho-education Condition (n=88)	Test statistic	<i>p</i>
Age (mean, <i>SD</i>)	19.82 (1.50)	19.73 (1.31)	19.70 (1.45)	20.02 (1.68)	$F = 1.18$.31
BMI (mean, <i>SD</i>)	22.65 (3.60)	22.86 (3.48)	22.59 (3.40)	22.50 (3.93)	$F = .23$.79
Race					$\chi^2 = 1.66$.44
% White	86	90	84	84		
Ethnicity					$\chi^2 = 1.55$.47
% Not Hispanic or Latina	90	93	88	90		
Marital status					$\chi^2 = 1.75$.42
% Never married	98	99	96	99		
Education					$F = 2.75$.07
% Freshmen	47	44	54	43		
Tanning Beliefs (mean, <i>SD</i>)	3.43 (.76)	3.56 (.70)	3.35 (.77)	3.38 (.80)	$F = 1.87$.16

Note. There were no significant ($p < .05$) differences between groups on any of these variables.

The average number of times that participants reported having tanned indoors in the last month was 1.67 (range = 0 to 29; $SD = 4.29$). Regarding sunbathing, the average number of times reported for the past month was 2.41 (range = 0 to 29; $SD = 3.41$).

Participants rated their sunscreen use on a five-point scale ranging from 1 “Never” to 5 “Always.” At baseline, the frequencies with which participants reported using sunscreen with an SPF of at least 15 on their face were: never (30%), rarely (10%), sometimes

(13%), often (17%), and always (30%). The frequencies with which participants reported using sunscreen with an SPF of at least 15 on their body were: never (37%), rarely (24%), sometimes (17%), often (10%), and always (12%). See Table 2 for a complete description of baseline tanning intentions and behaviors and Table 3 for a complete description of baseline sunscreen use intentions and behaviors.

Table 2
Baseline Tanning Intentions and Behaviors

	All participants (<i>N</i> =257)	Tanning Condition (<i>n</i> =88)	Healthy Lifestyle Condition (<i>n</i> =81)	Psycho-education Condition (<i>n</i> =88)	Test Statistic	<i>p</i>
Outdoor Tanning Behaviors (mean, <i>SD</i>)	1.67 (4.29)	1.60 (4.11)	2.06 (5.18)	1.39 (3.50)	<i>F</i> = .54	.58
Indoor Tanning Behaviors (mean, <i>SD</i>)	2.41 (3.41)	2.01 (2.44)	2.96 (4.44)	2.31 (3.10)	<i>F</i> = 1.72	.18
Outdoor Tanning Intentions (mean, <i>SD</i>)	2.20 (3.38)	1.91 (2.98)	2.50 (3.93)	2.22 (3.23)	<i>F</i> = .63	.53
Indoor Tanning Intentions (mean, <i>SD</i>)	1.91 (4.47)	1.98 (4.70)	1.96 (4.98)	1.78 (3.71)	<i>F</i> = .05	.95

Table 3
Baseline Sunscreen Intentions and Behaviors

	All participants (N=257)	Tanning Condition (n=88)	Healthy Lifestyle Condition (n=81)	Psycho-education Condition (n=88)	Test Statistic	<i>p</i>
Sunscreen Intentions: Face (mean, <i>SD</i>)*	7.13 (2.72)	7.29 (2.70)	6.95 (2.78)	7.14 (2.70)	<i>F</i> = .33	.72
Sunscreen Intentions: Body (mean, <i>SD</i>)*	5.79 (2.54)	5.87 (2.59)	5.76 (2.64)	5.72 (2.41)	<i>F</i> = .07	.93
Sunscreen Behaviors: Face (mean, <i>SD</i>)**	3.07 (1.63)	3.02 (1.65)	3.19 (1.58)	3.00 (1.67)	<i>F</i> = .32	.73
Sunscreen Behaviors: Body (mean, <i>SD</i>)**	2.37 (1.39)	2.36 (1.38)	2.52 (1.42)	2.23 (1.34)	<i>F</i> = .94	.39

*Scales range from 2 (Never) to 10 (Always)

**Scales range from 1 (Never) to 5 (Always)

Preliminary analyses were performed to confirm that randomization resulted in groups with similar demographic and pre-intervention tanning characteristics. Results indicated that there were no significant ($p < .05$) differences for age, race, ethnicity, marital status, education, BMI, beliefs about reasons for tanning (initial assessment), and current tanning behaviors (initial assessment). See Tables 1 and 2 for more details.

Relationship of Intervention Type to Dissonance Thermometer

To determine if the dissonance interventions were successful at inducing dissonance, separate one-way repeated measures ANOVAs were conducted for each intervention condition comparing scores on the discomfort scale of the Dissonance Thermometer from pre- to immediately post-intervention. It was expected that the scores

on this scale for the psycho-educational condition would remain the same or decrease, and that the scores on this scale for the tanning condition and the healthy lifestyle condition would increase. For the tanning condition, results revealed a significant effect, $F(1, 86) = 54.33, p < .0001$. Although the scores differed significantly from pre- to post-intervention, it is important to note that they went down, indicating a decrease in discomfort, contrary to what was predicted. For the healthy lifestyle condition, results again revealed a significant effect, $F(1, 80) = 17.67, p < .0001$. The scores again decreased, indicating a decrease in discomfort. Finally, for the psycho-educational condition, results also revealed a significant effect, $F(1, 86) = 24.16, p < .0001$. Again, the scores decreased over time, indicating a decrease in discomfort. See Table 4 for further details.

Table 4
Summary of Dissonance Thermometer Means by Intervention Condition

	Pre-Intervention	Post-Intervention
	Mean (SD)	Mean (SD)
Tanning condition	2.28 (1.07)	1.68 (.91)
Healthy lifestyle condition	2.02 (1.10)	1.58 (.88)
Psycho-educational condition	1.90 (.93)	1.54 (.78)

Relationship of Intervention Type to Tanning Intentions Immediately Post-Intervention

Hypothesis one stated that participants in the tanning condition would demonstrate a decrease in intentions to tan immediately post-intervention relative to the healthy lifestyle condition. To test this hypothesis, separate 2x2 repeated measures ANOVAs were performed comparing the tanning condition to the healthy lifestyle condition on the different measures of tanning intentions. To examine one-month frequency intentions to indoor tan, a 2x2 ANOVA was performed with the number of

times the participant intended to indoor tan in the next month as the dependent variable. The analysis did not reveal a significant Group x Time effect, $F(1, 167) = 2.75, p = .09$. A similar 2x2 ANOVA was performed to examine one-month frequency intentions to sunbathe and, likewise, did not reveal a significant Group x Time effect, $F(1, 167) = 1.96, p = .16$. In addition, a 2x2 ANOVA was performed with intended amount of hours spent sunbathing in the next month. The analysis did not reveal a significant Group x Time effect, $F(1, 167) = 2.53, p = .11$.

A 2x2 ANOVA was performed with the indoor tanning intentions rating format composite score as a dependent variable. Findings revealed a significant Group x Time effect, $F(1, 162) = 3.88, p = .05$. Tests for simple effects showed that scores on this measure decreased significantly over time among participants in the tanning condition, $F(1, 84) = 22.94, p < .0001$. Scores also decreased significantly over time among participants in the healthy lifestyle condition, $F(1, 78) = 4.47, p < .05$. See Table 5 for further details.

Table 5
Hypothesis One: Summary of ANOVA Comparing Tanning Condition to Healthy Lifestyle Condition on Indoor Tanning Intentions

	Pre-Intervention	Post-Intervention
	Mean (SD)	Mean (SD)
Tanning condition	31.94 (22.25)	27.91 (19.76)
Healthy lifestyle condition	31.59 (20.88)	29.87 (20.74)

Note. Group x Time $F(1, 162) = 3.88, p = .05$

Although the post-intervention mean for the tanning condition was less than the post-intervention mean for the healthy condition, this difference was not significant, $F(1, 162) = .39, p = .53$.

Because analysis of the composite score yielded a significant Group x Time effect, further analyses were conducted examining the individual items that comprised the composite score. A 2x2 ANOVA was performed with likelihood intentions to indoor tan in the next month as the dependent variable. The analysis revealed a significant Group x Time effect, $F(1, 162) = 4.45, p < .05$. Tests for simple effects showed that scores on this measure decreased significantly over time among participants in the tanning condition, $F(1, 84) = 20.78, p < .0001$. In contrast, there was no significant change over time among participants in the health lifestyle condition, $F(1, 78) = 2.55, p = .11$. See Table 6 for further details.

Table 6
Hypothesis One: Summary of ANOVA Comparing Tanning Condition to Healthy Lifestyle Condition on Indoor Tanning Intentions in the Next Month

	Pre-Intervention	Post-Intervention
	Mean (SD)	Mean (SD)
Tanning condition	2.45 (1.79)	2.10 (1.58)
Healthy lifestyle condition	2.47 (1.77)	2.35 (1.77)

Note. Group x Time $F(1, 162) = 4.45, p < .05$

A similar ANOVA was performed with intentions to indoor tan in the next 12 months as the dependent variable. The analysis did not reveal a significant Group x Time effect, $F(1, 162) = .95, p = .33$.

A 2x2 ANOVA was performed with the outdoor tanning intentions composite score as a dependent variable and did not reveal a significant Group x Time effect, $F(1, 162) = .04, p = .84$.

Hypothesis two stated that participants in the tanning condition would demonstrate a decrease in intentions to tan immediately post-intervention relative to the

psycho-educational condition. To test this hypothesis, separate 2x2 repeated measures ANOVAs were performed comparing the tanning condition to the psycho-educational condition on the different measures of intentions. To examine one-month frequency intentions to indoor tan, a 2x2 ANOVA was performed with the number of times the participant intended to indoor tan in the next month as the dependent variable. The analysis did not reveal a significant Group x Time effect, $F(1, 174) = 1.49, p = .22$. A similar 2x2 ANOVA was performed to examine one-month frequency intentions to sunbathe and, likewise, did not reveal a significant Group x Time effect, $F(1, 174) = 2.54, p = .11$. A 2x2 ANOVA was also performed with intended amount of hours spent sunbathing in the next month. The analysis did not reveal a significant Group x Time effect, $F(1, 174) = 1.93, p = .17$.

A 2x2 ANOVA performed with the indoor tanning intentions rating format composite score as the dependent variable did not reveal a significant Group x Time effect, $F(1, 155) = 2.24, p = .14$. A 2x2 ANOVA performed with the outdoor tanning intentions composite score as the dependent variable also did not reveal a significant Group x Time effect, $F(1, 155) = .82, p = .37$.

Relationship of Intervention Type to Tanning Behaviors One Month Post Intervention

Hypothesis three stated that participants in the tanning condition would demonstrate a decrease in actual tanning behaviors one-month post-intervention relative to the healthy lifestyle condition. To test this hypothesis, separate 2x2 repeated measures ANOVAs were performed comparing the tanning condition to the healthy lifestyle condition on the different measures of tanning behavior. To examine indoor tanning behaviors in the past one month, a 2x2 ANOVA was performed with estimated number

of times the participant indoor tanned in the past month as the dependent variable. The analysis did not reveal a significant Group x Time effect, $F(1, 153) = .08, p = .78$. To examine sunbathing behaviors in the past one month, a 2x2 ANOVA was performed with estimated number of times the participant sunbathed in the past month as the dependent variable. The analysis did not reveal a significant Group x Time effect, $F(1, 153) = 1.24, p = .27$. An additional 2x2 ANOVA conducted with estimated number of hours spent sunbathing in the past month as the dependent variable did reveal a significant Group x Time effect, $F(1, 153) = 4.04, p < .05$. Tests for simple effects showed that the hours spent sunbathing in the past month among participants in the tanning condition decreased significantly over time, $F(1, 78) = 28.13, p < .0001$. In contrast, there was no significant change over time in hours spent sunbathing in the past month among participants in the healthy lifestyle condition, $F(1, 75) = 2.60, p = .11$. See Table 7 for further details.

Table 7
Hypothesis Three: Summary of ANOVA Comparing Tanning Condition to Healthy Lifestyle Condition on Hours Spent Sunbathing in Past Month

	Pre-Intervention	One-month Follow-up
	Mean (SD)	Mean (SD)
Tanning condition	1.87 (2.10)	0.82 (1.30)
Healthy lifestyle condition	1.62 (1.47)	1.21 (2.04)

Note. Group x Time $F(1, 153) = 4.04, p < .05$

Hypothesis four stated that participants in the tanning condition would demonstrate a decrease in actual tanning behaviors one-month post-intervention relative to the psycho-educational condition. To test this hypothesis, separate 2x2 repeated measures ANOVAs were performed comparing the tanning condition to the psycho-educational condition on the different measures of behaviors. To examine indoor tanning

behaviors in the past one month, a 2x2 ANOVA was performed with estimated number of times the participant indoor tanned in the past month as the dependent variable. The analysis did not reveal a significant Group x Time effect, $F(1, 147) = .26, p = .61$. To examine sunbathing behaviors in the past one month, a 2x2 ANOVA was performed with estimated number of times the participant sunbathed in the past month as the dependent variable. The analysis revealed a significant Group x Time effect, $F(1, 147) = 4.03, p < .05$. Tests for simple effects showed that the number of times participants in the tanning condition sunbathed in the past month decreased significantly over time, $F(1, 79) = 11.71, p < .01$. The number of times participants in the psycho-educational condition sunbathed in the past month also decreased, $F(1, 69) = 23.67, p < .0001$. See Table 8 for further details.

Table 8
Hypothesis 4: Summary of ANOVA Comparing Tanning Condition to Psycho-educational Condition on Sunbathing Behaviors in Past Month

	Pre-Intervention	One-month Follow-up
	Mean (SD)	Mean (SD)
Tanning condition	1.97 (2.53)	1.07 (2.06)
Psycho-educational condition	2.43 (3.24)	0.63 (1.30)

Note. Group x Time $F(1, 147) = 4.03, p < .05$

Although the one-month post-intervention mean for the psycho-education condition was less than the one-month post-intervention mean for the tanning condition, this difference was not significant, $F(1, 147) = 2.45, p = .12$. An additional 2x2 ANOVA conducted with estimated number of hours spent sunbathing in the past month as the dependent variable did not reveal a significant Group x Time effect, $F(1, 147) = .89, p = .35$.

Relationship of Intervention Type to Tanning Intentions One-Month Post Intervention

Hypothesis five stated that participants in the tanning condition would demonstrate a decrease in intentions to tan one-month post-intervention relative to the healthy lifestyle condition. To test this hypothesis, separate 2x2 repeated measures ANOVAs were performed comparing the tanning condition to the healthy lifestyle condition on the different measures of intentions. To examine one-month frequency intentions to indoor tan, a 2x2 ANOVA was performed with the number of times the participant intended to indoor tan in the next month as the dependent variable. The analysis did not reveal a significant Group x Time effect, $F(1, 153) = .99, p = .32$. A similar 2x2 ANOVA was performed to examine one-month intentions to sunbathe and, likewise, did not reveal a significant Group x Time effect, $F(1, 153) = .80, p = .37$. A 2x2 ANOVA was performed with intended amount of hours spent sunbathing in the next month. The analysis did not reveal a significant Group x Time effect, $F(1, 153) = .67, p = .41$.

A 2x2 ANOVA performed with the indoor tanning intentions rating format composite score as the dependent variable did not reveal a significant Group x Time effect, $F(1, 148) = .29, p = .59$. Likewise, a 2x2 ANOVA performed with the outdoor tanning intentions composite score as the dependent variable did not reveal a significant Group x Time effect, $F(1, 148) = 1.20, p = .27$.

Hypothesis six stated that participants in the tanning condition would demonstrate a decrease in intentions to tan one-month post-intervention relative to the psycho-educational condition. To test this hypothesis, separate 2x2 repeated measures ANOVAs were performed comparing the tanning condition to the psycho-educational condition on

the different measures of intentions. To examine one-month frequency intentions to indoor tan, a 2x2 ANOVA was performed with the number of times the participant intended to indoor tan in the next month as the dependent variable. The analysis did not reveal a significant Group x Time effect, $F(1, 147) = .74, p = .39$. A similar 2x2 ANOVA was performed to examine one-month intentions to sunbathe and, likewise, did not reveal a significant Group x Time effect, $F(1, 147) = 0.00, p = .99$. A 2x2 ANOVA was performed with intended amount of hours spent sunbathing in the next month. The analysis did not reveal a significant Group x Time effect, $F(1, 147) = 1.35, p = .25$.

A 2x2 ANOVA was performed with the indoor tanning intentions composite score as the dependent variable and did not reveal a significant Group x Time effect, $F(1, 130) = .70, p = .40$. Likewise, a 2x2 ANOVA performed with the outdoor tanning intentions composite score as the dependent variable also did not reveal a significant Group x Time effect, $F(1, 130) = .97, p = .33$.

Comparisons of the Psycho-educational and Health Lifestyle Intervention Conditions for Tanning Intentions and Behaviors

Although no hypotheses were offered, additional analyses were performed to compare the psycho-educational condition to the healthy lifestyle condition on measures of tanning behaviors and intentions. To examine one-month frequency intentions to indoor tan, a 2x2 ANOVA was performed with the number of times the participant intended to indoor tan in the next month as the dependent variable. The analysis revealed a significant Group x Time effect, $F(1, 167) = 8.78, p < .01$. Tests for simple effects showed that scores on this measure decreased significantly over time among participants in the psycho-education condition, $F(1, 87) = 8.54, p < .01$. Scores did not decrease

significantly over time in the healthy lifestyle condition, $F(1, 80) = .89, p = .35$. See Table 9 for further details.

Table 9
Summary of ANOVA Comparing Healthy Lifestyle Condition to Psycho-educational Condition on Intentions to Indoor Tan in Next Month

	Pre-Intervention	Post-Intervention
	Mean (SD)	Mean (SD)
Healthy lifestyle condition	1.96 (4.98)	2.06 (5.07)
Psycho-educational condition	1.78 (3.71)	1.14 (2.83)

Note. Group x Time $F(1, 167) = 8.78, p < .01$

To examine one-month frequency intentions to sunbathe, a 2x2 ANOVA was performed with the number of times the participant intended to sunbathe in the next month as the dependent variable. The analysis revealed a significant Group x Time effect, $F(1, 167) = 6.7, p < .05$. Tests for simple effects showed that scores on this measure decreased significantly over time among participants in the psycho-education condition, $F(1, 87) = 7.31, p < .05$. Scores did not decrease significantly over time in the healthy lifestyle condition, $F(1, 80) = 1.88, p = .17$. See Table 10 for further details.

Table 10
Summary of ANOVA Comparing Healthy Lifestyle Condition to Psycho-educational Condition on Intentions to Sunbathe in Next Month

	Pre-Intervention	Post-Intervention
	Mean (SD)	Mean (SD)
Healthy lifestyle condition	2.49 (3.93)	2.86 (4.47)
Psycho-educational condition	2.22 (3.23)	1.77 (2.86)

Note. Group x Time $F(1, 167) = 6.7, p < .05$

A 2x2 ANOVA was performed with the indoor tanning intentions rating format composite score as a dependent variable. Findings revealed a significant Group x Time effect, $F(1, 149) = 10.35, p < .05$. Tests for simple effects showed that scores on this measure decreased significantly over time among participants in the psycho-education condition, $F(1, 71) = 30.40, p < .0001$. Scores also decreased significantly over time among participants in the healthy lifestyle condition, $F(1, 78) = 4.47, p < .05$. See Table 11 for further details.

Table 11
Summary of ANOVA Comparing Healthy Lifestyle Condition to Psycho-educational Condition on Intentions to Sunbathe in Next Month

	Pre-Intervention	Post-Intervention
	Mean (SD)	Mean (SD)
Healthy lifestyle condition	31.59 (20.88)	29.87 (20.74)
Psycho-educational condition	30.99 (20.92)	24.90 (17.81)

Note. Group x Time $F(1, 149) = 1.35, p < .05$

Although the post-intervention mean for the psycho-education condition was less than the post-intervention mean for the healthy lifestyle condition, this difference was not significant, $F(1, 149) = 2.47, p = .12$. Additional 2x2 ANOVAs were performed on hours intended to sunbathe in the next month and on the sunbathing intentions rating format composite score. These analyses did not reveal any significant Group x Time effects ($p > .05$).

Additional analyses were performed to compare the psycho-educational condition to the healthy lifestyle condition on measures of tanning intentions and behaviors one-month post-intervention. Separate 2x2 ANOVAs were performed and did not reveal any significant Group x Time effects ($p > .05$).

Relationship of Intervention Type to Sunscreen Use Intentions Immediately Post Intervention

Hypothesis seven stated that participants in the tanning condition would demonstrate an increase in intentions to wear sunscreen immediately following the intervention relative to the healthy lifestyle condition. To test this hypothesis, two separate 2x2 repeated measures ANOVAs were performed comparing the tanning condition to the healthy lifestyle condition on the different measures of sunscreen use intentions. To compare the two groups on intentions to use sunscreen on the face, a 2x2 ANOVA was performed with the face protection composite score as a dependent variable. The analysis did not reveal a significant Group x Time effect, $F(1, 162) = .42, p = .52$. To compare the two groups on intentions to use sunscreen on the body, a 2x2 ANOVA was performed with the body protection composite score as a dependent variable. The analysis revealed a significant Group x Time effect, $F(1, 162) = 7.98, p < .05$. Tests for simple effects showed that scores on this measure increased significantly over time among participants in the tanning condition, $F(1, 84) = 52.85, p < .0001$. Scores also increased significantly over time among participants in the healthy lifestyle condition, $F(1, 78) = 13.65, p < .001$. See Table 12 for further details.

Table 12
Hypothesis Seven: Summary of ANOVA Comparing Tanning Condition to Healthy Lifestyle Condition on Intentions to Use Sunscreen on the Body

	Pre-Intervention	One-month Follow-up
	Mean (SD)	Mean (SD)
Tanning condition	5.87 (2.59)	7.25 (2.54)
Healthy lifestyle condition	5.76 (2.64)	6.41 (2.69)

Note. Group x Time $F(1, 162) = 7.98, p < .05$

Although both groups demonstrated an increase in intentions to protect the body from pre- to post-intervention, the post-intervention mean for the tanning condition was significantly higher than the post-intervention mean for the healthy lifestyle condition, $F(1, 162) = 4.26, p < .05$.

Because analysis of the body protection composite score yielded a significant Group x Time effect, further analyses were conducted examining the individual items that comprised this composite score. A 2x2 ANOVA was performed with intentions to use sun protection on the body in the next month as the dependent variable. The analysis revealed a significant Group x Time effect, $F(1, 162) = 5.64, p < .05$. Tests for simple effects showed that scores on this measure increased significantly over time among participants in the tanning condition, $F(1, 84) = 42.58, p < .0001$. Likewise, scores on this measure also increased significantly over time among participants in the healthy lifestyle condition, $F(1, 78) = 18.79, p < .0001$. See Table 13 for further details.

Table 13
Hypothesis Seven: Summary of ANOVA Comparing Tanning Condition to Healthy Lifestyle Condition on Intentions to Use Sunscreen on the Body in Next Month

	Pre-Intervention	One-month Follow-up
	Mean (SD)	Mean (SD)
Tanning condition	2.80 (1.41)	3.56 (1.39)
Healthy lifestyle condition	2.70 (1.42)	3.14 (1.40)

Note. Group x Time $F(1, 162) = 5.64, p < .05$

Although both groups demonstrated an increase in intentions to protect the body from pre- to post-intervention, the post-intervention mean for the tanning condition was significantly higher than the post-intervention mean for the healthy lifestyle condition, $F(1, 162) = 3.96, p < .05$.

A similar ANOVA was performed with intentions to use sun protection on the body in the next 12 months as the dependent variable. The analysis also revealed a significant Group x Time interaction, $F(1, 162) = 7.66, p < .05$. Tests for simple effects showed that scores on this measure increased significantly over time among participants in the tanning condition, $F(1, 84) = 39.47, p < .0001$. Likewise, scores on this measure also increased significantly over time among participants in the healthy lifestyle condition, $F(1, 78) = 6.41, p < .05$. See Table 14 for further details.

Table 14
Hypothesis Seven: Summary of ANOVA Comparing Tanning Condition to Healthy Lifestyle Condition on Intentions to Use Sunscreen on the Body in Next 12 Months

	Pre-Intervention	One-month Follow-up
	Mean (SD)	Mean (SD)
Tanning condition	3.09 (1.38)	3.68 (1.26)
Healthy lifestyle condition	3.05 (1.33)	3.28 (1.33)

Note. Group x Time $F(1, 162) = 7.66, p < .05$

Although both groups demonstrated an increase in intentions to protect the body from pre- to post-intervention, the post-intervention mean for the tanning condition was significantly higher than the post-intervention mean for the healthy lifestyle condition, $F(1, 162) = 4.00, p < .05$.

Hypothesis eight stated that participants in the tanning condition would demonstrate an increase in intentions to wear sunscreen immediately following the intervention relative to the psycho-educational condition. To test this hypothesis, two separate 2x2 repeated measures ANOVAs were performed comparing the tanning condition to the psycho-educational condition on the different measures of intentions. To compare the two groups on intentions to use sunscreen on the face, a 2x2 ANOVA was

performed with the face protection composite score as a dependent variable. The analysis revealed a significant Group x Time effect, $F(1, 155) = 6.59, p < .05$. Tests for simple effects showed that scores on this measure increased significantly over time among participants in the tanning condition, $F(1, 84) = 21.73, p < .0001$. Scores also increased significantly over time among participants in the psycho-educational condition, $F(1, 71) = 44.97, p < .001$. See Table 15 for further details.

Table 15

Hypothesis Eight: Summary of ANOVA Comparing Tanning Condition to Psycho-educational Condition on Intentions to Use Sunscreen on the Face

	Pre-Intervention	One-month Follow-up
	Mean (SD)	Mean (SD)
Tanning condition	7.29 (2.70)	8.01 (2.45)
Psycho-educational condition	7.14 (2.70)	8.50 (1.87)

Note. Group x Time $F(1, 155) = 6.59, p < .05$

Although the post-intervention mean for the psycho-educational condition was higher than the post-intervention mean for the tanning condition, this difference was not significant, $F(1, 155) = 1.92, p = .17$.

Because analysis of the composite score yielded a significant Group x Time effect, further analyses were conducted examining the individual items that comprised the composite score. A 2x2 ANOVA was performed with intentions to use sun protection on the face in the next month as the dependent variable. The analysis did not reveal a significant Group x Time effect, $F(1, 155) = 1.66, p = .20$. A similar ANOVA was performed with intentions to use sun protection on the face in the next 12 months as the dependent variable. The analysis revealed a significant Group x Time interaction, $F(1, 155) = 10.85, p < .05$. Tests for simple effects showed that scores on this measure

increased significantly over time among participants in the tanning condition, $F(1, 84) = 20.22, p < .0001$. Likewise, scores on this measure also increased significantly over time among participants in the psycho-educational condition, $F(1, 71) = 44.58, p < .0001$. See Table 16 for further details.

Table 16

Hypothesis Eight: Summary of ANOVA Comparing Tanning Condition to Psycho-educational Condition on Intentions to Use Sunscreen on the Face in Next 12 Months

	Pre-Intervention	One-month Follow-up
	Mean (SD)	Mean (SD)
Tanning condition	3.74 (1.34)	4.08 (1.21)
Psycho-educational condition	3.54 (1.34)	4.33 (0.87)

Note. Group x Time $F(1, 155) = 10.85, p < .05$

Although the post-intervention mean for the psycho-educational condition was higher than the post-intervention mean for the tanning condition, this difference was not significant, $F(1, 155) = 2.16, p = .14$.

To compare the two groups on intentions to use sunscreen on the body, a 2x2 ANOVA was performed with the body protection composite score as a dependent variable. The analysis revealed a significant Group x Time effect, $F(1, 155) = 4.54, p < .05$. Tests for simple effects showed that scores on this measure increased significantly over time among participants in the tanning condition, $F(1, 84) = 52.85, p < .0001$. Scores also increased significantly over time among participants in the psycho-educational condition, $F(1, 71) = 84.38, p < .0001$. See Table 17 for further details.

Table 17

Hypothesis Eight: Summary of ANOVA Comparing Tanning Condition to Psycho-educational Condition on Intentions to Use Sunscreen on the Body

	Pre-Intervention	One-month Follow-up
	Mean (SD)	Mean (SD)
Tanning condition	5.87 (2.59)	7.25 (2.53)
Psycho-educational condition	5.72 (2.41)	7.71 (2.16)

Note. Group x Time $F(1, 155) = 4.54, p < .05$

Although the post-intervention mean for the psycho-educational condition was higher than the post-intervention mean for the tanning condition, this difference was not significant, $F(1, 155) = 1.48, p = .23$.

Because analysis of the composite score yielded a significant Group x Time effect, further analyses were conducted examining the individual items that comprised the composite score. A 2x2 ANOVA was performed with intentions to use sun protection on the body in the next month as the dependent variable. The analysis did not reveal a significant Group x Time effect, $F(1, 155) = 1.88, p = .17$. A similar ANOVA was performed with intentions to use sun protection on the body in the next 12 months as the dependent variable. The analysis revealed a significant Group x Time interaction, $F(1, 155) = 6.93, p < .05$. Tests for simple effects showed that scores on this measure increased significantly over time among participants in the tanning condition, $F(1, 84) = 39.47, p < .0001$. Likewise, scores on this measure also increased significantly over time among participants in the psycho-educational condition, $F(1, 71) = 82.55, p < .0001$. See Table 18 for further details.

Table 18

Hypothesis Eight: Summary of ANOVA Comparing Tanning Condition to Psycho-educational Condition on Intentions to Use Sunscreen on the Body in Next 12 Months

	Pre-Intervention	One-month Follow-up
	Mean (SD)	Mean (SD)
Tanning condition	3.09 (1.38)	3.68 (1.26)
Psycho-educational condition	2.99 (1.19)	3.94 (1.06)

Note. Group x Time $F(1, 155) = 6.93, p < .05$

Although the post-intervention mean for the psycho-educational condition was higher than the post-intervention mean for the tanning condition, this difference was not significant, $F(1, 155) = 1.96, p = .16$.

Relationship of Intervention Type to Sunscreen Use Behaviors One-Month Post Intervention

Hypothesis nine stated that participants in the tanning condition would demonstrate an increase in sunscreen use one-month following the intervention relative to the healthy lifestyle condition. To test this hypothesis, two separate 2x2 repeated measures ANOVAs were performed comparing the tanning condition to the healthy lifestyle condition on the different measures of sunscreen behaviors. A 2x2 ANOVA was performed with sunscreen use on the face as a dependent variable. The analysis did not reveal a significant Group x Time effect, $F(1, 153) = 2.40, p = .12$. A separate 2x2 ANOVA was performed with sunscreen use on the body as the dependent variable. The analysis revealed a significant Group x Time effect, $F(1, 153) = 4.15, p < .05$. Tests for simple effects showed that scores on this measure did not change over time among participants in the tanning condition, $F(1, 78) = .20, p = .66$. In contrast, scores decreased significantly over time among participants in the healthy lifestyle condition, $F(1, 75) = 4.88, p < .05$. Contrary to what was predicted, participants in the tanning

condition did not demonstrate an increase in sunscreen use. However, it is noteworthy that they did not demonstrate a decrease in sunscreen use, as did participants in the healthy lifestyle condition. See Table 19 for further details.

Table 19
Hypothesis Nine: Summary of ANOVA Comparing Tanning Condition to Healthy Lifestyle Condition on Sunscreen Use on the Body in Past Month

	Pre-Intervention	One-month Follow-up
	Mean (SD)	Mean (SD)
Tanning condition	2.29 (1.39)	2.35 (1.49)
Healthy lifestyle condition	2.52 (1.42)	2.11 (1.31)

Note. Group x Time $F(1, 153) = 4.15, p < .05$

Hypothesis 10 stated that participants in the tanning condition would demonstrate an increase in sunscreen use one-month following the intervention relative to the psycho-educational condition. To test this hypothesis, two separate 2x2 repeated measures ANOVAs were performed comparing the tanning condition to the psycho-educational condition on the different measures of sunscreen behaviors. A 2x2 ANOVA was performed with sunscreen use on the face as a dependent variable. The analysis did not reveal a significant Group x Time effect, $F(1, 147) = 1.18, p = .28$. A separate 2x2 ANOVA was performed with sunscreen use on the body as the dependent variable. Likewise, the analysis did not reveal a significant Group x Time effect, $F(1, 147) = .20, p = .65$.

Relationship of Intervention Type to Sunscreen Use Intentions One-Month Post Intervention

Hypothesis 11 stated that participants in the tanning condition would demonstrate an increase in intentions to wear sunscreen one-month following the intervention relative

to the healthy lifestyle condition. To test this hypothesis, two separate 2x2 repeated measures ANOVAs were performed comparing the tanning condition to the healthy lifestyle condition on the different measures of intentions. To compare the two groups on intentions to use sunscreen on the face, a 2x2 ANOVA was performed with the face protection composite score as a dependent variable. The analysis did not reveal a significant Group x Time effect, $F(1, 148) = .62, p = .43$. To compare the two groups on intentions to use sunscreen on the body, a 2x2 ANOVA was performed with the body protection composite score as a dependent variable. The analysis again did not reveal a significant Group x Time effect, $F(1, 148) = .02, p = .88$.

Hypothesis 12 stated that participants in the tanning condition would demonstrate an increase in intentions to wear sunscreen one-month following the intervention relative to the psycho-educational condition. To test this hypothesis, two separate 2x2 repeated measures ANOVAs were performed comparing the tanning condition to the psycho-educational condition on the different measures of intentions. To compare the two groups on intentions to use sunscreen on the face, a 2x2 ANOVA was performed with the face protection composite score as a dependent variable. The analysis did not reveal a significant Group x Time effect, $F(1, 130) = 1.31, p = .25$. To compare the two groups on intentions to use sunscreen on the body, a 2x2 ANOVA was performed with the body protection composite score as a dependent variable. The analysis again did not reveal a significant Group x Time effect, $F(1, 130) = 3.65, p = .06$.

Comparisons of the Psycho-educational and Health Lifestyle Intervention Conditions for Sunscreen Intentions and Behaviors

Although no hypotheses were offered, additional analyses were run to compare the psycho-educational condition to the health lifestyle condition. To examine one-month intentions to use sunscreen immediately post-intervention, separate 2x2 ANOVAs were performed. A 2x2 ANOVA was performed with intentions to protect the face as the dependent variable and revealed a significant Group x Time effect, $F(1, 149) = 9.02, p < .05$. Tests for simple effects showed that scores on this measure increased significantly over time among participants in the psycho-education condition, $F(1, 71) = 44.97, p < .0001$. Likewise, scores also increased significantly over time in the healthy lifestyle condition, $F(1, 78) = 11.15, p < .05$. Although both groups demonstrated an increase in intentions to use sunscreen from pre- to post-intervention, the post-intervention mean for the psycho-educational condition was significantly higher than the post-intervention mean for the healthy lifestyle condition, $F(1, 149) = 7.34, p < .05$. See Table 20 for further details.

Table 20
Summary of ANOVA Comparing Healthy Lifestyle Condition to Psycho-educational Condition on Intentions to Use Sunscreen on the Face

	Pre-Intervention	Post-Intervention
	Mean (SD)	Mean (SD)
Healthy lifestyle condition	6.95 (2.78)	7.52 (2.50)
Psycho-educational condition	7.14 (2.70)	8.50 (1.87)

Note. Group x Time $F(1, 149) = 9.02, p < .05$

Another 2x2 ANOVA was performed with intentions to protect the body as the dependent variable and also revealed a significant Group x Time effect, $F(1, 149) =$

23.62, $p < .0001$. Tests for simple effects showed that scores on this measure increased significantly over time among participants in the psycho-education condition, $F(1, 71) = 84.38, p < .0001$. Likewise, scores also increased significantly over time in the healthy lifestyle condition, $F(1, 78) = 13.65, p < .01$. See Table 21 for further details.

Table 21
Summary of ANOVA Comparing Healthy Lifestyle Condition to Psycho-educational Condition on Intentions to Use Sunscreen on the Body

	Pre-Intervention	Post-Intervention
	Mean (SD)	Mean (SD)
Healthy lifestyle condition	5.76 (2.64)	6.41 (2.69)
Psycho-educational condition	5.72 (2.41)	7.71 (2.16)

Note. Group x Time $F(1, 149) = 23.62, p < .0001$

Although both groups demonstrated an increase in intentions to use sunscreen from pre- to post-intervention, the post-intervention mean for the psycho-educational condition was significantly higher than the post-intervention mean for the healthy lifestyle condition, $F(1, 149) = 10.66, p < .05$.

Additional analyses were performed to compare the psycho-educational condition to the healthy lifestyle condition on measures of sunscreen use intentions and behaviors one-month post-intervention. Separate 2x2 ANOVAs were performed and did not reveal any significant Group x Time effects ($p > .05$).

Relationship of Beliefs about Tanning to Tanning Intentions Immediately Post-Intervention

Hypothesis 13 stated that the effects of the intervention would be mediated by appearance-related reasons for tanning, such that participation in the tanning condition would lead to a decrease in the endorsement of such reasons which, in turn, would lead to

a decrease in tanning intentions and behaviors. To test this hypothesis, the Baron and Kenny approach for establishing mediation was performed and the Sobel test was employed to confirm the findings. Specifically, for any measures of tanning intentions or behaviors found to significantly differ by intervention condition, residualized difference scores were calculated and entered into regression analyses. The expected Group x Time effects occurred for the tanning condition relative to the healthy lifestyle condition on intentions to indoor tan immediately post-intervention and on hours spent sunbathing in the past month one-month post-intervention. Given these findings, analyses were conducted to determine if those effects were mediated by a decrease in endorsement of appearance related reasons for tanning.

The Baron and Kenny approach (Baron & Kenny, 1986) for establishing mediation for a model containing the predictor variable (intervention type), the proposed mediator (reasons for tanning), and the outcome variable (indoor tanning intentions) was evaluated. On step 1, intervention condition was found to be significantly related to indoor tanning intentions ($\beta = .16, p < .05$). On Step 2, intervention condition and change in reasons for tanning were found to be significantly associated ($\beta = .45, p < .0001$). On Step 3, change in reasons for tanning and change in indoor tanning intentions, controlling for intervention type, were not found to be significantly associated ($\beta = .13, p = .12$). Because Step 3 was not significant, no further analyses following the steps outlined by Baron and Kenny were conducted; these results indicate that a change in reasons for tanning did not mediate the relationship between intervention type and changes in indoor tanning intentions pre- to post-intervention. The Sobel test further confirmed that this relationship was not mediated by reasons for tanning, $z = 1.51, p = .13$.

The Baron and Kenny approach for establishing mediation for a model containing the predictor variable (intervention type), the proposed mediator (reasons for tanning), and the outcome variable (hours spent sunbathing in the past month) was evaluated. On step 1, intervention condition was not found to be significantly related to hours spent sunbathing, although it revealed a trend in that direction ($\beta = .15$ $p = .07$). On Step 2, intervention condition and change in reasons for tanning were found to be significantly associated ($\beta = .26$, $p < .001$). On step 3 change in hours spent sunbathing and change in reasons for tanning, controlling for intervention type, were not found to be significantly associated ($\beta = .06$, $p = .45$). Because Step 3 was not significant, no further analyses following the steps outlined by Baron and Kenny were conducted. The Sobel test further confirmed that this relationship was not mediated by reasons for tanning, $z = .725$, $p = .47$.

Although no hypotheses were offered, mediational analyses were also conducted to examine whether reasons for tanning mediated the relationship between group assignment and sunscreen intentions and use. The expected Group x Time effects occurred for the tanning condition relative to the healthy lifestyle condition on intentions to use sunscreen on the body immediately post-intervention and actual sunscreen use on the body one-month post-intervention. Given these findings, analyses were conducted to determine if those effects were mediated by a decrease in endorsement of appearance related reasons for tanning.

To determine if a change in reasons for tanning mediated the relationship between intervention condition and sunscreen use intentions, the Baron and Kenny approach (Baron & Kenny, 1986) for establishing mediation for a model containing the predictor

variable (intervention type), the proposed mediator (reasons for tanning), and the outcome variable (intentions to use sunscreen on the body immediately post-intervention) was evaluated. . On step 1, intervention condition was found to be significantly related to sunscreen use intentions ($\beta = -.23, p < .05$). On Step 2, intervention condition and change in reasons for tanning were found to be significantly associated ($\beta = .45, p < .0001$). On Step 3, change in reasons for tanning and change in sunscreen use intentions, controlling for intervention type, were not found to be significantly associated ($\beta = -.12, p = .16$). Because Step 3 was not significant, no further analyses following the steps outlined by Baron and Kenny were conducted. The Sobel test further confirmed that this relationship was not mediated by reasons for tanning, $z = -1.39, p = .16$.

To determine if a change in reasons for tanning mediated the relationship between intervention condition and actual sunscreen use on the body one-month post-intervention, the Baron and Kenny approach (Baron & Kenny, 1986) for establishing mediation for a model containing the predictor variable (intervention type), the proposed mediator (reasons for tanning), and the outcome variable (sunscreen use on the body) was evaluated. On step 1, intervention condition was not found to be significantly related to sunscreen use, although it revealed a trend in that direction ($\beta = -.14, p = .07$). On Step 2, intervention condition and change in reasons for tanning were found to be significantly associated ($\beta = .47, p < .0001$). On Step 3, change in reasons for tanning and change in sunscreen use behaviors, controlling for intervention type, were not found to be significantly associated ($\beta = -.11, p = .24$). Because Step 3 was not significant, no further analyses following the steps outlined by Baron and Kenny were conducted. The Sobel test further confirmed that this relationship was not mediated by reasons for tanning, $z = -$

1.15, $p = .25$. Hypothesis 13 was not supported; a change in reasons for tanning did not mediate the relationship between intervention type and tanning intentions or behaviors, or sunscreen use intentions or behaviors.

Discussion

The current study sought to examine the utility of a cognitive dissonance induction intervention for decreasing tanning intentions and behaviors among college females. This study also sought to examine the utility of the dissonance intervention for increasing sunscreen use intentions and behaviors among the same population. This section will provide a summary of the findings, a review of several limitations of the current study, and a discussion of future research and clinical implications.

Summary of Results Comparing the Tanning Condition to the Healthy Lifestyle Condition

The pattern of results provided partial support for hypotheses about the impact of assignment to the tanning condition relative to assignment to the healthy lifestyle condition with regard to measures of tanning intentions, tanning behaviors, sunscreen intentions and sunscreen behaviors. It was hypothesized that participants in the tanning condition would demonstrate a decrease in intentions to tan relative to participants in the healthy lifestyle condition immediately post-intervention. While assignment to the tanning condition did not result in a decrease in intentions to outdoor tan, participants in the tanning condition did report a decrease in intentions to indoor tan. It was also hypothesized that participants in the tanning condition would demonstrate a decrease in intentions to tan relative to participants in the healthy lifestyle condition one-month post-intervention. This hypothesis was not supported.

With regard to actual tanning behaviors, it was hypothesized that assignment to the tanning condition would result in a decrease in tanning behaviors relative to the healthy lifestyle condition one-month post-intervention. Contrary to predictions, assignment to the tanning condition did not result in a decrease in the frequency of indoor or outdoor tanning relative to the healthy lifestyle condition. However, participants in the tanning condition did show a decrease in the number of hours they spent sunbathing in the past month relative to the healthy lifestyle condition. Although the study sought to decrease the frequency of sunbathing, decreasing the amount of time spent in the sun is an equally important strategy for decreasing skin cancer risk.

When comparing the tanning condition to the healthy lifestyle condition on measures of sunscreen use and intentions, the hypotheses were again partially supported. It was hypothesized that participants in the tanning condition would demonstrate an increase in intentions to use sunscreen relative to participants in the healthy lifestyle condition immediately post-intervention. While assignment to the tanning condition did not result in an increase in intentions to use sunscreen on the face immediately post-intervention relative to the healthy lifestyle condition, participants in the tanning condition did show a greater increase in intentions to use sunscreen on the body relative to participants in the healthy lifestyle condition. It was also hypothesized that assignment to the tanning condition would result in an increase in sunscreen use intentions relative to the healthy lifestyle condition one-month post-intervention. This hypothesis was not supported.

It was also hypothesized that participants in the tanning condition would demonstrate an increase in actual use sunscreen relative to participants in the healthy lifestyle condition one-month post-intervention. Neither the tanning condition nor the healthy

lifestyle condition resulted in an increase in sunscreen use on the face. However, participants in the healthy lifestyle condition showed a decrease in sunscreen use on the body, while participants in the tanning condition showed no change in sunscreen use on the body across time. Although the participants in the tanning condition did not increase their sunscreen use over time, they did not decrease it as the participants in the healthy lifestyle condition did. While the study sought to increase sunscreen use, it is important to note that without participation in the tanning condition, participants may have decreased their use of sunscreen thereby increasing their skin cancer risk.

In summary, results indicate that, relative to the healthy lifestyle condition, the tanning condition resulted in a decrease in intentions to tan indoors and a decrease in number of hours spent sunbathing. Additionally, the tanning condition resulted in an increase in intentions to use sunscreen on the body. Furthermore, while assignment to the tanning condition did not result in an increase in actual sunscreen use on the body one-month post-intervention, assignment to the healthy lifestyle condition resulted in a decrease in sunscreen use. Taken together, these findings support previous research suggesting that participation in an appearance-related intervention targeting UV-related behaviors will result in a decrease in tanning intentions and behaviors (Hillhouse et al., 2000; Jackson & Aiken, 2006; Mahler et al., 2007). Furthermore, these findings support previous research demonstrating the utility of a dissonance induction intervention for changing health-related behaviors (e.g., Simmons & Brandon, 2007; Stice et al., 2007; Stone et al., 1994).

Summary of Results Comparing the Tanning Condition to the Psycho-educational Condition

The pattern of results did not support the hypotheses about the impact of assignment to the tanning condition relative to assignment to the psycho-educational condition with regard to measures of tanning intentions, tanning behaviors, sunscreen intentions and sunscreen behaviors. Rather, the results suggest that the two conditions were equally successful in some respects and equally unsuccessful in other respects in changing UV-related intentions and behaviors. It was hypothesized that assignment to the tanning condition would result in a decrease in intentions to tan immediately post-intervention relative to assignment to the psycho-educational condition. Neither condition resulted in a decrease in intentions to indoor or outdoor tan relative to the other condition. It was also hypothesized that participants in the tanning condition would demonstrate a decrease in intentions to tan indoors and outdoors relative to participants in the psycho-educational condition one-month post-intervention. This hypothesis also was not supported.

With regard to actual tanning behaviors, it was hypothesized that participants in the tanning condition would demonstrate a decrease in actual tanning behaviors relative to participants in the psycho-educational condition one-month post-intervention. Results did not support the hypothesis. Instead, results indicated that participants in both conditions decreased their sunbathing behavior, specifically the number of times they sunbathed, by one-month post-intervention.

With regard to intentions to use sunscreen, it was hypothesized that participants in the tanning condition would demonstrate an increase in intentions to use sunscreen relative to participants in the psycho-educational condition immediately post-intervention. Instead,

results indicated that intentions to use sunscreen on the face and on the body increased in both conditions. It was also hypothesized that participants in the tanning condition would demonstrate an increase in intentions to use sunscreen relative to participants in the psycho-educational condition one-month post-intervention. This hypothesis was not supported. Neither condition produced changes in intentions to use sunscreen on the face or body one-month post-intervention. With regard to actual sunscreen use, it was hypothesized that participants in the tanning condition would demonstrate an increase in sunscreen use relative to the psycho-educational condition one-month post-intervention. This hypothesis was not supported. Neither the tanning condition nor the psycho-educational condition produced changes in sunscreen use on the face or the body one-month post-intervention.

In summary, assignment to the tanning condition or the psycho-educational condition resulted in a similar pattern of results. Positive changes in intentions and behaviors were evident in both groups on some measures (e.g. sunbathing behaviors one-month post-intervention, intentions to use sunscreen on the face and on the body immediately post-intervention) and in neither group on other measures (e.g., indoor tanning behaviors one-month post-intervention, indoor and outdoor tanning intentions one-month post-intervention). It is important to note that both conditions included some psycho-education about the appearance-related consequences of UV exposure. In addition, both conditions focused on negative appearance-related effects of UV exposure rather than long-term health consequences of UV exposure. The difference and similarities between these two conditions and their implications for the results are discussed in further detail below.

Summary of Results Analyzing Reasons for Tanning as a Potential Mediator

Additional analyses were conducted to determine if a decrease in appearance-related reasons for tanning mediated the relationship between intervention condition and tanning and sunscreen use intentions and behaviors. Based on results, mediation analyses were performed for the following outcome variables: intentions to indoor tan immediately post-intervention, hours spent sunbathing one-month post-intervention, intentions to use sunscreen on the body immediately post-intervention, and actual sunscreen use on the body one-month post-intervention. Analyses revealed that hours spent sunbathing and sunscreen use behaviors were not related to a change in reasons for tanning so further analyses were not conducted for those variables. Using the Baron and Kenny approach and the Sobel test for identifying mediators, it was shown that reasons for tanning did not mediate the relationship between intervention type and intentions to indoor tan or intentions to use sunscreen on the body.

Summary of Results Comparing the Healthy Lifestyle Condition to the Psycho-educational Condition

Although no hypotheses were offered, analyses were conducted comparing the psycho-educational condition to the healthy lifestyle condition. The results indicated that participants in the psycho-educational condition were more likely to report a decrease in intentions to indoor tan and sunbathe immediately post-intervention. There were no differences between the groups on tanning intentions and behaviors one-month post-intervention. Regarding sunscreen use intentions and behaviors, participants in both conditions demonstrated an increase in intentions to use sunscreen immediately post-intervention, but the psycho-educational condition participants reported a greater

increase. There were no differences between the groups on sunscreen use intentions and behaviors one-month post-intervention.

Explanation of Findings: Tanning Condition Compared to Healthy Lifestyle Condition

As noted previously, hypotheses that the tanning condition would outperform the healthy lifestyle condition on measures of tanning and sunscreen use intentions and behaviors were only partially supported. One possible explanation for the variability in the results is that the tanning condition may not have induced cognitive dissonance as intended. This possibility is suggested by analyses showing that scores on the discomfort scale of the Dissonance Thermometer decreased significantly from pre- to post-intervention in the tanning condition as well as in the other two conditions. In other words, there was no evidence that participants in the tanning condition experienced increases in discomfort, a typical indicator of dissonance, as a consequence of exposure to this intervention. It is possible that, had the tanning condition produced the expected changes on the Dissonance Thermometer indicating successful dissonance induction, the pattern of results would have more closely resembled those that were predicted.

The tanning intervention employed in this study used methods to induce dissonance that were adapted from previous studies of dissonance interventions targeting a variety of behaviors (e.g., Roehrig et al., 2006; Simmons & Brandon, 2007; Stice et al., 2007). For example, participants in this study were videotaped taking positions contrary to the target behavior, a strategy similar to one used to increase smoking cessation intentions (Simmons & Brandon, 2007). Participants in this study also engaged in role-play about the target behavior, a strategy similar to one used to decrease eating disorder behaviors (e.g. Roehrig et al., 2006; Stice et al., 2007). In addition, participants in this

study wrote challenges to personal encounters of pursuit of the tan-deal, a strategy similar to that used to decrease negative cognitions concerning the thin-ideal (e.g., Roehrig et al., 2006). It should be noted, however, that previous studies of dissonance interventions have used other techniques that were not utilized in this study. For example, in a study aimed at increasing fruit and vegetable intake among African American adolescents, participants were videotaped and were asked to comment not only on how others could increase their fruit and vegetable intake, but also on how they personally had coped with that issue in the past (Wilson et al., 2002). Although similar to the methodology used in the current study, Wilson et al. (2002) videotaped participants discussing their personal experiences. Another technique used in several studies aimed at decreasing eating disorder behavior and/or improving body image has been to have participants stand in front of a mirror and identify positive attributes about themselves (e.g., Becker et al., 2006; Roehrig et al., 2006; Stice et al., 2001; 2002). Yet another technique, used in a study aimed at increasing condom use (Aronson, Fried, and Stone, 1991), was to have participants write and deliver a short speech about the importance of using condoms, which was then videotaped. Finally, many of the previous studies that have employed dissonance induction strategies, particularly those aimed at improving body image, have delivered the intervention over the course of two to three sessions (e.g., Becker, et al., 2006; Roehrig et al., 2006; Stice et al., 2000; 2002; 2007). Without further research, it is not possible to know if inclusion of these other techniques might have been more successful at inducing dissonance regarding tanning. It is also possible that delivering the same intervention used in the current study over the course of several sessions may have resulted in a greater level of dissonance.

It is noteworthy that the tanning condition resulted in some positive changes in intentions and behaviors relative to the healthy lifestyle condition. These findings indicate that the tanning condition was at least partially successful. Given the Dissonance Thermometer results suggesting that dissonance induction was not successful, it is unclear why the tanning condition produced some positive effects. It is possible that the intervention may have worked through mechanisms different than dissonance, such as through psycho-education since there was a psycho-educational component. It is also possible that the Dissonance Thermometer did not capture the dissonance that was induced by the intervention. Research suggests that cognitive dissonance may result in both psychological discomfort and physiological arousal (Elliot & Devine, 1994); the current study only measured psychological discomfort, not physiological arousal. Alternatively, the timing of the administration of the Dissonance Thermometer may explain the findings. Cognitive Dissonance Theory states that the psychological effects of dissonance are eliminated following a reduction strategy of adopting a change in attitude (Elliot & Devine, 1994; Festinger, 1957). Thus, it is possible that participants in the current study adopted the attitude that tanning was bad during the course of the intervention, thereby reducing dissonance. If true, it would explain why they did not demonstrate increases in dissonance from pre- to post-intervention.

Explanation of Findings: Tanning Condition Compared to Psycho-educational Condition

As noted previously, results indicated that the tanning condition and the psycho-educational condition performed similarly, such that both groups were successful in some areas and unsuccessful in others. One possible explanation for this pattern of findings is that both conditions produced similar effects but through different mechanisms. As

discussed in the preceding section, the Dissonance Thermometer results suggest that the tanning condition did not work primarily through cognitive dissonance. It is possible, however, that the Dissonance Thermometer is not successfully capturing the construct of cognitive dissonance as induced in this study, and the two interventions did in fact operate through different mechanisms.

The other possibility is that the similar pattern of results for the two conditions is attributable to their operating via the same mechanism. This argument is supported by the fact that the tanning condition included a small amount of psycho-education. Specifically, it was necessary to provide education regarding the negative effects of tanning in order to allow participants to make dissonant arguments against pursuit of the tan-ideal. Previous research suggests that health-focused psycho-educational interventions may not be effective in changing UV-related behaviors (Hillhouse et al., 2000; Mahler et al., 2007; Pagoto et al., 2003). Individuals tend to place more importance on short-term, more immediate benefits of tanning in their pursuit of the “tan-ideal.” In doing so, people tend to ignore the more long-term health consequences of tanning and, as a result, interventions that focus solely on the health effects of tanning are likely to be less effective than those that focus on the appearance related effects (Hillhouse & Turrisi, 2002). The tanning condition included some appearance-focused psycho-education, which may be responsible, at least in part, for the results. The psycho-educational control condition in this study focused not just on health consequences, but also on the appearance related effects of tanning. Consequently, it is not entirely surprising that the psycho-educational condition yielded some positive findings. The fact that both interventions included appearance-related psycho-education suggests that they

may have operated through the same mechanism. The findings of this study do support previous literature suggesting that interventions focused on short-term, appearance related effects of tanning are successful at altering UV-related behaviors (e.g., Hillhouse & Turrisi, 2002; Mahler et al., 2007; Pagoto et al., 2003).

Study Limitations

Several limitations of the current study should be noted. First, the study was conducted solely with females who were predominantly Caucasian, thereby limiting generalizability in terms of both gender and race. Second, the measures used to assess tanning and sunscreen use behaviors were exclusively self-report and retrospective in nature. Consequently, the accuracy of participants' estimates of their previous tanning and sunscreen behaviors are unknown. Third, although the study sought to focus solely on appearance-related effects of tanning in the tanning condition, it was difficult to limit participants' discussion of other effects. It is plausible and possible that discussion of health effects, such as skin cancer, contributed to the findings. Fourth, analyses of the Dissonance Thermometer results indicate that participants' level of discomfort decreased during the intervention in all three conditions. Thus, it is possible that cognitive dissonance was not successfully induced, making it difficult to interpret the results that were obtained. Fifth, it is possible that some of the findings suggesting that both the tanning condition and the psycho-educational condition resulted in some alteration of UV-related behaviors may be explained, in part, by demand characteristics. Participants were necessarily aware that the interventions were targeting tanning and sunscreen use, so it is possible that they endorsed items as they believed were expected of them. Finally, participants completed questions assessing eligibility criteria anywhere from the day of

their participation to two months prior. These criteria included having indoor or outdoor tanned a combined total of six times in the past 12 months. Because of the variability in the time between eligibility screening and recruitment, it is possible that participants did not tan between completing the eligibility criteria assessment and the completion of the baseline questionnaire. Consequently, their tanning behaviors at baseline may not have reflected the population of interest (i.e., current frequent tanners).

Clinical Implications

The findings of this study have important implications for skin cancer prevention. Previous research suggests that sun exposure is responsible for more than 80% of all skin cancer cases (Parker, et al., 1997). Identifying interventions that successfully decrease people's tanning behaviors, as well as those that increase their use of sun protection behaviors, is an important strategy for decreasing skin cancer rates. A review of the literature indicates that this is one of the first studies to apply cognitive dissonance theory to tanning. Given the success of dissonance interventions in altering other health behaviors, dissonance induction merits study for its potential to alter tanning behaviors. Although the current hypotheses were only partially supported, the findings from this study do suggest that a dissonance-based appearance-related intervention may be successful at altering UV-related behaviors. Since UV exposure during the teenage and young adult years has been linked to causing subsequent skin damage and melanoma (Weinstock et al., 1989), identifying an intervention that successfully decreases tanning among college females is particularly important. Furthermore, cognitive dissonance can be relatively easy to induce since it basically requires having individuals state views that oppose their own beliefs. Although the current study may not have successfully induced

dissonance, future research may reveal which techniques are successful for doing so in order to alter tanning behaviors. As such, a successful dissonance induction intervention could be easily disseminated and administered in multiple settings, including high schools and colleges, thereby targeting populations most at risk for incurring skin damage.

Future Research

Findings from the current study suggest several directions for future research. Given that the current study enrolled only women, future research should examine the utility of dissonance induction for men who tan regularly. It is possible that men and women tan for different reasons, so it is important to identify interventions that work to decrease tanning behaviors in both populations.

Based on the variability in the results of this study and the lack of changes in the expected direction on the Dissonance Thermometer, it is not possible to draw any definitive conclusion regarding dissonance induction for altering UV-related behaviors. This study used dissonance-induction strategies adapted from previous research. It is not known which strategies are more or less effective at inducing dissonance, or if the effectiveness of each strategy differs by target behavior. In order to develop a dissonance induction intervention that successfully alters UV-related behaviors, pilot testing of the different strategies should be implemented. The information garnered from such testing could ultimately better inform studies examining the efficacy of dissonance induction for altering UV-related behaviors. Furthermore, investigation of alternate ways of measuring dissonance should be considered in order to ensure the interventions are operating through the proposed mechanisms. Along these lines, it may be necessary to examine

physiological arousal or to examine psychological discomfort at different time points during the intervention.

Another direction for future research would be to examine the utility of an intervention that explicitly combines psycho-education regarding the appearance-related effects of tanning with cognitive dissonance induction for altering UV-related behaviors. In the current study, both the tanning condition and the psycho-educational condition yielded some positive findings. If further research indicates that the tanning condition did in fact operate through a mechanism different than psycho-education, it raises the possibility that a combined intervention may be more effective than either intervention alone. In order to determine if the combined intervention is more effective, it should be compared to several control conditions: a solely psycho-educational condition, a solely dissonance induction condition, and a no-treatment condition. By so doing, it would be possible to examine whether providing participants with more formal education prior to inducing dissonance results in greater changes relative to only psycho-education or only dissonance induction.

Conclusions

Research suggests that sun exposure is implicated in the majority of skin cancer cases (Parker, et al., 1997), and that UV-exposure during the teenage and young adult years is most damaging (Weinstock et al., 1989). As such, it is important to identify interventions that successfully decrease young people's tanning behaviors and increase their sun protection behaviors. Research suggests that interventions that focus on the more immediate appearance related effects of tanning, rather than on future health risks, may be more effective in altering UV-related behaviors (Hillhouse & Turrisi, 2002).

Dissonance induction interventions have been used to successfully alter sexual behaviors (e.g., Stone et al., 1994), smoking behavior (e.g., Simmons & Brandon, 2007), and eating disorder behavior (e.g., Becker et al., 2006; Roehrig et al., 2006; Stice et al., 2000; 2001; 2003; 2007). This study sought to determine if a dissonance induction intervention might be similarly successful in changing UV-related behaviors. The study yielded mixed findings. Relative to a healthy lifestyle control condition, the tanning condition resulted in a decrease in intentions to tan indoors and in actual number of hours spent sunbathing. The tanning condition also resulted in an increase in intentions to use sunscreen on the body. However, compared to a psycho-educational control condition, both groups seemed to have been equally successful and unsuccessful on different measures of UV-related behaviors and intentions. The findings of this study suggest that a dissonance induction intervention for tanning may be successful, but that it requires further study. Despite the mixed findings, this study serves as an important step in the search for successful interventions for decreasing tanning behaviors and increasing sun-protection behaviors.

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Appendices

Appendix A: Tanning Condition Script

Informed Consent (5-7 minutes)

LEADER:

Okay, great, let's get started. We are part of a team that is working on a project to create a program to help adolescent females in high school feel better about their health and appearance. I want to invite each of you to participate in the focus group part of the project. What the focus group involves is several verbal exercises to help us create the materials for the program, and then we'll have you take part in a video we are creating to show to adolescent females. We are hoping to use the information from the video in order to create similar videos using professional actors that will be shown to high school females. Your videos will only be for research purposes so only members of the research team here will be watching them. As college students, you all are in the next phase of life just beyond our target audience, and you may serve as role models to these girls, so we thought having you help develop the program would be most effective, which is why we are recruiting participants from USF. You are under no obligation to participate in the focus group and video. If you think you would like to participate, please let us know now and we will pass out the consent forms.

If anyone is not interested, thank them for their time and have them leave the room.

This study involves participating in today's session that will last approximately 1 to 3 hours. You will also be asked to complete a packet of questionnaires about your health-related attitudes and behaviors before and after the session. Also, you will be contacted one month from today for a follow-up assessment. You will receive up to 6 credit points for your participation upon completion of today and a \$10.00 gift certificate to Target upon completion of the follow-up assessment.

PASS OUT INFORMED CONSENT (2 PER PERSON)

Please read over the consent form now. If you have any questions, feel free to ask. When you feel comfortable, please sign one copy of the consent form and then turn it in to me.

COLLECT ALL INFORMED CONSENTS (make sure they are signed)

Introduction to Study and Pre-Test Measures (30 minutes)

PASS OUT PRE-TEST MEASURES

Before we get started with our discussion, I'd like you to complete this packet of questionnaires. It should take you approximately 30 minutes. Your responses are completely confidential, so please be as open and honest as possible when completing your packet. When you are finished, turn them in to me.

COLLECT ALL QUESTIONNAIRE PACKETS

LEADER:

Thank you for joining us. Like I mentioned before, we are working on developing a program that will help adolescent females feel better about their health and appearance. This part of the program is called the focus group phase. At this point, we are only running focus groups on two topics; we have finished running all our other groups. The two topics we are still covering are tanning and proper nutrition and exercise, so I would like to ask you to decide as a group which of these two topics you would like to discuss.

(FLIP THRU QUESTIONNAIRES AS YOU SAY THIS) **Actually, as I look at the demographics of our group, I notice that everyone here has tanned to some extent in their life, which is actually rare. So, this would really be a great opportunity to work on a tanning focus group. And, it would really help us out if the group could do that. (It is important to sound like it would be a BIG help for them to do this – we want to them to choose tanning!)**

After group “chooses” tanning:

Great! In this focus group, we will spend our time discussing tanning and how adolescent females can resist the pressures in our society to get a tan by sunbathing or going to a tanning salon. You may also find that this program improves your own attitudes towards health and appearance which is why we are giving you questionnaires to complete. Are you all willing to give this a try? Get public commitment from everyone.

Introduction (5 minutes)

So now that we know about the study, let’s get to know each other. Can each of you tell us your name and where you’re from? Leaders start.

Have each participant write her name on a piece of paper and fold it so that everyone can see it.

Overview (5 minutes)

LEADER:

Great! Now here’s an overview of what we’ll be doing during our focus group. We will:

- 1. Define what researchers call the tan-ideal**
- 2. Examine the consequences associated with the pursuit of this tan-ideal**
- 3. Explore ways in which each of you have encountered people promoting the tan-ideal**

4. Participate in a role-play activity to help dissuade adolescent females from pursuing the tan-ideal.

While we're going through each of these topics, we'll have a basic structure to follow. We will ask you your thoughts on different topics and invite discussion; however, we do have certain things we need to cover, so sometimes I'll re-focus the discussion if we get off track.

Also, experience indicates that people will get the most out of these groups if everyone participates verbally and complete all of the exercises. Can you commit to this? *Get public commitment.*

We would also like to emphasize that everything that is said in these groups stays confidential and doesn't leave the group. We want to create an open and accepting atmosphere where everyone can freely discuss their thoughts. Can you all agree to keeping everything confidential and respecting one another's thoughts? *Get public commitment.*

Definition of the Tan-Ideal (5-10 minutes)

LEADER:

First, let's get a better understanding of what researchers call "the tan-ideal."

Pose the following questions to the group and promote participation and collaboration on their responses.

Q: What are we told the "perfect tan" looks like?

(i.e., even, no tan lines, blemish-free, firm, not too dark but not too light, etc.)

**Note race issues could be sensitive here, so proceed with caution*

We call this look, this perfect, even, tanned skin, the tan-ideal.

Q: Who are some individuals who might represent the tan-ideal in our society?

(Jennifer Aniston, Britney Spears, Brad Pitt, Charlize Theron, etc) Again, promote discussion, making sure that everyone understands what the tan-ideal is)

Q: How realistic is the tan-ideal for everyone?

(lead discussion to conclude that it is hard to achieve for many people naturally; discuss spray tanning if it comes up: still promotes tan-ideal, should not encourage adolescents to do so because that may lead to continued tanning)

Costs Associated with Pursuing the Tan-Ideal (10 minutes)

We've discussed the tan-ideal and where it comes from. Are there any questions about what this is and where it comes from?

Now let's think about some of the consequences for adolescents who seek out this ideal. *(Get group participation)*

Q: What are the consequences and costs of pursuing the tan-ideal on appearance?

(Include discussion on current feelings about appearance and future consequences to appearance. e.g., negative effects include wrinkling, freckling, sun damage, possible sunburn and peeling; if not tan, might feel embarrassed, lowered self-esteem, feel like look sick, won't wear certain clothes, etc)

Q: Does anyone benefit from our society's pursuit of the tan-ideal?

(i.e., sun tanning industry, beauty industry, spas, etc. Allow and encourage students to recognize that they are being exploited and angry; because society promotes the tan-ideal, people are making a great deal of money off of us as we pursue the tan-ideal with spray tans and tanning booths, etc.)

Q: Given these costs and benefits, does it make sense for adolescents to pursue the tan-ideal? *(try and get them to say no; however, they may note that there are some benefits. If so, discuss what they may be and how costs outweigh benefits)*

Make sure that you get each participant to make a public statement against the tan-ideal at this stage and anywhere else possible.

Verbal Challenge Exercise (20 minutes)

We have another activity for you to do today to help us better understand how to help adolescent females to resist pressures to achieve the tan-ideal.

First, we would like you to write about two examples from your own life where you have encountered other people promoting society's unrealistic tanning standards.

For example, say your best friend said to you that she/he thinks pale people are unattractive. How could you challenge this statement? *Have participants give some statements that counter this.*

****If seems like anyone in group needs another example, do this one too** Maybe someone in your family told you that you should tan before a big event. How could you challenge this?**

So, again, we'd like you to write down at least 2 actual examples of times in your life when you have heard other people endorsing the tan-ideal. Focus on times when people were promoting the tan-ideal and how it relates to your appearance. Then, write down a response that could challenge this statement. Is this exercise clear? Does anyone have any questions?

Please take about 10 minutes to work on this, and then we will discuss it when you are done.

PASS OUT VERBAL CHALLENGE EXERCISE FORMS

DISCUSSION: Can you each share one example with the group?

COLLECT VERBAL CHALLENGE FORMS

Role Plays to Dissuade the Pursuit of the Tan-Ideal (25 minutes)

RA should set up video on tripod at this point.

In this exercise, the leader will take turns in different roles of an adolescent female pursuing the tan-ideal. Going around the room, have each group member take a turn dissuading the individual (leader's role) from pursuing the tan-ideal. Play devil's advocate during this exercise and make them come up with at least three arguments against the statement they are given.

Now I would like us to do some role-plays. We are going to videotape these to turn into educational videos for adolescents. We will be editing them and having professional actors make the real video; we are hoping to use the stuff you all come up with to create a script for the actors. So, it is really important that you guys do your best to make these believable since we will be creating the professional videos based on how these comes out. I will play the role of different adolescents who are engaging in tanning behaviors. Your job will be to convince me that I should not pursue the tan-ideal. Feel free to use any information, including what has already been brought up in the group. Please try to give at least 3 reasons why I should not pursue the tan-ideal. Please focus on ways in which pursuing the tan-ideal may affect the adolescent's appearance. *Select each group member to participate.*

- 1. Homecoming is just around the corner. I'm going to start going to the tanning salon so I'll be tan for the big night.**
- 2. I'm sick of being so pale! I'm not going to use any sunscreen while I'm at the beach today. My sunburn will eventually turn into a tan.**
- 3. I just saw an ad for this new suntanning oil that I'm going to start using. It says that its oils attract the sun and bring out the ultimate tan. It says it's ok to use it after having a base tan, so I'm going to head to the tanning salon tonight. I'm so excited that I'll finally be as tan as I want to be!**
- 4. I wish I looked as tan as Katie does. She looks so healthy and pretty when she is tan!**
- 5. I feel like I look fat and dumpy today. I'm going to hang out at the pool all day and do whatever it takes to get tan. At least I'll feel good about that!**

6. **I only put sunscreen on my face because I don't want to get wrinkles. I don't need sunscreen on the rest of my body since I don't burn.**
7. **Have you seen how tan and toned Jenny looks? I look so fat and pale compared to her. I'm going to start tanning so that I'll look more fit.**
8. **I've started going to a tanning salon regularly because I need to get a base tan before I go on Spring Break.**
9. **I'm going to senior prom soon and my dress doesn't look good against pale skin. I'm going to go to the tanning salon after school and then lay out at the beach all weekend so I can get a good tan. I'll look so much better at prom if I'm tan!**
10. **With summer coming up, I can't wear shorts and flip flops with such pale legs! I am going to start laying out in the backyard every day so that when summer gets here, I'm already tan.**

Video Feedback (5-7 minutes)

RA: Plug the camcorder into the TV for playback mode.

We want to make sure that the video worked, so we are going to play back parts of it now.

RA: Play the video, making sure to show parts of EACH person's role-play.

Make sure that you do not leave the script on the table where participants can see it!

Closing Remarks (2-3 minutes)

Thank you very much for participating in this group. I have been very impressed with your thoughtful comments and participation and have enjoyed getting to know you.

Surveys (30 minutes)

You all have given us some really strong arguments for why adolescent females, and young people like you, should not tan. These should be really convincing, thank you!

Like we mentioned before, these focus groups may or may not change your own attitudes towards health and appearance. That is why we are giving you another packet of questionnaires to complete. You may see items that are similar to the ones you saw before; this is not a mistake, it is so we can see if any changes occurred.

Also remember, we will be contacting you over email in one month for a follow-up survey. You will receive a \$10 Target gift certificate for participating in the study upon completion of the follow-up assessment.

RA: PASS OUT QUESTIONNAIRE PACKET (make sure it is fully completed)

RA: PASS OUT CONTACT SHEET

Thanks again for coming today! We'll be in touch with you over email in one month.

Appendix B: Healthy Lifestyle Condition Script

Informed Consent (5-7 minutes)

LEADER:

Okay, great, let's get started. We are part of a team that is working on a project to create a program to help adolescent females in high school feel better about their health and appearance. I want to invite each of you to participate in the focus group part of the project. What the focus group involves is several verbal exercises to help us create the materials for the program, and then we'll have you take part in a video we are creating to show to adolescent females. We are hoping to use the information from the video in order to create similar videos using professional actors that will be shown to high school females. Your videos will only be for research purposes so only members of the research team here will be watching them. As college students, you all are in the next phase of life just beyond our target audience, and you may serve as role models to these girls, so we thought having you help develop the program would be most effective, which is why we are recruiting participants from USF. You are under no obligation to participate in the focus group and video. If you think you would like to participate, please let us know now and we will pass out the consent forms.

If anyone is not interested, thank them for their time and have them leave the room.

This study involves participating in today's session that will last approximately 1 to 3 hours. You will also be asked to complete a packet of questionnaires about your health-related attitudes and behaviors before and after the session. Also, you will be contacted one month from today for a follow-up assessment. You will receive up to 6 credit points for your participation upon completion of today and a \$10.00 gift certificate to Target upon completion of the follow-up assessment.

PASS OUT INFORMED CONSENT (2 PER PERSON)

Please read over the consent form now. If you have any questions, feel free to ask. When you feel comfortable, please sign one copy of the consent form and then turn it in to me.

COLLECT ALL INFORMED CONSENTS (make sure they are signed)

Introduction to Study and Pre-Test Measures (30 minutes)

PASS OUT PRE-TEST MEASURES

Before we get started with our discussion, I'd like you to complete this packet of questionnaires. It should take you approximately 30 minutes. Your responses are completely confidential, so please be as open and honest as possible when completing your packet. When you are finished, turn them in to me.

COLLECT ALL QUESTIONNAIRE PACKETS

LEADER:

Thank you for joining us. Like I mentioned before, we are working on developing a program that will help adolescent females feel better about their health and appearance. This part of the program is called the focus group phase. At this point, we are only running focus groups on two topics; we have finished running all our other groups. The two topics we are still covering are tanning and proper nutrition and exercise, so I would like to ask you to decide as a group which of these two topics you would like to discuss.

(FLIP THRU QUESTIONNAIRES AS YOU SAY THIS) **Actually, as I look at the demographics of our group, I notice that nobody here meets all the criteria for healthy eating habits and/or exercise practices, which is actually rare. So, this would really be a great opportunity to work on a healthy eating and exercise focus group. And, it would really help us out if the group could do that. (It is important to sound like it would be a BIG help for them to do this – we want to them to choose the eating/exercise group!)**

After group “chooses” healthy eating/exercise:

In this focus group, we will spend our time discussing healthy eating and exercise, and how adolescent females can resist the pressures in our society to engage in unhealthy nutrition and exercise habits. You may also find that this program improves your own attitudes towards health and appearance, which is why we are giving you questionnaires to complete. Are you all willing to give this a try? Get public commitment from everyone.

Introduction (5 minutes)

So now that we know about the study, let’s get to know each other. Can each of you tell us your name and where you’re from? Leaders start.

Have each participant write her name on a piece of paper and fold it so that everyone can see it.

Overview (5 minutes)

LEADER:

Great! Now here’s an overview of what we’ll be doing during our focus group. During this session we will:

**Learn what the recommendations are for a healthy diet and exercise regime.
Discuss barriers people encounter when trying to maintain a healthy diet and exercise regime.**

Discuss times when each of you had difficulty maintaining a healthy diet and exercise regime.

Participate in a role-play activity to help encourage adolescent females to maintain a healthy diet and exercise regime.

While we're going through each of these topics, we'll have a basic structure to follow. We will ask you your thoughts on different topics and invite discussion; however, we do have certain things we need to cover in each session, so sometimes I'll re-focus the discussion if we get off track.

Also, experience indicates that people will get the most out of these groups if everyone participates verbally and completes all of the exercise. Can you commit to this? Get public commitment.

We would also like to emphasize that everything that is said in these groups stays confidential and doesn't leave the group. We want to create an open and accepting atmosphere where everyone can freely discuss their thoughts. Can you all agree to keeping everything confidential and respecting one another's thoughts? Get public commitment.

Introduction to healthy foods and exercise

LEADER:

First, let's get a better understanding of what is considered healthy eating and exercising.

Pose the following questions to the group and promote participation and collaboration on their responses. Promoting discussion is key! Let students talk, not leaders.

Q: What are considered healthy foods?

(Veggies, fruits, whole grains, low fat, low sugar, etc.)

Great! It is recommended that everyone eat 5 or more servings of fruits and vegetables each day. It is also recommended that you choose whole grains over processed grains.

Q: What are some benefits of maintaining healthy eating habits?

(Lower cholesterol, less fat, heart health, better skin appearance, more attractive, etc.)

Okay, for exercise, it is recommended that adults engage in at least 30 minutes of moderate to vigorous physical activity, above usual activities, on 5 or more days per week. In fact, 45 to 60 minutes of intentional physical activity is preferable.

Q: What are some examples of exercise?

(Running, walking, bicycle, swim, aerobics, dance, etc.)

Q: What are some benefits of exercising regularly?

(Lower cholesterol, less fat, more muscle, look better, heart health, lung health, etc.)

Barriers

Now that we know what healthy eating and exercise recommendations are, let's discuss things that get in our way of engaging in these behaviors. (Get group participation)

Q: What are some reasons adolescents don't always eat healthy?

(Eating out is social activity, fast food is cheap, don't know they should eat healthy, parents don't buy healthy foods, etc.)

Q: What are some ways adolescents can incorporate healthy eating into their lives more easily?

(Bring fruits/veggies to school, teach parents what is healthy, encourage schools to supply healthy foods in cafeteria, encourage friends to eat healthy with them, etc.)

Q: What are some reasons adolescents don't always exercise regularly?

(No time, don't know they should, don't enjoy the activities that are considered exercise, friends don't exercise, parents don't exercise, etc.)

Q: What are some ways adolescents can incorporate exercise into their lives more easily?

(Find activities they enjoy, join a team, exercise with a friend, exercise with a parent, budget time for exercise, etc.)

Verbal Challenge Exercise (20 minutes)

We have another activity for you to do today to help us better understand how to help adolescent females to maintain a healthy lifestyle.

First, we would like you to write about two examples from your own life where you found it difficult to eat healthy OR to exercise regularly. What could you have done differently to be healthier?

So, for example, let's say you came home from school and your parents were both working late. There was leftover birthday cake from your dad's birthday yesterday, and since you're so tired, you want to have cake for dinner instead of cooking something. What could you do differently?

So, again, we'd like you to write down at least 2 actual examples of times in your life when you ate unhealthy OR didn't exercise enough. Then write down how you could have incorporated healthy eating and exercise into your life at that time. Is this exercise clear? Does anyone have any questions?

Please take about 10 minutes to work on this, and then we will discuss it when you are done.

RA: PASS OUT VERBAL CHALLENGE EXERCISE FORMS

DISCUSSION: Can you each share one example with the group?

COLLECT VERBAL CHALLENGE FORMS

Role Plays to Encourage Healthy Eating and Exercising (25 minutes)

RA should set up video on tripod at this point.

In this exercise, the leader will take turns in different roles of an adolescent female avoiding eating healthy and/or exercising. Going around the room, have each group member take a turn encouraging the individual (group leader) to engage in these healthy activities. Play devil's advocate during this exercise and make them come up with at least three arguments against the statement they are given.

Now I would like us to do some role-plays. We are going to videotape these to turn into educational videos for adolescents. We will be editing them and having professional actors make the real video; we are hoping to use the stuff you all come up with to create a script for the actors. So, it is really important that you guys do your best to make these believable since we will be creating the professional videos based on how these comes out. I will play the role of different adolescents who are not eating right or exercising regularly. Your job will be to convince me that I should be healthier. Feel free to use any information, including what has already been brought up in the group. Please try to use at least three arguments to convince me. Select each group member to participate.

I have a math final next week, I need to have chocolate and potato chips nearby so I can eat junk food while I study all week!

I'm so tired from school! I'm going to go home and watch tv instead of going to soccer practice.

I just saw an ad for a value meal at the fast food place around the corner! I'm going go get a huge burger, French fries, and a milkshake for an after school snack.

I decided not to do anything but play video games and watch tv all summer break!

I don't like fruits or vegetables but that's okay because I exercise so it doesn't matter if I eat healthy.

I don't have time during the week to exercise but it's okay because I just work out for 4 hours every Saturday.

I've always had a fast metabolism so it's okay if I don't eat right or exercise, I am still skinny.

I eat all my servings of fruits and vegetables every day and I never eat sweets. It's okay if I don't exercise regularly since I eat healthy.

I don't like the sports my school offers but it's okay because I am skinny, so I don't need the exercise anyway.

I eat healthy on the weekends, but it's too hard to find time during the week to eat my fruits and vegetables!

Video Feedback (5-7 minutes)

RA: Plug the camcorder into the TV for playback mode.

We want to make sure that the video worked, so we are going to play back parts of it now.

RA: Play the video, making sure to show parts of EACH person's role-play.

Closing Remarks (2-3 minutes)

Thank you very much for participating in this group. I have been very impressed with your thoughtful comments and participation and have enjoyed getting to know you.

Surveys (30 minutes)

You all have given us some really strong arguments for why adolescent females, and young people like you, should eat healthy and exercise. These should be really convincing, thank you!

Like we mentioned before, these focus groups may or may not change your own attitudes towards health and appearance. That is why we are giving you another packet of questionnaires to complete. You may see items that are similar to the ones you saw before; this is not a mistake, it is so we can see if any changes occurred. Also remember, we will be contacting you in one month for a follow-up session. You will receive a \$10 Target gift certificate for participating in the study upon completion of the follow-up assessment.

RA: PASS OUT QUESTIONNAIRE PACKET (make sure it is fully completed)

RA: PASS OUT CONTACT SHEET

Thanks again for coming today! We'll be in touch with you over email in one month.

Appendix C: Psycho-educational Condition

Informed Consent (5-7 minutes)

LEADER:

We are part of a team that is working on a project to create a program to help adolescent females in high school feel better about their health and appearance. I want to invite each of you to participate in the focus group part of the project. What this focus group involves is having us test out some of the material that has already been created. We are in the process of putting information together in various formats and we want to show you all a powerpoint presentation that we have. As college students, you all are in the next phase of life just beyond our target audience, and you may serve as role models to these girls, so we thought having you help develop the program would be most effective, which is why we are recruiting participants from USF. You are under no obligation to participate in the focus group. If you think you would like to participate, please let us know now and we will pass out the consent forms.

If anyone is not interested, thank them for their time and have them leave the room.

This study involves participating in today's session that will last approximately 1 to 3 hours. You will also be asked to complete a packet of questionnaires about your health-related attitudes and behaviors before and after the session. Also, you will be contacted one month from today for a follow-up assessment. You will receive up to 6 credit points for your participation upon completion of today and a \$10.00 gift certificate to Target upon completion of the follow-up assessment.

PASS OUT INFORMED CONSENT (2 PER PERSON)

Please read over the consent form now. If you have any questions, feel free to ask. When you feel comfortable, please sign one copy of the consent form and then turn it in to me.

COLLECT ALL INFORMED CONSENTS (make sure they are signed)

Introduction to Study and Pre-Test Measures (30 minutes)

PASS OUT PRE-TEST MEASURES

Before we get started with our presentation, I'd like you to complete this packet of questionnaires. It should take you approximately 30 minutes. Your responses are completely confidential, so please be as open and honest as possible when completing your packet. When you are finished, turn them in to me.

COLLECT ALL QUESTIONNAIRE PACKETS

Start PowerPoint presentation. Read script from notes under each slide.

SLIDES:

Slide 1 Thank you for joining us. Like I mentioned before, we are working on developing a program that will help adolescent females feel better about their health and appearance. This part of the program is called the focus group phase. Today, we would like to test out some of the material we have already created about tanning. You may also find that this program improves your own attitudes towards health and appearance, which is why we are giving you questionnaires to complete.

Slide 2 In order to help you understand everything we talk about today, it is good to start with an understanding of the skin.

The skin is the largest organ in the body. It does many different things. It covers the organs inside the body and protects them from injury, it helps to keep out germs, it helps keep in water and other fluids, and it helps control body temperature.

The skin has 3 layers: The epidermis, the dermis, and the subcutis. *(As you say each thing, point to it in the picture, on the right side).*

The top layer of the skin, the epidermis, is very thin and protects the deeper layers of skin and the organs. The epidermis itself has 3 layers: an upper, a middle, and a bottom layer made up of basal cells.

These basal cells divide to form squamous cells, which make a protein called keratin. This protein helps protect the body.

Melanocytes are the cells that can become melanoma. They are also found in the epidermis. These skin cells make the brown pigment called melanin.

Melanin makes skin tan or brown and protects the deeper layers of the skin from the harmful effects of the sun.

A layer called the basement membrane separates the epidermis from the deeper layers of skin. The basement membrane is important because when a cancer becomes more advanced, it may grow through this barrier.

Slide 3 Another important thing to understand is what ultraviolet rays are. Ultraviolet rays, or UV rays, are a form of invisible energy that is given off by the sun.

Too much exposure to UV radiation is thought to be the biggest risk factor for most melanomas. In addition to the sun, tanning lamps and booths are also sources of UV light. The amount of UV exposure depends on the strength of the radiation, how long the skin was exposed, and whether the skin was covered with clothing and sunscreen.

UV rays are divided into 3 wavelength ranges.

- Slide 4 The three wavelength ranges are UVA, UVB, and UVC.
Although UVA and UVB rays make up only a very small portion of the sun's wavelengths, they are mainly responsible for the harmful effects of the sun on the skin.
UVA rays help age skin cells and cause some damage to cells' DNA. They are mainly linked to long-term skin damage, like wrinkles, but may play role in some skin cancers
UVB radiation can damage the DNA of skin cells. They are mainly responsible for direct damage to DNA, and cause sunburns. If this damage affects the DNA of genes that control skin cell growth, skin cancer may be the result. Recent research has found that UVA also contributes to skin cancer formation. Scientists now believe that both UVA and UVB rays damage skin and cause skin cancer. There is no safe UV exposure!
UVC rays don't penetrate atmosphere so they are not present in sunlight. So, UVC rays are not normally a risk factor for skin cancer.
- Slide 5 Skin cancers are one result of getting too much sun, but there are others as well.
Short-term results of unprotected exposure are sunburn and tanning.
Long-term exposure causes prematurely aged skin, wrinkles, loss of skin elasticity, dark patches (sometimes called "age spots" or "liver spots"), and pre-cancerous skin changes (such as the dry, scaly, rough-textured patches called actinic keratoses).
- Slide 6 UV rays also increase a person's risk of cataracts and certain other eye problems and can suppress their immune system
Although dark-skinned people are generally less likely to get skin cancer than light-skinned people, they can still get cataracts and immune system suppression
- Slide 7 Skin cancer is most common of all cancers. In fact, more than 1 million cases of skin cancer are diagnosed in the US each year, and the number of cases has been on the rise in recent years.
Most skin cancers are caused by too much exposure to UV rays. This exposure can be from the sun and/or from artificial sources, like tanning beds.
- Slide 8 There are 2 main types of skin cancer: Non-melanoma and melanoma.
Non-melanoma skin cancers are the most common type. The 2 most common types of this cancer are basal cell carcinoma and squamous cell carcinoma.
These cancers occur mostly on parts of the body that are exposed to the sun and related to the amount of sun exposure one gets over her lifetime.

Slide 9 Melanoma skin cancers occur less often, but they are far more serious. In the United States, one person dies from melanoma every hour. Melanoma is a cancer that begins in the melanocytes. Because most of these cells still make melanin, melanoma tumors are often brown or black. But this is not always the case, and melanomas can also have no color. Melanoma most often starts on the trunk of fair-skinned men and on the lower legs of fair-skinned women, but it can start in other places, too. Having dark skin lowers the risk of melanoma. But it does not mean that a person with dark skin will never get melanoma. Melanoma can almost always be cured in its early stages. But it is likely to spread to other parts of the body if it is not caught early. Melanoma is much less common than basal cell and squamous cell skin cancers, but it is far more serious.

Slide 10 This is a graph showing the rate of death due to melanoma among females from 1975 through 2005. As you can see, by looking at the red blocks, the number of people diagnosed with melanoma has steadily increased in the last quarter of a century. The blue boxes demonstrate the mortality rate due to melanoma over the same time frame. Thankfully, that number has not been increasing at the same rate. This is due to better detection techniques and treatment options. However, it is important to remember that melanoma, if not caught early, is highly fatal. Treatment, even when caught in its early stages, includes surgery that can leave behind a big scar, several inches long!

Slide 11 These are some of the risk factors that have been identified for putting someone at risk for developing skin cancer.

UV (ultraviolet) light

Like we've discussed, too much exposure to UV radiation is thought to be the biggest risk factor for most melanomas. Again, the main source of UV is sunlight, but tanning lamps and booths are also sources of UV light. The amount of UV exposure depends on the strength of the radiation, how long the skin was exposed, and whether the skin was covered with clothing and sunscreen. Many studies have linked melanoma in the trunk, legs, and arms to frequent sunburns (especially in childhood).

Moles

A mole is a benign (not cancerous) skin tumor. Certain types of moles increase a person's chance of getting melanoma. The chance of any single mole turning into cancer is very low. But a person who has many moles is more likely to develop melanoma. These people should have very thorough skin exams by a skin doctor (dermatologist). Many doctors suggest that they should also look at their own skin every month. Good sun protection is always important.

Fair skin/light eyes/light hair/freckles

The risk of melanoma is more than 10 times higher for whites than for African Americans. Whites with fair skin, freckles, or red or blond hair have a higher risk of melanoma. Red-haired people have the highest risk.

Family history of melanoma

Around 10% of people with melanoma have a close relative (mother, father, brother, sister, child) with the disease. This could be because the family tends to spend more time in the sun, or because the family members have fair skin, or both. Less often, it is because of a gene change (mutation) along with sun exposure. People with a strong family history of melanoma should:
have regular skin exams by a skin doctor
learn to look at their own skin and know what it should look like
be very careful about sun exposure

Past history of melanoma

A person who has already had melanoma has a higher risk of getting another melanoma.

Age

Melanoma is more likely to happen in older people. But it is one of the few cancers that is also found in younger people.

- Slide 12 In addition to skin cancer, exposure to UV rays also cause other problems. Photoaging is damage done to skin from prolonged exposure to UV radiation. Most of the skin changes that occur as we get older are accelerated by sun exposure.
Examples of photoaging are:
Dark spots
Wrinkles
Droopy skin
Yellowish tint
Broken blood vessels
Leathery skin
- Slide 13 This is an example of freckling that can occur from sun exposure.
- Slide 14 On the left, you see a picture of a woman taken with a normal camera. On the right, is the same woman but this time a UV filter was used to take the picture. This kind of filter helps demonstrate the damage that has been done to the skin by UV exposure. As you can see, the woman has a great deal of sun spots and wrinkles that are forming. Without sun exposure, much of her skin would likely be smooth, like in the picture on the left.
- Slide 15 This picture demonstrates age spots, which are dark spots that appear with age, due to prolonged sun exposure over one's lifetime. So the sun exposure you receive now, can result in age spots years from now.
- Slide 16 An example of the effects of the sun on a woman's skin after several years of tanning and laying out. You can see she has wrinkles here (point) and sun spots here (point).

- Slide 17 So we know that UV exposure causes many problems, but it is not possible or practical to completely avoid sunlight, and it would be unwise to reduce your level of activity to avoid the outdoors.
But too much sunlight can be harmful.
There are some steps you can take to limit your amount of exposure to UV rays.
- Slide 18 Some people think about sun protection only when they spend a day at the lake, beach, or pool, but sun exposure adds up day after day, and it happens every time you are in the sun.
There are several key methods to help protect yourself from UV radiation. The most important thing is to limit your UV exposure! But, when you are outside, there are several things you can do to further protect yourself.
These methods provide the best protection when they are used together. We will go into detail for each of these things now.
- Slide 19 An important thing to protect yourself is to avoid UV exposure altogether. Although we can't always avoid being outside, there are steps we can take to protect our skin. It is important to stay in the shade. Look for shade, especially in the middle of the day, between the hours of 10 am and 4 pm, when the sun's rays are strongest. Keep in mind that sunlight (and UV rays) can come through clouds, can reflect off water, sand, concrete, and snow, and can reach below the water's surface.
Another way to protect yourself is to completely avoid other sources of UV light. Tanning beds and sun lamps are dangerous because they can damage your skin. Most skin doctors say not to use tanning beds and sun lamps. There is growing evidence that they may increase your risk of getting melanoma.
- Slide 20 Since we cannot always avoid UV exposure, it is important to always wear sunscreen. Apply sunscreen and remember to reapply it throughout the day. A sunscreen is a product that you apply to your skin for some protection against the sun's UV rays, although it does not provide total protection. Sunscreens are available in many forms -- lotions, creams, ointments, gels, wipes, and wax sticks, to name a few. You should also use sunscreen lip balm. Some cosmetics, such as lipsticks and foundations, also are considered sunscreen products if they contain sunscreen. Some makeup contains sunscreen, but only the label can tell you. Makeup, including lipstick, without sunscreen does not provide sun protection. Check the labels to find out. Experts recommend products with a Sun Protection Factor (SPF) of at least 15. The SPF number represents the level of protection against UVB rays provided by the sunscreen -- a higher number means more protection.
Be sure to apply the sunscreen properly. Always follow the label directions. Most recommend applying sunscreen generously to dry skin 20 to 30 minutes before going outside so your skin has time to absorb the chemicals. When applying it, pay close attention to your face, ears, hands, and arms, and generously coat the skin that is not covered by clothing. If you're going to wear

insect repellent or makeup, apply the sunscreen first..

Be generous. About 1 ounce of sunscreen (a "palmful") should be used to cover the arms, legs, neck and face of the average adult. For best results, most sunscreens must be reapplied at least every 2 hours and even more often if you are swimming or sweating. Products labeled "waterproof" may provide protection for at least 80 minutes even when you are swimming or sweating. Products that are "water resistant" may provide protection for only 40 minutes. Remember that sunscreen usually rubs off when you towel yourself dry, so you will need to reapply.

Sunless tanning products, such as bronzers and extenders, give skin a golden color. Unlike sunscreens, these products provide very little protection from UV damage.

It is important to remember that sunscreen does not give you total protection. When using an SPF 15 and applying it correctly, you get the equivalent of 1 minute of UVB rays for each 15 minutes you spend in the sun. So, 2 hours in the sun wearing SPF 15 sunscreen is the same as spending 8 minutes totally unprotected. Don't make the mistake of thinking that because you're using sunscreen, you can stay out in the sun longer. Staying out longer because you're using sunscreen just means you'll end up getting just a little less UV light as you would otherwise. You won't reduce your melanoma risk that way.

When selecting a sunscreen product, be sure to read the label before you buy. The SPF number is an indication of protection against UVB rays only.

Sunscreen products labeled "broad-spectrum" protect against UVA and UVB radiation, but there is no standard system for measuring protection from UVA rays.

Most sunscreen products expire within 2 to 3 years, but you should check the expiration date on the container to be sure it is still fully effective.

Slide 21 You should always wear protective clothing. Long-sleeved shirts, long pants, or long skirts are the most protective. Dark colors are better than light colors. A tightly woven fabric protects better than loosely woven clothing. And dry clothing is better than wet clothing. Some clothing is made with built-in UV protection. There are also newer products that can increase the ultraviolet protection factor value of clothes you already own. Used like laundry detergents, they add a layer of UV protection to your clothes without changing the color or texture.

Like I said, a few companies now make sun-protective clothing. They tend to be more tightly woven, and some have special coatings to help absorb UV rays. Some sun-protective clothes have a label listing the Ultraviolet Protection Factor (UPF) value - the level of protection the garment provides from the sun's UV rays (on a scale from 15 to 50+). The higher the UPF, the higher the protection from UV rays. This is like the SPF of sunscreen.

- Slide 22 Wear a hat. A hat with at least a 2- to 3-inch brim all around is good because it protects the neck, ears, eyes, forehead, nose, and scalp. A shade cap (which looks like a baseball cap with about 7 inches of fabric draping down the sides and back) is also good. These are often sold in sports and outdoor supply stores. A baseball cap can protect the front and top of the head, but not the back of the neck or the ears. Straw hats are not a good choice unless they are tightly woven.
Wear wrap-around sunglasses. Wrap-around sunglasses with at least 99% UV absorption give the best protection to your eyes and the skin around your eyes. Look for sunglasses labeled as blocking UVA and UVB light.
For the rest of the time, we are going to play a little game. I will show you a statement, and you tell me if you think it is Fact or Fiction.
- Slide 23 I can't get skin cancer, because my routine (school, drive to work, indoor hobbies, and vacations) doesn't include any outdoor activities
Hit button to bring on answer....
FICTION
Dermatologists say brief sun exposures all year round can add up to major damage for people with fair skin. And the sun's ultraviolet (UV) rays do pass through car windows, so driving during peak sun hours, 10:00 a.m.-4:00 p.m., to lunch or on weekends, bathes your hands and arms in damaging UV rays. When added up, everyday exposures are linked to squamous cell cancer. Although not as dangerous as melanoma, squamous cell cancer is far more common and the number of cases has been going up every year.
- Slide 24 My boyfriend should use sunscreen at football games, even though he only goes (and gets a burn!) once or twice a year
Hit button to bring on answer....
FACT
Many people think it's OK to get a sunburn now and then, but studies show that even occasional exposure to strong sunlight seems to increase the risk of the most serious type of skin cancer, melanoma.
- Slide 25 If I'm wearing sunscreen, I can stay in the sun as long as I want
Hit button to bring on answer...
FICTION
It's not smart to broil in the sun for several hours, even if you are wearing sunscreen. These products don't provide total protection from ultraviolet (UV) rays. The American Cancer Society recommends that people **seek shade** and **limit time in the sun at midday**. Also, **cover up** with a shirt, wear a wide-brimmed hat, use a sunscreen rated SPF 15 or higher, and reapply it about every 2 hours. And don't forget **sunglasses** for eye protection.

Slide 26 It's safe to stay in the pool all day if I slip on a T-shirt after a couple hours and reapply sunscreen to my face, arms, and legs

Hit button to bring on answer...

FICTION

UV rays easily go through a white cotton T-shirt, especially if it's wet. You will get only about as much protection as an SPF 4 sunscreen—certainly not enough for all day and well below the minimum of SPF 15 recommended by the ACS. Better clothing choices include dark colors, fabrics with tight weaves, and specially treated garments and bathing suits. Sun-protective clothing is often found at sporting goods stores. Another good choice is moving into the shade. Finally, don't forget to apply and re-apply your sunscreen!

Slide 27 Water-resistant sunscreen needs to be reapplied only after you sweat or swim

Hit button to bring on answer...

FICTION

For best results, most sunscreens need to be reapplied about every 2 hours or sooner AND after you sweat or swim AND after you towel dry. Be sure to check the label. Sunscreens labeled "water resistant" are made to protect you when swimming or sweating, but may only last for 40 minutes. Also, remember that sunscreen usually rubs off when you towel dry.

Slide 28 Getting a "base tan" at an indoor tanning salon is as good way to prevent sunburn when I go to the beach later this summer

Hit button to bring on answer...

FICTION

Experts say a "base tan" gives you very little protection against sunburn. And that goes for indoor tans, too, which provide a sun protective factor of about 4, much less than most sunscreens. A base tan may, in fact, increase the chance you'll get a burn, because you're likely to stay out longer without properly protecting your skin.

Also, tanning itself injures the skin. What you don't see is UV damage to deeper layers, where it builds-up from every tan and burn you've ever had. There really is no such thing as a "safe tan."

Slide 29 The two most common (and painful!) sunscreen mistakes are using too little and waiting too long to reapply

Hit button to bring on answer...

FACT

About 1 ounce of sunscreen (a 'palmful') should be used to cover the arms, legs, neck and face of the average adult. For best results, most sunscreens must be reapplied at least every 2 hours and even more often if you are swimming or sweating. Products labeled "waterproof" may provide protection for at least 80 minutes even when you are swimming or sweating. Products that are "water resistant" may provide protection for only 40 minutes.

To be safe use a lot of sunscreen and use it often.

Slide 30 Let's say you applied sunscreen at 12:00 noon for an afternoon of laying by the pool. At 2:30pm, moving to the shade would be more protection for your skin than putting on a long cotton sundress or re-applying your sunscreen

Hit button to bring on answer...

FACT

While all 3 actions help, getting out of the mid-day sun is the best choice in this situation. **Seeking shade** is a key element in preventing skin cancer, especially between 10:00 a.m. and 4:00 p.m.

The sundress blocks very little UV radiation because it's made of cotton. It compares to a sunscreen rated SPF 4. **Covering up** is the right idea, but dark colors, tight weaves, and clothing labeled at least UPF 30 work better.

Sunscreen should not be used to extend your time in intense sunlight. It's an important part of a larger strategy that the American Cancer Society recommends to protect your skin, but it does not provide total protection. To get the most from **sunscreen**, choose products of SPF 15 or higher that block both UVA and UVB rays, reapply at least every 2 hours, and use at least 1 ounce or a palmful for an adult.

Slide 31 I want a tan for summer! Using a tanning bed would be a safer option than laying out in the sun.

Hit button to bring on answer...

FICTION

There is no safe tan. Exposure to ultraviolet (UV) radiation — whether from sunlight or tanning beds — damages your skin, increasing your risk of skin cancer and premature skin aging. In fact, malignant melanoma, the most serious type of skin cancer, has seen a sharp rise in recent years, perhaps due to the increased exposure to UV radiation from both the sun and tanning beds.

You can prevent skin damage by limiting your exposure to UV radiation and by using a broad-spectrum sunscreen. If you want the golden glow of a tan without exposure to damaging UV radiation, consider using sunless tanning products or bronzers. Keep in mind, however, many of these products do not contain sunscreen and won't protect you from UV radiation.

- Slide 32 Great job today! To summarize what we've learned today:
UV exposure comes from the sun, but it also comes from tanning beds and sun lamps.
No amount of UV exposure is okay. Tanning, or getting UV exposure, increases your risk of developing skin cancer. It also increases your risk of developing wrinkles, acne, sun spots, and leathery skin.
- Slide 33 In order to help protect yourself from the harmful UV rays, you should always wear sunscreen. Experts recommend using a sunscreen with an SPF of at least 15, applying it generously, and reapplying it often.
It is also recommended that you avoid the sun as much as possible, particularly during the afternoon when the sun is at its strongest. If you are outside, try to stay in the shade.
In addition to sunscreen, it also helps to wear protective clothing, that is dark, tightly woven, covering most of your body. Hats and sunglasses can help protect your head, face, ears, and eyes.

When PPT is done, we need to do the surveys. Please go back to this script:

Closing Remarks (2-3 minutes)

Thank you very much for participating in this group. I have enjoyed getting to know you.

Surveys (30 minutes)

Lastly, like we mentioned before, these focus groups may or may not change your own attitudes towards health and appearance. That is why we are giving you another packet of questionnaires to complete. You may see items that are similar to the ones you saw before; this is not a mistake, it is so we can see if any changes occurred.

Also remember, we will be contacting you over email in one month for a follow-up survey. You will receive a \$10 Target gift certificate for participating in the study upon completion of the follow-up assessment.

RA: PASS OUT QUESTIONNAIRE PACKET (make sure it is fully completed)

RA: PASS OUT CONTACT SHEET

Thanks again for coming today! We'll be in touch with you over email in one month.

Appendix D: Demographic Questionnaire

1. Today's Date / /
2. Birth Date / /
3. Height (ft) (in)
4. Weight
5. Please identify your ethnic group (check one box):
 - Hispanic or Latino
 - Not Hispanic or Latino
6. Please identify your race (check one box):
 - American Indian or Alaska Native
 - Asian
 - Black or African American
 - Native Hawaiian or other Pacific Islander
 - White
 - More than one race
7. Marital status (check one box):
 - Never married
 - Currently married
 - Separated
 - Divorced
 - Widowed

8. Current living arrangement (check one box):

- Live alone
- Live with spouse/partner
- Live with spouse/partner and children
- Live with children (no spouse/partner)
- Live with roommate(s) who is not your partner
- Live with parents
- Other

9. What year of college are you currently in (check one box):

- First year
- Second year
- Third year
- Fourth year
- Fifth year, or beyond

1. Have you ever been told by a doctor that you had any form of skin cancer, including basal cell carcinoma or melanoma? (Check one box)

No

Yes

If yes, please indicate the year that this occurred, and the type of cancer

_____.

2. Has anyone in your immediate family ever been diagnosed with any form of skin cancer, including basal cell carcinoma or melanoma? (Check one box)

No

Yes

If yes, please indicate who:

Mother

Father

Brother

If yes, how many brothers? _____

Sister

If yes, how many sisters? _____

Son

If yes, how many sons? _____

Daughter

If yes, how many daughters? _____

3. If you were to lie in the sun for one hour UNPROTECTED (no sunscreen, protective clothing, etc.) in the early summer, when you had NO tan, your skin would: (Check one box)

- Always burn, never tan
- Always burn, tan less than average (with difficulty)
- Sometimes mild burn, tan about average
- Rarely burn, tan more than average (with ease)
- Rarely burn, always tan
- Never burn, grow deeply darker in pigmentation

4. What is the color of your untanned skin? (Check one box)

- Fair
- Medium
- Dark

Appendix E: Eating Behaviors

These next questions are about the foods you usually eat or drink. Please tell us how often you eat or drink each one. Include all foods you eat, both at home and away from home.

1. How often do you drink fruit juices, such as orange, grapefruit, or tomato?

<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
Never	1-3 times per month	1-2 times per week	3-4 times per week	5-6 times per week	1 time per day	2 times per day	3 times per day	4 times per day	5 or more times per day

2. Not counting juice, how often do you eat fruit?

<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
Never	1-3 times per month	1-2 times per week	3-4 times per week	5-6 times per week	1 time per day	2 times per day	3 times per day	4 times per day	5 or more times per day

3. How often do you eat green salad?

<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
Never	1-3 times per month	1-2 times per week	3-4 times per week	5-6 times per week	1 time per day	2 times per day	3 times per day	4 times per day	5 or more times per day

4. How often do you eat potatoes, not including French fries, fried potatoes, or potato chips?

<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
Never	1-3 times per month	1-2 times per week	3-4 times per week	5-6 times per week	1 time per day	2 times per day	3 times per day	4 times per day	5 or more times per day

5. How often do you eat carrots?

- | | | | | | | | | | |
|--------------------------|------------------------------|-----------------------------|-----------------------------|-----------------------------|--------------------------|--------------------------|--------------------------|--------------------------|-------------------------------------|
| <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> |
| Never | 1-3
times
per
month | 1-2
times
per
week | 3-4
times
per
week | 5-6
times
per
week | 1 time
per
day | 2
times
per
day | 3
times
per
day | 4
times
per
day | 5 or
more
times
per
day |

6. Not counting carrots, potatoes, or salad, how many servings of vegetables do you usually eat? (Example: A serving of vegetables at both lunch and dinner would be two servings)

- | | | | | | | | | | |
|--------------------------|------------------------------|-----------------------------|-----------------------------|-----------------------------|--------------------------|--------------------------|--------------------------|--------------------------|-------------------------------------|
| <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> |
| Never | 1-3
times
per
month | 1-2
times
per
week | 3-4
times
per
week | 5-6
times
per
week | 1 time
per
day | 2
times
per
day | 3
times
per
day | 4
times
per
day | 5 or
more
times
per
day |

Appendix F: Tanning Behaviors

1. Have you ever indoor tanned (e.g., used a sun lamp, sun bed, or tanning booth)?
 Yes
 No
2. Have you ever sunbathed (e.g., spent time in the sun deliberately trying to get a tan)?
 Yes
 No
3. Please give your best estimate of how many times you have indoor tanned (e.g., used a sun lamp, sun bed, or tanning booth) in the last **1 month**: times
4. Please give your best estimate of how many times you have indoor tanned (e.g., used a sun lamp, sun bed, or tanning booth) in the last **12 months**:
 I never indoor tanned in the last 12 months
 Less than once a month
 About once a month
 2-3 times per month
 1-2 times per week
 3-4 times per week
 Nearly every day

5. Please give your best estimate of how many times you have sunbathed (i.e., spent time in the sun deliberately trying to get a tan) in the last **1 month**: times
6. On average, how many hours did you spend each time you sunbathed in the last **1 month**: hours
7. Please give your best estimate of how many times you sunbathed (i.e., spent time in the sun deliberately trying to get a tan) in the last **12 months**:
- I never sunbathed in the last 12 months
 - Less than once a month
 - About once a month
 - 2-3 times per month
 - 1-2 times per week
 - 3-4 times per week
 - Nearly every day
8. Please give your best estimate of how many times you have used sunless tanning products (e.g., lotion, spray) in the **last 1 month**: times
9. Please give your best estimate of how many times you have used sunless tanning products (e.g., lotion, spray) in the **last 12 months**:
- I never used sunless tanning products (e.g., lotion, spray) in the last 12 months
 - Less than once a month
 - About once a month
 - 2-3 times per month
 - 1-2 times per week
 - 3-4 times per week
 - Nearly every day

10. How regularly did you use sunscreen with an SPF of at least 15 on your **face** when tanning in the **last 1 month**? (check one box)

- Never
- Rarely
- Sometimes
- Often
- Always

11. How regularly did you use sunscreen with an SPF of at least 15 on your **body** when tanning in the **last 1 month**? (check one box)

- Never
- Rarely
- Sometimes
- Often
- Always

Appendix G: Exercise Behaviors

Please report the frequency and average duration of any exercise **over the past week** in the spaces below. As an example: If you exercised four times last week at a moderate intensity you would put “4” in the frequency column following moderate exercise. We would like you to also give an estimate of the average time spent exercising. In our example, if two of those “4” exercise sessions were 30 minutes each and the other two were 20 minutes each, you would put 25 minutes in the average duration column following moderate exercise.

When answering these questions, please remember to:

- Only count exercise that was done in your free time (i.e., not occupational or housework).
- Note that the differences between the three categories is in the intensity of the exercise.
- If you did not engage in a type of exercise, write "0" in the frequency column.

1. STRENUOUS EXERCISE (HEARTS BEATS RAPIDLY, SWEATING)

Examples: running, jogging, vigorous swimming, vigorous long distance bicycling, vigorous aerobic dance classes.

Frequency: (number of times in the last week)

Duration: (average number of minutes spent in last week)

2. MODERATE EXERCISE (NOT EXHAUSTING, LIGHT PERSPIRATION)

Examples: fast walking, tennis, easy bicycling, easy swimming, popular and folk dancing

Frequency: (number of times in the last week)

Duration: (average number of minutes spent in last week)

3. MILD EXERCISE (MINIMAL EFFORT, NO PERSPIRATION)

Examples: easy walking, yoga, bowling, shuffleboard, horseshoes, golf

Frequency: (number of times in the last week)

Duration: (average number of minutes spent in last week)

Appendix H: Eating Intentions

These next questions are about the foods you **intend to eat or drink in the next month**. Please tell us how often you intend to eat or drink each one. Include all foods you intend to eat, both at home and away from home.

1. How often do you intend to drink fruit juices, such as orange, grapefruit, or tomato in the **next month**?

<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
Never	1-3 times per month	1-2 times per week	3-4 times per week	5-6 times per week	1 time per day	2 times per day	3 times per day	4 times per day	5 or more times per day

2. Not counting juice, how often do you intend to eat fruit in the **next month**?

<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
Never	1-3 times per month	1-2 times per week	3-4 times per week	5-6 times per week	1 time per day	2 times per day	3 times per day	4 times per day	5 or more times per day

3. How often do you intend to eat green salad in the **next month**?

<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
Never	1-3 times per month	1-2 times per week	3-4 times per week	5-6 times per week	1 time per day	2 times per day	3 times per day	4 times per day	5 or more times per day

4. How often do you intend to eat potatoes, not including French fries, fried potatoes, or potato chips in the **next month**?

<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
Never	1-3 times per month	1-2 times per week	3-4 times per week	5-6 times per week	1 time per day	2 times per day	3 times per day	4 times per day	5 or more times per day

5. How often do you intend to eat carrots in the **next month**?

- | | | | | | | | | | |
|--------------------------|-------------------------------------|------------------------------------|------------------------------------|------------------------------------|-----------------------------|------------------------------|---------------------------------|------------------------------|--|
| <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> |
| Never | 1-3
times
per
month | 1-2
times
per
week | 3-4
times
per
week | 5-6
times
per
week | 1 time
per
day | 2 times
per
day | 3
times
per
day | 4 times
per
day | 5 or
more
times
per
day |

6. Not counting carrots, potatoes, or salad, how many servings of vegetables do you intend to eat in the **next month**? (Example: A serving of vegetables at both lunch and dinner would be two servings)

- | | | | | | | | | | |
|--------------------------|-------------------------------------|------------------------------------|------------------------------------|------------------------------------|-----------------------------|---------------------------------|---------------------------------|---------------------------------|--|
| <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> |
| Never | 1-3
times
per
month | 1-2
times
per
week | 3-4
times
per
week | 5-6
times
per
week | 1 time
per
day | 2
times
per
day | 3
times
per
day | 4
times
per
day | 5 or
more
times
per
day |

Appendix I: Tanning Intentions

1. Please give your best estimate of how many times you **intend** to indoor tan (e.g., use a sun lamp, sun bed, or tanning booth) in the **next 1 month**: times

2. Please give your best estimate of how many times you **intend** to sunbathe (i.e., spend time in the sun deliberately trying to get a tan) in the **next 1 month**: times

3. Please give an estimate of the average number of hours you **intend** to spend each time you sunbathe (i.e., spend time in the sun deliberately trying to get a tan) in the **next 1 month**: hours

4. How likely are you to indoor tan (e.g., use a sun lamp, sun bed, or tanning booth) in the **next 1 month**? (circle one number)

1	2	3	4	5	6
Extremely unlikely	Very unlikely	Somewhat unlikely	Somewhat likely	Very likely	Extremely likely

5. How likely are you to sunbathe (i.e., spend time in the sun deliberately trying to get a tan) in the **next 1 month**? (circle one number)

1	2	3	4	5	6
Extremely unlikely	Very unlikely	Somewhat unlikely	Somewhat likely	Very likely	Extremely likely

6. Please give your best estimate of how many times you **intend** to indoor tan (e.g., use a sun lamp, sun bed, or tanning booth) in the **next 12 months**:

- I intend to never indoor tan in the next 12 months
- Less than once a month
- About once a month
- 2-3 times per month
- 1-2 times per week
- 3-4 times per week
- Nearly every day

7. Please give your best estimate of how many times you **intend** to sunbathe (i.e., spend time in the sun deliberately trying to get a tan) in the **next 12 months**:

- I intend to never sunbathe in the next 12 months
- Less than once a month
- About once a month
- 2-3 times per month
- 1-2 times per week
- 3-4 times per week
- Nearly every day

8. Please give your best estimate of how many times you **intend** to use sunless tanning products (e.g., lotion, spray) in the **next 1 month**: times

9. How likely are you to use sunless tanning products (e.g., lotion, spray) in the **next 1 month**? (circle one number)

1	2	3	4	5	6
Extremely unlikely	Very unlikely	Somewhat unlikely	Somewhat likely	Very likely	Extremely likely

10. Please give your best estimate of how many times you **intend** to use sunless tanning products (e.g., lotion, spray) in the **next 12 months**:

- I intend to never use sunless tanning products in the next 12 months
- Less than once a month
- About once a month
- 2-3 times per month
- 1-2 times per week
- 3-4 times per week
- Nearly every day

11. How regularly do you **intend** to use sunscreen with an SPF of at least 15 on your **face** when tanning in the **next month**? (check one box)

- Never
- Rarely
- Sometimes
- Often
- Always

12. How regularly do you **intend** to use sunscreen with an SPF of at least 15 on your **face** when tanning in the **next 12 months**? (check one box)

- Never
- Rarely
- Sometimes
- Often
- Always

13. How regularly do you **intend** to use sunscreen with an SPF of at least 15 on your **body** when tanning in the **next month**? (check one box)

- Never
- Rarely
- Sometimes
- Often
- Always

14. How regularly do you **intend** to use sunscreen with an SPF of at least 15 on your **body** when tanning in the **next 12 months**? (check one box)

- Never
- Rarely
- Sometimes
- Often
- Always

Appendix J: Exercise Intentions

Please report the frequency of any exercise **you intend to do in the next month** in the spaces below. As an example: If you plan to exercise at a moderate intensity 15 times in the **next one month**, you would put "15" in the frequency column following moderate exercise.

When answering these questions, please remember to:

- Only count exercise that will be done in your free time (i.e., not occupational or housework).
- Note that the differences between the three categories is in the intensity of the exercise.
- If you do not plan to engage in a type of exercise, write "0" in the frequency column.

1. STRENUOUS EXERCISE (HEART BEATS RAPIDLY, SWEATING)

Examples: running, jogging, vigorous swimming, vigorous long distance bicycling, vigorous aerobic dance classes.

Frequency:

(number of times in the **next month**)

2. MODERATE EXERCISE (NOT EXHAUSTING, LIGHT PERSPIRATION)

Examples: fast walking, tennis, easy bicycling, easy swimming, popular and folk dancing

Frequency:

(number of times in the **next month**)

3. MILD EXERCISE (MINIMAL EFFORT, NO PERSPIRATION)

Examples: easy walking, yoga, bowling, shuffleboard, horseshoes, golf

Frequency:

(number of times in the **next month**)

Appendix K: Beliefs of Tanning Questionnaire

Please check the appropriate box to indicate the level to which you agree or disagree with each statement below. Be sure to answer each question and to check only one box for each statement.

		Definitely disagree	Somewhat disagree	Neither agree nor disagree	Somewhat agree	Definitely agree
1.	I believe that having a tan gives me more sex appeal	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
2.	I believe that a tanned complexion makes me more attractive	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
3.	I believe that a tanned complexion makes me look better	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
4.	I believe a tanned complexion adds a nice glow to my appearance	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
5.	I believe a tanned complexion makes my acne less noticeable	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
6.	I believe a tan helps reduce the amount of acne on my face and body	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
7.	I believe that a tanned complexion helps cover up acne-related scars	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>

8. I believe a tanned complexion makes me look like I have less fat on my body
9. I believe that a tanned complexion makes me look more physically fit
10. I believe that a tanned complexion makes me look like I have more muscle tone
11. I believe that I look slimmer with a tan
12. I believe that a tanned complexion conceals my appearance of stretch marks

Appendix L: Beliefs of Eating/Exercise Questionnaire

Please check the appropriate box to indicate the level to which you agree or disagree with each statement below. Be sure to answer each question and to check only one box for each statement.

	Definitely disagree	Somewhat disagree	Neither agree nor disagree	Somewhat agree	Definitely agree
1. I believe that exercising gives me more sex appeal	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
2. I believe that exercising makes me more attractive	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
3. I believe that eating healthy makes me look better	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
4. I believe that exercising adds a nice glow to my appearance	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
5. I believe that eating healthy makes my acne less noticeable	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>

6. I believe that eating healthy helps reduce the amount of acne on my face and body
7. I believe eating healthy makes me look like I have less fat on my body
8. I believe that exercising makes me look more physically fit
9. I believe that exercising makes me look like I have more muscle tone
10. I believe that eating healthy makes me look slimmer
11. I believe that exercising conceals my appearance of stretch marks

Appendix M: Dissonance Thermometer

Instructions: Below are words that can describe different types of feelings. For each word, please indicate how much it describes *how you are feeling right now* by circling a number on the scale. "1" means "does not apply at all" and "7" means "applies very much" to how you are feeling *right now*. Don't spend much time thinking about each word. Just give a quick, gut-level response.

	Does not apply at all						Applies very much
1. Uncomfortable	1	2	3	4	5	6	7
2. Angry at myself	1	2	3	4	5	6	7
3. Shame	1	2	3	4	5	6	7
4. Uneasy	1	2	3	4	5	6	7
5. Friendly	1	2	3	4	5	6	7
6. Disgusted with myself	1	2	3	4	5	6	7
7. Embarrassed	1	2	3	4	5	6	7
8. Bothered	1	2	3	4	5	6	7
9. Optimistic	1	2	3	4	5	6	7
10. Annoyed at myself	1	2	3	4	5	6	7
11. Disappointed with myself	1	2	3	4	5	6	7
12. Happy	1	2	3	4	5	6	7
13. Energetic	1	2	3	4	5	6	7
14. Good	1	2	3	4	5	6	7

About The Author

Sari R. Chait grew up in South Florida and earned a B.A. in Psychology from New York University in 2002. She will earn her Ph.D. in Clinical Psychology in 2010 at the University of South Florida, where she studied under the mentorship of Paul B. Jacobsen, Ph.D. Sari completed her clinical psychology internship training at the VA Connecticut Healthcare System, in West Haven, Connecticut, with a focus on Health Psychology. She is continuing her training as a postdoctoral fellow in the Health Psychology department at the VA in West Haven. Sari is an author on several peer-reviewed articles and conference presentations in the area of health psychology.