

## **Longitudinal Examination of Tobacco Messaging and Communication in U.S. Military Young Adults**

Kinsey Pebley, MA,<sup>1</sup> Margaret C. Fahey, MA,<sup>1</sup> Xin-Qun Wang, MS,<sup>2</sup> Christi Patten, PhD,<sup>3</sup> G. Wayne Talcott, PhD,<sup>2,4</sup> Robert C. Klesges, PhD,<sup>2</sup> Melissa A. Little, PhD, MPH<sup>2</sup>

<sup>1</sup>The University of Memphis, Department of Psychology, Memphis, TN

<sup>2</sup>University of Virginia, School of Medicine Department of Public Health Sciences, Charlottesville, VA

<sup>3</sup>Department of Internal Medicine, Mayo Clinic, 200 1st St SW, Rochester, MN 55905, USA

<sup>4</sup>Wilford Hall Ambulatory Surgical Center, Joint Base San Antonio-Lackland AFB, TX

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Corresponding Author:  
Melissa A. Little, PhD, MPH  
mal7uj@virginia.edu  
560 Ray C. Hunt Dr.  
Charlottesville, VA, USA, 22903

## **Abstract**

Tobacco use is still the leading cause of preventable death in the United States, and there has been a history of targeting racial minorities with tobacco advertisements and promotions. However, there have not been many recent studies assessing racial and ethnic disparities related to tobacco messages and subsequent tobacco use. This is important given the rising prevalence of e-cigarettes, which have greatly changed the tobacco landscape. Additionally, social media has become much more prominent in recent years, adding another platform for tobacco-related messages. The current study aimed to determine racial and ethnic differences in perceived exposure to positive tobacco-related messages and subsequent engagement in tobacco use. Participants were 2,249 recruits in the U.S. Air Force completed baseline and follow-up surveys related to their tobacco use and exposure to tobacco content on different social (i.e., friends, family, social media) and environmental (i.e., tobacco advertisements and promotions) tobacco messages. Results indicated that Among racial minorities, those exposed to tobacco advertising/promotions were more likely to report tobacco use at 1-year follow-up compared to racial minorities who were not exposed to these environmental messages, while, among White individuals, there was no statistical difference in reporting tobacco product use at one-year follow-up between those exposed and not exposed to environmental messages. Among individuals who were not exposed to environmental messaging, White individuals were more likely than minorities to report tobacco use at 1-year follow-up. These results indicate continuing disparities related to tobacco promotions and advertisements that impact tobacco use behaviors, indicating a need for policies aimed at tobacco companies to inhibit their reach.

**Key words: Tobacco, nicotine, disparities, tobacco messages, social media, tobacco advertisements**

## **Introduction**

Despite drastic declines in cigarette use in the United States (U.S.), smoking continues to be the leading cause of preventable disease and death (U.S. Department of Health & Human Services [USDHHS], 2014). However, the tobacco landscape is changing with the rising popularity of electronic cigarette (e-cigarettes) among youth (Fadus et al., 2019; Creamer et al., 2019) and declining rates of cigarettes (Creamer et al., 2019). Currently, about 17% of U.S. young adults use tobacco, with the use of e-cigarettes almost as common (7.6%) as cigarettes (7.8%; Creamer et al., 2019). This is concerning, given reports from the Centers for Disease Control and Prevention (CDC) in the last year warning of e-cigarette and vaping associated lung injury (EVALI), which has resulted in otherwise healthy individuals being hospitalized or has caused death (CDC, 2019; Werner et al., 2020).

Notably, the U.S. military uses tobacco almost twice as commonly as civilians (Aguka et al., 2014; Creamer, 2019; Department of Defense [DoD], 2013; Little et al., 2015; Little et al., 2016; Little et al., in press). A recent study among Air Force personnel found 5.9% of Airmen use cigarettes, 4.5% use smokeless tobacco, and 2.2% use hookah, while 15.3% use electronic cigarettes (Little et al., under review), compared to the general population with 14.0% using cigarettes, 2.1% using smokeless tobacco, 1.0% using hookah, and 2.8% using e-cigarettes (Wang et al., 2017). Much research has been conducted examining the long history of tobacco companies promoting a tobacco culture within the military through targeted ads, discounts, and promotional events on base (Smith & Malone, 2009a; Smith & Malone, 2009b; Talcott et al., 2015). However, less is known about exposure to tobacco-related messages prior to military service when individuals are still in the civilian world, and how this contributes to future tobacco use behaviors.

### ***Tobacco-Related Messaging***

In the general population, it is well documented that pro-tobacco communication and messaging is related to initiation among adolescents and young adults (Charlesworth & Glantz, 2005; Depue et al., 2015; Henriksen et al., 2010; Lovato et al., 2011; Soneji et al., 2018; Wakefield et al., 2003). Traditional mediums for tobacco exposure include advertisements (e.g., television, retail point-of-sale; Henriksen et al., 2010; Wakefield et al., 2003) and media portrayal (e.g., movies, television; Charlesworth & Glantz, 2005). Yet, in recent years, adolescents and young adults have been widely exposed to online tobacco advertisements, particularly for e-cigarettes (Collins et al., 2019; Dai & Hao, 2016; Payne et al., 2016), which has been associated with tobacco use (Dai & Hao, 2016; Unger & Bartsch, 2018). Since 1999, combustible tobacco products have been strictly regulated by the U.S. government (Collins et al., 2019; National Association of Attorneys General, 1998). However, e-cigarette advertisements, which are increasing in prevalence (Collins et al., 2019; Dai & Hao, 2016; Payne et al., 2016) and often target youth by promoting discounts and social acceptability (Collins et al., 2019; Duke, 2014; Payne et al., 2016; Richardson et al., 2014), are largely unregulated by the FDA (Collins et al., 2019; USFDA, 2020). Further, online e-cigarette advertisements (i.e., JUUL) continue to target military populations by offering military discounts and using military testimonials (Fahey et al., in press).

In addition to online advertisements, tobacco communication has increased through social media platforms (e.g., Facebook, Instagram, Twitter) and is associated with tobacco use (Collins et al., 2019; Pokhrel et al., 2018). This is not surprising, given that youth are heavily influenced by social relationships (e.g., family, friends) in their tobacco use (Amin et al., 2019; Liu et al., 2017; Hall et al., 2016). However, social media offers a unique medium in which

youth can observe pro-tobacco behaviors, disseminate tobacco advertisements, and even generate their own pro-tobacco content (Depue, 2015; Hebert et al., 2017; Huang et al., 2014; Kim et al., 2015; Payne et al., 2016; Pokhrel et al., 2016; Pokhrel et al., 2018; Soneji et al., 2018). In fact, one study found that tobacco exposure via social media influenced future smoking more than exposure through television or movies (Depue et al., 2015). Given the changing landscape of tobacco products (Creamer et al., 2019; Fadus et al., 2019) and mediums for tobacco communication and messaging (Collins et al., 2019; Depue et al., 2015; Hebert et al., 2017; Huang et al., 2015; Kim et al., 2015; Payne et al., 2016; Pokhrel et al., 2016; Pokhrel et al., 2018; Soneji et al., 2018), it will be important to continuously examine tobacco exposure in relation to long-term use among vulnerable groups.

### ***Tobacco-Related Messaging and Diversity***

Military recruits are typically young adults (aged 18 to 21 years), which is a high-risk age group for tobacco initiation (USDHHS, 2016; Smith & Malone, 2009b) and e-cigarette use (Creamer et al., 2019; Fadus et al., 2019). Additionally, individuals who join the military represent a diverse group, with 16.4% of enlisted Air Force personnel identifying as Black, 4.2% identifying as multiracial, 3.4% identifying as Asian, and 2.0% identifying as Native American or Pacific Islander, and 19.0% identifying as female (DoD, 2016). To put this in perspective given the size of the military, there are approximately 41,332 Black enlisted Air Force members. The diversity of the military is important when considering tobacco use behaviors, as tobacco companies have historically targeted racial minorities. The number of tobacco advertisements are significantly higher in neighborhoods with larger populations of racial minorities (Barbeau et al., 2005). One study employing ecological momentary assessment methodology found that Black smokers reported high rates of advertisement exposure, particularly related to menthol cigarettes.

Exposure to more advertisements was subsequently associated with increased likelihood of purchasing cigarettes, making an impulse cigarette purchase, and smoking more cigarettes (Robinson et al., 2018).

### ***The Current Study***

The current study examined exposure to tobacco content across all products (i.e., cigarettes, e-cigarettes, snus, cigarillos/little cigars, hookah) and through a variety of mediums (i.e., family, friends, advertisements, event promotions, social media) in a U.S. Air Force sample largely comprised of young adults, and how their exposure to tobacco content was related to their smoking behaviors over time. It is important to note that the current study assessed Airmen's exposure to tobacco messaging prior to their service, when they were still civilians, and that they experience an enforced tobacco ban during the eight weeks of Basic Military Training (BMT) and during the first four weeks of Technical Training immediately following BMT, which is the training to learn the specific skills related to their jobs. This means that Airmen in the current study underwent an enforced smoking ban for a total of 12 weeks. We hypothesized that tobacco message exposure prior to enlistment would be related to tobacco product use at one-year follow-up, long after the enforced tobacco abstinence was lifted, among new recruits in the U.S. Air Force.

## **Methods**

### ***Participants and Procedures***

Procedures were approved by the 59<sup>th</sup> Medical Wing's DoD Institutional Review Board. Participants were U.S. Airmen attending Technical Training at five different Air Force bases between March, 2011 and March, 2015. Airmen were provided information about the study and allowed to ask questions in groups of approximately 50, and were provided informed consent

documents with study information. Study information was presented to 27,544 Airmen and they were subsequently allowed to ask questions about participation. Consent and HIPPA forms were signed in accordance with 59<sup>th</sup> Medical Wing Institutional Review Boards requirements.

Approximately 78.6% of Airmen consented to participate and completed the baseline questionnaire ( $N = 21,650$ ). Ninety-four (0.3%) were ineligible due to being 17 years of age, and 5,800 (21.1%) declined participation. At the time of baseline survey completion, Airmen were not permitted to use tobacco products as part of their restrictions while attending Technical Training.

One-year follow-ups were completed among active duty Airmen via telephone. At this time, the tobacco ban was no longer in place. Approximately 2,226 individuals from the baseline sample were non-active duty Airmen (i.e., National Guard, Reserves), and thus were not contacted at one-year follow-up. Of the 19,424 active duty Airmen, we used random selection in order to achieve a 25% follow-up rate. We assumed that 25% would be ineligible due to being overseas, separated, or incarcerated. Additionally, we assumed around 15% would be ineligible or terminated due to other reasons (e.g., deployed, switched service branches, deceased). Airmen were stratified by base (i.e., Lackland Air Force Base, Keesler Air Force Base and Sheppard Air Force Base).

Among the 19,424 (89.7%) participants eligible for the one-year follow-up, 8,022 (41.3%) were randomly selected. A list of selected participants was sent to the Defense Manpower Data Center (DMDC). The DMDC maintains the largest archive of personnel, manpower, training, and financial data in the DoD. DMDC returned the list with participants' contact information. Of the 8,022 eligible active duty Airmen who were randomly selected for one-year follow up, 1,380 participants were either ineligible ( $N = 995$ , 12.4%), terminated ( $N = 365$ , 4.5%), or withdrew

from the study ( $N = 20$ , 0.2%). Airmen were ineligible for follow-up if they were stationed overseas ( $N = 703$ , 50.9%), deployed ( $N = 286$ , 20.7%), switched to a different branch of the military ( $N = 4$ , 0.3%), or other ( $N = 2$ , 0.2%). Airmen were also excluded if they had separated from the Air Force ( $N = 359$ , 26.0%), were deceased ( $N = 4$ , 0.3%), or were incarcerated ( $N = 2$ , 0.1%). The one-year assessment was completed by 4,596 (69.2%) of selected Airmen. The current study used a subsample of participants who completed version two of the survey that asked about use of different types of tobacco products (e.g., cigarettes, smokeless tobacco, cigars, hookah, etc.) and tobacco messages, for a final sample size of 2,449.

### ***Measures***

Participants were asked questions related to demographic information (e.g., sex, race, education, marital status), their use of tobacco products prior to BMT and after Technical Training, and experiences with tobacco-related messages. At baseline, participants were asked “Prior to BMT, please indicate how often you used the following products” with answer options of *never*, *quit prior to BMT*, *less than monthly*, *monthly*, *weekly*, and *daily*. Product options included cigarettes, smokeless tobacco, snus, premium cigars, cigarillos/little cigars, pipe, e-cigarettes, roll your own cigarettes, hookah, or other. Participants were also asked to report their tobacco use over the previous 12 months at follow-up. Response options included *never*, *less than monthly*, *monthly*, *weekly*, and *daily*.

At baseline, participants were also asked “Prior to BMT, have you heard positive tobacco messages (in favor of) or reports of positive experiences with tobacco from...” with options to select *friends*, *family*, *tobacco advertising* (e.g., at stores, ads in magazines), *tobacco promotion* (e.g., at a bar or club), or social media (e.g., Facebook, Twitter). Messages from family, friends

and *social media* were considered to be social sources, while tobacco advertising and promotion were considered to be environmental sources of messages.

### ***Data Analysis***

We used multinomial logistic regression models to assess how race and tobacco messaging exposure at baseline influenced tobacco use at one-year follow-up. First, we tested each individual source of tobacco messaging and their association with tobacco use at one-year follow-up. Next, we tested models combining social tobacco messaging exposure (i.e., friends, family, and social media) and environmental messaging (i.e., advertisements, promotions) exposure at baseline in relation to tobacco use at one-year follow-up. We assessed main effects of participants' race (defined as racial minorities [non-White] vs. non-minorities [White]) and tobacco messaging sources, as well as potential two-way interaction effects between participants' racial minority status and tobacco messaging source, on use of tobacco products at one-year follow-up. The models were also adjusted for participants' age, education, marital status, and tobacco product use before BMT (i.e., any use of tobacco products, never use/quit before BMT, and other). Because eligible participants were randomly selected within each squadron across bases, the model was also adjusted for the sample design which included both stratification and clustering where the strata were the bases and clusters were squadrons, and the sampling weights due to different selection probabilities for the different bases. The overall ability of the multinomial logistic regression model to discriminate between three tobacco use categories was quantified by estimating nonparametric polytomous discrimination index and bootstrapped 95% confidence interval (Li et al., 2018; Van Calster et al., 2012), and pairwise C-statistics (Hand and Till, 2001) between each categories can be calculated to find out which categories can be well

discriminated. The significance level was specified at 0.05. All analyses were performed in SASv9.4 (Cary, NC, USA) and R3.6.0 (The R Foundation for Statistical Computing).

## **Results**

### ***Demographic Characteristics***

Participant characteristics are displayed in Table 1.*[Table 1 near here]*. Participants were 78.6% male, 69.1% White, 12.7% Black, 3.5% Asian, and 14.7% were another race or more than one race. Approximately 15.8% of the sample reported that they were Hispanic. Most participants were single, separated, or divorced (87.7%), 53.3% had a high school diploma or GED, and 40.3% had at least some education after high school.

### ***Tobacco Messaging and Tobacco Use at One-Year Follow-Up***

Tobacco messaging, in the overall sample, was received from friends most commonly (22.3%), followed by advertisements (21.9%), social media (17.1%), promotions (14.5%), and family members (7.5%). Participants who initiated/reinitiated tobacco product use at one-year follow-up were significantly more likely to have been exposed to tobacco product advertisements or promotions at baseline ( $OR = 1.18$ , 95% confidence interval [CI]: [1.01, 1.37]).

When assessing the association between race and individual messaging sources, results were non-significant ( $p > .05$ ). From the final multivariable multinomial logistic regression models, there were significant main effects when assessing minority status and exposure to environmental messaging ( $p = 0.029$ ) and no exposure to environmental messaging ( $p = 0.003$ ). Additionally, there was a significant two-way interaction effect between minority status and environmental messaging ( $p = 0.001$ ). However, we did not detect main effects or interaction effects between racial minority status and social messaging ( $p > 0.05$ ).

Significant two-way interaction effects between minority status and environmental messaging indicates that racial minorities and White individuals were differentially influenced by these tobacco advertisements and promotions. Among racial minorities, those exposed to tobacco advertising/promotions were 1.5 times more likely to report tobacco use at 1-year follow-up compared to racial minorities who were not exposed to these environmental messages ( $OR = 1.5$ , 95%  $CI$ : [1.1, 2.2],  $p = 0.025$ , see Table 2). [Table 2 near here]. In contrast, among Whites, there was no statistical difference in reporting tobacco product use at one-year follow-up between those exposed and not exposed to tobacco advertising/promotion ( $p > 0.05$ ). Among individuals who were not exposed to environmental messaging, White individuals were almost 1.3 times more likely than minorities to report tobacco use at 1-year follow-up ( $OR = 1.3$ , 95%  $CI$ : [1.1-1.7],  $p = 0.015$ ). However, among those who were exposed to environmental messages, there was no statistically significant difference between racial minorities and White individuals in reporting tobacco use at one-year follow-up ( $p > 0.05$ ).

## **Discussion**

The current study assessed if exposure to tobacco-related messages was associated with tobacco product use after a period of enforced abstinence. It is important to note that during this enforced ban, Airmen have not been exposed to tobacco advertising or promotions for the past 8.5 weeks of Basic Military Training, where the environment is restricted and Airmen are not able to venture off base or even go on the Internet. Thus, their exposure to tobacco-related content occurred prior to their military service.

When observing the prevalence of types of tobacco messaging exposure in this population, friends were the most common source, followed by advertisements, social media, promotions, and family. When examining these sources individually, there was not a relationship

between tobacco messaging exposure and tobacco use at the one-year follow-up. Further, despite the prevalence of these social mediums, tobacco messaging from friends, family, and social media, considered together, did not have a significant effect on tobacco use behaviors. This is contrary to previous studies that have found that friends, family, and social media heavily influence youth tobacco use (Amin et al., 2019; Depue et al., 2015; Liu et al., 2017; Hall et al., 2016). However, environmental exposure (i.e., tobacco advertisements, tobacco promotions) was associated with long-term tobacco use. Previously, high rates of tobacco use among military personnel have been credited to targeting by tobacco companies through promotions and advertisements on and off base (Smith, 2009a; Smith, 2009b ). However, the exposure examined in the current study occurred prior to military service when these individuals were still civilians, meaning that civilian exposure may also play an important role in future tobacco use.

Racial minorities exposed to tobacco advertising or promotions before enlisting in the military were significantly more likely to use tobacco at one year follow-up compared to racial minority individuals who were not exposed to advertisements or promotions, while there was no such effect among White individuals. Stated another way, increased visibility of promotions and advertisements among racial minorities seems to have a more influential effect compared to White individuals. This highlights the importance of the history of targeting by tobacco companies among minority groups, as targeting and ensuring visibility among racial minorities seems to increase their likelihood of tobacco use. This is consistent with previous studies that found that advertisement exposure among Black participants was associated with increased cigarette purchases and cigarette use (Robinson et al., 2018). It may be the case that the tobacco advertisements and promotions are the tipping point for racial minority individuals, where exposure to these mediums influences tobacco use.

Surprisingly, among individuals who were exposed to tobacco advertisements and promotions (excluding individuals not exposed to tobacco advertisements/promotions), White individuals were more likely to initiate or reinstate tobacco use at one-year follow-up. However, the current sample was comprised of young adults. Past studies have shown that Black individuals are more likely to start smoking at a later age compared to White individuals (Gardiner, 2001; Trinidad et al., 2004), which may have resulted in White individuals being more likely to use tobacco among all individuals exposed to advertising.

The influential impact of advertisements and promotions on tobacco use in this population suggest the heavy influence, and potentially devastating effects, of tobacco exposure through advertisements and promotions on young adults, particularly racial minorities. Given that these advertisements and promotions were seen prior to military service, it is clear that there is much work to do in the civilian world in order to reduce risk, particularly among racial minorities. There are policies that could help reduce exposure among Airmen after they enlist given that tobacco initiation and re-initiation is high (Little reference), such as policies that limit tobacco product advertisements on military bases or those directly targeting military populations with discounts and testimonials (Fahey et al., 2020). However, more stringent policies regarding advertisements and promotions within community settings may have a huge impact on future smoking behaviors of military personnel, and possibly civilians in general, especially among those in lower SES neighborhoods.

### ***Strengths and Limitations***

Strengths of the current study are that it used a large, diverse sample of Airmen and asked about several different sources of tobacco-related messages. One limitation of the study is that we do not know the specifics about the messaging sources (e.g., which social media site they

visited when they saw tobacco content, how or what kind of tobacco promotions they received, duration of exposure, etc.). Future studies examining factors such as timing, location, site, etc. and the impact on future tobacco use behaviors may be beneficial.

### ***Conclusions***

The current study found that exposure to tobacco-related messages from advertisements and promotions was associated with tobacco use after an enforced tobacco ban. Specifically, racial minorities are more at-risk for being influenced to initiate or reinstate tobacco use after exposure to tobacco promotions or advertisements. Future research would benefit from further examining the relationship between specific sources of tobacco-related messages and use, and what about these messages is so influential.

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Table 1: *Descriptive statistics of Air Force Trainees' demographic and baseline information by Any Tobacco Products Use at One-year Follow-up (N=2449)*

Variable at Baseline	Tobacco Products Use at One-year Follow-up		
	Nonuse/Quit (n=1203)	Initiated/Reinitiated (n=1085)	Other (n=161)
Age (n=2449)	20.6 (19.0, 20.0, 22.0)	20.3 (18.0, 19.0, 21.0)	20.9 (19.0, 20.0, 22.0)
Gender (n=2446): Male	923 (76.85%)	896 (82.66%)	106 (65.84%)
Female	278 (23.15%)	188 (17.34%)	55 (34.16%)
Race (n=2444): White	809 (67.47%)	773 (71.24%)	106 (66.25%)
Black/African American	179 (14.93%)	112 (10.32%)	20 (12.50%)
Asian	48 (4.00%)	27 (2.49%)	11 (6.88%)
More Than One Race	85 (7.09%)	84 (7.74%)	13 (8.13%)
Other Race	78 (6.51%)	89 (8.21%)	10 (6.26%)
Hispanic (n=2396): Yes	176 (14.89%)	170 (16.04%)	32 (20.78%)
No	1006 (85.11%)	890 (83.96%)	122 (79.22%)
Education (n=2432): Bachelor's Degree or Higher	77 (6.44%)	64 (5.94%)	15 (9.43%)
High School Graduate/GED	616 (51.55%)	610 (56.59%)	71 (44.65%)
Some Education after High School	502 (42.01)	404 (37.48%)	73 (45.91%)
Marital Status (n=2447): Married/Living as Married	166 (13.82%)	112 (10.32%)	22 (13.66%)

Single/Separated/Divorced	1035 (86.18%)	973 (89.68%)	139 (86.34%)
<b>Prior to BMT have you heard positive tobacco messages from:</b>			
Friends (n=2443):			
Yes	237 (19.75%)	272 (25.14%)	30 (18.63%)
No	963 (80.25%)	810 (74.86%)	131 (81.37%)
Family (n=2441):			
Yes	63 (5.25%)	64 (5.93%)	11 (6.83%)
No	1137 (94.75%)	1016 (94.07%)	150 (93.17%)
Social Media (e.g. Facebook, Twitter) (n=2449):			
Yes	120 (9.98%)	89 (8.20%)	17 (10.56%)
No	1083 (90.02%)	996 (91.80%)	144 (89.44%)
Tobacco Advertising (e.g. at store, ads in magazines) (n=2440)?			
Yes	329 (27.42%)	283 (26.23%)	48 (29.81%)
No	871 (72.58%)	796 (73.77%)	113 (70.19%)
Tobacco Promotion (e.g. at bar or club) (n=2441)?			
Yes	223 (18.60%)	209 (19.33%)	30 (18.63%)
No	976 (81.40%)	872 (80.67%)	131 (81.37%)
Tobacco Product(s) Use at Baseline (n=2449):			
Regular User	120 (9.98%)	474 (43.69%)	6 (3.73%)

Seldom User	158 (13.13%)	203 (18.71%)	10 (6.21%)
Quit before BMT	65 (5.40%)	109 (10.05%)	9 (5.59%)
Never User	860 (71.49%)	299 (27.56%)	90 (55.90%)
Other	0 (0.00%)	0 (0.00%)	46 (28.57%)

Note: Continuous variables were displayed as mean (1<sup>st</sup> quartile, median, 3<sup>rd</sup> quartile). P-value was estimated from univariate multinomial logistic regression analyses.

At baseline: Regular Use: at least monthly use; Seldom Use: less than monthly use; Never Use: Never use of any tobacco products; Other: answered 'Never' use to some of tobacco products and missed information on answering to use of the other tobacco products.

At 1-year follow-up: Initiation: any use among never users before BMT; Re-initiation: any use among any/ever users before BMT; Nonuse/Quit: no use among never/ever/any users before BMT; Other: answered 'Never' use to some of tobacco products and missed information on answering to use of the other tobacco products.

BMT=Basic Military Training.

Table 2: *Interaction effects between racial minorities and social-environmental messaging/communications in predicting probability of initiation or re-initiation of any tobacco products use at the 1-year follow-up*

Variable at baseline	Any Tobacco Products Use Initiation/Reinitiation at one-year follow-up		
	Odds Ratio	95% CI	P-value
Racial non-minorities & Tobacco advertising/promotion: Yes vs. No	0.87	0.69-1.10	0.249
Racial minorities & Tobacco advertising/promotion: Yes vs. No	1.53	1.05~2.21	0.025
Among no tobacco advertising/promotion: Racial non-minorities vs. minorities	1.32	1.06~1.66	0.015
Among tobacco advertising/promotion: Racial non-minorities vs. minorities	0.76	0.49~1.18	0.215

Note: The multinomial logistic regression model was also adjusted for social factors (positive tobacco messaging), age, gender, education, marital status, and tobacco products use before BMT. The reference category is non-use.

Tobacco products use before BMT was defined as any tobacco products use, never use/quit before BMT, other (answered 'Never' use to some of tobacco products and missed information on answering to use of the other tobacco products).

Tobacco products use at 1-year follow-up was defined as initiation/re-initiation, nonuse, and other (answered 'Never' use to some of tobacco products and missed information on answering to use of the other tobacco products).