Evaluating Anti-Tobacco Message Effectiveness Among Lesbian, Gay, Bisexual, and Transgender Young Adults

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I. OBJECTIVES

Summary. Through the proposed K99/R00 studies, Dr. Joanne Patterson will receive direct training in communications and tobacco regulatory science, and application of this knowledge to mentored research *to develop and gain skills necessary to develop anti-tobacco messages that effectively communicate the risks of polytobacco use to lesbian, gay, bisexual, and transgender polytobacco users.* Using a conceptual model based on the Extended Parallel Process Model (EPPM)[1-3] and message impact framework[4] *we will develop and refine anti-tobacco messages targeting <u>young adult polytobacco users</u>*; specifically, lesbian, gay, bisexual, and transgender young adults—a polytobacco use disparities population (Aim 1, Phases 1 and 2).

Brief Background*. **Between 21-40% of lesbian, gay, bisexual, and transgender (LGBT) young adults (YA)[5-8] (vs 12-21% of non-LGBT YA[9,10]) report polytobacco use, defined as using more than one tobacco product including electronic nicotine delivery systems (ENDS).** This difference is alarming as polytobacco use is associated with nicotine dependence[11] and continued tobacco use[12-16] into adulthood, which may widen existing tobacco disparities.[17] Markedly low tobacco risk perceptions[8,18-24] among LGBT YA may reinforce polytobacco use.[25] National anti-tobacco communications are a successful strategy for increasing public knowledge about tobacco health risks and decreasing tobacco use;[26-29] however, they may not engage YA LGBT polytobacco users for two reasons: ***First, existing YA anti-tobacco communications are not framed to specifically address polytobacco use risks. Second, LGBT populations report low engagement with non-targeted anti-tobacco communications.[30,31]*** The proposed study will use experimental methods to address these concerns. ***This proposal directly supports the FDA's mandate to educate the public about the risks of tobacco[32] by addressing the FDA research priority of*** <u>***Communications***</u>***: The study goal is to determine effective communication of polytobacco use risk to at-risk LGBT YA.*** We propose to:

<u>Aim 1. Identify absolute and relative risk anti-tobacco messages that effectively communicate polytobacco risks to LGBT young adults (K99).</u> *Hypothesis:* Messages emphasizing relative (vs absolute) risk of polytobacco use will most effectively increase tobacco risk perceptions. *Hypothesis:* AR and RR messages emphasizing quit efficacy will increase intentions to quit all tobacco while AR and RR messages emphasizing switch efficacy will increase intentions to switch to exclusive ENDS use.

<u>Aim 2. Determine the effects of cultural targeting on LGBT young adult polytobacco users' attention to anti-tobacco messages and perceived effectiveness (K99).</u> Hypothesis: Exposure to culturally targeted messages will result in greater engagement with and perceived effectiveness of anti-polytobacco messages among LGBT YA.

<u>Aim 3. (a) Assess the feasibility of delivering MMS anti-tobacco messages developed in the K99 to LGBT young adults via texting; and (b) Estimate effect sizes of exposure to anti-tobacco messages on risk perceptions and tobacco use over time (R00).</u> *Hypothesis*: LGBT young adult polytobacco users exposed to *any* anti-tobacco messages (vs not exposed) will report greater risk perceptions and reduced tobacco use.

A team of exceptional NIH-funded researchers will provide mentorship for the proposed K99/R00 mentored research: *Amy Ferketich*, a tobacco prevention and control expert, with experience leading health communications studies to inform tobacco regulatory policy will provide primary mentorship with collaborative support from a team of co-mentors. This team is comprised of *Elizabeth Klein* and *Darren Mays* who are experts in leveraging psychophysiological measurement for health communications studies; and *Theodore Wagener*, Director of the Center for Tobacco Research and expert in lab-based tobacco studies. A Mentoring Advisory Committee will provide further mentoring support and include *Michael Pennell*, biostatistician and expert in the statistical analysis of psychophysiological data and experimental studies, *Michael Slater*, health communications expert, and *Paul Nini*, an expert in applied visual communications design.

II. BACKGROUND and RATIONALE

This K99/R00 proposal addresses the FDA research priority area of <u>***Communications.***</u> The rationale for the scientific aims is the following. While tobacco regulation has contributed to steady declines in combustible tobacco use, there has been a marked increase in the use of novel tobacco products, including electronic nicotine delivery systems (ENDS).[6,33] Polytobacco use, defined as using more than one tobacco product

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including ENDS, is increasing[34] and is high in LGBT populations.[5,21,35-37] Between 22-40% of LGBT young adults (YA)[5-7] (vs 12-21% of non-LGBT YA[9,10]) report past 30-day polytobacco use. This is concerning as many polytobacco users progress to exclusively using combustible tobacco.[38,39] Both LGBT people[8] and polytobacco users[8,18-24] are also less likely to perceive tobacco as harmful, which may reinforce tobacco use.[25] The Food and Drug Administration (FDA) Center for Tobacco Products (CTP) is mandated to educate the public about the risks of tobacco products.[26-29,32] Yet, no evidence describes how to effectively frame anti-tobacco messages to communicate risks to LGBT YA. Anti-tobacco campaigns may use cultural targeting[40] to increase engagement, but this strategy demonstrates mixed effectiveness for health communications.[41-45] If culturally-targeted anti-tobacco messages are not more engaging than non-targeted messages, then general anti-tobacco campaigns may reach LGBT YA. We propose to develop and test anti-tobacco messages for an at-risk group, LGBT YA, with the goal of increasing risk perceptions and reducing tobacco use over time.

While anti-tobacco communications effectively reduce cigarette smoking[46,47] by preventing initiation[48-51] and progression,[50,52] no campaigns have specifically addressed polytobacco use. Existing campaigns (e.g., *The Real Cost*, *This Free Life*) focused on communicating <u>absolute risks</u> (AR) of *specific tobacco products (e.g., "cigarette smoking leads to lung cancer")* with the goal of preventing uptake in non-users or experimental users. YA polytobacco users have established tobacco patterns, so anti-tobacco campaign goals must also aim to: (1) prevent uptake of additional products, and (2) promote total tobacco cessation, or (3) harm reduction[53] by switching to lower risk products, like ENDS.[54,55] The FDA's regulatory plan places tobacco products on a risk continuum,[56] yet little evidence describes the effect of <u>relative risk</u> (RR) communications *(e.g., "cigarettes contain 9 times more cancer-causing chemicals than ENDS)* on risk perceptions and tobacco use.[57-59] Among smokers, RR communications increase intentions to quit smoking[58] and switch to ENDS.[57,58] RR messages may also influence quitting and switching behaviors in polytobacco users.

Targeting is a broadly supported communications strategy[40] to increase engagement with anti-tobacco communications. LGBT adults engage less with anti-tobacco campaigns than heterosexuals;[30,31] however, they report high exposure,[30,60,61] engagement,[30,62] and receptivity[60,63] to LGBT-targeted tobacco industry marketing.[60,63,64] Tobacco marketing messages emphasize LGBT community values of choice and pride.[65] These values have been leveraged in health campaigns targeting LGBT people,[66,67] including *This Free Life*, the FDA's first anti-tobacco campaign for LGBT YA who occasionally smoke.[68] The campaign's culturally targeted smoking prevention messages reached perceived effectiveness ratings similar to prior youth[49,69] and adult[70] anti-tobacco campaigns. Yet, no studies have <u>tested</u> if LGBT culturally targeted (vs non-targeted) messages are more engaging or effective for reducing polytobacco use.[71] Targeted anti-tobacco campaigns are costly.[72,73] To manage costs[74] anti-tobacco communications must effectively engage audiences. ***<u>If cultural targeting does not increase engagement and effectiveness of anti-tobacco messages, then the FDA may be able to reach at-risk LGBT people via campaigns targeting YA more generally</u>***.

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A conceptual model based on the Extended Parallel Process Model (EPPM)[1-3] and message impact framework[4] will guide the proposed research (Figure 2). Together they posit that, upon exposure to anti-tobacco messages, a person proceeds through three steps: attention, reaction, and formation of attitudes and intentions. These steps determine whether a person engages in the behavior promoted in the message.[75] The EPPM includes four key variables: perceived susceptibility, perceived severity, response efficacy and self-efficacy.[25,76] The model predicts that messages which cause a high perceived threat and high efficacy will result in action (quitting, switching). **The effectiveness of high threat[58,77,78] messages for behavior change is well established; however, less is known about how to effectively frame efficacy messages. Prior anti-tobacco campaigns have omitted efficacy statements entirely[1] or encouraged tobacco avoidance/cessation.[28,79] Yet for polytobacco users, both cessation *and* harm reduction efficacy messages may be needed**. Recent studies have applied combination efficacy messages that emphasize total tobacco cessation, while stating that if smokers are not ready to quit, switching to exclusive ENDS use can reduce health risks.[58,80] However, combined quit/switch messages may be confusing for users.[81] We will investigate optimal framing of threat/efficacy messages to communicate absolute and relative risk of

Figure 2. Conceptual model based on the Extended Parallel Process Model (1992) and Noar's (2017) Message Impact Framework
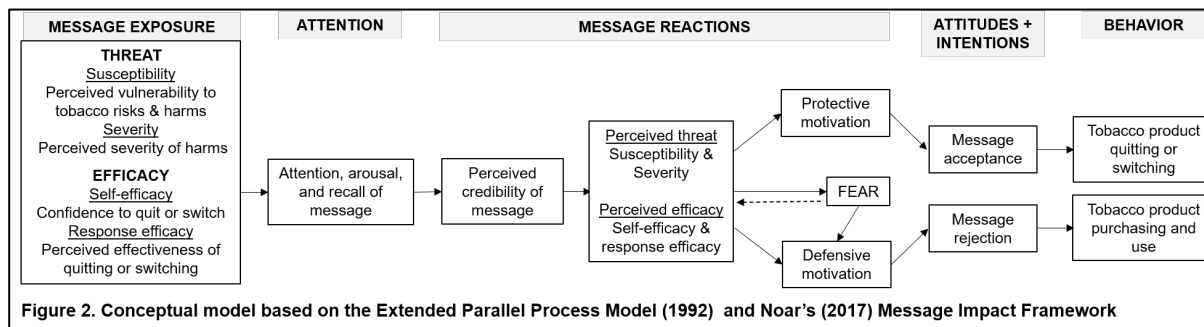
polytobacco use.

Bio-behavioral methods may be used to objectively quantify attention to culturally targeted anti-tobacco messages. Studies using self-report after anti-tobacco message exposure have revealed important information about behavioral intentions to use tobacco[27,82-84]; however, self-report outcomes are subject to social desirability bias[85] and can be enhanced by bio-behavioral methods.[86-88] More specifically, psychophysiological measures can clarify which messages capture polytobacco users' attention (eye-tracking) and evoke emotional responses (skin conductance).[89] These processes are prerequisite steps that inform risk perceptions, behavioral intentions and, ultimately, behaviors.[89] Bio-behavioral methods are used in studies of tobacco advertising[90-92] and warnings,[87,93,94] and will be used here to objectively study attention to anti-tobacco messages.

Anti-tobacco messages delivered via texting may effectively increase tobacco risk perceptions and reduce tobacco use. Texting-based communications have demonstrated effectiveness for increasing cessation in YA smokers[95-97] and preliminary efficacy[97] for changing risk perceptions and behaviors in YA waterpipe users. It is possible that anti-tobacco mobile multimedia messages (i.e., text plus graphic; MMS) may be similarly applied to communicate polytobacco use risks and reduce polytobacco use in LGBT YA. Over 96% of YA own a mobile device with MMS,[98] and 75% use it to seek health information.[99] By delivering anti-tobacco messages via texting we can target content[95] to LGBT YA and, using MMS, mimic real-life exposure to anti-tobacco communications that LGBT YA may encounter while seeking health information using their device.

The proposed research will have an impact on the growing field of tobacco regulatory science. This study will provide results that can directly inform future FDA anti-tobacco public education efforts. At the completion of the study, we will have conducted an evaluation of the effectiveness of absolute and relative risk anti-tobacco ENDS messages that includes both formative and summative evaluation.[100]

III. PROCEDURES

A. K99/R00 Aim 1 Research Design Overview

Using qualitative and experimental designs, the proposed K99/R00 research is scientifically rigorous in its application of formative and summative evaluation.[100] Aims are synergistic and focused on developing and evaluating effective anti-tobacco messages for LGBT YA. Aim 1 is formative evaluation and focuses on optimal message framing for AR and RR anti-tobacco messages. Aim 1 outcomes are presented in **Table 1.**

	Table 1. Overview of primary and secondary outcome measures for K99/R00 studies, by specific aim		
Aim	**Phase**	**Domain**	**Outcome Measure**
1	1 + 2	Cognitive	*General*[70,101] and *health-specific*[102] *perceived effectiveness*
1	2	Cognitive	EPPM constructs*: self-efficacy* to quit tobacco,[103] *response efficacy,*[103] and *reactance*[104]
1	2	Cognitive	*Risk perceptions:* Significance, severity, and seriousness of health threats from tobacco use,[105] absolute/relative risks of polytobacco use (vs exclusive ENDS use)
1	1+ 2	Behavioral	*Behavioral intentions* to use tobacco; intentions quit all tobacco, intentions to switch to exclusive ENDS use[58]
1	1	Qualitative	Acceptability and perceived effectiveness, recommendations for further refining

B. AIM 1 Phase 1 study *procedures*

(K99 Grant Year 1) In Aim 1 we will develop anti-tobacco messages and assess effectiveness.

In Aim 1 Phase 1, we will use multi-methods to gain feedback on textual anti-tobacco messages and gain insights about visual elements (images, fonts, colors) that are appealing to young adult polytobacco users. Phase 1 studies will include the following:

- Aim 1, Phase 1: Study 1 – FOCUS GROUPS will explore terminology and message themes used in absolute and relative risk anti-tobacco messages and quit/switch efficacy statements

- Aim 1, Phase 1: Study 2 – ONLINE RATING SURVEY will quantitatively assess how young adults rate absolute and relative polytobacco risk messages and quit/switch efficacy statements for perceived effectiveness and reactance

- Aim 1, Phase 1: Study 3 – IN-DEPTH INTERVIEWS will explore qualitatively how young adults perceive 8 absolute risk and 8 relative risk anti-tobacco messages.

Aim 1, Phase 1: Study 1 – FOCUS GROUPS: Focus group participants will be asked to share their opinions on possible textual anti-tobacco messages (**Table 2**). Anti-tobacco risk statements will pe presented in two sets; communicating either absolute (e.g., "*tobacco smoke contains 69 cancer-causing chemicals, including arsenic and formaldehyde*") or relative risk *(e.g., "combustible tobacco products contain 9 times more cancer-causing chemicals than ENDS).* Messages will address FDA-regulatory topics[106]; for example: addiction, toxic

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exposure, and health effects **(see supplemental documents for sample risk statements).** We will then present examples of efficacy statements including quit only (e.g., *"Quit all tobacco products to reduce health risks."*), switch only (e.g., *"Switch to using e-cigarettes to reduce health risks."*), or quit plus switch messages (e.g., *"Quit all tobacco products to reduce your risk of cancer. If you're not ready to quit, switch to e-cigarettes only."*). <u>Focus group feedback will be used to further develop text for anti-tobacco messages that will be further tested in Aim 1, Phase 2.</u> (**see supplemental documents A for sample efficacy statements).** Focus group participants will also be asked to provide feedback on the acceptability, appeal, and comprehension of specific terms (e.g., "traditional cigarettes" vs. "combustible cigarettes", "e-cigarettes" vs. "nicotine vapes" vs "vapes").

To assess graphics that are appealing to using adult polytobacco users, we will present examples of existing anti-tobacco messages from FDA and Truth anti-tobacco campaigns **(see samples in supplemental documents)**. We will ask focus group participants to identify the graphic components that are more and less appealing from existing anti-tobacco ads. <u>We will use focus group feedback to add visual elements to the textual anti-tobacco messages that will be further tested in Aim 1, Phase 2.</u> Graphics will mirror visual styles of existing campaigns[107] using bold colors and images of YA[108] to represent topics conveyed in text. Messages and images will be refined based on focus group feedback.

Table 2. Message sets for formative message testing in a 2x3 between subjects experiment (Aim 1 Phase 2)			
		THREAT	
		ABSOLUTE RISK (AR)	**RELATIVE RISK (RR)**
EFFICACY	**Quit only (Q)**	Set 1: AR/Q (n = 8)	Set 2: RR/Q (n = 8)
	Switch only (S)	Set 3: AR/S (n = 8)	Set 4: RR/S (n = 8)
	Combined quit + switch (QS)	Set 4: AR/QS (n = 8)	Set 6: RR/QS (n = 8)

Aim 1, Phase 1: Study 2 –ONLINE RATING SURVEY: In Phase 1, Study 2 we will conduct an online survey to quantitatively examine young adults' perceptions of 8 absolute risk and 8 relative risk anti-tobacco messages and quit/switch efficacy statements. To reduce participant burden, each participant will view a random sample of messages as follows: n = 5 absolute and relative risk anti-tobacco messages (of N = 24), and n = 3 (of N = 12) efficacy messages. They will be asked to rate absolute and relative risk antitobacco messages and quit/switch efficacy statements for perceived message effectiveness, likeability, and reactance.

Aim 1, Phase 1: Study 3 –IN-DEPTH INTERVIEWS: Interviewees will be asked to share their reactions to the 24 textual anti-tobacco messages tested in Study 2. Specifically, interviewees will be asked to rate their top 5 (of N =12) absolute risk and top 5 (of N =12) relative risk antitobacco messages. We will then qualitatively explore their rationale for their top 5 selected messages.

Aim 1, Phase 2: ONLINE FACTORIAL EXPERIMENT: Using a 2x3 factorial experiment (Table 2), plus control group design we will test the influence of AR and RR message framing on perceived effectiveness, tobacco risk perceptions, and behavioral intentions in young adult ever polytobacco users. Participants will be randomized to one of 8 conditions, including 6 experimental sets of AR and RR anti-tobacco messages(**Table 3**) and a control set of AR or RR regulatory control messages. We will present 8 messages within each experimental and control set. An expert panel of scientists, selected and invited by the mentoring team, will review all messages, which we will further refine based on expert feedback prior to testing in Aim 1, Phase 2.

B.1 Sample

Participants for Aim 1, Phase 1 studies will be young adults (age 18-35 years) who live in the United States. and are susceptible to multiple nicotine and tobacco product use (i.e., have used combustible tobacco or e-cigarettes at least once).

In the Aim 1 Phase 1 focus groups and interviews, participants expressed concern that relative risk messages comparing combustible cigarette and ENDS use could increase young adult non-users' curiosity and intentions to use ENDS. The goal of anti-tobacco messages being tested in this study is to increase harm perceptions and decrease use intentions among susceptible nicotine and tobacco users, However, we also do not want to negatively impact nonusers. After conferring with the mentoring committee and scientific experts, in Phase 2, we will address this concern by empirically testing whether responses to absolute and relative risk messages vary by nicotine and tobacco user type. As such, our sample will include young adults (age 18-35 years) who live in the United States. Per the Aim 1, Phase 1 studies, half of our sample will include young adults who are susceptible to multiple nicotine and tobacco product use (i.e., have used combustible tobacco or e-cigarettes at least once) and approximately half of the sample will comprise U.S. young adult nonusers.

For Aim 1, Phase 1, Study 1--FOCUS GROUPS: The maximum overall sample size will be N = 58. However, our analytic sample size will start with 3 focus groups of size 6-8 individuals (N = 18-24 total participants). This sample size is standard in "usability research," where existing messages are tested to uncover issues of effectiveness, and newly designed prototypes are tested to improve any communication issues. *If we do not reach thematic saturation, we will conduct additional focus groups until thematic saturation is achieved, up to a total analytic sample size of N = 48 participants.* We have inflated the overall sample size to 29 participants for each round of focus groups (N = 58) to allow for 20% dropout.

Recruitment will occur online via social media, on OSU's campus, and in the Columbus community. On campus, we will reach out to student groups and we will place flyers in residence halls and other buildings. We have used these methods in the past with success. We will also work with the Office of Minority Health at Columbus Public Health to reach a racially, ethnically, and economically diverse group of young men and women. Co-investigator Ferketich has partnered with this office in the past and they have helped successfully recruit young people through their community connections. We will also partner with The Equitas Health Institute to reach LGBT young adults. Both the PI (Patterson) and Co-I (Ferketich) have relationships with The Equitas Health Institute through the College of Public Health. Focus groups will be balanced by gender and sexual orientation.

Aim 1, Phase 1: Study 2 –ONLINE RATING SURVEY: The overall sample size will be N = 550. Participants will be recruited via Prolific (https://www.prolific.co/), a platform for online subject recruitment for research, which is supported by Isis Innovation of the University of Oxford. In recent years, Prolific has been extensively used in social science research and by the PI in prior studies. Prolific enables researchers to recruit participants to perform tasks such as filling out surveys, opinion polls, cognitive psychological studies, and many others. Researchers advertise their studies on Prolific, and participants choose only those studies that interest them. Participants are paid for completing the studies. In the PI's prior research using Prolific to recruit young adults into survey studies, approximately 3% of survey participants had inconsistencies between the prescreening questions asked by Prolific (e.g., age range) and demographic questions reported as part of the survey (e.g., numerical age). Data for these participants was not included in analyses, as we could not confirm that they met study eligibility criteria. As our analytic sample size is N = 500 participants; we have inflated our overall sample size is inflated by 10% to account for estimated inconsistencies between prescreening and survey responses.

We will monitor enrollment with the goal of recruiting a balance of young adult participants by age (younger: age 18-25, older: age 26-35), gender, and sexual orientation. From current population-based estimates, we expect that study participants will be 57% non-Hispanic white, 19% non-Hispanic black, 15% Hispanic, and 6% Asian, and the remaining representing other race groups.

Aim 1, Phase 1: Study 3 – IN-DEPTH INTERVIEWS. For interviews, the maximum overall sample size will be N = 20. However, our initial analytic sample size will be N = 8 participants. *If we do not reach thematic saturation, we will conduct additional interviews until thematic saturation is achieved, up to a total analytic sample size of N = 16 participants.* We have inflated the overall sample size to 20 participants to allow for 20% dropout.

Recruitment will occur online via social media, via email listservs, on OSU's campus, and in the Columbus community. We will invite prior focus group participants to participate in in-depth interviews. On campus, we will reach out to student groups and we will place flyers in residence halls and other buildings. We have used these methods in the past with success. We will also partner with The Equitas Health Institute to reach LGBT young adults. Both the PI (Patterson) and Co-I (Ferketich) have relationships with The Equitas Health Institute through the College of Public Health. We will aim to balance interviews by gender and sexual orientation.

For the Aim 1, Phase 2—ONLINE FACTORIAL EXPERIMENT: The overall sample size will be N = .2940. Participants will be recruited via Prolific (https://www.prolific.co/), a platform for online subject recruitment for research, which is supported by Isis Innovation of the University of Oxford. In recent years, Prolific has been extensively used in social science research and by the PI in prior studies. Prolific enables researchers to recruit participants to perform tasks such as filling out surveys, opinion polls, cognitive psychological studies, and many others. Researchers advertise their studies on Prolific, and participants choose only those studies that interest them. Participants are paid for completing the studies. In the PI's prior research using Prolific to recruit young adults into survey studies, approximately 3% of survey participants had inconsistencies between the prescreening questions asked by Prolific (e.g., age range) and demographic questions reported as part of the survey (e.g., numerical age). Data for these participants was not included in analyses, as we could not confirm that they met study eligibility criteria. In our phase 1 study, <1% of the sample reported inconsistencies between prescreening and survey responses. As our analytic sample size is N = 2800 participants (n = 400 participants per experimental or control group); we have inflated our overall sample size is inflated by 5% to account for estimated inconsistencies between prescreening and survey responses.

We will monitor enrollment with the goal of recruiting a balance of young adult participants by age (younger: age 18-25, older: age 26-35), gender, and sexual orientation. From current population-based estimates, we expect that study participants will be 57% non-Hispanic white, 19% non-Hispanic black, 15% Hispanic, and 6% Asian, and the remaining representing other race groups.

B.2. Measurement / Instrumentation

For Aim 1, Phase 1: Study 1--FOCUS GROUPS: A focus group guide will be developed and will be used to facilitate the research for preliminary work. Participants will be asked about their opinions on a series of absolute and relative risk polytobacco use statements, efficacy statements, and visual elements of anti-tobacco communication campaigns. Participants will also be asked their thoughts on the types of images to pair with anti-tobacco risk statements.

For Aim 1, Phase 1: Study 2—ONLINE RATING SURVEY: Primary outcome measures are presented in **Table 1**. Baseline questionnaires will assess EC and combustible tobacco use,[109] pro- and anti-tobacco advertising exposure,[110] receptivity,[111] social media use and risk perceptions[105] and behavioral intentions.[58] Post-viewing their randomly assigned messages participants will be asked to rate each message for perceived message effectiveness,[70,101] likeability,[112] and reactance.[104] Finally, sociodemographic questions also include age, race/ethnicity, education level, location (state, zip code, rurality), sexual orientation[113] and gender identity.[114]

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For Aim 1, Phase 1: Study 3—IN-DEPTH INTERVIEWS: An interview guide will be developed and will be used to facilitate the research. Specifically, interviewees will be asked to rate their top 5 (of N =12) absolute risk and top 5 (of N =12) relative risk antitobacco messages. We will then qualitatively explore their rationale for their top 5 selected messages. We will also ask participants to share their opinions on the types of images to pair with anti-tobacco risk statements.

For Aim 1, Phase 2-ONLINE FACTORIAL EXPERIMENT: Primary outcome measures are presented in **Table 1**. These measures were largely selected from the Tobacco Regulatory Research PhenX Toolkit.[115,116] Baseline questionnaires will assess ENDS and combustible tobacco use,[109] pro- and anti-tobacco advertising exposure,[110] receptivity,[111] social media use, risk perceptions,[105] self- and response efficacy,[103] and behavioral intentions.[58] Post-viewing their assigned message condition, all participants will be asked about their responses to the posts including perceived acceptability, attitude toward, and effectiveness of the messages. All baseline measures (excluding social media use and prior anti-tobacco message exposure) will be asked post-viewing all messages. Finally, sociodemographic questions also include age, race/ethnicity, education level, location (state, county, rurality), sexual orientation[113] and gender identity.[114]

The purpose of the R00 Phase is to identify which anti-polytobacco messages most strongly influence LGBT YA's attention, tobacco risk perceptions, and behavioral intentions (Aim 2) and evaluate the impact of exposure to anti-polytobacco communications delivered by mobile multimedia messaging (MMS) on tobacco use over time in YA polytobacco users of diverse sexual orientations and gender identities *(Aim 3)*

IV. DETAILED STUDY PROCEDURES

A. Aim 1, Phase 1: Study 1- FOCUS GROUP Procedures

Prescreening and consent. Participants will be recruited from OSU student organizations, flyers on campus, Reddit, other social media, or through word of mouth from participants who completed the study. The recruitment materials will include a study phone number and an OSU email address that will be set up for the study. Individuals who are interested in the study will be asked to call or email the study email address. An IRB-approved research team member will call the individual and go through the screener that explains the study and determines eligibility.

Eligible participants will complete a verbal informed consent. The research team member will read the informed consent script and verbally explain the online questionnaire and focus group process. The research team member will indicate that participation in the questionnaire and focus group is voluntary. The eligible participant will be given an opportunity to ask questions and have all questions answered to their satisfaction. Once the eligible participant understands the consent form and process, then and only then will the eligible participant be asked to give verbal consent. Eligible participants that do not consent will be released at this time. Consenting participants will be emailed the informed consent script for their records. A PDF copy of the informed consent script will also be made available for download as part of the online questionnaire.

The research team member will ask eligible and consented participants for an email address for online questionnaire distribution and to send information for the future focus group. After the call has concluded, the research team member will email participants a link to a short questionnaire distributed via Qualtrics with questions about tobacco use, intentions to quit smoking, and demographic characteristics.

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Focus group procedures. On the day of focus group, OSU IRB approved study personnel will provide an opportunity for verbal reconsent immediately preceding the focus group. Prior to audio-recording, the IRB-approved research team member will re-affirm participant consent. The research team member will indicate that participation in the focus group is voluntary and that participants may withdraw participation at any time. Eligible participants who do not reaffirm consent to focus group participation will be released at this time.

Focus groups will take place online via CarmenZoom in a secure, private space. A growing body of evidence describes the use of web-based videoconferencing platforms—also known as Voice over Internet Protocol (VoIP)-mediated technologies (e.g., CarmenZoom, Skype, FaceTime)—for collecting data in qualitative studies.[117-121] Zoom, in particular, has been cited by qualitative interview participants as straightforward, easy to use, and preferred for its "robust but simple privacy and security options" (e.g., secure webinar options and local device- or server-based recording).[117] Online focus group are also a feasible option for conducting qualitative human subjects research during the COVID-19 pandemic where meeting in groups may not be preferred in order to protect participants' health and wellbeing.

All focus groups will be audio-recorded and transcribed for subsequent analysis. Focus group length is anticipated to be about 90 minutes. Audio-recorded data will capture participants' verbal ratings and reactions to polytobacco use risk statements (absolute and relative risk), quit efficacy statements, and visual elements of existing national anti-tobacco campaigns. Specifically, participants will be asked to rate and then describe their reactions to anti-tobacco messages, including whether they believe the message effectively communicates tobacco risk (absolute or relative) and whether the message would be effective at preventing polytobacco use among young adults. Then, they will be asked to provide their opinion about how to visually represent that idea. They will also be asked about their reactions to self-efficacy statements promoting quitting and, if participants are not ready to quit, switching to lower harm products. Finally, participants will be asked to share their reactions to visual elements (images, fonts, colors) used in existing FDA and Truth© anti-tobacco campaigns. Participants will receive $30 via Amazon gift card distributed via email in appreciation of their time.

Aim 1, Phase 1: Study 1-FOCUS GROUP data will be used to further develop/refine text and graphics for anti-tobacco messages that will be further tested in Aim 1, Phase 2.

B. Aim 1, Phase 1: Study 2—ONLINE RATING SURVEY Procedures

Prescreening and consent. Participants will be recruited via Prolific, an online platform open to participants who are compensated for completing surveys and online behavioral experiments. Prolific is an efficient online recruitment platform, ideal for pilot studies, as it can deliver a high number of participants, per day, at low cost (recommended, minimum $0.175 per minute of survey participation time). Data quality provided by Prolific samples is high and comparable to that from traditional college student samples.[122] Prolific offers access to over 38,000 United States nationals. Prolific samples are young; approximately 1/3 of the Prolific population reports ages < 35 years old, which makes Prolific an ideal pool for recruiting young adult survey participants. Prolific is also a viable method for recruiting hard-to-reach populations for survey research, including LGBT populations.[123]

Prescreening will be conducted via Prolific. Prolific is able to segment our population of interest for age (18-35 years) and currently residing the United States. It can also help us track gender and sexual orientation in order to balance recruitment. We are able to add in a custom pre-screening question to assess for prior history of ever nicotine or tobacco use (i.e., use of combustible tobacco or e-cigarette products at least once).

Participants who meet eligibility criteria will be directed to an online survey administered via Qualtrics. Consent will be completed online prior to the Qualtrics survey.

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Qualtrics survey procedures. Following online consent, participants will be directed to complete a survey that includes questions assessing tobacco use, including exposure to tobacco related advertising, coupons, and discounts; harms perceptions and tobacco-related behavioral intentions (i.e., quit, switch). It is estimated that the survey will take 20 minutes to complete.

Participants will answer baseline survey questions before viewing a random sample of 5 messages (of N = 24); they will rate each message for perceived effectiveness[70,101,102], likeability,[112] and reactance.[104] After viewing all messages, participants will complete a post-survey and receive $0.175/minute (estimated $3.50) via Prolific for participating.

As per Prolific procedures, participants are paid via Prolific only when submitted work is approved by the study team. Participants are redirected back to Prolific at the end of the Qualtrics survey via a Completion URL, which proves that they have completed the study. This code is given to the participants who submit a complete and valid response to the survey. The study team compares the Qualtrics surveys to the participants redirected back to Prolific via the URL. If a survey participant is not matched to a redirect URL, a participant is not paid.

To contextualize data quality, we will include an instructional manipulation check[124] at the end of the survey. A participant's answer to this question will not affect payment for survey participation; rather, it will be used during data analysis to identify potential problematic survey responses for in-depth data checks. Participants will be asked the following:

> *Research suggests that, when making decisions and answering questions, people prefer not to pay attention and minimize their efforts. Some studies show that over 50% of people do not carefully read questions. You will be compensated for survey participation regardless of your answer to this question. If you are reading this question and have read all the other questions, please select the box marked 'other" and type 'yes" in the box below. Thank you for participating in our survey!*
>
> o   *Yes*
> o   *No*
> o   *Other:_____*

C. Aim 1, Phase 1: Study 3:-IN-DEPTH INTERVIEW Procedures

Prescreening and consent. Participants will be recruited from OSU student organizations, flyers on campus, Reddit, other social media, email listservs, or through word of mouth from participants who completed the Phase 1 Focus group or interview study. The recruitment materials will include a study phone number and an OSU email address that will be set up for the study. Individuals who are interested in the study will be asked to call or email the study email address. An IRB-approved research team member will call the individual and go through the screener that explains the study and determines eligibility.

Eligible participants will complete a verbal informed consent. The research team member will read the informed consent script and verbally explain the online questionnaire and interview process. The research team member will indicate that participation in the questionnaire and interview is voluntary. The eligible participant will be given an opportunity to ask questions and have all questions answered to their satisfaction. Once the eligible participant understands the consent form and process, then and only then will the eligible participant be asked to give verbal consent. Eligible participants that do not consent will be released at this time. Consenting participants will be emailed the informed consent script for their records. A PDF copy of the informed consent script will also be made available for download as part of the online questionnaire.

The research team member will ask eligible and consented participants for an email address for online questionnaire distribution and to send information for the interview. After the call has concluded, the research team member will email participants a link to a short questionnaire distributed via Qualtrics with questions about tobacco use, intentions to quit smoking, and demographic characteristics.

Interview procedures. On the day of interview, OSU IRB approved study personnel will provide an opportunity for verbal reconsent immediately preceding the interview. Prior to audio-recording, the IRB-approved research team member will re-affirm participant consent. The research team member will indicate that participation in the interview is voluntary and that participants may withdraw participation at any time. Eligible participants who do not reaffirm consent to interview participation will be released at this time.

Interviews will take place online via CarmenZoom in a secure, private space. A growing body of evidence describes the use of web-based videoconferencing platforms—also known as Voice over Internet Protocol (VoIP)-mediated technologies (e.g., CarmenZoom, Skype, FaceTime)—for collecting data in qualitative studies.[117-121] Zoom, in particular, has been cited by qualitative interview participants as straightforward, easy to use, and preferred for its "robust but simple privacy and security options" (e.g., secure webinar options and local device- or server-based recording).[117] Online interviews are also a feasible option for conducting qualitative human subjects research during the COVID-19 pandemic where meeting in-person may not be preferred in order to protect participants' health and wellbeing.

All interviews will be audio-recorded and transcribed for subsequent analysis. Interview length is anticipated to be about 60 minutes. Audio-recorded data will capture participants' verbal ratings and reactions to antitobacco risk statements (absolute and relative risk), quit efficacy statements, and visual elements of existing national anti-tobacco campaigns. Specifically, participants will be asked to rate their top 5 of both absolute and relative risk anti-tobacco messages, including whether they believe the message effectively communicates tobacco risk (absolute or relative) and whether the message would be effective at preventing polytobacco use among young adults. Then, they will be asked to provide their opinion about how to visually represent that idea. They will also be asked about their reactions to self-efficacy statements promoting quitting and, if participants are not ready to quit, switching to lower harm products. Participants will receive $30 via Amazon gift card distributed via email in appreciation of their time.

D. Aim 1, Phase 2: ONLINE FACTORIAL EXPERIMENT Procedures

Prescreening and consent. Participants will be recruited via Prolific, an online platform open to participants who are compensated for completing surveys and online behavioral experiments. Prolific is an efficient online recruitment platform, ideal for pilot studies, as it can deliver a high number of participants, per day, at low cost (recommended, minimum $0.175 per minute of survey participation time). Data quality provided by Prolific samples is high and comparable to that from traditional college student samples [122]. Prolific offers access to over 38,000 United States nationals. Prolific samples are young; approximately 1/3 of the Prolific population reports ages < 35 years old, which makes Prolific an ideal pool for recruiting young adult survey participants. Prolific is also a viable method for recruiting hard-to-reach populations for survey research, including LGBT populations [123].

Prescreening will be conducted via Prolific. Prolific is able to segment our population of interest for age (18-35 years) and currently residing the United States. It can also help us track gender and sexual orientation in order to balance recruitment. We are able to add in a custom pre-screening question to assess for prior history of ever nicotine and tobacco use.

Participants who meet eligibility criteria will be directed to an online survey administered via Qualtrics. Consent will be completed online prior to the Qualtrics survey.

Qualtrics survey procedures. Following online consent, participants will be directed to complete a survey that includes questions assessing tobacco use, including exposure to tobacco related advertising, coupons, and discounts; harms perceptions and tobacco-related behavioral intentions (i.e., quit, switch); and online/social media use questions.

Participants will answer baseline survey questions before random assignment to 1 of 6 experimental conditions in the 2 (Threat: Absolute/Relative Risk) X 3 (Efficacy: Quit, Switch, Quit plus Switch) design. Participants will view 8 randomly-ordered, anti-tobacco messages within their assigned condition; they will rate each message for perceived effectiveness[70,101,102] and reactance.[104] After viewing all messages, participants will complete a post-survey and receive $0.225/minute (estimated $4.50) via Prolific for participating.

As per Prolific procedures, participants are paid via Prolific only when submitted work is approved by the study team. Participants are redirected back to Prolific at the end of the Qualtrics survey via a Completion URL, which proves that they have completed the study. This code is given to the participants who submit a complete and valid response to the survey. The study team compares the Qualtrics surveys to the participants redirected back to Prolific via the URL. If a survey participant is not matched to a redirect URL, a participant is not paid.

To contextualize data quality, we will include an instructional manipulation check[124] at the end of the survey. A participant's answer to this question will not affect payment for survey participation; rather, it will be used during data analysis to identify potential problematic survey responses for in-depth data checks. Participants will be asked the following:

> *Research suggests that, when making decisions and answering questions, people prefer not to pay attention and minimize their efforts. Some studies show that over 50% of people do not carefully read questions. You will be compensated for survey participation regardless of your answer to this question. If you are reading this question and have read all the other questions, please select the box marked 'other" and type 'yes" in the box below. Thank you for participating in our survey!*

> ○ *Yes*
> ○ *No*
> ○ *Other:_____*

V. RISKS, BENEFITS, SAFETY PLANS

A. Risks associated with the study
Potential risks are minimal for the focus group and survey studies. Some of the questions may upset individuals; however, we have used these questions and procedures in many previous studies without upsetting participants. A potential risk is loss of confidentiality In our screener, we collect participant contact information. We have rigid procedures in place to protect against loss of confidentiality. Participant identifiers will be kept in password-protected files, stored on secure OSU servers.

B. Benefits associated with the study
There are no direct benefits to be gained by participants. However, the anticipated societal benefit resulting from this study is considerable, given the increasing prevalence of polytobacco use, including ENDS. Societal benefits include increased public health resulting from this study providing evidence that directly informs and strengthens FDAs tobacco public education efforts. Few studies have been conducted on effectively communicating tobacco risk to polytobacco users and at the same time, there is mounting evidence that LGBT young adult polytobacco users, a vulnerable population from a tobacco control perspective, are largely misinformed of the risks of combustible tobacco and ENDS use.

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VI. DATA ANALYSIS

A. Aim 1, Phase 1: Study 1—FOCUS GROUPS Data Analysis

For focus groups, the goal is to refine messages and determine which images should be matched to the AR and RR anti-tobacco messages. These images will then move on to Aim 1 Phase 2 of this study. We will qualitatively summarize the feedback in response to each focus group question.

Sample size justification: For Aim 1 Phase 1: Study 1—FOCUS GROUPS: A planned analytic sample size of N = 24 participants is standard for usability research, where the aim is to test existing messages to improve any communication issues. If we do not reach thematic saturation during the first round of focus group, we will enroll up to an additional 24 participants (for a maximum analytic of N = 48).The sample size was inflated to 29 participants for each round of focus groups to allow for 20% dropout; resulting in a maximum overall sample size of N = 58 focus group participants.

B. Aim 1, Phase 1: Study 2-ONLINE RATING SURVEY Data Analysis

For online rating survey data, we will describe mean and median values of participants' ratings of perceived message effectiveness, likeability, and reactance.

In exploratory analyses, we will l assess whether there are systematic differences in participants' ratings *by message type (AR vs RR), gender, LGBT status (vs non-LGBT)*, *race/ethnicity, age (e.g., 18-24 vs 25-35)* and *tobacco user ty*pe (e.g., current, former, never polytobacco user). We will test mean differences between groups using t-tests or ANOVA. If there are violations of assumptions (e.g., normality) we will test median differences between groups using Wilcoxon rank-sum test (two groups) or Kruskal Wallis test (more than 2 groups).

We will also run exploratory regression models to evaluate the effect of risk message type (e.g., absolute risk vs. relative risk) and efficacy message type (e.g., quit; switch; combination) on messages on perceived message effectiveness, likeability, and reactance; controlling for pro- and anti-tobacco marketing exposure, baseline risk and efficacy perceptions and behavioral intentions. For models testing the effect of efficacy messages, we will conduct overall F-tests to determine if there is an effect of efficacy message type in each model. If so, pairwise t-tests will be conducted, and Holm's procedure will be used to control Type I error rate.

Sample Size Justification**:** For Aim 1, Phase 1, Study 2--ONLINE RATING SURVEY: An analytic sample size of 200 participants per group will allow us to detect differences between two groups in terms of perceived message effectiveness. Assuming a pooled standard deviation of 1.0 units, the study would require a minimum sample size of n = 199 for each group to achieve power of 80% and two-sided significance level of p = .05 for detecting a 0.25 unit difference in perceived message effectiveness scores, which has been reported previously in the literature.[58] Under these same parameters, we will be able to detect a 0.25 unit difference in PME scores with 75% probability assuming a significance level of p = 0.1. As multi-group comparisons are exploratory, we believe this a prior sample size calculation is appropriate. As our desired analytic sample size is N = 500 participants (n = 250 participants per experimental group; AR vs RR messages); we have inflated our overall sample size is inflated by 10% to account for estimated inconsistencies between prescreening and survey responses, resulting in an overall sample size of N = 550.

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C. Aim 1, Phase 1: Study 3—IN-DEPTH INTERVIEWS:

For in-depth interviews the goal will be to refine messages and determine which images should be matched to the AR and RR anti-tobacco messages. These images will then move on to Aim 1 Phase 2 of this study. We will qualitatively summarize the feedback in response to each focus group question using rigorous and accelerated data reduction (RADaR) analytic methods.[125] Used in applied research, RADaR organizes transcribed textual data from qualitative interviews into data tables; which are then organized and iteratively reduced, coded, and analyzed using team-based coding.

Sample size justification: For Aim 1, Phase 1: Study 3—IN-DEPTH INTERVIEWS our planned analytic sample size of N = 8 is designed to maximize the information power of qualitative research in which an initial sample of 6- 8 participants for is recommended for qualitative interviews. The aim of these interviews is to test existing messages to improve any communication issues. If we do not reach thematic saturation, we will enroll additional participants up to a maximum of N = 16. We have inflated the overall sample size to 20 participants to allow for ~20% dropout.

D. Aim 1, Phase 2: ONLINE FACTORIAL EXPERIMENT Data Analysis

We will fit linear regression models to evaluate the effect of condition on perceived effectiveness, risk perceptions, and behavioral intentions. Covariates will include exposure to pro- and anti-tobacco marketing, and baseline risk perception and behavioral intention items (per respective models). Baseline and post-viewing scores may be transformed if violations of assumptions are detected. We will conduct overall F-tests to determine if there is an effect of condition in each model. If so, pairwise t-tests will be conducted, and Holm's procedure will be used to control Type I error rate. Exploratory analyses will be conducted to determine if there is an interactive effect between Condition x Topic. *Responses will be examined by gender and sexual orientation to determine if there are systematic differences*.

Sample Size Justification: For the Aim 1, Phase 2: ONLINE FACTORIAL EXPERIMENT an analytic sample size of 400 participants per group will allow us to detect the best message in terms of risk perception score with 75% probability assuming the mean score in the best group is at least 0.1 standard deviations better than the mean score in the second best group.[126] As effect sizes of 2 or greater are reported in the literature for this outcome, we do not consider smaller differences to be of interest. As our analytic sample size is N = 2800 participants (n = 400 participants per experimental or control group); we have inflated our overall sample size is inflated by 5% to account for estimated inconsistencies between prescreening and survey responses, resulting in an overall sample size of N = 2940.

VII. DATA SAFETY and MONITORING PLAN

The Ohio State University Comprehensive Cancer Center Data Safety Monitoring Committee (DSMC) will be the DSMC of record and, thus, will be responsible for reviewing the study. The PI will submit a summary report of the study's progress, including all subsite activities and data status to the DSMC on an annual basis. All adverse events related to the study will be recorded by the investigators. The study investigators will evaluate adverse events and study data during their weekly meetings and make a determination of whether any adverse events affect the risk/benefit ratio of the study and whether modifications to the protocol (e.g., Potential risks) or consent procedures are required.

Serious unanticipated events are not anticipated. In the unlikely case that such serious adverse events occur, they will be reviewed by the OSUCCC – James Data and Safety Monitoring Committee (DSMC). All reportable serious adverse events will be reported within 48 hours to the OSU IRB and any appropriate funding and regulatory agencies. The investigators will specify whether the serious unanticipated adverse event is related to the study. Adverse events will be reported to the NCI when frequency and magnitude clearly exceed expectations.

The OSU IRB provides annual review of all open protocols and hence this is one level of monitoring that will occur. In this annual report, the investigator is required to report the number of subjects enrolled and treated, any adverse events that have occurred, and a summary of the findings from either the study or the literature that would affect the safety of the participants or the ethics of the trial. The PI will provide a summary of the Data Safety and Monitoring Plan annually as part of the progress report to the National Cancer Institute (NCI).

All data and safety monitoring will adhere to the policies and procedures of the OSU Comprehensive Cancer Center's Data and Safety Monitoring Plan which has been approved by NCI.

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VIII. REFERENCES

1. LaVoie NR, Quick BL. What is the truth? an application of the Extended parallel process Model to televised truth® ads. *Health communication.* 2013;28(1):53-62.
2. Chung H, Ahn E, Kang S. Processing anti-smoking ads among college students: The role of emotional response and level of smoking. *Journal of Promotion Management.* 2016;22(3):370-385.
3. Leshner G, Bolls P, Wise K. Motivated processing of fear appeal and disgust images in televised anti-tobacco ads. *Journal of Media Psychology.* 2011.
4. Noar SM, Francis DB, Bridges C, Sontag JM, Brewer NT, Ribisl KM. Effects of strengthening cigarette pack warnings on attention and message processing: A systematic review. *Journalism & Mass Communication Quarterly.* 2017;94(2):416-442.
5. Ridner SL, Ma JZ, Walker KL, et al. Cigarette smoking, ENDS use and dual use among a national sample of lesbians, gays and bisexuals. 2019.
6. Delahanty J, Ganz O, Hoffman L, Guillory J, Crankshaw E, Farrelly M. Tobacco use among lesbian, gay, bisexual and transgender young adults varies by sexual and gender identity. *Drug and alcohol dependence.* 2019.
7. Fallin-Bennett A, Lisha NE, Ling PM. Other tobacco product use among sexual minority young adult bar patrons. *American journal of preventive medicine.* 2017;53(3):327-334.
8. Nayak P, Salazar LF, Kota KK, Pechacek TF. Prevalence of use and perceptions of risk of novel and other alternative tobacco products among sexual minority adults: results from an online national survey, 2014–2015. *Preventive medicine.* 2017;104:71-78.
9. Osibogun O, Taleb ZB, Bahelah R, Salloum RG, Maziak W. Correlates of poly-tobacco use among youth and young adults: Findings from the Population Assessment of Tobacco and Health study, 2013–2014. *Drug and alcohol dependence.* 2018;187:160-164.
10. Stanton CA, Bansal-Travers M, Johnson AL, et al. Longitudinal e-cigarette and cigarette use among US youth in the PATH Study (2013–2015). *JNCI: Journal of the National Cancer Institute.* 2019.
11. Strong DR, Pearson J, Ehlke S, et al. Indicators of dependence for different types of tobacco product users: Descriptive findings from Wave 1 (2013–2014) of the Population Assessment of Tobacco and Health (PATH) study. *Drug and alcohol dependence.* 2017;178:257-266.
12. Dutra LM, Glantz SA, Lisha NE, Song AV. Beyond experimentation: Five trajectories of cigarette smoking in a longitudinal sample of youth. *PLoS One.* 2017;12(2).
13. Klein EG, Bernat DH, Lenk KM, Forster JL. Nondaily smoking patterns in young adulthood. *Addictive behaviors.* 2013;38(7):2267-2272.
14. Saddleson M, Kozlowski L, Giovino G, Homish G, Mahoney M, Goniewicz M. Assessing 30-day quantity-frequency of US adolescent cigarette smoking as a predictor of adult smoking 14 years later. *Drug and alcohol dependence.* 2016;162:92-98.
15. Taylor KA, Sharma E, Edwards KC, et al. Longitudinal pathways of exclusive and polytobacco cigarette use among youth, young adults and adults in the USA: findings from the PATH Study Waves 1–3 (2013–2016). *Tobacco Control.* 2020;29(Suppl 3):s139-s146.
16. Edwards KC, Sharma E, Halenar MJ, et al. Longitudinal pathways of exclusive and polytobacco cigar use among youth, young adults and adults in the USA: findings from the PATH Study Waves 1–3 (2013–2016). *Tobacco Control.* 2020;29(Suppl 3):s163-s169.
17. Institute of Medicine Committee on Lesbian G, Bisexual, and Transgender Health Issues and Research Gaps and Opportunities,. The Health of Lesbian, Gay, Bisexual, and Transgender People: Building a Foundation for Better Understanding. In: Washington, D.C.: National Academies Press; 2011: http://www.ncbi.nlm.nih.gov/books/NBK64806/.
18. Lee YO, Pepper JK, MacMonegle AJ, Nonnemaker JM, Duke JC, Porter L. Examining youth dual and polytobacco use with e-cigarettes. *International journal of environmental research and public health.* 2018;15(4):699.

19.   Kowitt SD, Patel T, Ranney LM, Huang L-L, Sutfin EL, Goldstein AO. Poly-tobacco use among high school students. *International journal of environmental research and public health.* 2015;12(11):14477-14489.
20.   Osman A, Kowitt SD, Ranney LM, Heck C, Goldstein AO. Risk factors for multiple tobacco product use among high school youth. *Addictive behaviors.* 2019;99:106068.
21.   Vu T-HT, Groom A, Hart JL, et al. Socioeconomic and Demographic Status and Perceived Health Risks of E-Cigarette Product Contents Among Youth: Results From a National Survey. *Health Promotion Practice.* 2020;21(1_suppl):148S-156S.
22.   Leavens EL, Meier E, Brett EI, et al. Polytobacco use and risk perceptions among young adults: The potential role of habituation to risk. *Addictive behaviors.* 2019;90:278-284.
23.   Haardörfer R, Berg CJ, Lewis M, et al. Polytobacco, marijuana, and alcohol use patterns in college students: A latent class analysis. *Addictive behaviors.* 2016;59:58-64.
24.   Ganz O, Johnson AL, Cohn AM, et al. Tobacco harm perceptions and use among sexual and gender minorities: findings from a national sample of young adults in the United States. *Addictive behaviors.* 2018;81:104-108.
25.   Witte K. Putting the fear back into fear appeals: The extended parallel process model. *Communications Monographs.* 1992;59(4):329-349.
26.   Institute UNC. A Socioecological Approach to Addressing Tobacco-Related Health Disparities. In: US Department of Health and Human Services, National Institutes of Health …; 2017.
27.   Duke JC, Farrelly MC, Alexander TN, et al. Effect of a national tobacco public education campaign on youth's risk perceptions and beliefs about smoking. *American Journal of Health Promotion.* 2018;32(5):1248-1256.
28.   Kranzler EC, Hornik RC. The Relationship Between Exogenous Exposure to "The Real Cost" Anti-Smoking Campaign and Campaign-Targeted Beliefs. *Journal of health communication.* 2019;24(10):780-790.
29.   Calabro KS, Khalil GE, Chen M, Perry CL, Prokhorov AV. Pilot study to inform young adults about the risks of electronic cigarettes through text messaging. *Addictive Behaviors Reports.* 2019;10:100224.
30.   Emory K, Buchting F, Trinidad DR, Vera L, Emery SL. Lesbian, Gay, Bisexual, and Transgender (LGBT) View it Differently Than Non-LGBT: Exposure to Tobacco-related Couponing, E-cigarette Advertisements, and Anti-tobacco Messages on Social and Traditional Media. *Nicotine & Tobacco Research.* 2018;1:10.
31.   Matthews AK, Balsam K, Hotton A, Kuhns L, Li C-C, Bowen DJ. Awareness of media-based antitobacco messages among a community sample of LGBT individuals. *Health promotion practice.* 2014;15(6):857-866.
32.   Products UFaDACfT. CTP's Key Strategic Priorities. https://www.fda.gov/tobacco-products/about-center-tobacco-products-ctp/ctps-key-strategic-priorities. Published 2017. Updated 10/17/2017. Accessed June 12, 2020.
33.   Wheldon CW, Kaufman AR, Kasza KA, Moser RP. Tobacco Use Among Adults by Sexual Orientation: Findings from the Population Assessment of Tobacco and Health Study. *LGBT Health.* 2018;5(1):33-44.
34.   Jamal A, Phillips E, Gentzke AS, et al. Current cigarette smoking among adults—United States, 2016. *Morbidity and Mortality Weekly Report.* 2018;67(2):53.
35.   Mirbolouk M, Charkhchi P, Kianoush S, et al. Prevalence and distribution of e-cigarette use among US adults: behavioral risk factor surveillance system, 2016. *Annals of internal medicine.* 2018;169(7):429-438.
36.   Hoffman L, Delahanty J, Johnson SE, Zhao X. Sexual and gender minority cigarette smoking disparities: An analysis of 2016 Behavioral Risk Factor Surveillance System data. *Prev Med.* 2018;113:109-115.

37.   Johnson SE, O'Brien EK, Coleman B, Tessman GK, Hoffman L, Delahanty J. Sexual and Gender Minority US Youth Tobacco Use: Population Assessment of Tobacco and Health (PATH) Study Wave 3, 2015–2016. *American journal of preventive medicine.* 2019;57(2):256-261.

38.   Piper ME, Baker TB, Benowitz NL, Jorenby DE. Changes in use patterns over 1 year among smokers and dual users of combustible and electronic cigarettes. *Nicotine and Tobacco Research.* 2020;22(5):672-680.

39.   Petersen A, Myers MG, Tully L, Brikmanis K, Doran N. Polytobacco use among young adult smokers: prospective association with cigarette consumption. *Tobacco control.* 2020;29(1):43-48.

40.   Grier SA, Kumanyika S. Targeted marketing and public health. *Annual review of public health.* 2010;31:349-369.

41.   Stead M, Angus K, Langley T, et al. Mass media to communicate public health messages in six health topic areas:: a systematic review and other reviews of the evidence. *Public Health Research.* 2019.

42.   Halas G, Schultz AS, Rothney J, et al. A Scoping Review of Foci, Trends, and Gaps in Reviews of Tobacco Control Research. *Nicotine and Tobacco Research.* 2020;22(5):599-612.

43.   Mosdøl A, Lidal IB, Straumann GH, Vist GE. Targeted mass media interventions promoting healthy behaviours to reduce risk of non-communicable diseases in adult, ethnic minorities. *Cochrane Database of Systematic Reviews.* 2017(2).

44.   Hill S, Amos A, Clifford D, Platt S. Impact of tobacco control interventions on socioeconomic inequalities in smoking: review of the evidence. *Tobacco control.* 2014;23(e2):e89-e97.

45.   Niederdeppe J, Kuang X, Crock B, Skelton A. Media campaigns to promote smoking cessation among socioeconomically disadvantaged populations: what do we know, what do we need to learn, and what should we do now? *Social science & medicine.* 2008;67(9):1343-1355.

46.   White VM, Warne CD, Spittal MJ, Durkin S, Purcell K, Wakefield MA. What impact have tobacco control policies, cigarette price and tobacco control programme funding had on Australian adolescents' smoking? Findings over a 15-year period. *Addiction.* 2011;106(8):1493-1502.

47.   Farrelly MC, Davis KC, Haviland ML, Messeri P, Healton CG. Evidence of a dose—response relationship between "truth" antismoking Ads and youth smoking prevalence. *American journal of public health.* 2005;95(3):425-431.

48.   Farrelly MC, Nonnemaker J, Davis KC, Hussin A. The influence of the national truth® campaign on smoking initiation. *American journal of preventive medicine.* 2009;36(5):379-384.

49.   Farrelly MC, Duke JC, Nonnemaker J, et al. Association between The Real Cost media campaign and smoking initiation among youths—United States, 2014–2016. *MMWR Morbidity and mortality weekly report.* 2017;66(2):47.

50.   Sly DF, Hopkins RS, Trapido E, Ray S. Influence of a counteradvertising media campaign on initiation of smoking: the Florida" truth" campaign. *American Journal of Public Health.* 2001;91(2):233.

51.   Weiss JW, Cen S, Schuster DV, et al. Longitudinal effects of pro-tobacco and anti-tobacco messages on adolescent smoking susceptibility. *Nicotine & Tobacco Research.* 2006;8(3):455-465.

52.   Siegel M, Biener L. The impact of an antismoking media campaign on progression to established smoking: results of a longitudinal youth study. *American Journal of Public Health.* 2000;90(3):380.

53.   Abrams DB, Glasser AM, Pearson JL, Villanti AC, Collins LK, Niaura RS. Harm minimization and tobacco control: reframing societal views of nicotine use to rapidly save lives. *Annual review of public health.* 2018;39:193-213.

54.   Bhatnagar A, Whitsel LP, Ribisl KM, et al. Electronic cigarettes: a policy statement from the American Heart Association. *Circulation.* 2014;130(16):1418-1436.

55.   Farsalinos KE, Polosa R. Safety evaluation and risk assessment of electronic cigarettes as tobacco cigarette substitutes: a systematic review. *Therapeutic advances in drug safety.* 2014;5(2):67-86.

56.   Warner KE, Schroeder SA. FDA's innovative plan to address the enormous toll of smoking. *Jama.* 2017;318(18):1755-1756.

57.   Pepper JK, Byron MJ, Ribisl KM, Brewer NT. How hearing about harmful chemicals affects smokers' interest in dual use of cigarettes and e-cigarettes. *Preventive medicine.* 2017;96:144-148.

THE OHIO STATE UNIVERSITY   CSRC PROTOCOL OSU_20427
INITIAL APPROVAL: 03/05/2021   IRB PROTOCOL #: 2021C0020
LAST UPDATED PROTOCOL (Aim 1): 07/22/2022 NCT05393869

58. Yang B, Owusu D, Popova L. Testing messages about comparative risk of electronic cigarettes and combusted cigarettes. *Tobacco control.* 2019;28(4):440-448.
59. Barnes AJ, Bono RS, Lester RC, Eissenberg TE, Cobb CO. Effect of flavors and modified risk messages on e-cigarette abuse liability. *Tobacco regulatory science.* 2017;3(4):374-387.
60. Dilley JA, Spigner C, Boysun MJ, Dent CW, Pizacani BA. Does tobacco industry marketing excessively impact lesbian, gay and bisexual communities? *Tobacco control.* 2008;17(6):385-390.
61. Balsam KF, Beadnell B, Riggs KR. Understanding sexual orientation health disparities in smoking: a population-based analysis. *Am J Orthopsychiatry.* 2012;82(4):482-493.
62. Soneji S, Knutzen KE, Tan AS, et al. Online tobacco marketing among US adolescent sexual, gender, racial, and ethnic minorities. *Addictive behaviors.* 2019.
63. Smith EA, Thomson K, Offen N, Malone RE. "If you know you exist, it's just marketing poison": meanings of tobacco industry targeting in the lesbian, gay, bisexual, and transgender community. *American journal of public health.* 2008;98(6):996-1003.
64. Smith EA, Offen N, Malone RE. What makes an ad a cigarette ad? Commercial tobacco imagery in the lesbian, gay, and bisexual press. *Journal of Epidemiology & Community Health.* 2005;59(12):1086-1091.
65. Stevens P, Carlson LM, Hinman JM. An analysis of tobacco industry marketing to lesbian, gay, bisexual, and transgender (LGBT) populations: strategies for mainstream tobacco control and prevention. *Health Promotion Practice.* 2004;5(3_suppl):129S-134S.
66. Drabble L, Keatley J, Marcelle G. Progress and opportunities in lesbian, gay, bisexual, and transgender health communications. *Clinical Research and Regulatory Affairs.* 2003;20(2):205-227.
67. Combs R, Wendel M, Gonzales T. Considering transgender and gender nonconforming people in health communication campaigns. *Palgrave Communications.* 2018;4(1):1-6.
68. Food U, Administration D. This Free Life Campaign. 2016. In:2017.
69. Duke JC, Alexander TN, Zhao X, et al. Youth's awareness of and reactions to the real cost national tobacco public education campaign. *PLoS one.* 2015;10(12).
70. Davis KC, Duke J, Shafer P, Patel D, Rodes R, Beistle D. Perceived effectiveness of antismoking ads and association with quit attempts among smokers: evidence from the tips from former smokers campaign. *Health communication.* 2017;32(8):931-938.
71. Baskerville NB, Dash D, Shuh A, et al. Tobacco use cessation interventions for lesbian, gay, bisexual, transgender and queer youth and young adults: A scoping review. *Preventive medicine reports.* 2017;6:53-62.
72. MacMonegle AJ, Nonnemaker J, Duke JC, et al. Cost-effectiveness analysis of The Real Cost campaign's effect on smoking prevention. *American journal of preventive medicine.* 2018;55(3):319-325.
73. Xu X, Alexander Jr RL, Simpson SA, et al. A cost-effectiveness analysis of the first federally funded antismoking campaign. *American journal of preventive medicine.* 2015;48(3):318-325.
74. Grosse SD. Assessing cost-effectiveness in healthcare: history of the $50,000 per QALY threshold. *Expert review of pharmacoeconomics & outcomes research.* 2008;8(2):165-178.
75. Rice RE, Atkin CK. *Public communication campaigns.* SAGE publications; 2012.
76. Rogers RW. A protection motivation theory of fear appeals and attitude change1. *The journal of psychology.* 1975;91(1):93-114.
77. O'Keefe DJ, Jensen JD. Do loss-framed persuasive messages engender greater message processing than do gain-framed messages? A meta-analytic review. *Communication Studies.* 2008;59(1):51-67.
78. Wong NC, Cappella JN. Antismoking threat and efficacy appeals: effects on smoking cessation intentions for smokers with low and high readiness to quit. *Journal of Applied Communication Research.* 2009;37(1):1-20.
79. Navarro MA, Hoffman L, Crankshaw EC, Guillory J, Jacobs S. LGBT Identity and Its Influence on Perceived Effectiveness of Advertisements from a LGBT Tobacco Public Education Campaign. *Journal of health communication.* 2019:1-13.

THE OHIO STATE UNIVERSITY   CSRC PROTOCOL OSU_20427
INITIAL APPROVAL: 03/05/2021   IRB PROTOCOL #: 2021C0020
LAST UPDATED PROTOCOL (Aim 1): 07/22/2022   NCT05393869

80. Yang H-K, Shin D-W, Park J-H, et al. The association between perceived social support and continued smoking in cancer survivors. *Japanese journal of clinical oncology.* 2012;43(1):45-54.
81. Owusu D, Lawley R, Yang B, et al. 'The lesser devil you don't know': a qualitative study of smokers' responses to messages communicating comparative risk of electronic and combusted cigarettes. *Tobacco Control.* 2020;29(2):217-223.
82. Huang L-L, Lazard AJ, Pepper JK, Noar SM, Ranney LM, Goldstein AO. Impact of The Real Cost campaign on adolescents' recall, attitudes, and risk perceptions about tobacco use: a national study. *International journal of environmental research and public health.* 2017;14(1):42.
83. Vidrine JI, Simmons VN, Brandon TH. Construction of Smoking-Relevant Risk Perceptions Among College Students: The Influence of Need for Cognition and Message Content 1. *Journal of Applied Social Psychology.* 2007;37(1):91-114.
84. Stevens EM, Kim S, Leshner G, et al. The Attitudinal and Motivational Effects of Anti-waterpipe Messages. *American journal of health behavior.* 2019;43(3):478-489.
85. Rozin P, Singh L. The moralization of cigarette smoking in the United States. *Journal of Consumer Psychology.* 1999;8(3):321-337.
86. Webb TL, Sheeran P. Does changing behavioral intentions engender behavior change? A meta-analysis of the experimental evidence. *Psychological bulletin.* 2006;132(2):249.
87. Maynard OM, McClernon FJ, Oliver JA, Munafò MR. Using Neuroscience to Inform Tobacco Control Policy. *Nicotine Tob Res.* 2019;21(6):739-746.
88. Kaufman A, Klein EG, Koblitz A, Price S. A Vision for Eye-tracking Research in Tobacco Regulatory Science. *Tobacco regulatory science.* 2018;4(6):3-7.
89. RF P, PD B. *Psychophysiological Measurement and Meaning : Cognitive and Emotional Processing of Media. .* New York, NY: Routledge; 2012.
90. Stevens EM, Johnson AL, Leshner G, et al. People in E-Cigarette Ads Attract More Attention: An Eye-tracking Study. *Tobacco Regulatory Science.* 2020;6(2):105-117.
91. Garrison KA, O'Malley SS, Gueorguieva R, Krishnan-Sarin S. A fMRI study on the impact of advertising for flavored e-cigarettes on susceptible young adults. *Drug Alcohol Depend.* 2018;186:233-241.
92. Londerée AM, Roberts ME, Wewers ME, Peters E, Ferketich AK, Wagner DD. Adolescent Attentional Bias toward Real-world Flavored E-cigarette Marketing. *Tobacco Regulatory Science.* 2018;4(6):57-65.
93. Mercincavage M, Burdge J, Lochbuehler K, Souprountchouk V, McCullough AA, Strasser AA. Visual Attention Patterns Differ by Pictorial Health Warning Label Features. *Tob Regul Sci.* 2018;4(6):8-17.
94. Peterson EB, Thomsen S, Lindsay G, John K. Adolescents' attention to traditional and graphic tobacco warning labels: an eye-tracking approach. *J Drug Educ.* 2010;40(3):227-244.
95. Spohr SA, Nandy R, Gandhiraj D, Vemulapalli A, Anne S, Walters ST. Efficacy of SMS text message interventions for smoking cessation: a meta-analysis. *Journal of Substance Abuse Treatment.* 2015;56:1-10.
96. Kong G, Ells DM, Camenga DR, Krishnan-Sarin S. Text messaging-based smoking cessation intervention: a narrative review. *Addictive behaviors.* 2014;39(5):907-917.
97. Mays D, Phan L, Johnson AC, et al. Results of a Single Arm Pilot Study of a Mobile Messaging Intervention for Hookah Tobacco Cessation in Young Adults. *Tobacco Use Insights.* 2020;13:1179173X20915200.
98. Center PR. *Mobile Fact Sheet.* 2019.
99. Smith A. Chapter Two: Usage and attitudes toward smartphones. *Pew Research Center.* 2015.
100. McGRATH JC. Evaluating national health communication campaigns: Formative and summative research issues. *American Behavioral Scientist.* 1991;34(6):652-665.
101. Davis KC, Nonnemaker J, Duke J, Farrelly MC. Perceived effectiveness of cessation advertisements: the importance of audience reactions and practical implications for media campaign planning. *Health Communication.* 2013;28(5):461-472.
102. Baig SA, Noar SM, Gottfredson NC, Boynton MH, Ribisl KM, Brewer NT. UNC perceived message effectiveness: validation of a brief scale. *Annals of Behavioral Medicine.* 2019;53(8):732-742.

THE OHIO STATE UNIVERSITY
INITIAL APPROVAL: 03/05/2021
LAST UPDATED PROTOCOL (Aim 1): 07/22/2022

CSRC PROTOCOL OSU_20427
IRB PROTOCOL #: 2021C0020
NCT05393869

103. Cancer IAfRo. Methods for evaluating tobacco control policies. In: *Methods for evaluating tobacco control policies.*2008.
104. Hall MG, Sheeran P, Noar SM, Ribisl KM, Boynton MH, Brewer NT. A brief measure of reactance to health warnings. *Journal of behavioral medicine.* 2017;40(3):520-529.
105. Witte K. Predicting risk behaviors: Development and validation of a diagnostic scale. *Journal of health communication.* 1996;1(4):317-342.
106. Laws USP. Public Law 111-31 [H.R. 1256] Family Smoking Prevention and Tobacco Control Act. In:2009.
107. Cotter T, Perez D, Dunlop S, Hung WT, Dessaix A, Bishop JF. The case for recycling and adapting anti-tobacco mass media campaigns. *Tobacco Control.* 2010;19(6):514-517.
108. Brennan E, Gibson LA, Kybert-Momjian A, Liu J, Hornik RC. Promising themes for antismoking campaigns targeting youth and young adults. *Tobacco regulatory science.* 2017;3(1):29-46.
109. Health NIo, Food U, Administration D. Population of assessment of tobacco and health (path) study: final adult baseline (wave 1) questionnaire. *Bethesda, MD: National Institutes of Health.* 2013.
110. Guillory J, Crankshaw E, Farrelly MC, et al. LGBT young adults' awareness of and receptivity to the This Free Life tobacco public education campaign. *Tobacco Control.* 2020.
111. Pierce JP, Sargent JD, White MM, et al. Receptivity to Tobacco Advertising and Susceptibility to Tobacco Products. *Pediatrics.* 2017;139(6):e20163353.
112. Villanti AC, LePine SE, West JC, et al. Identifying message content to reduce vaping: Results from online message testing trials in young adult tobacco users. *Addictive behaviors.* 2021;115:106778.
113. Badgett MVL. *Best Practices for Asking Questions about Sexual Orientation on Surveys.* 2009.
114. The GenIUSS Group. *Best Practices for Asking Questions to Identify Transgender and Other Gender Minority Respondents on Population-Based Surveys.* Los Angeles, CA: The Williams Institute;2014.
115. Toolkit P. Tobacco Regulatory Science Research Collections. RTI International. https://www.phenxtoolkit.org/collections/trrc. Published 2020. Updated June 11, 2020. Accessed June 12, 2020.
116. Unger JB, Chaloupka FJ, Vallone D, et al. PhenX: environment measures for tobacco regulatory research. *Tobacco Control.* 2020;29(Suppl 1):s35-s42.
117. Archibald MM, Ambagtsheer RC, Casey MG, Lawless M. Using Zoom Videoconferencing for Qualitative Data Collection: Perceptions and Experiences of Researchers and Participants. *International Journal of Qualitative Methods.* 2019;18:1609406919874596.
118. Lo Iacono V, Symonds P, Brown DH. Skype as a tool for qualitative research interviews. *Sociological Research Online.* 2016;21(2):1-15.
119. Weller S. Using internet video calls in qualitative (longitudinal) interviews: Some implications for rapport. *International Journal of Social Research Methodology.* 2017;20(6):613-625.
120. Weller S. The potentials and pitfalls of using Skype for qualitative (longitudinal) interviews. 2015.
121. Seitz S. Pixilated partnerships, overcoming obstacles in qualitative interviews via Skype: A research note. *Qualitative Research.* 2016;16(2):229-235.
122. Peer E, Brandimarte L, Samat S, Acquisti A. Beyond the Turk: Alternative platforms for crowdsourcing behavioral research. *Journal of Experimental Social Psychology.* 2017;70:153-163.
123. Legate N, Weinstein N, Ryan WS, DeHaan CR, Ryan RM. Parental autonomy support predicts lower internalized homophobia and better psychological health indirectly through lower shame in lesbian, gay and bisexual adults. *Stigma and Health.* 2019;4(4):367.
124. Goodman JK, Cryder CE, Cheema A. Data collection in a flat world: The strengths and weaknesses of Mechanical Turk samples. *Journal of Behavioral Decision Making.* 2013;26(3):213-224.
125. Watkins DC. Rapid and rigorous qualitative data analysis: The "RADaR" technique for applied research. *International Journal of Qualitative Methods.* 2017;16(1):1609406917712131.
126. Bechhofer RG. *Design and analysis of experiment for statistical selection, screening, and multiple comparisons.* 1995.

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INITIAL APPROVAL: 03/05/2021
LAST UPDATED PROTOCOL (Aim 1): 07/22/2022

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