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Young Adult E-Cigarette Exposure: Implications for Policy and Prevention

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Young Adult E-Cigarette Exposure: Implications for Policy and Prevention

A dissertation submitted in partial fulfillment
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by

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ABSTRACT

Objective. The purpose of this study is to examine factors associated with e-cigarette use among college students to better understand their behavior. Using Ajzen's Reasoned Action Approach, this study sought to better understanding the influence of attitudes, social norms, and perceived behavioral controls (PBCs) on college students' intention to try e-cigarettes (even one puff) in the next 30 days.

Methodology. This study employed three phases for a mixed methods design that took place between December 2015 and April 2016. Phase 1 used Middlestadt's salient belief elicitation procedure to capture responses through an open ended survey (n=58). Phase 2, a pilot sample (n=49), was employed to develop and validate a quantitative measure of the underlying RAA constructs, using responses from Phase 1. For Phase 3, a convenience samples (n=499) allowed for the assessment of the measurement models of both the underlying and global constructs of the RAA using exploratory factor analysis, confirmatory factor analysis, and structural equation modeling. All samples consisted of University of Arkansas students between the ages of 18 and 26 years of age.

Results. Responses from Phase 1 were used to develop a 162 item measure of the underlying constructs that was reduced to 78 items during Phase 2. During Phase 3, the underlying constructs, attitude, injunctive norms, and PBC were found to significantly predict their respective global measure. Global constructs loaded onto the predicted four factors: intent, attitude, social norms and PBC, after removing six items. In the final path model, global constructs attitude (.27, $p<.001$) and injunctive norm (.58, $p<.001$) significantly predicted intention.

Conclusion. The RAA allows for a better understanding of the values and beliefs people have about a given behavior and how these beliefs influence behavioral intention. College students' attitudes toward e-cigarettes (e.g., cessation device, fear of addiction) may influence their intention to try these products. Moreover, disapproving referents (e.g., family, parents, and friends) may discourage the use of e-cigarettes for some college students.

ACKNOWLEDGMENTS

Special thanks are due to my co-dissertation chairs, Dr. Heather Blunt and Dr. Bart Hammig for their guidance, expertise, and patience throughout my learning process. Dr. Hammig has provided me with valuable support regarding analysis, manuscript writing, and perseverance throughout the research process over the past several years. He has been my expert leader regarding e-cigarettes, a topic in which I am interested, and he has allowed me to pursue this interest through several research opportunities. His encouragement and support has allowed me to pursue a passion for research, and his coaching has helped me navigate the academic world with words of wisdom. Dr. Hammig helped initiate the research design for this study by suggesting a mixed methods design. It was his connection with the Arkansas Biosciences Institute (ABI) that helped secure funding for this study, and without Dr. Hammig, this dissertation would not have been possible. Dr. Blunt provided the expertise, knowledge and patience through the preparation and analysis processes of my dissertation. When considering analysis processes, only one method seem plausible, path analysis. While this analysis process is ideal, I've yet to take a course regarding structural equation modeling (SEM) or path analysis. Dr. Blunt has taught me a tremendous plethora about SEM through hands-on application and multiple detailed explanations. Dr. Blunt has been crucial throughout the entire process of my dissertation, and it would not have been possible without her.

Additionally, I would like to acknowledge my committee member, Dr. Kristen Jozkowski for her knowledge and expertise of the Reasoned Action Approach (RAA) theory, which was used for this study. Dr. Jozkowski has a direct connection with the author of the salient elicitation procedure, Dr. Susan Middlestadt. Dr. Jozkowski afforded me the material that taught me, step-by-step, how to conduct this research as intended by the authors. She also coached me

throughout the year regarding best practices of the RAA, and she sought out validation and affirmation from other experts and colleagues to insure I was using correct measures. Her guidance and support has helped this study make a unique contribution to the RAA.

I would like to acknowledge my research assistant, Abbie Sudduth, of whom I am ever grateful for her hard work, attention to details, and patience throughout the entire year. Abbie helped me gather and analyze data, and she afforded me a second coder during the qualitative analysis. She has provided an important contribution to this study.

I would also like to acknowledge my committee members Dr. Wen-Juo Lo, who thankfully agreed to join my committee as an expert in SEM and measurement evaluation. Dr. Lo has provided me guidance over the past several years through statistical courses, and his knowledge and expertise is extremely valuable. Additionally, I would like to acknowledge my committee member, Dr. Dean Gorman. Dr. Gorman is personally responsible for my existence in this program. In 2012, Dr. Gorman called me, two weeks before July, and offered me a graduate assistantship (GA) position with the Health, Human Performance and Recreation (HHPR) department. When he asked if I was interested, I replied, "Yes, I'm interested." The next day, I saw Dr. Hammig, and he congratulated me on my new job with the department. That job changed my life forever, and afforded me the path that led to my enrollment in the PhD program at Arkansas. Finally, but certainly not last, I would like to acknowledge my committee member, Dr. Jean Henry. Dr. Henry was one of my first professors within community health promotion, and it was her support and encouragement that helped me become a more involved student, GA, and professional. Dr. Henry invited me to join Age-Friendly Fayetteville (AFF). AFF is an initiative that will soon recognize our community for its accomplishments of providing an inclusive environment for all ages, as well as a blue print of a plan to provide future

improvements. I have had the great privilege to work with diverse people and learn about my community, others, and myself throughout these past three years with AFF. In addition to service, Dr. Henry has been my role model. Dr. Henry lives life to the fullest, and she is probably one of the most fascinating people I've ever met. Her welcoming nature, energy, and seminaries with my mother have helped make the HHPR department my family.

I would like to acknowledge the ABI, who allowed the funding of this research. Without this funding, it would not have been possible for Abbie to be my research assistant. Additionally, it would have been near-to-impossible to recruit participants for all three phases of this study without the funding afforded by the ABI. ABI has allowed me to further explore e-cigarette use among college students and provide a theoretical contribution to RAA literature.

DEDICATION

I would like to dedicate this dissertation to my husband, Ty Dobbs. He has been my rock throughout the past three years of my doctoral program, lifting me up during low times, and giving me undeserved acknowledgement during the high times. He is the most driven, patient, kind, and intelligent person I know, and I'm thankful to go through life with him. I owe him my sanity, and I hope he knows how much I appreciate him.

Additionally, I would like to dedicate this dissertation to my late grandfather, J.D. Burton (Pepaw). My Pepaw was born September 9, 1931, in the town of Moreland, Arkansas. He was the last living child of seven children. Education has always been valued in my family, but no one was more proud of my education than my Pepaw. In the ninth grade, my Pepaw dropped out of school because his family needed help. He picked cotton, and when he was 16 years old, he lied about his age to join the United States Marine Corps. He told me the Marine recruiter promised him clothes, something for which that his family didn't have the money. Not having a high school education was an insecurity for my Pepaw his whole life. My mom told me that he once studied for the General Educational Development (GED) exam, but he never took it. He was extremely talented and worked for the Food and Drug Administration in refrigeration and air conditioning for 34 years, yet he always persisted that education was important. When I told him that I was beginning a PhD program, he said "You'll make the big bucks." I explained that I wasn't going into the appropriate field if I was concerned with money, but he never seemed to believe me. On March 26, 2014, during my first year in the PhD program, my Pepaw passed away after a long battle with Parkinson's disease, heart disease, and kidney failure. He worked harder than anyone I've ever known to simply live. He loved his wife, Dorothy Oliger Burton, to whom he was married for nearly 62 years, and he did everything in his power to spend as much

time with her on this earth. If he were here, I know he would tell me "You're the best

granddaughter I've got." This was our favorite joke, because I was his only granddaughter.

I have always admired my grandfather for his hard work, dedication, and determination

to provide a better life for his family than he experienced. I learned from him that education does

not make a person who they are, but it simply supplies a person with tools. While I'm proud that

am pursuing a PhD, this is simply because it is a requirement of the job that I want to do. My

education does not define my character, heart, soul, or who I am as a person; however,

completing this degree is something that I wish to accomplish for myself, my husband, my

family, and especially, my Pepaw.

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CHAPTER 1: INTRODUCTION

Definition of Key Terms

E-cigarettes: Abbreviation for electronic cigarettes.

Ever use: When someone has tried an e-cigarette at least once in their life.

Conventional cigarette: A combustible cigarette.

Duel use: Using both an e-cigarette and a conventional cigarette.

Lifetime use: The measure of e-cigarette use over a person's lifetime.

Minor: Defined by state law as either someone below 18 or 19 years of age.

Tobacco products: Includes all products created with or derived from tobacco and that contain nicotine.

Vape: The inhalation or use of an e-cigarette.

Youth: A person younger than 18 years of age.

Young Adults: A person between 18 and 26 years of age (Choi, Fabian, Mottey, Corbett, & Forster, 2012).

Emerging Adults: A person between 18 and 25 years of age (Allem, Forster, Neiberger, & Unger, 2015).

E-cigarette initiation: Point at which a person tries an e-cigarette for the first time.

Electronic Nicotine Delivery Systems

Electronic cigarettes (e-cigarettes) are an electronic nicotine delivery system, battery powered to deliver aerosolized nicotine and other byproducts to the user. E-cigarettes provide a noncombustible means of inhaling vaporized nicotine, yet they are just one subcategory of electronic nicotine delivery systems (ENDS), or personal vaporizers (Brown & Cheng, 2014). E-cigarettes are currently the most popular of these products, which also include electronic cigars and vapor pens (Center for Disease Control and Prevention [CDC], 2015), although there can be confusion as to which product people are refering, due to various designs and modifications among ENDS (Farsalinos, Romagna, Tsiapras, Krzopoulos, & Voudris, 2014). This study will address all ENDS but will use "e-cigarette" as terminology due to its familiarity both within literature and laypeople.

E-cigarettes were first manufactured in China in 2003; although, studies show that Philip Morris (tobacco manufacturer) conducted research regarding e-cigarettes as early as the 1990s (Adkison et al., 2013). They made their way to Europe in 2006, and they were first introduced to the U.S. in 2007 (Pauly, Li, & Barry, 2007). E-cigarettes have evolved over the past eight years into generational models. The first-generation model has been referred to as 'cigalikes', (see *Figure 1.* Electronic Cigarette Design), due to their resemblance of conventional cigarettes in shape and size (Zhu et al., 2014); they usually are disposable, do not have a rechargeable battery, and are not refillable (Brown & Cheng, 2014).

E-cigarettes are made from three main components: a nicotine solution, a heating element that vaporizes the liquid solution, and a battery power source, typically a rechargeable lithium battery (Brown & Cheng, 2014). The liquid solution, also known as e-juice or e-liquid, contains flavoring and nicotine along with an e-liquid base, such as humectant(s) propylene glycol and/or

vegetable glycerin (Kosmider et al., 2014). When the liquid solution is heated, it becomes a

vapor aerosol and can be inhaled by the user. Heating can be activated by inspiration of a user or

through a trigger that manually activates this vaporizing process (Collaco, Drummond, &

McGarth-Morrow, 2015; Gourdet, Chriqui, & Chaloupka, 2014).

Figure 1. Electronic Cigarette Design (Wollscheid & Kremzner, 2009)

E-cigarettes can be either disposable or reusable. Either may or may not have the light-

emitting diode (LED) on the end which gives the visual effect of a conventional cigarette, as

seen in *Figure 1*. Electronic Cigarette Design (Wollscheid & Kremzner, 2009). Cigalikes are

used by inhaling on the e-cigarettes, activating the airflow sensor. This sensor initiates the LED

imitation and heating element initiation (Brown & Cheng, 2014). The e-liquid is absorbed into

the wick, found in the atomization chamber in *Figure 1*. Electronic Cigarette Design (Wollscheid

& Kremzner, 2009), and then converted to an aerosol by the heating element. The aerosol e-

liquid then flows from the e-cigarette into the user's mouth and lungs (Wollscheid & Kremzner,

2009).

The second-generation model (eGos) are larger than cigalikes, and they usually are

reusable, being refilled with e-liquid and recharged for multiple use. The newest-generation

model is the "mods", which are larger than eGos and can be customized (voltage, ml of e-juice,

battery power, etc.) by the consumer (Farsalinos et al., 2014; Zhu et al., 2014). In a YouTube

video explaining differences of e-cigarettes, VapePowered describes eGos as being used for vape

pens to make "the battery and the tank interchangeable." This video also explains that mods

allow the consumer to produce larger clouds of vape and the taste of flavors are "enhanced"

(VapedPowered, 2013).   As seen in *Figure 2*. E-cigarette Examples of Different Products

(Grana, Benowitz, & Glantz, 2014a)*,* e-cigarettes have evolved through these generational

designs. The first generation design is comparable to a conventional cigarette, while the newest

generation of eGos seem to resemble hookah and are customizable to the individual.

Product	Description	Some Brands
Disposable e-cigarette	Cigarette-shaped device consisting of a battery and a cartridge containing an atomizer to heat a solution (with or without nicotine). Not rechargeable or refillable and is intended to be discarded after product stops producing aerosol. Sometimes called an e-hookah.	NJOY OneJoy, Aer Disposable, Flavorvapes
Rechargeable e-cigarette	Cigarette-shaped device consisting of a battery that connects to an atomizer used to heat a solution typically containing nicotine. Often contains an element that regulates puff duration and /or how many puffs may be taken consecutively.	Blu, GreenSmoke, EonSmoke
Pen-style, medium-sized rechargeable e-cigarette	Larger than a cigarette, often with a higher capacity battery, may contain a prefilled cartridge or a refillable cartridge (often called a clearomizer). These devices often come with a manual switch allowing to regulate length and frequency of puffs.	Vapor King Storm, Totally Wicked Tornado
Tank-style, large-sized rechargeable e-cigarette	Much larger than a cigarette with a higher capacity battery and typically contains a large, refillable cartridge. Often contains manual switches and a battery casing for customizing battery capacity. Can be easily modified.	Volcano Lavatube

Figure 2. E-cigarette Examples of Different Products (Grana, Benowitz, & Glantz, 2014a)

E-cigarettes in the United States

As awareness of e-cigarettes has grown, global use of e-cigarettes has increased as well

(Zhu et al., 2013; Goniewicz, Gawron, Nadolska, Balwicki, & Sobczak, 2014a; Pearson,

Richardson, Niaura, Vallone, & Abrams, 2012). In 2009, only 16% of U.S. adults had ever heard

of e-cigarettes and only one percent had ever tried them (Regan, Promoff, Dube, & Arrazola, 2013); however, in 2013, 86% of U.S. adults were aware of e-cigarettes (Pepper, Emery, Ribisl, & Brewer, 2014a) and 15% had tried them (Pepper & Brewer, 2014). Initial studies suggest that younger, white males, with higher incomes, higher educational attainment, and who are heavier smokers are more likely to be aware of e-cigarettes (Adkison et al., 2013; Pepper et al., 2014a); however, prevalence of ever using an e-cigarette is higher among younger, female adults, who were nondaily smokers, with a higher income, lower educational attainment, and believed e-cigarettes to be safer than conventional cigarettes (Adkison et al., 2013; Grana, Popova, & Ling, 2014b; Zhu et al., 2013).

Currently, studies track the progression of awareness, use and consumer perception of harm and benefits (Ambrose et al., 2014; Amrock, Zakhar, Zhou, & Weitzman, 2015; Pokhrel, Fagan, Kehl, & Herzog, 2015); however, few studies exist about e-cigarette use beyond these factors. Studies suggest that there is a higher e-cigarette use rate among those who also smoke conventional cigarettes; these people are referred to as duel users (Benowitz & Goniewicz, 2013). Some believe duel use is occurring due to the use of e-cigarettes to stop smoking (Etter, 2010); however, others see duel use as the facilitation of exposure to nicotine in places where people are not allowed to smoke, instead of helping people quit smoking (Benowitz, 2011). Some are concerned that those who have tried e-cigarettes but have never smoked conventional cigarettes (Coleman et al., 2015; Sutfin, McCoy, Morrell, Hoeppner, & Wolfson, 2013) may become duel users after initiating nicotine addiction through e-cigarettes; implying that e-cigarettes could be a "gateway" to conventional cigarettes (Grana, 2013). Currently there are no completed longitudinal studies regarding long-term use or health effects of e-cigarettes (Lessard

et al., 2014; Choi & Forster, 2014; Etter & Bullen, 2014) to support if they are improving health or are causing nicotine initiation.

E-cigarettes Among High School Students

E-cigarette use among U.S. high school students increased from 0.6% in 2010 (Corey et al., 2013) to 13.4% in 2014, estimating that two million students are currently using the products (U.S. Department of Health and Human Services [USDHHS], 2015). This increase makes e-cigarette use more common for high school students than hookah (9.4%), cigarettes (9.2%), and smokeless tobacco (5.5%) (Johnston, O'Malley, Miech, Bachman, & Schulenberg, 2015; USDHHS, 2015). This drastic increase in adolescent e-cigarette initiation cause many to questions if e-cigarettes are becoming a "gateway" (Grana, 2013; Pepper et al., 2013) or "starter product" (Dutra & Glantz, 2014b) for conventional cigarettes and other tobacco products.

Additionally, the number of students who have never smoked a conventional cigarette but who have tried an e-cigarette increased from 79,000 to 263,000 between 2011 and 2013 (Bunnell et al., 2014). The 2012 National Youth Tobacco Survey (NYTS) found that 9.3% of who had ever tried an e-cigarette and 20.3% of past-month e-cigarette users had never smoked a conventional cigarette (Corey et al., 2013). Additionally, in 2012, 20.3% of middle school students and 7.2% of high school students who never smoked a conventional cigarette indicated that they had tried e-cigarettes (Corey et al., 2013). This increase is concerning to public health because those who have ever smoked an e-cigarette are two (Bunnell et al., 2014) to six times (Dutra & Glantz, 2014a) more likely to indicate intention to smoke a conventional cigarette than those who have not smoked an e-cigarette. This suggests that youth initiation to nicotine, a drug known to be addictive, is now beginning with e-cigarettes (Grana, Benowitz, & Glantz, 2014a).

Just as with adults, awareness and use has increased globally in adolescents; however, use varies between countries. In Korean adolescents, Cho et al. (2011) found that only 0.5% of Korean students had ever tried an e-cigarette, but during the 2010-2011 school year, 23.5% of Polish high school students reported that they had ever tried an e-cigarette (Goniewicz & Zielinska-Danch, 2012). Suggested reasons for this varability between countries include differences in "availability" and "popularity" within the respective country (Carroll Chapman & Wu, 2014, p. 44). Canada, similar to the U.S., does not federally regulate youth access to e-cigarettes (Thatcher, 2015). As in the U.S., Canadian youth (15-19 years old) e-cigarette use (20%) has now surpassed conventional cigarette use (11%; USDHHS, 2015). International studies may help inform prevention efforts and effective policies, not currently seen in the U.S., that could potentially help the U.S. reduce adolescent e-cigarette exposure.

Initial studies suggest adolescent e-cigarette user profiles may be similar to adults. Youth who reported ever trying e-cigarettes were more likely to be older (17 to 19 years old; Pepper et al., 2013) white (Camenga et al., 2014a; Pepper et al., 2013) males (Cho, Shin, & Moon, 2011) who lived in urban areas (Goniewicz & Zielinska-Danch, 2012) in lower socioeconomic status (Pepper et al., 2013) and were duel users of e-cigarettes and conventional cigarettes (Saddleson et al., 2015). From a study of adolescent males, 18% were willing to try an e-cigarette if offered by a friend; however less than one percent of these males had actually tried an e-cigarette in 2011 (Pepper et al., 2013). Other covariates include mother's smoking status, sensation seeking, and use of other substances (Hampson, Andrews, Severson, & Barckley, 2015). Due to the gap in literature explaining adolescent e-cigarette use, research has been requested to better understand "why and how adolescents use e-cigarettes" (Carroll, Chapman, & Wu, 2014, p. 44).

E-cigarettes Among College Students and Young Adults

Literature regarding e-cigarettes primarily addresses adults or adolescents, with little known about young adults (Choi & Forster, 2013; King, Alam, Promoff, Arrazola, & Dube, 2013; Pearson et al., 2012; Pepper et al., 2013). Choi and Forster (2013) reported the one of the first assessment of U.S. young adults' awareness, perceptions, and use of e-cigarettes. Their study found that from 2010 to 2011, 69.9% of U.S. Midwestern adults, between the ages 20 and 28, had heard of e-cigarettes. Of these adults, 7.0% had ever tried an e-cigarette, and 1.2% had used e-cigarettes in the past 30 days. Another study in 2010 found that 41% of U.S. young adults (18-24 years) reported that they had heard of e-cigarettes, which was more than the 32.2% of the total adult population in the study who reported awareness of e-cigarettes (Regan et al., 2013). In addition, 10.1% of the young adults in this study reported that they had ever used an e-cigarette.

In 2011, Trumbo and Harper (2013) reported the first assessment of college students' acceptance of e-cigarette use. Using a convince sample of freshmen and sophomore students, Trumbo and Harper shed light to a missed population. Although not generalizable to other populations, they found 71% of their sample had heard of e-cigarettes and 13% had ever tried e-cigarettes (Trumbo & Harper, 2013). In 2013, a convenience sample of college students found almost all (95.5%) were aware of e-cigarettes, while 29.9% had tried e-cigarettes in their lifetime and 14.9 were current e-cigarette users (Saddleson et al., 2015). E-cigarette use is highest among older adolescents (Pepper et al., 2013), younger adults (Adkison et al., 2013), and higher among emerging adults (18-25) than other adults age categories (Coleman et al., 2015); thus, this population appears to be at risk for e-cigarette exposure and possibly nicotine initiation.

Since Trumbo and Harper's initial study (2013), they have since examined the construct validity of the Diffusion of Innovation and the Theory of Reasoned Action (TRA), using a

nationally representative young adult sample, (Trumbo & Harper, 2015a; Trumbo & Harper, 2015b) controlling for percentage of college students (48%) and internet households. They effectively captured a generalizable population of young adults through their sampling methods. They found that in October 2012, 81% of young adults had heard of e-cigarettes, and 14% had tried them. Those with greater educational attainment (completed some college or with a college degree) are less likely to smoke and find smoking in public less acceptable. Educational attainment influence on e-cigarette use and acceptance is not reported. Their findings suggest that the TRA construct, attitude, significantly influences intention to use e-cigarettes, while the construct, social norms, does not significantly influence intention to use e-cigarettes (Trumbo & Harper, 2015a). The current study utilized the Reasoned Action Approach (RAA), due to its inclusion of descriptive norms as well as injunctive norms. Further explanation is mentioned in chapter two, theoretical framework.

Sutfin et al. (2013) reported the first analysis of college students' use and user profiles. Of the eight colleges surveyed in North Caroline in 2009, they found 4.9% of college students had ever tried an e-cigarette, and 1.5% had used e-cigarettes in the past 30 days. In a bivariate analysis, Sutfin et al. (2013) found ever use was associated with males, Greek membership, living off campus, sensation seeking behavior, duel use with conventional cigarettes, ever trying hookah, binge drinking, marijuana use, using other illegal drugs, and perception of harm of e-cigarettes. This study provided the first representative snapshot of e-cigarette use on college campuses.

As mentioned earlier, most e-cigarette research has focused on awareness, perception of harm, and use; however, recent studies regarding college students' e-cigarette use have focused additionally on better understanding predictors of e-cigarette use (Allem et al., 2015; Trumbo &

Harper, 2013). In a recent pilot study, Allem et al. (2015) used a six subscale instrument, the Inventory of the Dimensions of Emerging Adulthood (IDEA), to better understand e-cigarette use as it relates to emerging adulthood. Of this convenience sample of two California State Universities, the only subscale that was significantly associated with lifetime use of e-cigarettes and past 30-day use was experimentation/possibility "time of finding out who you are". This is consistent with another study (Kong, Morean, Cavallo, Camenga, & Krishnan-Sarin, 2014) that found the top reason for youth and young adults to try e-cigarettes was curiosity.

A recently pilot study of college students at four-year and two-year colleges in Hawaii examined college students' outcome expectancies of smoking e-cigarettes (Pokhrel, Little, Fagan, Muranaka, & Herzog, 2014). Of the convenience sample, 43% had ever used an e-cigarette and 28% reported past 30-day use. This outcomes expectancy scale will provide a comparison for the current study's assessment of the construct, attitude, which is influenced by one's evaluation of the consequences of the behavior (outcome expectations). Pokhrel et al. (2014) found seven factors emerge from the 40 item outcome expectancies scale. Three factors reflected positive expected outcomes (social enhancement, affect regulation, positive sensory experience), and four factors reflected negative expected outcomes (negative health consequences, negative appearance, addiction concern, negative sensory experience).

Due to the gap in literature regarding e-cigarette behaviors among young adults, specifically college students, there remains a need for research in this area. With e-cigarette use higher among young adults (18-25) than other adult age categories (Coleman et al., 2015) and highest among older adolescents 17 to 19 years old than younger adolescents (Pepper et al., 2013), this population appears to be at risk for e-cigarette exposure and possibly nicotine initiation more than other age categories. Research suggests that college students are less likely

to use tobacco products than other young adults (Erickson, Lenk, & Forster, 2014) who do not attend college; however, these studies lumped e-cigarettes with all other alternative tobacco products. The current study seeks to address gaps in literature regarding college student e-cigarette use using a theory based approach.

E-cigarette Policy/Legislation Regarding Youth Access

In 1996, the FDA attempted to regulate tobacco products under the Food, Drug, and Cosmetic Act of 1938 (Wollscheid & Kremzner, 2009); however, the proposal was overturned. On June 29, 2009, President Barack Obama signed the Family Prevention and Tobacco Control Act, allowing the FDA to regulate tobacco products (USDHHS, 2009). One piece of this legislation requires that tobacco industries cannot attract children through marketing tactics. E-cigarettes were not included in this Act. The FDA sought to prevent youth e-cigarette initiation through public health policy by regulating e-cigarettes as a drug delivery device; however, the U.S. Court of Appeals (2010) overruled this attempt. Rather the court decided that e-cigarettes fall within the definition 'tobacco products'. This ruling prohibits the FDA from regulating e-cigarettes unless they are marketed as a cessation product; thus e-cigarettes still remain unregulated at the federal level. On April 24, 2014, the FDA indicated intent to regulate e-cigarettes as a tobacco product (USDHHS, 2014), but this intent has yet to be approved or implemented. The proposed regulation of e-cigarettes includes prohibiting the sale to minors by defining a minimum age, requiring a warning label on packaging, prohibiting the sale of e-cigarettes through vending machines (unless in a facility that does not allow minors), and the FDA's approval to review of new products (USDHHS, 2014).

With no federal regulation, all laws applying to e-cigarettes fall under invididual state responsibility. Gourdet et al. (2014) published the first baseline assessment of state laws regulating e-cigarette use and youth access. By September 2013, 34 states and municipalities had passed laws prohibiting the sale of e-cigarettes to minors, with age minimums ranging from 18 to 21 depending on the state (Paradise, 2014); however, by November 15, 2013, only 22 states had passed youth access laws, prohibiting the sale of e-cigarettes those under 18 (or 19 for some states) years of age (Gourdet et al., 2014). During that time, youth prevalence of e-cigarettes doubled each year from 2011-2013 (Corey et al., 2013). As of July 1, 2015, all but three states in the U.S. and the District of Columbia restrict the sale of e-cigarettes to minors (Dobbs, Hammig, & Sudduth, 2016).

Currently some states have protected youth from access to nicotine through policies beyond just minimum age to purchase. Effective July 1, 2016, 14 states will require child-proof packaging for e-cigarette and e-juice containers, eight states will include e-cigarettes in their state-wide smoke-free policy, and five states will impose a tax on e-cigarettes containing nicotine (Dobbs et al., 2016). Additionally, states such as Wyoming and Oregon have passed laws promoting public health prevention by requiring a media campaign to educate about the risks of nicotine (State of Wyoming, 2015), and prohibiting packaging that could be "attractive to minors" (Oregon Legislative Assembly, 2015).

E-cigarettes and Public Health

Some claim that e-cigarettes may be a safer alternative to conventional cigarettes and a potential cessation device to reduce smoking (Etter & Bullen, 2014). Although e-cigarettes have not been evaluated thoroughly by the Food and Drug Administration (FDA), preliminary studies suggest e-cigarettes release fewer toxins than cigarettes and do not burn tobacco (Goniewicz et

al., 2014b). Although many remain hopeful that e-cigarettes will reduce mortality and morbidity among current smokers (Benowitz, 2014; Hajek, Etter, Benowitz, Eissenberg, & McRobbie, 2014), others raise caution to the recent increase of e-cigarette use among youth and those who have never smoked a conventional cigarette (Coleman et al., 2015; Grana et al., 2014a; Kong et al., 2014). While focusing on the public health impact of e-cigarettes, the potential of the health benefit they may offer cannot be overlooked; however, for this study, I focus on the health impact of e-cigarette use on a young population.

   Health concern. E-cigarette use among youth and young adults raises two major concerns (1) nicotine exposure during adolescence can impair brain development (Dwyer, Broide, & Leslie, 2008), and (2) e-cigarette use may lead to nicotine addiction and future use of conventional cigarettes. Prior research suggests that nicotine exposure during development may comprise several health risks. Biological vulnerabilities include altered development of the cerebral cortex and hippocampus in adolescents (England, Bunnell, Pechacek, Tong, & McAfee, 2015) if exposed. Exposure during youth and young adulthood may also lead to nicotine dependence, promote or prolong addiction, and increase the likelihood of adopting the use of tobacco products (Corey et al., 2013). In a survey conducted in Connecticut, as many as 37.3% of the middle school, high school, and college participants who had ever tried an e-cigarette had never smoked a conventional cigarette (Kong et al., 2014). E-cigarette use has the potential to promote the acceptance of smoking in a young culture and has quickly become a public health concern.

   Advertisements. With the exception of being able to make health claims (D. C. Ciruit, 2010), there are presently very few restrictions on e-cigarette advertising. E-cigarettes are often marketed to youth and promoted as a safer alternative to tobacco. Research suggests that

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exposure to tobacco advertisements, including e-cigarettes, increases the likelihood of experimentation among adolescents (Agaku, Ayo-Yusuf, Vardavas, Alpert, & Connolly, 2013) and young adults (Duke et al., 2014). With expenditures on e-cigarette advertising estimated at $60 million dollars in 2013, and doubling every year since 2010 (Duke et al., 2014), many public health advocates are concerned about the implications on young nicotine initation (Grana, Glantz, & Ling, 2011). E-cigarette companies have used a wide variety of mediums to market their products, including television, social media, and online and print media (Duke et al., 2014; Huang, Kornfield, Szczpaka, & Emery, 2014). Many fear these tactics, such as celebrities smoking in movies, normalizes the behavior (Grana et al., 2011). Even the show, "The Doctors" featured e-cigarettes as one of the top ten health innovations of 2009 (CBS Television Distribution, 2009). While the marketing of e-cigarettes is increasing, and use among youth and young adults is growing, we still lack critical information about the public health risks and implications of e-cigarette use.

In a longitudinal study of young adults (mean age 22.4 years), Hampson et al. (2015) found that those who indicate sensation seeking behaviors are significantly more likely to use novel tobacco products (such as e-cigarettes). Using measures from Russo and colleague's (1993) Sensation Seeking Scale, Hampson et al. provided the first behavioral risk factors to help predict e-cigarette use besides smoking conventional cigarette. E-cigarettes messages are not different from the themes previously used by the tobacco industry, including independence and adventure seeking. Pro-tobacco advertising and promotional activities have been proven to cause youth initiation and prolonged tobacco use (USDHHS, 2010), and it may now also influence youth and young adults' use of e-cigarettes through seeking sensations as seen in advertisements (Hampson et al., 2015).

Current Study

Although several studies about e-cigarette use have emerged over the past few years, little is known about college students' e-cigarette behavior beyond awareness, use, and perception of harm, which has been best documented with young adults. With a drastic increase in youth and young adult e-cigarette use from 2000-2014, understanding emerging adults 'attitudes, social norms, perceived behavioral controls (PBC), and behavioral intentions regarding e-cigarettes is imperative to provide health educators and advocates with direction for policies and prevention efforts. Validated, theory based measures are needed to better understand this rapid onset of young e-cigarette initiation.

The following four questions regarding e-cigarettes are used in the nationally representative study, NYTS (Centers for Disease Control and Prevention's [CDC], 2013):

(1) Have you ever heard of e-cigarettes?

(2) Have you ever tried e-cigarettes?

(3) Have you used e-cigarette in the past 30 days?

(4) How harmful are e-cigarettes compared to regular cigarettes?

The CDC adult version of this study included eight items that asked about e-cigarettes in the 2012-2013 National Adult Tobacco Survey, which uses a telephone questionnaire to interview adult participants (Coleman et al., 2015). These items included:

(1) Before today, had you ever heard of electronic cigarettes or e-cigarettes?

(2) Have you ever used an electronic cigarette, even just one time in your entire life?

(3) How many times in total do you think you have used an electronic-cigarette during your lifetime?

      a. 1-10

      b. 11-20

      c. 21-50

      d. Over 50 times

(4) Do you now use electronic cigarettes every day, some days, rarely, or not at all?

(5) Were any of the electronic cigarettes that you used in the past 30 days flavored to taste like menthol, mint, clove, spice, candy, fruit, chocolate, or other sweets?

(6) Do you think you will use an electronic cigarette or e-cigarette in the next year? Would you say…?

      a. Definitely yes

      b. Probably yes

      c. Probably not

      d. Definitely not

(7) How old were you when you first smoked a cigar, cigarillo or little filtered cigar; a regular pipe or a hookah; or an electronic cigarette—--even if only one or two puffs?

(8) At any time during the past 12 months, did you completely switch from smoking traditional cigarettes to using electronic or e-cigarettes?

The NATS gathers more information regarding use, intention, and better understanding of the products than the NYTS, yet these few items still leave much unknown. Measures are needed to help explain behavior and intention among both youth and young adults.

Research suggests that risk factors for e-cigarette use include conventional cigarette use (Cho et al., 2011; Goniewicz et al., 2014a), sensation seeking behaviors (Hampson et al., 2015), experimentation as a part of young adulthood (Allem et al., 2015), and demographic variables.

Protective factors suggested to help reduce e-cigarette use among youth and young adults include perception that all tobacco products are harmful (Agaku et al., 2013), distrust of the tobacco industry (Choi & Forster, 2013), education and health warnings (Roditis & Halpern-Felsher, 2015), perceived severity of harm (Choi & Forster, 2013), and parental monitoring (Lessard et al., 2014). With limited known risk and protective factors of e-cigarette use, it is difficult to understand what is causing the e-cigarette epidemic amongst youth and emerging adults. Additional research is needed to develop and validate items that may address these gaps literature regarding young adult e-cigarette behavior.

The current study sought to better understand college students' intention and behavior using the RAA (Fishbein, 2008). Trumbo and Harper (2015a) used the TRA (an earlier theory from which RAA derived) to develop an online, closed-ended survey given to college students (and later a representative sample of young adults). By assessing the construct validity of the TRA, they were able to better understand behavioral intentions based on young adults' attitudes and social norms regarding e-cigarettes. The current study sought to expand on Trumbo and Harper's (2015a) research by measuring the construct validity of the RAA by using a mixed methods procedure of item elicitation and later, path analysis. The RAA constructs will be explained further in chapter two, theoretical framework.

Phase 1 of this study invited college students at the University of Arkansas to participate in a closed-ended survey, using Qualtrics, an online surveillance system. Using recommendations from Middlestadt (2006), the study recruited 58 participants. Of the total, 30 (51.7%) participants had not tried an e-cigarette in their lifetime; 28 (48.3%) participants reported that they had tried an e-cigarette in their lifetime (even one or two puffs). These open-ended surveys were collected during December of 2015. Open-ended surveys were employed

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due to Middlestadt's recommendation that salient beliefs be collected in either interviews or self-completion surveys, as opposed to a focus group study, to prevent data from contamination of other's opinions. The open-ended survey included a brief demographic section, questions regarding past behavior (to established e-cigarette users and non-users), and an additional items (asking for a list of e-cigarette brands) to address a current gap in e-cigarette literature. The theory based elicitation procedure (Middlestadt, Bhattacharyya, Rosenbaum, Fishbein, & Shepperd, 1996) was used to group themes. This approach allowed the development of a quantitative scale in second phase of the study. During Phase 1, the first eight open-ended items on the open-ended survey came from Ajzen's (2006) guidelines to constructing a planned behavior/reasoned action approach questionnaire. This is explained further in chapter three, methodology, and study instrument and measurement development. The responses to these questions identified the salient and most frequently mentioned constructs. This type of qualitative research allowed for the operational definitions of each RAA construct to be measured by items using the language of the college students (Middlestadt et al., 1996). With e-cigarette models evolving and use increasing amongst a young population, this procedural method will add value to future research by wording items it such a way that is best interpreted by the population of interest.

Phase 2 involved the development of a quantitative closed-ended item questionnaire to assess the relative importance of determinants of e-cigarette intentions by measuring the global constructs of attitudes, social norms, and PBC, as well as the indirect constructs of behavioral beliefs, outcome evaluations, injunctive normative beliefs, descriptive normative beliefs, control beliefs, and power of control factors. Frequency and cross-tabulation analysis of the categories from Phase 1 were used to elicit items for Phase 2, which will allow account for validity of

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application to the target audience. The quantitative survey was pilot tested with a sample of 49

students and examined for face validity, content validity, and construct validity. Reliability and

validity measures procedures are explained further under chapter three's section, analysis plan.

When acceptable reliability and validity standards were met, the final online survey was

administered to a sample of 499 college students using Qualtrics, the same surveillance medium

used for the open-ended survey.

Research Purpose

The purpose of this study is to examine factors associated with e-cigarette use among

college students to better understand their behavior. Using constructs from the RAA, this study

seeks to analyze influences on behavioral intent and intentions determinacy of behavior.

Research Aims

Using the mixed methods procedures described, this study addresses the gaps in literature

regarding college student e-cigarette behaviors by addressing two research aims. Research aim

one sought to elicit salient consequences, referents, and circumstances that would affect their use

of an e-cigarette (even one puff) in the next 30 days. This aim is purely exploratory to elicit

items which were used for Phase 2, a cross-sectional survey. Aim two sought to formulate direct

and indirect measures that will be tested for their ability to predict behavioral intent (e-cigarette

use in the next 30 days). The following aims are listed with sub-aims to describe how the aim

will be measured. The research aims and sub-aims include:

Aim 1: Elicitation of Salient Beliefs

1: Describe college students' behavioral outcomes beliefs of using e-cigarettes.

      1.1.1: Elicit college students' belief of advantages of e-cigarette use.

      1.1.2: Elicit college students' belief of disadvantages of e-cigarette use.

2: Describe college students' normative beliefs about e-cigarettes.

    1.2.1: Elicit a list of individuals or groups who would approve of e-cigarette use.

    1.2.2: Elicit a list of individuals or groups who would disapprove of e-cigarette use.

    1.2.3: Elicit a list of descriptive norms who are most likely to use e-cigarettes.

    1.2.4: Elicit a list of descriptive norms who are least likely to use e-cigarettes.

3: Describe college students' perception of controlling factors of e-cigarettes.

    1.3.1: Elicit a list of factors or circumstances that may enable e-cigarette use.

    1.3.2: Elicit a list of factors or circumstances that may prevent e-cigarette use.

Aim 2: Formulating Direct and Indirect RAA Measures on Intention to Use E-cigarettes

1: Explore whether college students' attitudes influence intention to use e-cigarettes.

    2.1.1: Identify e-cigarette belief strength.

    2.1.2: Identify e-cigarette outcome evaluation.

    2.1.3: Calculate the cross product of the belief strength and the outcome evaluation.

    2.1.4: Examine if attitude predicts intention to use e-cigarettes.

2: Explore whether college students' social norms influence intention to use e-cigarettes.

    2.2.1: Identify injunctive norms strength.

    2.2.2: Identify motivation to comply with referent other.

    2.2.3: Calculate the cross product of the injunctive norm strength and the motivation to comply with identified referent.

    2.2.4: Identify descriptive norms strength.

    2.2.5: Identify how strongly the participant identifies with the referent descriptive norm.

    2.2.6: Calculate the cross product of the descriptive norms strength and the identification with the referent descriptive norm.

2.2.7: Examine if injunctive and descriptive norms predict intention to use e-cigarettes

3: Explore whether college students' PBCs influence intention to use e-cigarettes.

2.3.1: Identify control beliefs.

2.3.2: Identify power of control.

2.3.3: Calculate the cross product of the control belief and the power of control.

2.3.4: Examine if PBC predicts intention to use e-cigarettes.

Significance of the Study

Little is known currently about college students' consequences, referent, and circumstances regarding e-cigarettes. This study provides valuable insight of college students' behavior through the development and testing of a theory based measures. This study is the first study to measure construct validity of the RAA, as it applies to college student e-cigarette use. By better understanding their salient consequences, referent, and circumstances, this study supports public health educators and policymakers to make informed decisions regarding e-cigarette prevention programs, policies and laws.

CHAPTER 2: LITERATURE REVIEW

Theoretical Framework

Trumbo and Harper (2013) introduced the first theoretical application to e-cigarette use with their construct validity assessment of the TRA and Diffusion of Innovation Theory. They used these two models to understand a theoretical approach to college students' e-cigarette beliefs and behaviors. While these models have been well established with other behaviors (Crosby, Salazar, & DiClemente, 2013; Rogers, 2003), their assessment was a significant contribution to better understanding the behavioral science of e-cigarettes. The current study sought to expand this understanding by using the RAA, an updated prediction model that has derived from the TRA and the Theory of Planned Behavior (TPB) (Fishbein & Ajzen, 2010). The following sections will explain the TRA and the TPB theories and their contribution to the RAA.

Theory of Reasoned Action. The TRA was developed by Fishbein (1980), building on his previous research regarding a theory of attitude and its ability to predict behavior (Crosby et al., 2013), as a response to scholars who were skeptical of attitude as a behavioral prediction construct (Fishbein et al., 1996). The TRA provided three contributions to behavioral sciences. First, it shaped how behavioral literature explains behavioral intent today, with it as the immediate preceptor to behavior. Second, it explained the difference between attitude toward a behavior and attitude toward actually performing the behavior. Someone may have a favorable attitude toward e-cigarettes, believing them to be a cessation device. Yet if they do not smoke, they may not believe it is necessary for them to use an e-cigarette. This would be an example of their behavior, and their evaluation of outcomes, not finding it necessary for them to use e-cigarettes. Finally, the TRA included normative factors that may influence someone's behavioral

intention. This construct (subjective norms) originates from sociology and focuses on the

perceptions of acceptability from referent others and a person's motivation to comply with the

beliefs of these referent others (Crosby et al., 2013). *Figure 3.* Theory of Reasoned Action

depicts the TRA. The constructs help predict intention to perfume the behavior and intention

predicts behavior. The TRA is most applicable with behaviors that are voluntary and can be

specific to "time, action, target, and context" (Crosby et al., 2013, p. 70).
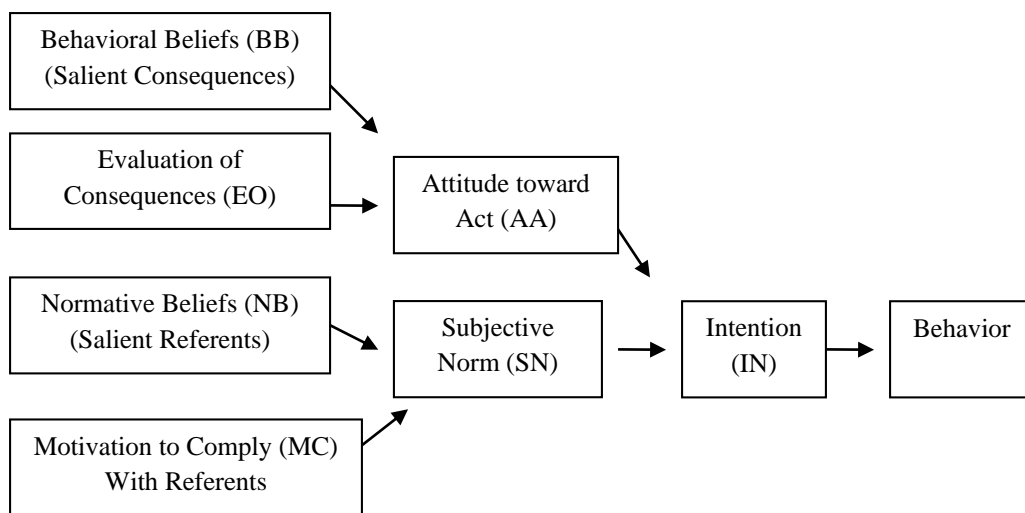
Figure 3. Theory of Reasoned Action (Fishbein, 1980; Ajzen, 1991)

In their construct validity assessment of the TRA, Trumbo and Harper (2015a) asked

respondents about their opinion of e-cigarette use from three referent others and the emphasis of

one's desire to comply with the "wishes" of each of the three referent others. They found that

attitudes toward e-cigarettes significantly impacted one's intention to use e-cigarettes; however,

they did not find that social norms made a significant impact on e-cigarette use. The current

study sought to measure all constructs by using Ajzen's (2006) recommendation for wording

items when measuring each construct. These recommendations include "defining the behavior"

with a time frame of the intention and "specifying the research population" (p. 2). For the current study, the behavior is trying an e-cigarette (even on puff) in the next 30 days, and the research population is college students.

Assumptions of the TRA include that attitude is determined by one's behavioral beliefs. A person's beliefs about a behavior are evaluated, and this evaluation in turn determines their attitude toward the behavior. Using this framework, Trumbo and Harper (2015a) measured attitudes of college students by measuring their beliefs regarding legality of e-cigarettes, perception of e-cigarettes as a smoking cessation device, and perception of e-cigarettes as "modern" cigarettes. Three items were used to measure the construct "attitudes" of college students surrounding e-cigarettes. Another study explored college students' outcome expectancies of e-cigarette use (Pokhrel et al., 2014). This study found positive outcomes expectancies of e-cigarette use in college students to include social enhancement, affect regulation, positive sensory experience; negative outcome expectancies of e-cigarette use in college students include negative health consequences, addiction concern, negative appearance, and negative sensory experience. These outcome may also be help explain evaluation of consequences e-cigarette use among of college.

Theory of Planned Behavior. Ajzen (1991) later extended the TRA to circumstances that are not completely under control or perceived control of the individual. The TPB added two contributions to behavioral prediction literature. First, it added PBC as a construct to the TRA's existing constructs. The TPB acknowledges that some PBCs may not only determine intention but rather completely control behavior. An example of restricting behavior and not intention could be smoke-free policies. Someone may have the intention of smoking at dinner, but if there is a smoke-free policy in the area in which they are eating, they will not be able to perform the

behavior. The second contribution of the TPB is that it outlined that facilitating factors,

inhibiting factors, and perceived power are the foundation of PBC (Crosby et al., 2013). The

TPB can be send in *Figure 3.* Theory of Reasoned Action as all the white and tan textboxes

(PBC).
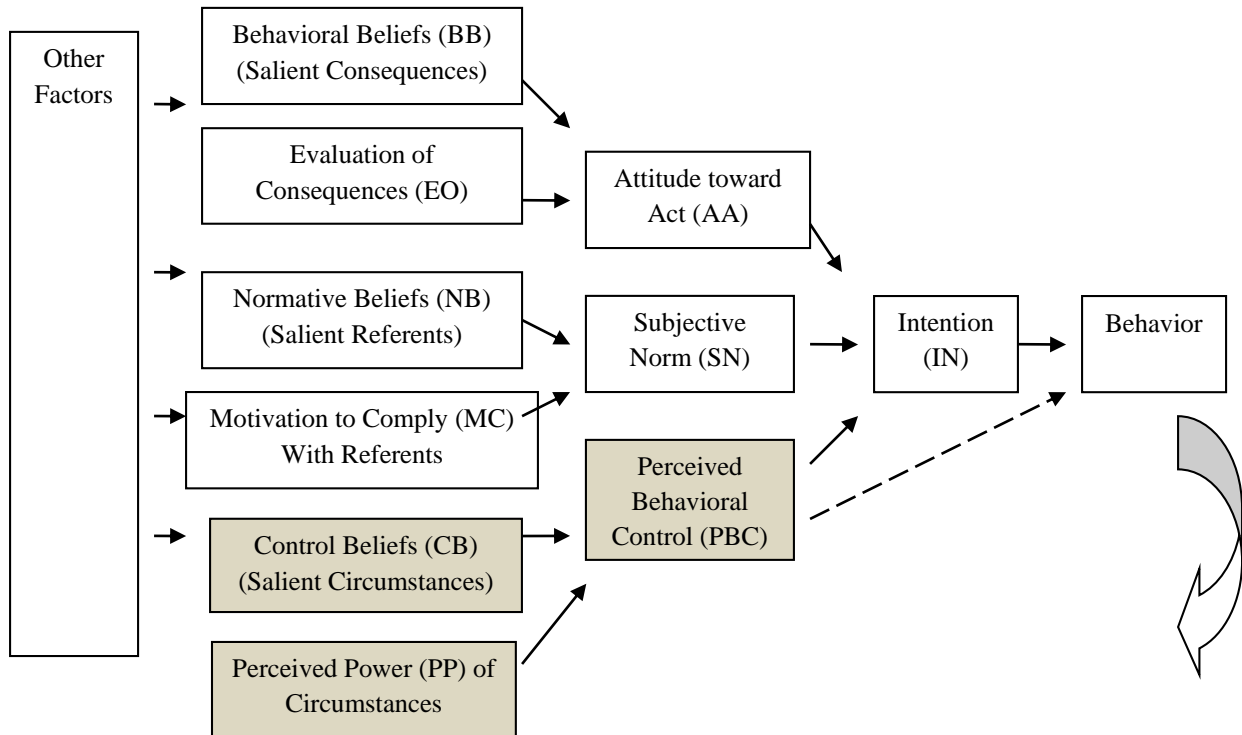
Figure 4. Theory of Planned Behavior (Fishbein, 1980; Ajzen, 1991)

Facilitating factors of e-cigarette use previously seen in studies include: accessibility;

convenience (Choi et al., 2012); attractive and modern design (Choi et al., 2012; Roditis &

Halpern-Felsher, 2015); media influence (Roditis & Halpern-Felsher, 2015; Agaku & Ayo-

Yusuf, 2014); fun and recreational, and ability to conceal and hide behavior due to lack of smell

(Choi et al., 2012; Peters, Meshack, Lin, Hill, & Abughosh, 2013). Inhibiting factors to e-

cigarette use include distrust of the tobacco industry (Choi & Forster, 2013), education and

health warnings (Roditis & Halpern-Felsher, 2015), perceived severity of harm (Choi & Forster,

2013), and parental monitoring (Lessard et al., 2014). In literature regarding conventional cigarette initiation, the self-efficacy to refuse a cigarette (or remain a "nonsmoker") has been identified as a PBC of adolescents using the TPB (Harakeh, Scholte, Vermulst, de Vries, & Engels, 2004).

Reasoned Action Approach. The RAA builds from the TRA and TPB, measuring behavioral intention from attitudes, perceived norms, and PBC. The RAA has previously been used to explain other behavioral intentions such as condom use (Albarracín, Johnson, Fishbein, & Muellerleile, 2001), physical activity (Hagger, Chatzisarantis, & Biddle, 2002), HPV vaccination among college women (Geshnizjani, Jozkowski, & Middlestadt, 2013; Jozkowski & Geshnizjani, 2016), decisions to buy and eat dark leafy vegetables (Sheats, Middlestadt, On, Juarez, & Kolbe, 2013), tobacco cessation (Yzer et al., 2015) and yoga attendance (Eggleston, Middlestadt, Lindeman, McCormick, & Koceja, 2011); however, no current literature addresses e-cigarette use using the RAA.

The RAA begins by recognizing the origination of behavior beliefs. Behavioral beliefs are influenced by individual experiences, education, environmental influences, and interpersonal relationship (Fishbein & Ajzen, 2010). Just as seen in the TRA and TPB, behavioral beliefs are measured by one's evaluation of the outcomes that may take place if they perform the identified behavior. Also, as with the TRA and TPB, the RAA recognizes PBC to encompass perceived circumstances that may facilitate or inhibit the behavioral intention or control the actual behavior.

Other Factors

Individual
Personality
Mood
Values
Perceived risk
Past behavior
Social
Education
Age, Gender
Income
Religion
Race
Culture
Information
Knowledge
Media
Intervention

Behavioral Beliefs (BB) (Salient Consequences)

Evaluation of Consequences (EO)

Normative Beliefs (NB) (Salient Referents)

Motivation to Comply (MC) With Referents

Control Beliefs (CB) (Salient Circumstances)

Perceived Power (PP) of Circumstances

Attitude toward Act (AA)

Perceived Norm (PN) (Injunctive & Descriptive)

Self-Efficacy (SE) (PBC)

Environmental Constraints

Intention (IN)

Skills and Abilities

Behavior

Figure 5. Reasoned Action Approach (Fishbein, 2008; Fishbein & Ajzen, 2010)

The RAA expands TRA's and TPB's construct of subjective (injunctive) norms to also include descriptive norms. Injunctive norms are one's perception of other's (who are important to them) opinions about what they should do. This construct measures one's perception of these referent others' opinion and their motivation to comply with their opinions. Descriptive norms are one's perception of others they consider to be similar to themselves and whether these people perform the identified behavior (Fishbein, 2008). As seen in *Figure 5.* Reasoned Action Approach , the RAA evaluates perceived norms using both injunctive norms and descriptive norms. Additionally, the RAA integrates environmental constraints and skills and abilities into behavioral performance. As mentioned earlier, Trumbo and Harper (2015a) did not find an association between social norms and behavioral intention when using the TRA model. The current study seeks to measure the influence of both descriptive and injunctive norms on college

student's intention to try an e-cigarette (even one puff) in the next 30 days. Using Middlestadt et

al.'s (1996) salient belief elicitation procedure will allow for items to capture each of the RAA

constructs, as seen in *Table 1. Constructs of Reasoned Action Approach and College E-Cigarette*

Behavior, in the language culturally most appropriate for college students.

Table 1. Constructs of Reasoned Action Approach and College E-Cigarette Behavior
(Fishbein & Ajzen, 2010; Middlestadt, 2006)

Construct	Conceptual definition	Operational definition
Global Determinants		
Intention	Perceived likelihood of performing the behavior	Rating on intention to try e-cigarette in the next 30 days (response options: Definitely Yes, Probably Yes, Probably No, Definitely No)
Attitude toward the act (not attitude to object)	Evaluation of an action as good or bad	Rating of behavior on bipolar evaluative scale e.g., good/bad
Perceived norm	Perceived social pressure to perform the behavior; overall normative influence	Combination of injunctive norms and descriptive norms
Injunctive norm	Belief about whether most people who are important expect the person to perform the behavior; perceptions of what others think I should do	Rating on bipolar agree/disagree
Descriptive norm	Belief about whether most people like me actually perform the behavior; perception; perceptions of what others do	Rating on bipolar agree/disagree
Perceived behavioral control	Belief about the extent to which one can control the performance of the behavior or that one is capable of performing the behavior (not the degree that performance of the behavior will lead to attainment of goal)	Rating on behavior up to me – not up to me scale, unipolar (1 to 5)
Deeper and Specific Determinants		
Salient consequences	Top of the mind outcomes or consequences of performing the behavior	Ask open-ended questions; most frequently mentioned become modal salient outcomes
Salient referents	Top of the mind people or social groups who influence	Ask open-ended questions; most frequently mentioned become modal salient referents
Salient circumstances	Top of the mind conditions perceived to facilitate or hinder the performance of the behavior	Ask open-ended questions; most frequently mentioned become modal salient circumstances

Table 1. Constructs of Reasoned Action Approach and College E-Cigarette Behavior Cont.

Construct	Conceptual definition	Operational definition
Deeper and Specific Determinants		
Behavioral beliefs (about consequences)	Belief about the likelihood that the behavior will lead to each of 5 to 7 salient consequences or outcomes	Open-ended questions to identify salient (top of the mind) consequences; rating of each on bipolar (5-point) likely/unlikely scale
Injunctive normative beliefs (about referents)	Belief about whether specific referents think one should perform the behavior for 5 to 7 salient referents	Open-ended question to identify salient referents; rating of each on bipolar (5-point) should/should not scale
Motivation to comply with referents	Extent that one wants to do what the referent expects	Rating of each modal salient referent on unipolar scale bipolar (5-point) agree/disagree scale
Descriptive normative beliefs (about descriptive referents)	Belief that specific descriptive referents do or do not perform the behavior	Open-ended question to identify salient descriptive referents; rating of each on bipolar (5-point) agree/disagree
Identification with descriptive referent	Weight for descriptive norm similar to evaluation as weight for behavioral beliefs and motivation to comply for normative beliefs.	Rating of each referent on bipolar (5-point) very much/ not at all scale
Control belief strength (about circumstances)	Perceived likelihood of occurrence of each salient facilitating or constraining condition	Open-ended question to identify salient facilitating & constraining conditions; rating of each on bipolar (5-point) likely/unlikely scale
Perceived power	Perceived effect each condition has on making the performance of the behavior easy or difficult	Rating of each circumstance on bipolar (5-point) disagree/agree scale

Behavioral Beliefs of E-cigarettes

Few measures regarding behavioral beliefs of e-cigarette besides those that compare conventional cigarettes and e-cigarettes. This section will explain what is known about e-cigarettes from current research, what measures exist that help explain perceptions of salient consequences of using e-cigarettes, beliefs and studies assessing e-cigarettes' use as a cessation device amongst those who smoke conventional cigarettes for both adults and adolescents. This section offers literature to compare what has been discovered through preliminary research studies and what is known by the general population (those who have participated in social research).

Safety: What is known?
- In the safety debate of e-cigarettes, some argue that nicotine does not contribute to smoking-related illnesses as much as chemicals in conventional cigarettes (Sugerman, 2014).

- Nicotine alone can contribute to some health-related illnesses; however, it is proven to be less harmful than combustible products such as conventional cigarettes (Benowitz, 2008).

- E-cigarettes contain some of the same chemicals as conventional cigarettes such as: 4 carbonyl compounds (formaldehyde, acetaldehyde, acrolein, and o-methylbenzaldephyde); 2 volatile organic compounds (toulene and m, p-xylene); two nitrosamines (NNN and NNK), and cadminium, nickel, and lead. Acetaldehyde may cause mouth and throat irritation among e-cigarette users (Goniewicz et al., 2014b). However, the levels at which they have been detected do not warrant reason to believe they are dangerous. Long-term health implications are unknown, but when compared to conventional cigarettes, they appear to be less harmful (Hajek et al., 2014).

- Some studies have shown that e-cigarette emit ultrafine particles (such as benzylacohol, menthol, vanillin, L-limonene, 1, 2-propanediol, glycerine, and nicotine, formaldehyde, aluminum, FeNO, and cotinine), causing them to not be completely harm free to users and bystanders (Schober et al., 2014).

- Studies indicate that e-cigarettes are significantly less cytotoxic than conventional cigarettes (Romagna et al., 2013); however there is a vast variety of the chemicals found and the concentrations in which there were found depending on the e-cigarette brand and dose of nicotine.

  o Chemicals and metals found in e-cigarettes are 9-450 times less potent as those found in conventional cigarettes; however, they are higher than those found in nicotine replacement therapies currently regulated by the FDA (Goniewicz et al., 2014b). The drastic range in concentration ranges across brand and packaging. This indication of variety between brands and even between cartilages of e-juice indicate a need for regulation for consistency and a label in make users aware of the contents of the solution.

  o Of the 15 carbonyl compounds analyzed, four were detected (except one e-cigarette that did not contain acrolein). The other three carbonyl compounds were formaldehyde, acetaldehyde, and o-methylbenzaldehyde. Formaldehyde [ranging from 2.0 micrograms (μg- one millionth of a gram) to 56.1μg depending on the e-cigarette], acetaldehyde (1.1μg to 13.6μg) and acrolein (0.7μg to 41.9μg) are known to be toxic and harmful.

  o Of the 11 volatile organic compounds, two (toluene and m, p-xylene) were detected in all but one e-cigarette. The concentration of toluene varied from 0.2μg

to 6.3µg per e-cigarette, and m, p-xylene only varied from 0.1 µg to 0.2 µg (which

was also detected in blank samples).

- o Both tobacco-specific nitorsamines (NNN, NNK) were identified in all by three of

  the e-cigarette samples. They ranged from 0.8 ng (one billionth of a gram) to 4.3

  ng for NNN and from 1.1ng to 28.3ng per e-cigarette for NNK.

- o Of the 12 metals tested in the e-cigarettes, only cadmium, nickel, and lead were

  detected. Cadmium (which was the only metal not detected in one sample of

  vapor) varied from 0.01µg to 0.22µg. Nickel ranged from .11µg to 0.29µg, and

  lead ranged from 0.03µg to 0.57µg per cigarette.

- Those advocating for e-cigarette's safety have compared child access equivalent to access

  to normal household products, and that e-cigarettes are vital to public health by reducing

  conventional cigarette use (Wagner, Siegel, & Borrelli, 2012a).

  - o Wagener et al. (2012a) have pointed out "why should the e-cigarette, a product

    that delivers nicotine without the harmful effects of combustion, be banned from

    the market until it can be proven safe and effective, while the tobacco cigarette, a

    product we know to be harmful and deadly, is allowed to stay?" (pg. 1555;

    Wagner et al., 2012b).

  Measures of salient consequences.

- In a focus group study of young adults, many reported that they believed e-cigarettes are

  "obviously healthy compared to cigarettes", while others reported they did not trust the

  safety of the products and worried, even if they didn't cause lung cancer, what other

  problems they could potentially cause (Choi et al., 2012).

- High school and college students who smoked conventional cigarettes believed e-cigarettes to provide immediate health benefits when compared to conventional cigarettes. They explained that e-cigarettes didn't upset their stomach, were "less hard, cheaper," and that they smelled better (Kong et al., 2014, p. 850).

- A recently pilot study of college students at four-year and two-year colleges in Hawaii examined college students' outcome expectancies of smoking e-cigarettes (Pokhrel et al., 2014).

  - Of the convenience sample, 43% had ever used an e-cigarette and 28% reported past 30-day use.

  - This study found seven factors emerge from the 40 item outcome expectancies scale.

    - Three factors reflected positive expected outcomes: social enhancement, affect regulation, positive sensory experience, and

    - Four factors reflected negative expected outcomes: negative health consequences, negative appearance, addiction concern, negative sensory experience.

Cessation Device.

- E-cigarettes have sparked much debate about their safety and how they should be regulated due to their potential as a cessation device (Cobb & Abrams, 2012).

- With the discovery of the dangers of conventional cigarettes in the 1950s, the conversation began of "safer smoking" and a new "safer" products began (Berridge, 2014).

- o Tobacco industries sought filters that would reduce tar and nicotine, but it wasn't until 1971 that two Swedish researchers developed first nicotine gum, Nicorette, the first product intended to wean people off nicotine.

- E-cigarettes could be a safer alternative to smoking, by reducing the number of chemicals to which the user is exposed and assisting smoking cessation by supplying nicotine and the hand-to-mouth sensation of smoking (Cahn & Siegel, 2011).

- Initial studies found that people were using e-cigarettes to quit smoking conventional cigarettes, and some feared they may relapse to conventional cigarettes without e-cigarettes (Etter & Bullen, 2011).

- 70.4% of those who used e-cigarettes reported they used them to abstain nicotine in smoke-free spaces (Adkison et al., 2013).

- An uncontrolled clinical trial study reported that e-cigarettes help people quit smoking and reduce the number of e-cigarettes smoked each day (Polosa et al., 2011).

- However, in a longitudinal study in the U.S., e-cigarettes use was not significantly associated with increased intention to quit smoking (Grana et al., 2014b).

- To reduce the global tobacco epidemic, many in public health have sought a "clean nicotine" alternative to assist with smoking cessation (Benowitz & Goniewicz, 2013).
  - o Over the past 30 years, there have been several forms of nicotine replacement therapy treatments; however, many do not satisfy the inhalation of nicotine through a cigarette.
  - o The possibility that e-cigarettes can release nicotine without the toxins of combustion provides some hope for an effective smoking cessation device. Although they have not been proven to be a cessation device, nor have been

proven to be safe or harmful, e-cigarettes have quickly gained popularity of some in public health (Caponnetto et al., 2013)

Cessation device among youth.

- In Korea, 9.4 percent of adolescents had ever tried an e-cigarette and 8 percent of these youth were duel users (Lee, Grana, & Glantz, 2014).
    - These Korean youth are 1.58 times more likely to have tried to quit smoking conventional cigarettes than those who had not smoked e-cigarettes, suggesting that Korean adolescents may be using e-cigarettes as a potential cessation device.
- In an analysis of the 2011 and 2012 NYTS, those who had used e-cigarettes were 1.53 times more likely to intend to quit in the next year than those who did not smoke e-cigarettes; however e-cigarettes did not indicate to be an effective cessation device, with lower association of abstinence from conventional cigarettes in the past 30 days, six months, and one year (Dutra & Glantz, 2014a).
- In a large (N=15,267) cross sectional study of U.S. adolescents, Lippert (2015) found that there was not a significant association between e-cigarette use and intention to quit or quit attempt.
- Kong et al. (2014) found that high school and college students believed that e-cigarettes could be used as a cessation device, although it was not clear if they had used or were using them to quit smoking.

Adolescent E-cigarette Beliefs and Behavior

Adolescent e-cigarette use.

- E-cigarette use rose from 3.3% in 2011 to 6.8% in 2012 (Corey et al., 2013).

- Prevalence of adolescent e-cigarettes use in 2014 was greater than any other tobacco product, including conventional cigarettes (USDHHS, 2015).

  o In a nationally representative sample, 17.1% of 12th grade, 16.2% of 10th grade, and 8.7% of 8th grade students had tried e-cigarettes.

  o This indicates that twice as many 8th and 10th grade students tried e-cigarettes than conventional cigarettes (Johnston et al., 2015).

- Assessing the e-cigarette epidemic, other countries are experiencing similar rates of adolescent use as the U.S.

  o In Canada, researchers found similar results to the U.S. adolescents. Canadian youth (15-19 years old) e-cigarette use (20%) has now surpassed conventional cigarette use (11%), as seen in the U.S. (USDHHS, 2015).

  o This study is also found Canadian adolescent's prevalence of e-cigarette use is greater than young adult (20-24 years old) use (18%) and the national average for all ages (15%) (Thatcher, 2015).

  o Similar to the US, Canada also does not regulate age restrictions to e-cigarettes federally.

- E-cigarette adolescent use may exceed adult use (Grana et al., 2014a).

- Cigarette rates among youth have decreased over the past 15 years. Ever use of cigarettes among 12th graders decreased from 75.7% to 34.4% from 1977 to 2014 (Johnston et al., 2014). However, tobacco remains a public health concerns, and at the current rate, 5.6 million youth in the U.S. are projected die from a tobacco-related illness (USDHHS, 2012b).

- Cho and colleagues (2011) found that Korean middle school (mean age= 14 years) and high school students (mean age= 16.5 years) learned about e-cigarettes from the internet, friends, television, books, and others. Of these Korean students, those most likely to use e-cigarettes were males who felt pressure from peers, had family members who smoked, had lower satisfaction in school life, and who had previously smoked.

- In Poland, 23.5% of Polish High School and college students (ages 15 to 24) had ever tried e-cigarettes, and 8.2% had used e-cigarettes in the past 30 days. Smoking conventional cigarettes, white, males, living in urban areas, and children of parents who smoked were more likely than their counterparts to smoke e-cigarettes (Goniewicz & Zielinska-Danch, 2012).

- Beyond demographic predictors, sensation seeking has been explored as a behavioral predictor of e-cigarette use due to this previous connection with established conventional cigarette smoking (Sargent, Tanski, Stoolmiller, & Hanewinkel, 2010).

- Other behavioral predictors of e-cigarette use include duel use of conventional cigarettes and e-cigarettes (Mejia, Ling, & Glantz, 2010).

  Gateway to conventional cigarettes.

- While e-cigarettes have found social acceptability from many people in the U.S. (Choi et al., 2012), others believe e-cigarettes could be a gateway (Grana, 2013; Zhu et al., 2013) or "starter product" (Dutra & Glantz, 2014b) to conventional cigarette smoking for adolescents.

  - According to the "gateway theory" (Kandel, Yamaguchi, & Chen, 1992), e-cigarettes could initiate nicotine addiction, progress to dependence, and ultimately lead to the use of conventional cigarettes and/or other substances.

- In a study of two suburban high schools in Connecticut and New York between 2010 and 2011, students who use e-cigarettes are more likely to try hookah (3.12; 95% CI: 1.90-5.13) and blunts (1.81; 95% CI: 1.21-2.71) than students who only smoke cigarettes; however, they are less at risk for alcohol or marihuana use (Camenga et al., 2014b).
  - Those who had used e-cigarettes and conventional cigarettes were significantly more likely to use all types of alternative tobacco products than those who had never smoked.
  - E-cigarettes could potentially lead to adolescents trying other forms of nicotine and lead to conventional cigarette use and/or nicotine addiction (Durmowicz, 2014).
- The number of students who have never smoked a conventional cigarette but who have tried an e-cigarette increased from 79,000 to 263,000 student between 2011 and 2013 (Bunnell et al., 2014).
  - E-cigarettes use makes youth twice as likely to indicate intentions to smoke a conventional cigarette as those who have not tried an e-cigarette (Bunnell et al., 2014).
  - 2012, 20.3% of middle school students and 7.2% of high school students who never smoked a conventional cigarette indicated that they had tried e-cigarettes (Corey et al., 2013).
- Of Polish high school students, 3.2% of those who had never smoked a conventional cigarette indicated they had tried an e-cigarette in their lifetime (Goniewicz & Zielinska-Danch, 2012).

Beliefs about e-cigarettes.

- In focus group studies of youth and young adults, participants have described e-cigarettes

  as

  - "high tech" (Choi et al., 2012) and

  - "Classy, because you can walk around with them. They don't have any vapor that goes around and they look nice. It's really hyped up, like 'No nicotine.' That's what everybody's saying. 'There's no nicotine.' 'It's good for you. cuz i's vapor.' (Roditis & Halpern-Felsher, 2015).

  - A few youth in Roditis & Halpern's (2015) focus group study were skeptical, due to mistrust of the tobacco industry, stating "apparently people think that, 'Oh, it's electronic-- it won't hurt 'em.' They're too stupid to realize it's almost the same thing."

Perceived risk of e-cigarettes.

- Risk perception of e-cigarette use, compared to conventional cigarettes or other drugs may help explain adolescent use.

  - In a national representative sample, most students did not believe that e-cigarettes were a "great risk" to their health (p. 8) (Johnston et al., 2015), indicating that e-cigarettes have a low perception of harm among youth.

  - Perception of harm of all tobacco products has been proposed to serve as a protective factor against tobacco use (Agaku et al., 2013); however e-cigarettes do not contain tobacco.

- Research suggests that the majority of adults believe e-cigarettes are less harmful than conventional cigarettes (Pearson et al., 2012), and this perception can increase their likelihood to try e-cigarettes.

- Based on the health belief model, perceived severity can influence behavior; thus, perceived harm of e-cigarette use could potentially be a protective factor to e-cigarettes initiation (Choi & Forster, 2013).

- Youth initiation begins with forming accepting attitudes and beliefs about nicotine products, which may lead to experimentation, maintaining the behavior, and ultimately addiction (USDHHS, 2012a).

Social Normative Beliefs

Little literature currently addresses social normative beliefs regarding e-cigarettes. Existing literature that addresses social norms does so in the reflection of social marketing and e-cigarette advertisements. This section will address marketing and advertisements that may influence the descriptive norms of college students' perception of e-cigarettes.

- E-cigarettes have grown to a $4 billion market (Zhu et al., 2014).

- By January 2014, there were 466 brands of e-cigarettes (up from 288 in 2012). There were 7,764 unique flavors of e-cigs in 2014, an increase of 10.5 brands and 242 new flavors per month. Older brands marketed differences between conventional cigarettes and e-cigs, while new brands market consumer choice and customization (Zhu et al., 2014).

  Advertisement expenditures.

- E-cigarette advertisements have increased rapidly over the past 5 years.

- - From 2011 to 2012, e-cigarette advertisement expenditures tripled from $6.4 million to $18.3 million (Kim, Arnold, & Makarenko, 2014).
  - Of the 80 unique brands Kim et al. (2014) assessed, blu eCigs invested the most in advertisement expenditures with 76.7% of all e-cigarette advertisements in 2012.
- In 2013, e-cigarette advertisement expenditures of only six companies reached $60 million (Duke et al., 2014; Sebastain, 2014).
- Over 3 months, tobacco and e-cig industries spent almost $20 million in advertising of non-combustible products, including e-cigarettes, snus, dissolvable, and chew/dip/snuff (Richardson, Ganz, Stalgaitis, Abrams, & Vallone, 2014).

E-cigarette on television and in the movies.

- With e-cigarette advertisement unregulated on television, youth exposure to television advertisements increased 256% from 2011 to 2013 (Duke et al., 2014).
- Blu e-cigarettes capitalized the television market with 81.7% of the total e-cigarettes advertisements on major cable networks seen by youth (12-17 years old) (Duke et al., 2014).
- Advertisements, such as celebrities smoking in movies, normalizes the behavior. Even the show, "The Doctors" featured e-cigarettes as one of the top ten health innovations of 2009 (CBS Television Distribution, 2009).
- E-cigarettes began showing up in films with Johnny Depp explaining the benefits of e-cigarettes to Angelina Jolie in "The Tourist" (Khan, 2011).
- Other celebrities, such as Katherine Heigl, have also used their influence to highlight health claims regarding e-cigarettes. On "The Late Show with David Letterman",

Katherine claimed the device helped her quit and shared it with David Letterman who also "vaped" on national television (Zee, 2010).

- Media reported that e-cigarettes were included in the "swag bags" of those attending the 2010 Grammy Awards and 2011 Academy Awards (Grana et al., 2011).

- In a focus group study of adolescents, students pointed out that they had seen commercials on TV promoting e-cigarettes, but they had not seen or heard anything negative about them (Roditis & Halpern-Felsher, 2015).

- Many believe eliminating e-cigarette advertisements in movies and on television would help decrease the tobacco burden on adolescents (Grana R. A., 2013).

E-cigarette advertisements on the internet and social media.

- E-cigarette companies have used innovative advertisements strategies by utilizing the internet.

- Using search query surveillance to assess consumer curiosity about e-cigarettes, Ayers, Ribisl, and Brownstein (2011) found that Google searches to e-cigarettes increased from 2008 to 2010, and prevalence for e-cigarette searchers were 700 times greater than searches for any other alternative nicotine device.

- E-cigarettes have demonstrated to be very popular online, and most popular in the U.S. when compared to similar countries, such as Canada and the UK (Ayers et al., 2011).

- E-cigarette has also taken to social media avenues. In an analysis of e-cigarettes on twitter, 90% of the 73,672 tweets were classified as commercial (Huang et al., 2014)
    - Commercial tweets were driven mainly by a small group of very active accounts.
    - Of commercial accounts, 94% included a link to a website, 10% mentioned smoking cessation, and 34% included prices or discounts for e-cigarettes.

E-cigarette retail messaging.

- The e-cigarette industry has made several claims to promote their product.

  o They have made health benefit claims including: harm reduction by comparing e-cigarettes and conventional cigarettes (Richardson et al., 2014); stating e-cigarettes reduce conventional cigarette use, helping people quit; stating there are no secondhand smoke risks; and promoting the use of e-cigarettes in places where people cannot conventional cigarettes do to smoke-free laws (Noel, Rees, & Connolly, 2011).

- Comparing e-cigarettes and conventional cigarettes has been shown to initiate interest in conventional cigarette users (Pepper, Emery, Ribisl, Southwell, & Brewer, 2014b).

- While some may be interested in quitting conventional cigarettes, others may also see e-cigarettes as a way to avoid smoke-free laws (Noel et al., 2011).

- Blu ads in magazines targeted white women by including Star and Us Weekly (Richardson et al., 2014).

  o In Us Weekly uses "an attractive woman dressed in stylish cloths with the text" 'Freedom never goes out of fashion... blue produces no tobacco smoke and no ash, only vapor, making it the ultimate accessory... Step out in style with blue.'"

  o Other ads include links to Facebook to target females. Promotes "individuality, sociability, and sexuality."

  o Ads tend to use white males and females more than other race and ethnicities. E-cigarette print advertisements focus comparing conventional cigarettes and e-cigarettes, "use as an alternative to cigarettes, and sexuality".

- - Ads were tailored to the audience by using sexualized advertisements in Rolling Stones that appealed to men.
  - The ad "displays a man undressed from the wait up lying next to an overweight scantily clad woman sprawled across a bed with the words 'no regrets' boldly highlighted."
- Two advertising firms collected all US advertisements for e-cigs, snus, dissolvable, and chew/dip/snuff (Richardson et al., 2014).
  - E-cigs had the highest number of observations (print insertions, radio or TV airings, E-mails, and so on).
  - While most appear to be targeting men, blu cigarettes appear to be targeting women.
  - Themes for advertising e-cigs were harm reduction, alternative to cigs (duel use), as well as individuality, sociability, and sexuality. Price reduction or discounts may appeal to people in low income households.

Advertisements effects on youth and young adult e-cigarette use.

- With these new, innovative, and unregulated products, advertisement strategies seem to include appeal to youth and young adults by using flavorings and point-of-sale positioning that is visible and reachable for children (Widome, Brock, Klein, & Forster, 2012).
- Many are concerned that flavors in e-cigarettes, "such as Cherry Crush, Chocolate Treat, Snappin' Apple, and Vanilla Dreams" target a young audience and those who have never used conventional cigarettes (Barrington-Trimis, Samet, & McConnell, 2014).

- Data from the 2011 and 2012 NYTS found that pro-tobacco advertisements on the internet increased from 22.3% to 43% from 2000-2012, while advertisements in magazines and newspaper and advertisements (65% to 35.9%) and advertisements in retail stores (87.8% to 76.2%) decreased (Agaku, King, & Dube, 2014).

- In 2012, more females (46.7%) were exposed to pro-tobacco advertisements than males (39.4%; Agaku & Ayo-Yusuf, 2014); however, this could be due gender differences in internet use, specifically social media (Pew Research Center, 2010).

- Controlling for socio-demographic factors, U.S. students between the 6th and 12th grade who were exposure to two or three types of pro-tobacco advertisements were 1.83 (95% CI = 1.14- 2.93) and 2.23 (1.22 - 4.06) times more likely to try e-cigarettes than students not exposed to pro-tobacco advertisements (Agaku & Ayo-Yusuf, 2014).

  - Advertisements with significant impact on e-cigarette use were retail stores [adjusted odds ratio (aOR) = 1.71; 95% CI = 1.21-2.41] and the internet (aOR = 1.59; 95% CI = 1.71-2.16).

  - Other influencing factors of e-cigarette use were tobacco use by close friends (aOR = 3.05; 95% CI = 2.17-4.28), tobacco use by a member of the household (aOR = 1.55; 95% CI = 1.17-2.07), current smoking of any combustible tobacco product (aOR = 14.1; 95% CI = 10.57-18.82), and current use of chewing tobacco, snuff, or dip (aOR = 2.16; 95% CI = 1.61-2.91.

- According to data from the NYTS, pro-tobacco advertisements on the internet, in magazines and newspapers, in retail stores, and on television program and in movie advertisements significantly increase a child's intention to smoke (Bunnell et al., 2014).

- In a study of cigarette brands used amongst youth (10 to 17 years old), brand loyalty was found to begin with the first cigarette smoked. Establishing brand loyalty with young users may be beneficial for e-cigarette companies (DiFranza, Eddy, Brown, Ryan, & Bogojavlensky, 1994).

- Future research is needed to better understand of youth are establishing brand loyalty to e-cigarettes.

Perceived Behavioral Controls: E-cigarette Policies

- With the exception of prohibiting health claims, there are presently very few restrictions on e-cigarette advertising.   E-cigarettes are often marketed to youth using similar methods that were used to promote tobacco products prior to the 1971 government regulation that restricted advertising of tobacco products (Ayers et al., 2011).

- In a review of literature regarding nicotine exposure and human development, England et al. (2015) provided eight measures that could protect youth from the harmful effects of nicotine, which included

  o probations of marketing to youth;

  o youth access laws as those pertaining to tobacco products;

  o health warnings of dangers of nicotine exposure;

  o child-proof packaging;

  o protection from secondhand e-cigarette aerosol through vape-free laws;

  o taxing e-cigarettes as conventional cigarettes;

  o regulations of nicotine content to reduce addiction potential;

  o and defined age of legal sale.

- These measures have also been supported by the American College of Physicians (Crowley, 2015), who recommends:
  - to extend the Family Smoking Prevention and Tobacco Control Act to cover e-cigarettes,
  - flavors should be prohibited from e-cigarettes,
  - e-cigarettes should be taxed and local governments should be able to tax higher than state or federal government,
  - marketing and promotion should be restricted from television to protect youth,
  - indoor clean air laws should include e-cigarettes,
  - funding supportive of research evaluating use, exposure, and consumer behavior.
- Strategies that have been proven to be effective in reducing tobacco initiation and prevalence in youth have included mass media campaigns, price increases through taxes, and changes to smoke-free policies which have shaped social norms of attitudes and beliefs about tobacco. Recommendations for e-cigarettes are currently following the health promotion path seen effective for conventional cigarettes (USDHHS, 2012b).
- Due to the variety of e-cigarettes between and with-in respective products, regulation will need to find a balance for consistency across all brands. There is no standardized measure of testing e-cigarettes; thus, the development of such regime will aid in the evaluation and regulation of future health standards (Brown & Cheng, 2014).

Marketing to youth.

- On May 26, 2105, Oregon passed the first bill that included packaging could not be "attractive to minors" (Oregon Legislative Assembly, 2015). This bill also prohibited the sale of "inhalant delivery systems" to anyone under the age of 18.

- Lawmakers such as Senator Barbara Boxer (D-CA), Representative Elizabeth Esty (D-CT), and Representative Jackie Speier (D-CA) have proposed bills in the house and senate to strengthen youth access laws to include prohibition of marketing tactics such as flavors and cartoons (U.S. Congress, 2015), which has not been included in the FDAs intent to regulate e-cigarettes (USDHHS, 2014).

Child-proof packaging.

- Other major health concerns regarding e-cigarettes and adolescents include a drastic increase in calls received by state poison control centers for nicotine toxicity in young children.

    o From 2012 to 2013, the Nebraska Regional Poison Center (2014) received 52 calls for young children drinking solutions from e-cigarettes; reportedly attracted to the fruity or candy flavors and aromas.

    o The Nebraska Department of Health and Human Serves reports that health effects of nicotine toxicity can include "vomiting, nausea, lethargy, gagging, and a pale or flushed appearance to depressed respiration, cardiac arrhythmia, and convulsions".

    o To prevent these unintended illness, fourteen states (as of July 1, 2015) have passed laws prohibiting the sale of e-cigarettes unless they use child-proof packaging (Dobbs et al., 2016).

Including e-cigarette use in smoke-free policies.

- Smoke-free policies have been proven to shape social norms by de-normalizing conventional cigarettes, increasing smoker's intention to smoke, and increasing support for smoke-free policies (Brown, Moodie, & Hastings, 2009).

- Some are concerned that e-cigarettes may undermine social norms, and cause e-cigarettes to become a "starter" product for conventional cigarettes (Mejia et al., 2010).

- E-cigarette use have become especially popular in areas with strong tobacco control policies. This may indicate that e-cigarettes are being used to avoid indoor smoking restrictions (Ayers et al., 2011).

- The U.S. Airforce was one of the first government agencies to restrict the use of e-cigarettes in the workplace (U.S. Air Force, 2010).

Taxing e-cigarettes.

- Currently four states tax e-cigarettes.

  - Nevada passed a bill on June, 9 2015 that will enforce a 30 percent whole sale tax on e-cigarette as of July 1, 2015 (Nevada State Legislature, 2015).

  - North Carolina (State of North Carolina, 2013) and Louisiana (State of Louisiana, 2015) currently taxes liquid nicotine at 5 cents per milliliter sold,

  - and Minnesota taxes one time use e-cigarettes and cartridges containing nicotine as a tobacco product, which is currently 95 percent of the wholesale cost (Minnesota State Revenue Office., 2012).

  - As of July 1, 2016, Kansas will increase this to six states that tax e-cigarettes with a 20 cents per milliliter tax on e-cigarettes (State of Kansas, 2015).

  - Currently, no states prohibit the use of flavors to be sold with e-cigarettes.

Defined age of legal sale.

- Gourdet, Chriqui, and Chaloupka (2014) published the first baseline assessment of state laws regulating e-cigarette use and youth access.

- In 2011, only three states (California, Utah, and New Jersey) prohibited the sale of e-cigarettes to those under 18 (or 19 for some states) years of age (Hampson et al., 2015).

- By November 15, 2013, twenty two states had passed youth access laws (Gourdet et al., 2014).

- During that time, youth prevalence of e-cigarettes doubled each year from 2011-2013 (Corey et al., 2013).

Global regulation.

- The Food and Drug Monitoring Agency of Indonesia has warned that e-cigarettes would be more dangerous than combustible cigarettes (Osman, 2010).

- E-cigarettes that contain nicotine have been outlawed in Canada for both adults and minors; however, reports from e-cigarette users in Canada indicate that they use e-cigarettes that contain nicotine, indicating unlawful sale these products due to lack of enforcement (Thatcher, 2015).

RAA Questions

Intention.

- In a RAA study regarding tobacco cessation among blue-collar workers, intention was measured by asking participants "How likely is it that you will use tobacco cessation treatment options in the next 12 months?" (1=*very unlikely*, 7=*very likely*) and "I expect to use tobacco cessation treatment options in the next 12 months" (1=*definitely not* and 7=*definitely expect to*) (Yzer et al., 2015). The scores from each question were averaged to provide an intention scale score.

- In a RAA study regarding yoga attendance, intention was measured using the item "I will attend at least one yoga class each week for the next three months" on a seven-point agree or disagree scale (Eggleston et al., 2011). This study found that intention was a significant predictor of the behavior.

- In a study regarding physician's intention to prescribe emergency contraception, intention was measured by assessing the extent to which the physician would prescribe emergency contraception to each of the following five groups (women who specifically ask for info about the method; women who have experienced incest or rape; women who have experienced a problem with their method, such as a condom break; sexually active teenagers; and women who request the method have having unprotected sexual intercourse). Responses were provided on a seven-point scale (1=*not at all*, 7=*very much*). The scores from the five groups were averaged, allowing a range of scores from five to 35 (Sable, Schwartz, Kelly, Lisbon, & Hall, 2006).

- In a study of college women's intention to get the HPV Vaccine, intention was measured using two items "I will go to my doctor to ask for HPV vaccine in the next 6 months" and "My going to my doctor to ask for HPV vaccine in the next 5 months is…" Responses were provided on a seven-point Likert scale (*extremely unlikely* to *extremely likely*). A factor analysis and reliability analysis verified the measure of intention with a Cronbach's alpha of .72 (Geshnizjani et al., 2013; Jozkowski & Geshnizjani, 2016).

- In a study regarding intentions toward engaging in the food safety behaviors, specifically toward clean and uncontaminated turkey products, intention was assessed using five items. The items reflected statements of "I *desire/intend/plan/want/am willing* to do all that is needed to produce clean and uncontaminated turkey products." Responses were all

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assessed on seven-point Likert scales (7 =*strongly agree* to 1 =*strongly disagree*). The average of the five responses were taken as the score for intention (Hinsz & Nickell, 2015).

- In a RAA assessment of African American women's decisions to buy and eat dark green leafy vegetables, intention was measured using three items. Participants were asked: "Is it likely that you will buy more dark green leafy vegetables each week over the next three months?", "I will buy more dark green leafy vegetables each week over the next 3 months.", and "My buying more dark green leafy vegetables each week over the next 3 months is likely." Responses included two five-point scales (1=*extremely unlikely*, 5=*extremely likely*) and one five-point scale for agreeability (1=*strongly disagree*, 5=*strongly agree*). Similar items were created for intention to eat dark green leafy vegetables, and the intention score for each was calculated by averaging the three items (Sheats et al., 2013).

Attitude

- In their assessment of tobacco cessation, Yzer et al. (2015) assessed both instrumental attitude (e.g., "My using tobacco cessation treatment options in the next 12 months would be… *bad–good*, *harmful–beneficial, unnecessary–necessary*") and experiential attitude (e.g., "My using tobacco cessation treatment options in the next 12 months would be…*not enjoyable–enjoyable* and *stressful–relaxing*.) Scores on each set of items were averaged to provide scores for both instrumental attitude and experiential attitude.

- Eggleston et al. (2011) measure attitude through the item "Attending at least one yoga class each week for the next three months is…" Five responses were provided on a

seven-point sematic differential scale (*good—bad, favorable—unfavorable, sweet—sour, strong—weak, active—passive*).

- In a dissertation regarding intentions to abstain from sexual practices due to religious rituals during menstruation, the RAA was used to measure attitudes. Attitudes were measured by using the item "Refraining from activities listed above during future niddah periods is (e.g., *good—bad, pleasant—unpleasant, rewarding—punishing, beneficial— harmful, useful—useless, wise—foolish, relaxing—stressful, a turn-on—a turn-off, holy— unholy*". Responses were on a seven-point bipolar scale (Septimus, 2011).

- Sable et al. (2006) measured attitude toward prescribing emergency contraceptive on schematic scale ranging from -3 (e.g., *extremely bad, negative, harmful*) to +3 (e.g., *good, positive, beneficial*).

- Geshnizjani et al. (2013) and Jozkowski and Geshnizjani (2016) measured attitude through the use of four items "My going to my doctor to ask for HPV vaccine in the next six months is..." Responses were on a seven-point Likert scale and recoded to -3 (e.g., *unpleasant, unenjoyable, worthless, bad*) to +3 (e.g., *pleasant, enjoyable, valuable, good*). The four item measure was found to be reliable, with a Cronbach's alpha of .82 and loaded together during a factor analysis assessment of all RAA constructs (Geshnizjani et al., 2013).

- Hinsz and Nickell (2015) measured attitude by using seven alternative semantic differential responses to five questions having the stem "My doing all that is needed to produce clean and uncontaminated turkey products is". Responses included: *favorable-unfavorable, pleasing-annoying, important-- unimportant, enjoyable-unenjoyable, and something I like-I dislike*.

- Sheats et al. (2013) measured attitude toward the action of buying/eating dark green leafy vegetables with ratings of the statements pertaining to buying more/eating more dark green leafy vegetables each week over the next three months on two five-point semantic differential scales ranging from one (e.g. extremely unenjoyable, extremely bad) to five (e.g. extremely enjoyable, good).

- As outlined by theory, attitude is to be measured by using a semantic differential scale containing a variety of evaluative (e.g., harmful-beneficial) and affective (e.g., pleasant -- unpleasant) adjective pairs (Ajzen, 1991).

Injunctive norms

- Yzer et al. (2015) measured injunctive norms through the item "How do you think most people important to you would feel about you using tobacco cessation treatment options in the next 12 months? They would: …" (strongly disapprove—strongly approve).

- Eggleston et al. (2011) measured subjective norms through agreement statements to the items "Most people who are important to me think I should attend at least one yoga class each week" and "Most people like me think I should attend at least one yoga class each week."

- Septimus (2011) used one item to measure subjective norms, "Most people who are important to me think that I should refrain from these activates during future niddah periods" Responses were on a seven-point Likert scale from *extremely unlikely* to *extremely likely*.

- Sable et al. (2006) measured subjective norms with one item "In general, most people or groups important to me think I should prescribe emergency contraception." Responses ranged from *definitely should not* (-3) to *definitely should* (+3).

- Jozkowski and Geshnizjani (2016) measured subjective norms with two items: (1) "Most people who are important to me think I should go to my doctor to ask for HPV vaccine in the next six months, and (2) Most people like me will go to their doctor to ask for HPV vaccine in the next six months. Responses were on a seven-point Likert scale from *extremely disagree* to *extremely agree*.

- Hinsz and Nickell (2015) used five items to measure subjective norms. The statement "Most people who are important to me (think I should do/ approve of my doing/ support my doing/ want me to do)" was used with responses on a seven-point Likert scale, ranging from *strongly disagree* to *agree*.

- Sheats et al. (2013) measured descriptive norms using the items "Most people who are important to me think that I should buy/eat more dark green leafy vegetables each week over the next three months." Responses ranged from 1 (*strongly disagree*) to 5 (*strongly agree*).

Descriptive Norms

- Yzer et al. (2015) measured descriptive norms using the item "How many of the people important to you who smoke tobacco do you think will use tobacco cessation treatment options in the next 12 months?" Anchors ranged from 1 (*almost none*) to 7 (*almost all*).

- Sheats et al. (2013) measured descriptive norms using the item "Most people like me will buy more dark green leafy vegetables each week over the next three months." Responses ranged from 1 (*strongly disagree*) to 5 (*strongly agree*).

Perceived Behavioral Control

- Yzer et al. (2015) measured PBC by assessing both perceived capacity and perceived autonomy. Perceived capacity was measured on a seven-point scale using one item

"There can be a variety of obstacles to your using tobacco cessation treatment options in the next 12 months. Even in the face of such obstacles, how sure are you that if you really wanted to, you could use tobacco cessation treatment options in the next 12months." Perceived autonomy was measured using two sematic differential scales, "My using tobacco cessation treatment options in the next 12 months would be…" Responses included: *not under my control-under my control* and *not up to me-up to me*.

- Eggleston et al. (2011) measured PBC using three items. The first statement included two items: "Attending at least one yoga class each week is…" Responses include: (*up to me – not up to me*) and (*under my control—not under my control*). The third item was "How confident are you in attending at least one yoga class each week for the next three months?" Responses ranged from *completely confident* to *not at all confident*. PBC score was created by averaging the scores to the two items.

- Septimus (2011) measure PBC with three items. The first item was "How much control do you have over whether you do or do not refrain from activities during future niddah periods?" Responses ranged from *no control* to *complete control*. The second item was "For me to refrain from these activities during future niddah periods is…" Responses ranged from *extremely difficult* to *extremely easy*. The third item was "If I wanted to, I could easily refrain from these activities during future niddah periods." Responses ranged from *definitely untrue* to *definitely true*.

- Jozkowski and Geshnizjani (2016) measured PBC using three items: (1) "My going to my doctor to ask for HPV vaccine in the next six months is (*not at all under my control—completely under my control,*)" (2) How sure are you that you can go to your doctor to ask for HPV vaccine in the next six months (*not sure at all—completely sure*)?", (3)

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Having health insurance that covers the HPV vaccine makes getting the HPV vaccine (*very difficult—very easy*)."

- Hinsz and Nickell (2015) measured PBC using five items. Samples measures include: (1) "If I wanted to, I could easily do all that is needed to produce clean and uncontaminated turkey products," and (2) "It is mostly up to me if I do all that is needed to produce clean and uncontaminated turkey products." These items were assessed on seven-point Likert scales ranging from *strongly agree* to *strongly disagree* and *extremely difficult* to *extremely easy*.

- Sheats et al. (2013) measured PBC using three items: (1) "Buying/eating more dark green leafy vegetables each week over the next three months is…" (*extremely difficult—extremely easy*), (2) "It is up to me to buy/eat more dark green leafy vegetables each week over the next three months." (*strongly disagree—strongly agree*), and (3) "I am sure that I can buy more dark green leafy vegetables each week over the next three months." (*strongly disagree—strongly agree*).

E-cigarettes as a Public Health Concern

- In a benefit verse risk analysis, several health concerns regarding e-cigarettes need to be taken into consideration.
   - Some of these health concerns include: the risk of nicotine initiation among youth and transferring that addiction to other tobacco products; promoting duel use of e-cigarettes, undermining smoking cessation; health risks of nicotine exposures during development; renormalizing smoking, exposure to new pollutants in areas without smoke-free policies that include e-cigarettes; and marketing product that are appealing to adolescents and youth adults (Benowitz & Goniewicz, 2013).

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- Recent studies suggest that e-cigarettes cause cardiovascular health issues such as hypertension and could increase the risk of cardiac arrhythmias (Lippi et al., 2014).
    - Malfunctions of e-cigarettes have included battery explosions and leaking, which can cause excess exposure to nicotine.
- Health and safety claims regarding e-cigarettes should be subject to evidentiary review. They should be restricted, banned, or regulated as medicines or tobacco products (Schraufnagel et al., 2014).

Standardization.

- Although many e-cigarettes have a basic model design, the variation in the devices may cause potential performance issues in nicotine delivery and other potential health risks (Brown & Cheng, 2014).
- While some states do require an ingredient level, without FDA regulation, it is uncertain what chemicals are within an e-cigarette.
- Initial students have found some to contain aerosolized propylene glycol and glycerol, flavorings, and nicotine (Callahan-Lyon, 2014).
    - Concerns regarding aerosolized propylene glycol and glycerol are mouth and throat irritation, and they may cause a dry cough.
    - Some studies show that aerosol exposure may cause respiratory function impairment.
    - Serum cotinine (a byproduct of nicotine) found in e-cigarette users was similar to that found in conventional cigarette users.
- Formaldehyde and acetaldehyde were found in eight of 13 samples (Kosmider et al., 2014).

- o Korsmider et al., (2014) has created the first automatic smoking machine (Palaczbot) to be able to test e-cigarettes using simulated puffing. Using 30 puffs of e-cigarettes in a two series of 15 puffs with a five minute interval between, the Palaczbot is able to detect chemical inhaled from an e-cigarette. Vapors from each e-cigarette were tested three times each. Vapors were generated using three different voltages: 3.2, 4.0, and 4.8V. The compounds inhaled were extracted from aerosol to a solid form by saturating silica gel with 2, 4- dinitrophenyl hydrazine. Using high-performance liquid chromatography, chemicals inhaled from an e-cigarette were detected.

  - o The amounts of formaldehyde and acetaldehyde in vapors from lower voltage EC were on average 13- and 807-fold lower than in tobacco smoke, respectively. This range is due to variety between popular brands. Brands selected for this study were the top selling e-cigarettes in Poland.

  - o The highest levels of carbonyls were observed in vapors generated from propylene glycol-based solutions, as compared to e-liquids of vegetable origin.

  - o Increasing voltage from 3.2 to 4.8 V resulted in a 4 to more than 200 times increase in formaldehyde, acetaldehyde, and acetone levels.

  - o The levels of formaldehyde in vapors from high-voltage device were in the range of levels reported in tobacco smoke.

- The major concern of smokeless tobacco for health promotion and reducing harm is that it may promote duel use of cigarettes and e-cigarettes; thus instead of helping people quit smoking, e-cigarettes simply facilitate more exposure to nicotine (Benowitz, 2011)

- Beyond the risk of attracting youth with flavoring, some scientist fear that flavorings may be harmful when created into an aerosol. Diacetyl (2, 3-butanedione) is a chemical found in some e-cigarettes flavorings (Barrington-Trimis et al., 2014).
  - It is also found in foods to provide a buttery or creamy flavor; however, in high dosages, diacetyl, which is safe to ingest, can cause bronchial obliterations, a non-curable lung disease.

Youth health concern.

- E-cigarette use among youth raises two major concerns (1) nicotine exposure during adolescence can impair brain development (Dwyer et al., 2008), and (2) e-cigarette use may lead to future use of conventional cigarettes and nicotine addiction.
  - The number of youth using e-cigarettes who have never smoked a conventional cigarette continue to rise, supporting the second concern.
  - In a survey conducted in Connecticut, as many as 37.3% of those who had ever tried an e-cigarette had never smoked a conventional cigarette (Kong et al., 2014).
- Medical research shows that nicotine can affect the development of the hippocampus and the cerebral cortex if exposed during adolescence (England et al., 2015), and it can be harmful to reproduction (USDHHS, 2012a).
- However, 11% of health care providers in Minnesota reported telling an adolescent patient to use e-cigarettes as a cessation device to quit smoking (Pepper, McRee, & Gilkey, 2014c).
  - Providers receive most information from patients, new stories, and advertisements.

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- Several providers expressed concern that e-cigarettes could be "gateway to tobacco use", but most had little knowledge about e-cigarettes and did not feel comfortable talking about e-cigarettes with their patients below 18 years of age.
- Family medicine physicians were more knowledgeable about e-cigarettes than pediatricians and nurse practitioners.
- Almost all respondents (92%) were eager to learn more about e-cigarettes.

Youth initiation.

- Youth initiation begins with forming accepting attitudes and beliefs about nicotine products, which may lead to experimentation, maintaining the behavior, and ultimately addiction (USDHHS, 2012b).
- Public health advocates fear that the changing social norm of e-cigarette acceptance may increase prevalence of e-cigarette use (Trumbo & Harper, 2015a).
- E-cigarette use has increased among youth drastically across the globe, and many youth are trying nicotine for the first time through e-cigarettes. Many fear e-cigarettes will serve as a "starter product", leading to other tobacco products (Dutra & Glantz, 2014b).
  - The number of students who have never smoked a conventional cigarette but who have tried an e-cigarette increased from 79,000 to 263,000 student between 2011 and 2013 (Bunnell et al., 2014).
  - E-cigarettes use makes youth twice as likely to indicate intentions to smoke a conventional cigarette as those who have not tried an e-cigarette (Bunnell et al., 2014).

- 2012, 20.3% of middle school students and 7.2% of high school students who never smoked a conventional cigarette indicated that they had tried e-cigarettes (Corey et al., 2013).

- Of Polish high school students, 3.2% of those who had never smoked a conventional cigarette indicated they had tried an e-cigarette (Goniewicz & Zielinska-Danch, 2012).

- The implications of e-cigarettes effect on the health of children is unknown, but many recommend that exposure needs to be assessed to determine a need for regulation to protect youth. (Collaco et al., 2015).

CHAPTER 3: METHODOLOGY

With few published studies regarding college student behaviors regarding e-cigarettes, there remains many unanswered questions regarding college students' e-cigarette use. Also, nationally representative data lacks validated measures that could help explain behavioral intent of college students' e-cigarette use. In order to help fill this gap, this study aims to better understand college students' attitudes, social norms, and perceived behavioral controls (PBCs) regarding e-cigarettes. The current study includes two phases of data collection: (1) eliciting open-ended responses to capture salient beliefs regarding e-cigarettes through an open-ended online survey, and (2) developing items using the salient belief elicitation procedure (Middlestadt, 2006), pilot testing the identified items for refinement, and administering the final survey to a group of college students. The three phases, described below, have been approved by the Institutional Review Board at the University of Arkansas for the use of human subjects.

Study Design

Mixed methods research includes a study that collects multiple sets of data (whether they be quantitative, qualitative or both), separate approaches to analysis, and/or research of separate populations or groups. Mixed methods, in true form, consist of one "core" project, which is a sufficient method alone, and a second project that is insufficient without the first phase (Morse, 2010). This is separate from a multiple methods design, which includes two or more studies that use different methods and address the same research questions (Collins, 2010). Within a multiple methods design, each separate method could be an independent publishable study. For this study, we will use a mixed methods design, using a qualitative study (with a concurrent quantitative analysis as a supplementary component) as the theoretical drive, (QUAL) and the quantitative study (QUAN) listed as an equal sequential ($\rightarrow$) supplementary component. This is written in

mixed methods research as a QUAL + quan → QUAL mixed methods design (Morse, 2010). The reason that the quantitative aspect of Phase 2 is given equal importance as the theoretical drive of Phase 1 is because the focus study is intended to explore new themes to create and measure validated items. Phase 2 cannot be independent of Phase 1, but the quantitative assessment is equally as important as the qualitative assessment.

Using this deductive theoretical drive with a sequential pacing (how the phases are organized in relation to one another) from the qualitative focus group to the quantitative measurement scale, we have two points of interface (where these phases complement one another). The analytic point of interface begins with the items creation from the conceptualization of Phase 1 (QUAL), and the inferential analysis of these created items finalizes the results in Phase 2 (quan) (Collins, 2010).

Sampling Procedures

Kemper, Stringfield, and Teddlie (2003) began the first theoretical matrix of mixed methods sampling techniques, which was later developed into five types of sampling techniques by Teddlie and Yu (2007). These five mixed methods sampling techniques include: basic, sequential, concurrent, multilevel, and a combination of these strategies. A key construct of this typology is that the importance of the connection between the sampling method and the strand. The strand is the component of the study that that follows the three phases from conceptualization, experiential, to the inferential analysis (Tashakkori & Teddlie, 2003). For this study, we will use a sequential sampling procedure of Phase 1, followed by Phase 2. Phase 1 strand conceptualizes themes from the responses to the open-ended items. The concurrent quantitative study then provides inferential analysis of the college student sample. The

theoretical drive of the study is exploratory, focusing on the exploration of measures using the language of college students.

Participants in both phases of this study will include college students attending the University of Arkansas. Students will be recruited by through Newswire, classrooms, and email list serves. Although the samples are recruited by convenience, and they must meet the criterion of college students.

Phase 1: Open-ended survey. For Phase 1, college students will be recruited to participate in an open-ended survey. Middlestadt (2006) stresses the importance of collecting data individually (through either open-ended surveys or individual interviews) in order to prevent contamination of data of other's opinions influencing participants responses. Middlestadt also states the minimum number of participants necessary for this procedure is at least 40, with half of the participants having performed the behavior (ever using an e-cigarette) and half the participants having not performed the behavior. This open-ended survey was distributed online using Qualtrics, a survey software system in December of 2015.

Students will be recruited to participate in the survey by sending a recruitment letter (*Appendix A: Recruitment Letter for Open-Ended Survey*) which was distributed on the University Newswire (online daily news) in addition to sending through teachers to their classes and university list serves. Responses were collected from 58 participants, 51.7% who indicated having ever used e-cigarettes and 48.3% who had not used e-cigarettes. We were seeking about half of the participants to have used and about half who had never used e-cigarettes. Consent was be sought using implied consent, with the consent form on the first page of the Qualtrics survey (*Appendix B: Implied Consent: Open-Ended Survey*). The first 50 participants to take this survey

were offered $5. Participants were emailed to pick up their $5 at the Co-PI's office between December 2015 and January2016. The survey asked for participants' email for purposes of a monetary incentive. The participant's confidentiality was protected by only accessing data using a password protected computer, and participants' names were sorted so that they did not correspond with their responses. After the drawing, the participants contact information was terminated and responses on Qualtrics were deleted, after downloading data from Qualtrics to a password protected computer. Data was only accessed and analyzed by the principal investigator (PI), co-researcher, and research assistant. The open-ended survey measured expected advantages, expected disadvantages, behavioral beliefs, and injunctive norms, descriptive norms, enabling circumstances, and inhibiting circumstances that may affect e-cigarette behaviors in college students. These open-ended items can be found in *Appendix C: Open-Ended Survey*.

Phase 2: Pilot survey. For Phase 2, a parallel sample from Phase 1 was recruited to participate in a pilot test of the instrument to test for internal consistency and validity and refine the instrument for final distribution. Parallel samples are separate from the original sample, but they represent the same population of interest (Collins, 2010), in the case of this study, college students. Experimental trials for a one-tailed hypothesis should have at least 21 participants (Onwuegbuzie, Jiao, & Bostick, 2004). For a grounded theory research design, Creswell (2005) suggests 15 to 20 participants, and Creswell and Plano Clark (2007) suggests 20 to 30 participants. Originally, the study proposed to have at least 25 students for the pilot test of the instrument. With evidence that factor solutions can be determined with small sample sizes (less than 50 participants) if the structure exemplifies high factors loadings (e.g., .8 and above) and high communalities (e.g., .60 to .80), the sample size was set for no more than 50 participants (de Winter, Dodou, & Wieringa, 2009; Gaskin & Happell, 2014). Students were recruited to

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participate in the pilot study through two classrooms in the Health, Human Performance and Recreation department using a recruitment email (*Appendix E: Recruitment Letter for PILOT Closed-ended Survey*). Students read an implied consent form (*Appendix F: Implied Consent Form: PILOT Closed-ended Survey*), and by clicking forward to the Qualtrics survey, participants provided consent to participate in the PILOT survey (*Appendix G: E-Cigarette Beliefs & Behaviors PILOT*). Participants were offered extra credit in the classes from which they were recruited, and an alternative extra credit opportunity of equal value was offered for those who did not wish to participate.

Phase 3: Closed-ended survey. After refinement through principles component analysis (PCA) and reliability analysis, the study employed a convenience sample of college students for the final cross sectional survey. In order to achieve a power of 80% ($\alpha=.05$) with the known population of e-cigarette use at 13% (Trumbo & Harper, 2015a) among young adults and a predicted 8.5% among college students in the study group, the suggested sample size was at least 395 participants (ClinCalc LLC, 2014). For the closed-ended study, 499 students were recruited for the final cross-sectional survey.

Students were recruited for the closed-ended survey just as they were for the open-ended group. A recruitment letter (*Appendix I: Recruitment Letter for Closed-ended Survey*) was distributed through newswire (the campus daily news), classrooms, and campus list serves with a link to the online cross sectional survey. This survey also employed Qualtrics, which required internet access for participation. The survey (*Appendix K: E-Cigarette Beliefs & Behaviors Closed-ended Survey*) took no more than 20-25 minutes. Consent was sought using implied consent (*Appendix J: Implied Consent Form: Closed-ended Survey*), by the participant clicking forward to the survey. There were five drawings for $50 Visa Walmart gift cards as a monetary

incentive for participation. The survey asked for participants email for purposes of a monetary

incentive. The participant's confidentiality was be protected by only accessing data using a

password protected computer, and participant's names were sorted so that they did not

correspond with their responses.

Thirty days after the closed ended survey, a separate sample was collected. Participants were

sent a recruitment email (*Appendix I: Recruitment Letter for Closed-ended Survey* & *Appendix*

M: Recruitment Letter for Closed-ended Survey Follow-Up) explaining there would be a drawing

for five $50 Walmart gift cards from the participants in the study. This email also explained that

the drawing was not connected to the original survey or original drawing. If they received a gift

card after the first survey, they could still be drawn again for another gift card in the second

survey. As with the first survey, the first page of the survey includes an implied consent form

(*Appendix N: Implied Consent Form: Closed-ended Survey Follow-Up*). By clicking forward, the

participant provides consent to participant in the survey (*Appendix K: E-Cigarette Beliefs &*

Behaviors Closed-ended Survey). After the second survey, all participants contact information

was deleted. Electronic data was saved on a password protected computer on University

property. Only the CO-PIs, researcher, and research assistant had access to data.

Study Instrument and Measurement Development

This section will explain the methods used to develop the measurement tool. The item

development included a measure of salient consequences, referents, and circumstances regarding

e-cigarettes use in the next 30 days. Responses from the open-ended survey were used to create

items in the language of the participants for the quantitative survey.

Phase 1: Item-Elicitation. The open-ended survey included: (1) demographic variable (assessing age, sex, race, and grade classification); (2) a question asking if the participant had ever tried an e-cigarette (even one puff), to separate those who had performed the behavior and those who have not; (3) eight open ended questions regarding salient consequences, norms, and circumstances that may influence their intention to use e-cigarette (even one puff) in the next 30 days; and (4) a question asking the participants to list e-cigarette brands of which they are familiar. The open-ended item asking the participants to list brands of e-cigarettes was an exploratory item to create a list of e-cigarette brands most commonly used by college students. Items on nationally representative studies currently ask about conventional cigarette brand use, but no surveys currently ask about e-cigarette brand use.

The salient belief elicitation procedure (Middlestadt, 2006) provides a seven step process for eliciting items themes using a qualitative process. These steps include: (1) identification of the target population; (2) collecting a sample; (3) asking the sample open-ended questions to elicit the salient factors; (4) conducting content analysis by identifying emerging themes to develop a code book; (5) tabulating participants' responses into an EXCEL spreadsheet; (6) comparing those who have done the behavior and those who have not; and (7) interpreting the findings by using factors and categories between "doers" and "non-doers" (p. 6). Middlestadt states there are six open-ended questions that are provided to the sample; however Ajzen (2006) provides nine open-ended questions when using the Reasoned Action Approach (RAA). This study will use Ajzen's guidelines for the wording of eight open-ended questions (see *Appendix C: Open-Ended Survey*).

Phase 2: quantitative survey. The survey, found in *Appendix K: E-Cigarette Beliefs & Behaviors Closed-ended Survey*, sought to validate measures of global and salient consequences,

referents, and circumstances e-cigarettes use among college students. Demographic measures for the closed-ended survey came from the National Youth Tobacco Survey (NYTS [CDC, 2013]) and rephrased questions from the NYTS to include e-cigarettes instead of cigarettes. The questions regarding acceptance of e-cigarette use in public comes from Trumbo and Harper's (2015a) study of the TRA. The items measuring the RAA constructs were derived from Phase 1 of the study, and items were refined through elimination of items not meeting acceptable reliability, Cronbach's alpha below .70 (Cronbach, 1951), or items that did not load together during the PCA used for this pilot study.

The first five demographic questions come from the NYTS, with grade classification reworded for college classifications specific to the University of Arkansas campus. The sixth through eighth question on the survey came from the NYTS to gauge conventional cigarette use and age of cigarette initiation. Question nine comes from the NYTS, and questions 10 and 11 are reworded from the NYTS questions regarding conventional cigarettes to measure e-cigarettes. The age of initiation questions are intended to be compared to see if young adults are using e-cigarettes or cigarettes first. The questions regarding products and brands were developed from eliciting brands during Phase 1 and developing a quantitative measure for Phase 2. By including an open ended item in the final survey regarding preference, we are able to better understand what makes particular e-cigarette brands more preferable to college students.

Pilot measures. Participants completed a 206 item cross sectional survey. The first 22 items addressed demographics (sex, age, class standing, ethnicity, and race) along with items to measure e-cigarette use and conventional cigarette use. Salient beliefs used to measure the underlying constructs of the RAA were assessed using 162 items (*Appendix G: E-Cigarette Beliefs & Behaviors PILOT*), which were derived from responses elicited in Phase 1. The

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underlying constructs were measured with two sub-constructs each that are used together to explain a person's perception of the construct as applied to themselves. Fishbein and Ajzen (1975) explained this as the expectancy-value model, which multiplies the sub-constructs (e.g. strength of salient belief and outcome evaluation) by one another and then the cross-products are summed together to create a variable measuring the overall underlying construct (Ajzen, 1991).

The underlying construct, attitude, is derived from both the behavioral belief and the behavior outcome evaluation. To assess behavioral belief, participants were asked to rate how much they agreed with statements, such as, "I will relieve stress as a result of using e-cigarettes in the next 30 days" on a seven-point (*disagree* [-3] or *agree* [+3]) bipolar scale (Ajzen, 1991). To assess the behavioral outcome evaluation associated with this consequence, participants were asked to rate if they believed the statement (such as, "Feeling stress relief") to be *bad* (-3) or *good* (+3). The statements included responses elicited as advantages or disadvantages from Phase 1. A measure of participants' salient attitude was then derived by calculating the cross products of behavioral beliefs and the behavior outcome evaluations. This procedure is consistent with Ajzen's (1991) expectancy-value model, which accounts for the strength of the belief and the subjective evaluation of the belief's attribution to the individual. The total salient attitude measures consisted of nineteen cross products.

The underlying construct, injunctive norm, derives from the injunctive normative belief and the motivation to comply with referent others. To assess the injunctive normative belief strength, participants were asked to rate how much they felt the listed person/s thought they *should not* (-3) or *should* (+3) smoke an e-cigarette in the next 30 days using statements, such as, "Current smokers think that (*I should not* or *I should*) use e-cigarettes in the next 30 days." To assess motivation to comply with referent others, participants were asked to rate how much they

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disagreed (-3) or agreed (+3) with the statements, such as, "When it comes to matters like using e-cigarettes, I want to do what current smokers think I should do." The statements included responses elicited during Phase 1 as those who approve or disapprove of you using an e-cigarette. A measure of participants' salient injunctive norms was then derived by calculating the cross products of the injunctive normative beliefs and the motivation to comply with referent others. The total salient injunctive norm measure consisted of twenty cross products.

The underlying construct of descriptive norms derives from descriptive normative belief and identification to referent others who perform the behavior. To assess the descriptive normative belief strength, participants were asked to rate how *false* (-3) or *true* (+3) they believed the statements to be, using statements, such as, "Most fraternity members will use e-cigarettes in the next 30 days." To assess the identification with referent others, participants were asked to rate how much they wanted to be like the listed person/s using statements, such as, "When it comes to matters of using e-cigarettes, how much do you want to be like fraternity members." Responses were measured on a seven-point *not at all* (-3) or *very much* (+3) scale. The statements included responses elicited during phase 1 as those most likely and least likely to use e-cigarettes. A measure of participants' salient descriptive norms was then derived by calculating the cross products of descriptive normative beliefs and the identification with the referent others. The total salient descriptive norm measure consisted of twenty-one cross products.

The underlying construct of perceived behavioral control derives from the control belief and the perceived power of the individual. To assess the control beliefs, participants were asked to rate how *unlikely* (-3) or *likely* (+3) the statements, such as the following, were: "I will go to a bar in the next 30 days." To assess perceived power, participants were asked to rate how much

they disagreed (-3) or agree (+3) with statements, such as, "Going to a bar would make it easier for me to use e-cigarettes in the next 30 days." The statements included responses elicited during Phase 1 as facilitators or barriers to using e-cigarettes. A measure of participants' salient perceived behavioral control was then derived by calculating the cross products of control beliefs and the perceived power respectfully of each circumstance. The total salient perceived behavioral control measure consisted of twenty-one cross products.

Final measures. For the final survey, both global constructs and the underlying constructs validated during the pilot test were included. Direct RAA items measuring the three global constructs (attitude, perceived norm, and PBC) were adopted from previous validated measures (Eggleston et al., 2011; Geshnizjani et al., 2013; Hinsz & Nickell, 2015; Sable et al., 2006; Septimus, 2011; Sheats et al., 2013; Yzer et al., 2015). The global constructs consisted of a four-item measure of intention to use e-cigarettes in the next 30 days for recreational use, an 11-item measure of attitude, a 12-item measure of perceived norm (eight-item injunctive norms and four-item descriptive norms), and a five-item measure of PBC (*Appendix K: E-Cigarette Beliefs & Behaviors Closed-ended Survey FINAL*). It is advised to use a minimum of three measures to assess TPB constructs (Francis et al., 2004), thus this study sought to follow parallel guidelines for the RAA constructs.

The global construct of attitude included an 11-item measure that included the statement: "Me using an e-cigarette in the next 30 days, just because I want to do it is…" Responses were evaluated on a seven-point (-3 to +3) scale with bipolar options, such as, *bad-good*, *harmful-beneficial, unnecessary-necessary*. The measured variable of attitude was computed by taking the average of the eleven responses. The underlying constructs of attitude in the final survey were measured as mentioned in the pilot survey.

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The global construct for social norms included a twelve item measure that was broken into injunctive norms (eight items) and descriptive norms (four items). The global injunctive norms included the statements: "Most people who are important to me (*approve of me using/think I should use/support me using/want me to use*) an e-cigarette in the next 30 days" and "My closest friends (*approve of me using/think I should use/support me using/want me to use*) an e-cigarette in the next 30 days." Responses were on a seven-point *strongly disagree* (-3) or *strongly agree* (+3) scale, and the measured variable of injunctive norm was computed by taking the average of the eight responses. The global construct of descriptive norms included the statements: "Most people who are important to me (*will use/will buy*) an e-cigarette in the next 30 days" and "My closest friends (*will use/will buy*) an e-cigarette in the next 30 days." Responses were on a seven-point *strongly disagree* (-3) or *strongly agree* (+3) scale. The measured variable of descriptive norms was computed by taking the average of the four responses. For the global construct of social norms (both injunctive and descriptive norms), the average of all twelve items was computed. The underlying constructs for both injunctive and descriptive norms were constructs for the final survey as mentioned in the pilot survey.

The global construct of PBC included a five-item measure that included three statements including "Using an e-cigarette in the next 30 days, just because I want to do it is (*difficult – easy/ up to me – not up to me/ not at all under my control – under my control*)". Two other statements measuring the PBC were also included (See Appendix 2). Response options were on a seven-point (-3 to +3) bipolar scale. The measured variable of PBC was computed by taking the average of the five responses. The underlying constructs for PBC were measured as mentioned in the pilot survey.

Behavioral intention was measured by asking participants how much they agreed with to

the statement "I (*want/intent/plan/am willing*) to use e-cigarettes in the next 30 days, just because I want to do it."   Responses were on a seven-point *strongly disagree* (-3) or *strongly agree* (+3) bipolar scale. The measured variable of intention was computed by taking the average of the four responses, a method used in previous RAA studies (Jozkowski & Geshnizjani, 2016),

Analysis Plan

Phase 1: Item elicitation. The theory based semi structured elicitation procedure (Middlestadt et al., 1996) was used to identify themes. Analysis of the item responses to the open-ended survey used a five-phase cycle to identify themes (Yin, 2011). The first phase of the qualitative analysis cycle begins by "compiling" all data. The second phase of the study is "disassembling" fragments of statements into codes or labels to describe the word or phrase. The third phase then reorganizes the codes or labels into groups or sequences that make sense with the theoretical framework. This procedure is referred to by Yin (2011) as "reassembling". These reassembled codes are then "interpreted", in our case as the categories which interpret the constructs of the RAA theory. For this phase, two coders (PI and research assistant) collectively disassembled fragments and reassembled these responses into categories.   The final phase is the "conclusion" of the interpretations into themes and how those themes apply to the RAA. Each phase of the five-phase cycle may require overlap of other cycles or repeating of past phases. For the final phase, the two coders separate assigned codes (identified earlier with both Co-PI and research assistant) to each response. Cohen's (1960) kappa was used to compute inter-rater reliability for each of the eight separate questions *Table 2: Inter-Rater Reliability from Open-Ended Questions*. Kappa measures the observed agreement between coders for nominal ratings. The equation for kappa can be seen below.

$$\kappa = \frac{P(a) - P(e)}{1 - P(e)}$$

κ = Cohen's kappa

$P(a)$ = The observed percentage of agreement

$P(e)$ = The probability of expected agreement due to chance

Table 2: Inter-Rater Reliability from Open-Ended Questions

Open Ended Questions	(κ)
Attitude- Advantages	.973
Attitude- Disadvantages	.853
Injunctive Norm- Approve	.883
Injunctive Norm- Disapprove	.857
Descriptive Norm- Most Likely	.922
Descriptive Norm- Least Likely	.781
PBC- Enabling Factor	.778
PBC- Preventative Factor	.697

As Middlestadt (2006) explains, the analysis process of the item elicitation approach used Microsoft Word to organize and provide codes to responses. Once categories (themes) were created, the responses were tabulated into an EXCEL spreadsheet to be used for comparative analysis between those who have tried e-cigarettes (even one puff) and those who have not. These coded themes used axial codes to identify the salient and most frequently mentioned constructs. According to Middlestadt, there should be five to seven themes for each question

asked and between five to 15 different responses per theme (Middlestadt et al., 1996). Axial coding informed the items developed from the themes, in the language of the population, by selecting a minimum response cut-off percentage based on overall sample responses.

Phase 2: pilot test. Using axial codes, the operation definitions in the quantitative survey were derived from the open-ended survey responses. Using the responses to derive items allowed for the creation of the pilot scale. The Pilot scale was distributed to 49 participants, as mentioned earlier. The pilot scale assessed face validity by gathering feedback from a panel of experts. Internal consistency was measured using Cronbach's alpha and PCA to evaluate the developed items. Extracted factors used a oblique rotation, and the reliability of items in each factor was examined using Cronbach's alpha (α). During the PCA, items that did not load significantly on a factor, or items that cross-loaded on more than one factor within .1 points were removed. Guided by theory and the rationalization of the scale development, eight factors derived from the salient, underlying constructs. Pearson correlations were calculated to test for rotation method of the exploratory factor analysis (EFA). Factors retained in the model were based on (1) the underlying constructs of the RAA, (2) scree test, and (3) eigenvalue great than one (Cattell, 1966; Kaiser, 1960). The cut-off score for salient item loading was set at 0.4 (Raubenheimer, 2004).

Phase 3: final survey. Analysis for the final closed-ended survey phase of the study included univariate and bivariate statistics. IBM SPSS vs 23 and University Edition SAS were used to assess all initial descriptive statistics. Univariate statistics provided descriptive statistics, which will include frequencies, percentages, means, and standard deviation of responses. Descriptive statistics include: age, grade classification, race, smoking history, e-cigarette smoking history, age from first cigarette, age from first e-cigarette, brand preference, and

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intention to use e-cigarettes (next 30 days and next six months). Normality was tested using

Shapiro-Wilk test for skewness and kurtosis (Steven, 2009). An EFA, using IMB SPSS Stastics

23, was employed to evaluate the global measures (developed in Phase 3), and the measurement

model of both the underlying and global constructs were assessed by employing structural

equation modeling (SEM), using M*plus* software v. 7. (http://www.statmodel.com/).

Structural equation modeling. The measurement model measured each items

contribution to the overall salient construct/measure (i.e. intention, attitude, injunctive norma,

descriptive norm, perceived behavioral control). This would normally be seen as a confirmatory

factor analysis (CFA); however, the global measures had not previously been validated through

an EFA. This will be referred to as the measurement model throughout the remainder of the

study. The structural model refers to the overall SEM and path analysis used to determine items

and salient constructs/measures ability to predict intention to use e-cigarettes in the next 30 days

SEM and path analysis has been used in previous literature to test the validity of the TRA and the

TPB (Madden, Ellen, & Ajzen, 1992). SEM affords several benefits. It can be used to test the

theory-based models, limiting type one error inflation which can result from multiple bivariate

correlations or regression (Buhi, Goodson, & Neilands, 2007). It also allows for the analysis to

measure the direct and indirect effects of the whole model, without controlling for other items

(Raykov & Marcoulides, 2006). SEM and path analysis are also unique from other techniques

because M*plus*, the software we used to analyze SEM, is capable of analyzing continuous,

categorical, ratio, and binary variables through a weighted least squares estimation technique

(Blunt, 2012; Muthen & Asparouhov, 2002).

SEM was employed to test the hierarchy model of the latent factors of underlying

constructs to predict the global constructs and the global constructs to predict intention of e-

cigarette use in the next 30 days. Model goodness-of-fit statistics were calculated using chi-square of model fit (χ^2), Root Mean Square Error of Approximation (RMSEA), Standardized Root Mean Square Residual (SRMR), and comparative fit index (CFI). While guidelines have been provided for interpreting model fit statistics, there are currently no definitive cut-off values for interpretation (Fan, Thompson, & Wang, 1999). Chi-square statistics measures the difference between the expected and observed covariance (Hu & Bentler, 1999). When significance is found in the chi-square test, it indicates a difference in the observed and expected values, suggesting the model may not be correct; however, chi-square tests are sensitive to large sample sizes (Hu & Bentler, 1995). Literature regarding RMSEA and SRMR suggests acceptable model fit can be interpreted at scores of .08 and below, and scores of .06 and below indicate "close" fit (Hu & Bentler, 1995). CFI scores above .90 are suggested by some to be acceptable, and scores above .95 are considered to be good model-fit (Hu & Bentler, 1999; Kline, 2005).

Summary of analysis. Phase 1 addressed the open-ended survey, using a mix-methods approach of qualitative assessment with a quantitative analysis of the categories to define cut-off standards for items that were elicited for the second phase of the study. The second phase of the study used reliability and validity analysis to assess the underlying constructs of the RAA during pilot survey, and Phase 3 used an EFA for the global constructs and SEM to analyze the RAA model as it pertains to e-cigarette use in college students. To address the analysis plan of each research aim, see Table 3. Analysis Plan.

Table 3. Analysis Plan

Aim	Aim Description	Variable notation (DV = dependent variable; IV = Independent variables)	Endpoints	Analytic Plan
Aim 1: Elicitation of Salient Beliefs				
1.1.1	Elicit college students' belief of advantages of e-cigarette use.	DV: Attitude about people e-cigarette use e-cigarettes IV: Salient belief of behavioral advantages	Establish themes that reflect salient consequences of e-cigarette use	Open coding and axial coding (frequency analysis)*
1.1..2	Elicit college students' belief of disadvantages of e-cigarette use.	DV: Attitude about people e-cigarette use e-cigarettes IV: Salient belief of behavioral disadvantages	Establish themes that reflect behavioral salient consequences of e-cigarette use	Open coding and axial coding
1.2.1	Elicit a list of individuals or groups who would approve of e-cigarette use.	DV: College students' e-cigarette behavioral intention IV: Salient referents	Establish themes that reflect injunctive norm of e-cigarettes use	Open coding and axial coding
1.2.2	Elicit a list of individuals or groups who would disapprove of e-cigarette use.	DV: College students' e-cigarette behavioral intention IV: Salient referents	Establish themes that reflect injunctive norm of e-cigarettes use	Phase 1: Open coding and axial coding Phase 2: Path Analysis
1.2.3	Elicit a list of descriptive norms that are most likely to use e-cigarettes.	DV: College students' e-cigarette behavioral intention IV: Belief that descriptive norms smoke e-cigarettes	Establish themes that reflect descriptive norms of e-cigarettes use	Phase 1: Open coding and axial coding
1.2.4	Elicit a list of descriptive norms that are least likely to use e-cigarettes.	DV: College students' e-cigarette behavioral intention IV: Belief that descriptive norms do not smoke e-cigarettes	Establish themes that reflect descriptive norms of e-cigarettes use	Phase 1: Open coding and axial coding
1.3.1	Elicit a list of factors or circumstances that may enable e-cigarette use.	DV: College students' e-cigarette behavioral intention IV: Salient circumstances (facilitating factors)	Establish themes that reflect PBC of e-cigarettes use	Phase 1: Open coding and axial coding
1.3.2	Elicit a list of factors or circumstances that may prevent e-cigarette use.	DV: College students' e-cigarette behavioral intention IV: Salient circumstances (inhibiting factors)	Establish themes that reflect PBC of e-cigarettes use	Phase 1: Open coding and axial coding
Aim 2: Formulating Direct RAA Measures on Intention to Use E-cigarettes				
2.1.1	Identify e-cigarette belief strength.	DV: Attitude toward e-cigarettes IV: Behavioral beliefs strength	Will provide strength of association between behavioral beliefs and attitude toward e-cigarettes.	Phase 2 and three: PCA, CFA, Path Analysis

Table 3. Analysis Plan Cont.

Aim	Aim Description	Variable notation	Endpoints	Analytic Plan
2.1.3.	Calculate the cross product of the belief strength and the outcome evaluation.	DV: College students' e-cigarette behavioral intention (in the next 30 days) IV: College students' attitude toward e-cigarettes	Will provide association between attitude and intention to use e-cigarettes among college students	Phase 2 and three: PCA, CFA, Path Analysis
2.1.4	Examine if attitude predicts intention to use e-cigarettes.	DV: College students' global e-cigarette behavioral intention (in the next 30 days) IV: College students' global attitude toward e-cigarettes	Will provide association between global attitude and intention to use e-cigarettes among college students	Phase 3: PCA, EFA, Path Analysis
2.2.1	Identify injunctive norms strength.	DV: College students' Injunctive norms towards e-cigarettes IV: Injunctive normative belief strength	Will provide strength of association between injunctive normative belief strength and injunctive norms	Phase 2 and three: PCA, CFA, Path Analysis
2.2.2	Identify motivation to comply with referent other.	DV: College students' Injunctive norms towards e-cigarettes IV: Motivation to comply with referent others	Will provide strength of association between motivation to comply with referent others and injunctive norms	Phase 2 and three: PCA, CFA, Path Analysis
2.2.3	Calculate the cross product of the injunctive norm strength and the motivation to comply with identified referent.	DV: College students' e-cigarette behavioral intention (in the next 30 days) IV: Injunctive norms	Will provide strength of association between injunctive norms and intention to use e-cigarettes	Phase 2 and three: PCA, CFA, Path Analysis
2.2.4	Identify descriptive norms strength.	DV: College students' Descriptive norms towards e-cigarettes IV: Descriptive normative belief strength	Will provide strength of association between descriptive norms and descriptive normative belief strength.	Phase 2 and three: PCA, CFA, Path Analysis
2.2.5	Identify how strongly the participant identifies with the referent descriptive norm.	DV: College students' Descriptive norms towards e-cigarettes IV: Identification with descriptive referent	Will provide strength of association between descriptive norms and participants' identification with descriptive referent.	Phase 2 and three: PCA, CFA, Path Analysis
2.2.6	Calculate the cross product of the descriptive norms strength and the identification with the referent descriptive norm.	DV: College students' e-cigarette behavioral intention (in the next 30 days) IV: Descriptive norms	Will provide strength of association between descriptive norms and intention to use e-cigarettes.	Phase 2 and three: CFA, EFA, Path Analysis
2.2.7	Examine if injunctive and descriptive norms predict intention to use e-cigarettes	DV: College students' global e-cigarette behavioral intention (in the next 30 days) IV: Global Descriptive norms	Will provide strength of association between global descriptive norms and intention to use e-cigarettes.	Phase 3: EFA, Path Analysis

Table 3. Analysis Plan Cont.

Aim	Aim Description	Variable notation	Endpoints	Analytic Plan
2.3.2	Identify perceived power.	DV: College students' e-cigarette PBC	Will provide strength of association between power of control and PBC	Phase 2 and three: PCA, CFA, Path Analysis
2.3.3	Calculate the cross product of control belief and perceived power.	IV: Power of control DV: College students' e-cigarette behavioral intention (in the next 30 days) IV: PBC	Will provide strength of association between PBC and intention to use e-cigarettes.	Phase 2 and three: PCA, CFA, Path Analysis
2.3.4	Examine if PBC predicts intention to use e-cigarettes.	DV: College students' global e-cigarette behavioral intention (in the next 30 days) IV: PBC	Will provide strength of association between global PBC and intention to use e-cigarettes.	Phase 3: EFA, Path Analysis

Note. Following Middlestadt et al.'s (1996) guidelines for open coding and axial coding.

Delimitations and Limitations of the Study

Due to the nature of this study, findings are limited to only college students at a southern university who have access to the internet. Findings are not intended to be generalized to any population. The study's intent is to create and validate items measuring the RAA constructs in regards to college students' intention to use e-cigarettes in the next 30 days. To ensure a young adult population, the study was delimited to those between the ages of 18 and 26. Those below 18 were not eligible to participate in the study, due to legality of the behavior, and those above 26 were not included in the final analysis due to the definition of young adults employed for this study (Choi et al., 2012).

Due to convenience sampling and a cross-sectional research design, no generalizations or causal inferences can be made. Both phases consisted of self-reported items that may have resulted in bias. By only using college students, this study provides a narrow scope for e-cigarette use that may not be a model representation for e-cigarette patterns. Moreover, the RAA was developed to analyze behaviors that result in a positive health outcome (i.e., eating more

green leafy vegetates, using a condom during intercourse). By using the RAA to predict what we

are interpreting to be a negative health behavior, we are not using the RAA in its intended form.

CHAPTER 4: MANUSCRIPT #1

Perceptions of E-Cigarettes among College Students:

Results from a Salient Belief Elicitation

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Running Head: College students' perceptions of e-cigarettes

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Abstract

Purpose. Theory-based quantitative instruments assessing people's salient attitudes, norms and circumstances regarding e-cigarettes are scarce. With use among young adults continuing to rise, this study sought to elicit the salient factors influencing college students' perceptions and use of e-cigarettes.

Methods. This study represents Phase 1 of a multi-phase, scale-development study. Phase 1 used a salient-belief elicitation survey, using the Reasoned Action Approach (RAA) as a theoretical framework, to collect open-ended responses from college students (n = 58). Data were analyzed using an inductive coding approach resulting in overarching themes. Responses from Phase 1 were used to elicit items for a quantitative measure employed in Phase 2.

Results. Fifty two percent of the participants indicated not having ever tried e-cigarettes (non-users); 48 percent indicated having tried e-cigarettes (users). Responses suggest attitudes toward e-cigarettes are favorable if used as a cessation device; however, some fear e-cigarettes may cause harm, addiction, or negative perceptions from others. Disapproval from salient referents (i.e., family, parents, and friends) may discourage use for some; however, identifying with referent others (i.e., friends from Greek life organizations), and motivation to comply with others' wishes, may promote use. Salient circumstances, such as a friend offering an e-cigarette, may enable use, while inhibiting factors, including cost, vape-free policies, and social influence, may prevent e-cigarette use.

Conclusions. Salient beliefs elicited in this study provide insight to college students' attitudes, norms, and perceived behavioral controls regarding e-cigarettes. Future research should continue

to explore the influence that consequences, referents, and circumstances have on behavioral

intention to use e-cigarettes.

Introduction

Electronic cigarettes (e-cigarettes) are an electronic nicotine delivery system, battery powered to deliver aerosolized nicotine and other byproducts to the user (Centers for Disease Control and Prevention [CDC], 2015). E-cigarettes are currently the most popular product of among the electronic nicotine delivery devices, which also include electronic cigars and vapor pens (USDHHS, 2015). Although some remain hopeful that e-cigarettes will reduce mortality and morbidity among current smokers (Etter & Bullen, 2014), they have not been shown to be completely 'safe' or 'harm free'. This is especially concerning due to the recent increase of e-cigarette use among youth and young adults, and its potential for addiction and harm (Camenga et al., 2014b; Benowitz, 2014). The possibility of e-cigarettes becoming a gateway substance to other tobacco related products has been postulated (Giroud et al., 2015; Wasowicz, Feleszko, & Goniewicz, 2015). Although research regarding the potential health impact of e-cigarettes is in its infancy, e-cigarettes have been found to contain hazardous substances such as formaldehyde (Cooke, Fergeson, Bulkhi, & Casale, 2015), and diacetyl, which are linked to bronchiolitis obliterations (commonly known as "Popcorn Lung") (Allen et al., 2016).

In 2009, only 16% of U.S. adults had ever heard of e-cigarettes and only one percent had ever tried them (Regan, Promoff, Dube, & Arrazola, 2013). Awareness of these products increased to 86% (Pepper, Emery, Ribisl, & Brewer, 2014a) among adults, and use increased to 15% by 2013 (Pepper & Brewer, 2014). Compared to other adults, e-cigarette use is highest among young adults, ages 18 to 25 (Adkison et al., 2013; Coleman et al., 2015). An internet survey conducted on four campuses in upstate New York in 2013 found use among college students was higher than the national average; suggesting that use of e-cigarettes among this

sample of college students may be greater than the general adult population (Saddleson et al., 2015).

Trumbo and Harper (2013) introduced the first theoretical application to e-cigarette use with their construct validity assessment of the Theory of Reasoned Action (TRA) and Diffusion of Innovation Theory. They later employed their validated measure with generalizable sample of young adults (Trumbo & Harper, 2015a), to help explain behavioral intention to use e-cigarettes. Their findings suggested that attitudes toward the behavior, but not social norms, were found to significantly influence young adults' intention to use e-cigarettes. Such findings prompted us to examine social norms of e-cigarette use among college students using an updated version of this theory to better understand the underlying theoretical constructs contribution to intention.

The Reasoned Action Approach (RAA) is a theoretical framework that has emerged from the TRA, the Theory of Planned Behavior (TPB), and the Integrated Behavioral Model (Fishbein & Ajzen, 2010). It uses constructs to identify salient factors that influence a person's intention to perform a specific behavior. The RAA suggests that intention can predict behavior, and that behavior is influenced by attitudes, perceived norms, and perceived behavioral control. The RAA is a well-recognized theory that has been used to better understand behaviors such as human papillomavirus (HPV) vaccinations (Geshnizjani, Jozkowski, & Middlestadt, 2013), condom use (Albarracín, Johnson, Fishbein, & Muellerleile, 2001), and physical activity (Hagger, Chatzisarantis, & Biddle, 2002); however, no current literature applies the RAA to e-cigarette use. The RAA differs from the TRA in that the RAA divides social norms into injunctive normative beliefs (as seen in the TRA) and descriptive normative belief (people similar to oneself, such as peers) (Fishbein & Ajzen, 2010). Considering Trumbo and Harper's (2015a) findings, we believe there to be a difference between injunctive and descriptive norms, and we

believe this difference in the operation definition may cause differences in predicting intention to use e-cigarettes in the next 30 days.

The purpose of this study was to elicit salient consequences, referents, and circumstances associated with e-cigarette use in the next 30 days from the population of interest. This study is Phase 1 of a multi-phase scale development study. Responses (salient consequences, referents, and circumstances) from this phase will later be used to develop a quantitative measure, testing the application of the RAA to e-cigarette use among college students.

Methods

Procedures and Data Collection

An online survey was administered to collect open-ended responses from a convenience sample of college students (n=58) using Qualtrics. To be eligible, participants were required to be enrolled as a student at the University where the study was held and 18 years of age or older. Students were recruited using a daily campus newsletter. As an incentive for participation, students were paid $5. Participation was voluntary; after reading the consent form, the participants' consent was implied by clicking forward with the survey. Sixty one students began the survey, but only 58 completed enough of the survey to be included in the analysis (demographic information and at least one of the open-ended responses). This study was approved by the Institutional Review Board at the academic institution where the data was collected.

Measures

Participants completed a closed-ended and open-ended questionnaire. The first six items were closed-ended items including demographic questions (sex, age, class standing, ethnicity, and race) along with one item to measure e-cigarette use. To determine users and non-users, one item asked whether they had "ever tried an electronic cigarette or e-cigarette in your lifetime, even one or two puffs?" Response options included *yes* and *no*. The remaining nine items were open-ended, included eight questions measuring the constructs of the RAA (behavioral outcomes, normative referents, and control factors). The constructs were elicited using the questions such as, "When thinking about yourself as a college student, what are some advantages of trying an e-cigarette (even one puff) in the next 30 days?" Other items assessed consequences, referents, and circumstances of using e-cigarettes in the next 30 days.

Analytic Methods

A salient belief elicitation procedure (Middlestadt, Bhattacharyya, Rosenbaum, Fishbein, & Shepperd, 1996) was employed to elicit responses relevant to the population of interest, and include terminology that is applicable to the population of interest. This procedure allowed for a content analysis of the eight open-ended items by grouping responses into categories of consequences, referents, and circumstances. The salient-belief elicitation procedure was used to elicit salient determinants according to the constructs of the RAA (attitude, perceived norms, and perceived behavioral control). The determinants of a behavior can vary per population; thus, frequency of responses from participants is important when conducting a salient-belief elicitation to assure that the factors are relevant to the appropriate population and context. The RAA outlines the need to identify the population and the behavior, using both a specific action and a time-frame for the action. The current study examines college students' intention to use e-cigarettes in the next 30 days.

As outlined by Middlestadt et al. (1996), researchers aimed for five to seven categories per item, with at least five to 15 unique response per category. Any category with less than five unique responses was grouped in an "other" category. After categories were identified, a coding manual was developed, and inter-rater reliability between researchers' categorization of participants' responses was analyzed. Kappa for inter-rater reliability among the eight items ranged from .70 to .97. Once both researchers agreed on the final consensus, the qualitative responses were quantified, allowing for analysis of responses from users versus non-users. Once recoded, the quantitative data were entered into IMB SPSS Statistics 23, along with the data from the closed-ended responses.

Results

Demographics and E-Cigarette Use

Among the 58 participants, 87.9% were white, 6.9% were black, and 5.2% were Asian. Two (3.4%) participants reported they were "Mexican, Mexican American, Chicano or Chicana", while the other 96.6% of participants reported that they were "not of Hispanic, Latino, Latina, or Spanish origin". Of the total, 38 (65.5%) of the participants were female, the mean age of participants was 23.4 years (SD=5.48), and the median age was 21 years. Class standings indicated that 10.3% of the participants were freshmen, 15.5% were sophomores, 22.4% were juniors, 15.5% were seniors, 31% were graduate students, and 1.78% were law students. Of the total, 28 (48.3%) participants reported that they had tried an e-cigarette in their lifetime (even one or two puffs); 30 (51.7%) participants had not tried an e-cigarette in their lifetime.

Behavioral Outcomes

Participants' perceived consequences (i.e., behavioral outcomes) of e-cigarettes are

presented in Table 1. Participants who had ever tried an e-cigarette most commonly reported

advantages of using e-cigarettes in the next 30 days to include no advantages (32.1%), quitting

smoking or not using regular cigarettes (28.6%), and other advantages, (e.g., "*don't have the

odor of a regular cigarette*", "*nicotine might make you a little more alert and help for late night

study sessions*", and "*usable in public*"; 46.4%). Non-users, or those who had never tried an e-

cigarette, most commonly perceived there to be no advantages of using e-cigarettes (46.7%).

Additionally, non-users reported advantages of using an e-cigarette in the next 30 days to

include: to "fit in" or "look cool" (20%), it causes less harm to me and/or my environment

(16.7%), and other advantages (e.g., "*satisfying a curiosity*", "*less addicting*", and "*is looked

better upon than smoking an actual cigarette*"; 20%).

When asked about disadvantages of using an e-cigarette in the next 30 days, users most

commonly reported fear of getting addicted to nicotine (42.9%), harm to their body (28.6%),

unknown side effects (17.9%), cost (17.9), and other disadvantages (e.g. "*Unattractive,

unhealthy, irresponsible*", and if "*it blew up in my face*"; 17.9%). Similarly, non-users most

commonly reported fear of harm to their body (53.3%), fear of getting addicted to nicotine

(40%), cause me to be judged by others (33.3%), and other disadvantages (e.g. "*also might lead

to 'real' cigarettes*", "*gross*", and "*it is a drug*"; 16.7%).

Perceived Norms

Normative referents were divided into injunctive norms and descriptive norms. Injunctive

norms are those who participants identified as perceived referents who approved or disapproved

of them using an e-cigarette in the next 30 days. Descriptive norms are perceptions about referent

others (people like themselves, such as peers) behavior and how likely they believe these referents are to use an e-cigarette in the next 30 days.

Injunctive norms. Users most commonly reported those most likely to approve of them using an e-cigarette in the next 30 days to include: no one (25%), e-cigarette users (17.9%), and other approving referents (e.g., *"only the companies trying to sell e-cigs, juice, or get me addicted to nicotine products", "adventurers",* and "*college students*"; 42.9%). Non-users most commonly reported current smokers (26.7%), e-cigarette users (16.7%), fraternity members (16.7%), and other approving referents (e.g., "*people I work with", "people at parties who are smoking*", and "*sorority students*"; 30%), to be people who would approved of them using an e-cigarette in the next 30 days (Table 2).

Users most commonly reported disapproving referents to include: friends (35.7%), family (32.1%), parents (21.4%), and other disapproving referents (e.g., "*nurses, doctors*", "*fraternities, sororities*", "*future employers*"; 42.9%). Non-users most commonly reported disapproving referents to be friends (30%), family (23.3%), church members (20%), parents (16.7%), mentors (16.7%), and other disapproving referents (e.g., "*students who wouldn't like smoke/smell around the area*", "*students who focus on their academics", "health conscious people*"; 30%).

Descriptive norms. Users reported people most likely to use e-cigarettes to be those in Greek organizations (17.9%), people that already smoke cigarettes (17.9%), and others (e.g., "*hipsters, hippies", "people living in the dorms", "those looking to quit smoking*"; 53.6%). Non-users reported those in Greek organizations (30.0%), freshmen (20.0%), people that already smoke cigarettes (16.7%), and others (e.g., "*people that engage in other similar practices like…*

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drinkers", "*those that can't handle peer pressure or the stress of college*", "*less educated individuals* "; 36.7%) to be most likely to use e-cigarettes (Table 2).

Users reported those least likely to use e-cigarettes in the next 30 days to include athletes (14.3%), no one (14.3%), and others (e.g., "*students who did not frequently attend parties or gatherings where alcohol or drugs are being used*", "*health conscious people*", and "*people who have already given up smoking*"; 67.9%). Non-users reported those least likely to use e-cigarettes to include religious people (16.7%), upper classmen (13.3%), and others (e.g., "*individuals who have friends or family who've had negative health issues caused by smoking*", "*sorority girls*", and "*most teachers*"; 53.3%).

Salient Circumstances

Student reported perceived behavioral controls by providing responses to factors that would make it easier or more difficult for them to use an e-cigarette in the next 30 days. Users most commonly reported facilitating factors of e-cigarette use to include a friend offering one to try (53.6%), having access to places that sell e-cigarettes (17.9%), and other facilitators (e.g., "*cheap to purchase*", "*if I was drunk*", and "*easy to use*"; 50.0%). Non-users most commonly reported a friend offering one to try (60.0%), going to a party (13.3%), and other facilitators (e.g., "*frequenting bars*"; 30.0%) as enabling factors of e-cigarette use in the next 30 days (Table 3).

Users reported the most common barriers of using an e-cigarette in the next 30 days to include some vape-free policies (17.9%) and other barriers (e.g., "*not attending parties or bars as much or not at all due to better life choices*", "*I have cigarettes to smoke (assuming a smoking friendly environment)*", "*maintenance*"; 42.9%). Non-users reported the most common barriers

for of using an e-cigarette in the next 30 days to include cost (20%), vape-free policies (16.7%), caring about what other people think (16.7%), and some other barrier (e.g., "*(lack of) knowledge of what to buy*", "*respect for myself*", and "*I don't want to become addicted or even go near that activity*"; 20.0%).

Discussion

Behavioral Outcomes

A previous study (Pokhrel, Little, Fagan, Muranaka, & Herzog, 2014) measured perceived behavioral outcomes of e-cigarette use among college students in Hawaii, using a 40-item measure adapted from a conventional cigarette outcome expectancy scale. The current study elicited responses supporting several of the measures found in Pokhrel and colleagues study including: social enhancement, negative health consequences, addiction concern, positive sensory experience, negative appearance, and negative sensory experience. Moreover, responses from our study suggest additional behavioral outcomes of e-cigarettes to include: positive health consequences, positive environmental effect, potential cessation device, and negative monetary loss (costs). The perception of less harm of e-cigarettes among youth and young adults has been seen in previous studies (Amrock et al., 2015; Kong et al., 2014; Pokhrel et al., 2015), and e-cigarette's ability to serve as a cessation device continues to be evaluated (Etter & Bullen, 2014). Other responses elicited in our study, such as "satisfying a curiosity" are also consistent with previous literature which found curiosity to incentivize young adults to try e-cigarettes (Choi, Fabian, Mottey, Corbett, & Forster, 2012; Kong et al., 2014).

Social Norms

Using the RAA, social norms were assessed using both injunctive norms and descriptive norms. In Trumbo and Harper's (2015a) test of the TRA, three injunctive norms including "my very closest friends" (which demonstrate people like me), "most people I know", and "closest family members" were used. By eliciting salient referents, we were able to expand this list of referent others. Trumbo and Harper (2015a) did not find social norms to have a significant influence on young adults' behavioral intention to use e-cigarettes. Possibly by expanding the list of referent others, we will be able to determine if some referent others have a stronger influence on behavioral intention than others. While parental monitoring has been suggested as a protective factor of youth from trying e-cigarettes (Lessard et al., 2014), it is unknown if parental approval influences college students' e-cigarette use, given that they are generally not measured the same.

Minimal research has assessed profiles of college e-cigarettes users. Our findings of descirptive norms of e-cigarettes shed some light to how college students perceive those who use e-cigarettes. Consistent with Sutfin an colleaugues (2013), our participants perceived those in Greek organizations, duel users (of conventional cigarettes and e-cigarettes), binge drinkers (or those who attend parties), and those who use illegal drugs to be to be more likely to use e-cigarettes. Consistent with a recent study (Saddleson et al., 2016), those most likely to use e-cigarettes were also perceived to attend parties, drink alcohol, and smoke cigarettes. Those believed not to use e-cigarettes were perceived to be older (e.g., upperclassmen), to demonstrate increased academic commitment, to be protective of their health and physicality, or to demonstrate a need to meet cultural/societal standards. Previously qualitative studies have found some people believe e-cigarettes to be just another "manipulative and cunning" (Fabian, Mottey, Corbett, & Forster, 2012, p. 2090) tactic by tobacco companies, or e-cigarettes to basically be the "same thing" (Roditis & Halpern-Felsher, 2015, p. 182) as cigarettes; some participants in our

study may have transferred their beliefs of conventional cigarettes to e-cigarettes, believing e-cigarettes users to be similar to users of conventional cigarettes. The majority of participants in our study were older students and graduate students. Being a graduate student may have possibly influenced findings. While previous findings have analyzed college students, it is unclear of graduate students (more likely to be older than undergraduate students) perceive e-cigarettes differently than undergraduate students.

Perceived Behavioral Control

College students' perspectives of facilitating and inhibiting factor regarding e-cigarettes have not been explored in previous literature. Responses elicited from the current study, such as offering samples to customers, suggest that e-cigarette companies are employing similar tactics as cigarette companies (Biener & Albers, 2004). Additionally, the greatest influencing circumstance appears to be pressure from friends/peers who offer their e-cigarette for someone to try. Such findings are consistent with Trumbo and Harper's (2015b) assessment of the Diffusion of Innovation Theory, and the trialability of e-cigarettes. Barriers of e-cigarette use provide interesting findings, such as the use of vape-free policies to promote abstinence among users (17.9%) and non-users (16.7%). Such findings suggest that vape-free policies are perceived by some to potentially reduce exposure and use of e-cigarettes among young adults.

Limitations

Due to convenience sampling and research design, no generalizations of findings can be made. Recruitment for this study took place through a campus online daily newsletter with e-cigarettes mentioned in the title, which may have recruited more users than the campus average. Additionally, there was a large percentage of graduate students within the sample, which may also reflect the recruitment method. Users were only defined as those who had tried an e-

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cigarette (even one or two puffs) in their lifetime, so responses cannot interpreted as a consistent e-cigarettes user.

Conclusion and Future Implications

Salient beliefs provide insight beyond measures previously used for conventional cigarettes, and allow exploration of how e-cigarette use differs from conventional cigarette use. With discrepancies regarding perceptions of harm or safety of e-cigarettes (e.g., unknown side effects), there appears to be a need for education and swift dissemination of findings to the general public when discovered in clinical and social research. Improved awareness of potential harms of e-cigarettes can help people make more informed decisions regarding use of the product. Understanding influencing referent others, such as friends, parents, mentors (e.g. teachers, coaches), and health professions may help those working in health prevention to better refine their target audience. Lastly, future studies should further analyze the accessibility, triability, and exposure of e-cigarette advertising to youth and young adults, as previously seen with conventional cigarettes. Additional analysis of underlying determinants of the RAA's constructs can potentially provide appropriate information to those advocating for vape-free policies and those working to prevent nicotine addiction in youth and young adults.

Acknowledgements

Table 1. Behavioral Outcomes of E-Cigarette Use in the Next 30 Days (n=58)

	Users		Non-Users	
	N=28	%	N=30	%
Advantages				
No advantages	9	32.1	14	46.7
To quit smoking or not use regular cigarettes	8	28.6	3	10.0
To Relieve Stress or Relax	3	10.7	4	13.3
To "fit in" or "look cool"	2	7.1	6	20.0
It causes less harm to me and/or my environment	2	7.1	5	16.7
Other advantages	13	46.4	6	20.0
Disadvantages				
Getting addicted to nicotine	12	42.9	12	40.0
Harm to my body	8	28.6	16	53.3
Unknown side effects	5	17.9	2	6.7
Cost	5	17.9	9	30.0
Cause me to be judged by others	2	7.1	10	33.3
You aren't allowed to use it on campus	2	7.1	3	10.0
It tastes/smells bad	1	3.6	4	13.3
Other disadvantages	5	17.9	5	16.7

Note. Totals do not add up to 100%. Participants were not limited to one response.

Table 2. Perceived Norms of E-Cigarette Use in the Next 30 Days (n=58)

	Users		Non-Users	
	N=28	%	N=30	%
Injunctive Norms- Approving Referents				
No one	7	25.0	4	13.3
E-cigarette users	5	17.9	5	16.7
Smokers trying to quit	4	14.3	4	13.3
Friends	4	14.3	3	10.0
Current Smokers	2	7.1	8	26.7
Fraternity members	1	3.6	5	16.7
Other approving referents	12	42.9	9	30.0
Injunctive Norms- Disapproving Referents				
Friends	10	35.7	9	30.0
Family	9	32.1	7	23.3
Parents	6	21.4	5	16.7
Significant other (i.e. Boyfriend/Girlfriend/Fiancé)	4	14.3	2	6.7
Non Smokers/ non-e-cigarette users	4	14.3	3	10.0
Just about everyone I know	4	14.3	3	10.0
Church members	1	3.6	6	20.0
Mentors (i.e. teachers, coaches, advisors)	1	3.6	5	16.7
Other disapproving referents	12	42.9	9	30.0
Descriptive Norms- Those Most Likely to Use				
Greek Life	5	17.9	9	30.0
People that already smoke cigarettes	5	17.9	5	16.7
Freshmen	3	10.7	6	20.0
People who know someone who uses e-cigarettes	3	10.7	3	10.0
People who regularly attend parties	3	10.7	2	6.7
People who want to "fit in"	1	3.6	4	13.3
Others most likely to use	15	53.6	11	36.7
Descriptive Norms- Those Least Likely to Use				
Athletes	4	14.3	1	3.3
No one	4	14.3	1	3.3
Pre-professional students	2	7.1	3	10.0
Upper classmen (i.e. juniors, seniors)	1	3.6	4	13.3
Religious people	1	3.6	5	16.7
Others least likely to use	19	67.9	16	53.3

Note. Totals do not add up to 100%. Participants were not limited to one response.

Table 3. PBC of E-Cigarette Use in the Next 30 Days (n=58)

	Users		Non-Users	
	N=28	%	N=30	%
Facilitators				
A friend offering one to try	15	53.6	18	60.0
Having access to places that sell e-cigarettes	5	17.9	2	6.7
Being offered samples	3	10.7	2	6.7
Going to a party	2	7.1	4	13.3
Other facilitators	14	50.0	9	30.0
Barriers				
Vape-free policies	5	17.9	5	16.7
Cost	3	10.7	6	20.0
Not hanging out with people who use e-cigarettes	3	10.7	4	13.3
Knowing it is harmful to my health	3	10.7	3	10.0
Not sure	3	10.7	2	6.7
Caring about what other people think	2	7.1	5	16.7
Lack of access	2	7.1	3	10.0
Other barriers	14	50.0	8	26.7

*Note. Totals do not add up to 100%. Participants were not limited to one response.

CHAPTER 5: MANUSCRIPT #2

Factors Influencing College Students' Intention to Try E-cigarettes:

A Reasoned Action Approach

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Running Head: College students' intention to try e-cigarettes

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Abstract

Purpose. Theoretically driven measures of electronic cigarette (e-cigarette) use are scarce due to the novelty of these products. The purpose of this study was to develop measures that would assess the construct validity of the Reasoned Action Approach (RAA) as applied to college students' intention to use e-cigarettes.

Methods. This study represents Phase 2 of a multi-phase scale-development study. The current phase developed and validated a quantitative measure of the salient constructs of the RAA (from responses collected in Phase 1) through a pilot sample (n=49). The measurement model of both the salient underlying and global constructs were tested in a sample of 499 college students, using a hierarchy structural equation modeling analysis, to test the construct validity of the RAA theory.

Results. During the pilot study, a 162 item measure of the underlying constructs was reduced to 78 items, which loaded onto eight factors. During the final study, the underlying constructs, attitude, injunctive norms, and perceived behavioral control significantly predicted their respective global measure. After removing six items, the global constructs loaded onto the predicted four factors: attitude, social norms, PBC, and intent. In the final path model, global constructs of attitude (.27, *p*<.001) and injunctive norm (.58, *p*<.001) significantly predicted intention to use e-cigarettes in the next 30 days.

Conclusions. This study serves as the first test application of the RAA to e-cigarette use among college students. Results suggest that theoretical application can apply to e-cigarettes use. Preventative efforts should use the RAA as a theoretical framework when developing education material or advocacy efforts.

Introduction

Electronic cigarettes (e-cigarettes) are an electronic nicotine delivery system, battery powered to deliver aerosolized nicotine and other byproducts to the user (U.S. Department of Health and Human Services, 2015). E-cigarettes are made from three main components: a nicotine solution, a heating element that vaporizes the liquid solution, and a battery power source, typically a rechargeable lithium battery (Brown & Cheng, 2014). The liquid solution (e-juice or e-liquid) contains flavoring, nicotine, and an e-liquid base, such as humectant(s) propylene glycol and/or vegetable glycerin (Kosmider et al., 2014). Since their first appearance in the U.S. in 2007, these various products (e-cigarettes, e-hookah, vape-pens, hookah pens, and personal vaporizers) have gained popularity and attention with more than 466 brands of e-cigarettes and as many as 7,764 unique flavors (Barrington-Trimis, Samet, & McConnell, 2014).

Based on limited research, some researchers claim that e-cigarettes may be a safer alternative to conventional cigarettes (Green, Bayer, & Fairchild, 2016) and a potential cessation device to reduce smoking (Etter & Bullen, 2014). Although e-cigarettes have not been evaluated thoroughly by the Food and Drug Administration (FDA), preliminary studies suggest e-cigarettes release fewer toxins than conventional cigarettes (Goniewicz et al., 2014). Those researching e-cigarettes as a cessation device remain hopeful that e-cigarettes will reduce mortality and morbidity among current smokers (Benowitz, 2014; Hajek, Etter, Benowitz, Eissenberg, & McRobbie, 2014), while others raise caution to the recent increase of e-cigarette use among youth and those who have never smoked a conventional cigarette (Coleman et al., 2015; Grana et al., 2014a; Kong, Morean, Cavallo, Camenga, & Krishnan-Sarin, 2014). While research regarding the potential health impact of e-cigarettes is in its infancy, e-cigarettes have been found to contain hazardous substances such as formaldehyde (Cooke, Fergeson, Bulkhi, &

Casale, 2015), and diacetyl, which has been known to cause bronchiolitis obliterations (commonly known as "Popcorn Lung") (Allen et al., 2016).

Additionally, there is concern for adolescent and young adult exposure to nicotine, due to nicotine's effect on the cerebral cortex and hippocampus during development (England, Bunnell, Pechacek, Tong, & McAfee, 2015). Some fear that youth exposure to e-cigarettes may also lead to nicotine dependence, promote or prolong addiction, and increase the likelihood of adopting the use of other tobacco products (Corey et al., 2013). With a lack of state and federal regulation of youth exposure to e-cigarette in the U.S. (Dobbs, Hammig, & Sudduth, 2016), these products may promote the acceptance of e-cigarette among youth (Grana R. A., Electronic cigarettes: a new nicotine gateway?, 2013).

E-cigarette use is suggested to be highest among older adolescents (16-19 years) (Pepper et al., 2013) and younger adults (18-26 years) (Adkison et al., 2013; Coleman et al., 2015). In 2013, Trumbo and Harper reported the first assessment of college students' acceptance of e-cigarette use. Using a convenience sample of freshmen and sophomore students, Trumbo and Harper found 71% of their sample had heard of e-cigarettes and 13% had ever tried them (Trumbo & Harper, 2013), an increase from the 7.0% of U.S. Midwestern adults found to have tried e-cigarettes in 2010 (Choi & Forster, 2013). In 2013, a convenience sample of college students in upstate New York reported that almost all participants (95.5%) were aware of e-cigarettes, 29.9% had tried e-cigarettes in their lifetime, and 14.9% were current e-cigarette users (Saddleson et al., 2015).

Studies using theory-based frameworks to better understand e-cigarette use are scarce. Trumbo and Harper provided the first analysis of the Theory of Reasoned Action (TRA) as applied to college student e-cigarettes behavior, finding that attitudes, but not social norms,

predicted intention to use e-cigarettes (Trumbo & Harper, 2013). Later, they expanded this study to a generlizable yound adult population (Trumbo & Harper, 2015a) where they found consistent findings. In an analysis of the TRA as applied to e-cigarette advertising, Trumbo and Kim (Trumbo & Kim, 2015) found both attitudes and social norms to significantly predict intention of e-cigarettes use in a hierarchial regression model. While these studies are vital to the theoretical understanding of behavioral intention of e-cigarettes use, there remain many unanswered questions regarding construct application of theories to this specific behavior. Additioanlly, there remains a need for more e-cigarettes measures, applicable to theoretical health models, in national survyes to better understand the reasons for the rapid updatke of e-cigarette use among young and young adults.

Conceptual Framework

The current study utilized the Reasoned Action Approach (RAA) as the theoretical framework. The RAA is the most recent version of the TRA, the Theory of Planned Behavior (TPB), and the Integrated Behavioral Model (Fishbein & Ajzen, 2010). The TPB explains attitude toward a behavior to be influenced by one's beliefs about the behavior and their evaluation of the potential behavioral outcome from performing the behavior. Additionally, the TPB acknowledges the construct of perceived behavioral control to be one's belief regarding facilitating or inhibiting factors and their perceived power, or self-efficacy, to perform the behavior based on the control belief. The RAA expands upon the social norm construct from the TRA and TPB, which is recognized as only a subjective (injunctive) norms, in the TRA and TPB, by also including descriptive norms. Injunctive norms are one's perception of salient other's opinions (who are important to them) about what they should do. This construct measures one's perception of these referent others' opinions and their motivation to comply with such

opinions. Descriptive norms are one's perception of others they consider to be similar to themselves and whether these individuals perform the identified behavior (Fishbein, 2008). Considering Trumbo and Harper's (2015a) findings that social norms did not influence intention to use e-cigarettes, we question if these findings may change when including descriptive norms. Without current measurement instrument included in national studies, we are uncertain of the influence that descriptive norms (such as peers) may have on college students' intention to use e-cigarettes.

The RAA suggests that salient consequences, referents, and circumstances influence a person's intention to perform a specific behavior. The RAA suggests that intention can predict behavior, and that behavior is influenced by attitudes, perceived norms, and perceived behavioral control. Previous studies have used the RAA to better understand behavioral intentions of HPV vaccination among college women (Geshnizjani, Jozkowski, & Middlestadt, 2013; Jozkowski & Geshnizjani, 2016), decisions to buy and eat dark leafy vegetables (Sheats, Middlestadt, On, Juarez, & Kolbe, 2013), tobacco cessation (Yzer, et al., 2015), and yoga attendance (Eggleston, Middlestadt, Lindeman, McCormick, & Koceja, 2011); however, no current literature addresses e-cigarette use using the RAA.

The constructs of the RAA (attitude, social norms, PBC), each are defined by deeper and more specific underlying constructs. Consistent with the TRA and TPB, the RAA recognizes the underlying construct, attitude, to derive from both the behavioral belief and the behavior outcome evaluation. The underlying construct, injunctive norm, derives from both the injunctive normative belief (perception of acceptance from referent others) and the individuals' motivation to comply with referent others. The underlying construct of descriptive norms derives from descriptive normative belief (belief that specific reference do or do not perform the behavior) and

identification to referent others who do perform the behavior. The underlying construct of perceived behavioral control derives from the control belief (perceived enabling and inhibiting factors) and the perceived power of the individual (perception that the circumstance makes the behavior easier or more difficult).

The RAA outlines the need to identify the population and the behavior, using both a specific action and a time-frame for the action. This study investigates the construct validity of the RAA as it applies to college students' intention to use e-cigarettes in the next 30 days. The current study consists of two aims (1) to develop and evaluate direct (global) and indirect (underlying) measures of the salient consequences, referents, and circumstances of e-cigarette use among college students and (2) to assess the construct validity of the RAA by using a path analysis to test the influence of the RAA constructs on college students' intention to use e-cigarettes in the next 30 days.

Methods

Study Design and Data Collection

During a previous phase of this study (cite), salient-belief elicitation procedure (Middlestadt, Bhattacharyya, Rosenbaum, Fishbein, & Shepperd, 1996) was used to elicit salient responses relevant to the population of interest. This procedure was important for the item development conducted in the present study. For Phase 1 of the current study, the underlying RAA measures was tested using a convenience pilot sample of college students (n=49) using Qualtrics, an online surveillance medium. Students were recruited from two classes within the same department. To be eligible, participants were required to be enrolled as a student at the University and be 18 years of age or older. Participation was voluntary, and after reading the

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consent form, the participants' consent was implied by clicking forward with the survey. This study was approved by the Institutional Review Board at the academic institution where the data was collected.

After the underlying construct measure was revised in Phase 1, a second phase employed an online survey with a convenience sample of college students (n=553) using Qualtrics. Consistent with previous research (Choi, Fabian, Mottey, Corbett, & Forster, 2012), young adults were defined as those between the ages of 18 and 26 years; thus participants above the age of 26 were removed, bringing the total population to 499 for the final analysis. As with the pilot study, participation was voluntary, and implied consent was employed. Students were recruited using a daily campus newsletter, campus list serves, and classrooms. As an incentive for participation, a drawing was held for five $50 gift cards.

Measures Phase 1

Participants completed a 206 item cross sectional survey. The first 22 items addressed demographics (sex, age, class standing, ethnicity, and race) along with items to measure e-cigarette use and conventional cigarette use. Salient beliefs used to measure the underlying constructs of the RAA were assessed using 162 items (See Attachment 1: PILOT Study Underlying Constructs). Measures developed in this study were used to accomplish the development scope of aim 1.

As mentioned earlier, the underlying construct, attitude, derives from both the behavioral belief and the behavior outcome evaluation. To assess behavioral belief, participants were asked to rate how much they agreed with a number of statements, such as: "I will relieve stress as a result of using e-cigarettes in the next 30 days" on a seven-point (*disagree* [-3] or *agree* [+3])

bipolar scale (Ajzen, 1991). To assess the behavioral outcome evaluation associated with this consequence, participants were asked to rate if they believed the statement (such as, Feeling stress is *bad* (-3) or *good* (+3). The statements included responses elicited as advantages or disadvantages from Phase 1. A measure of participants' salient attitude was then derived by calculating the cross products of behavioral beliefs and the behavior outcome evaluations. This procedure is consistent with Ajzen's (1991) expectancy-value model, which accounts for the strength of the belief and the subjective evaluation of the belief's attribution to the individual. The total salient attitude measures consisted of nineteen cross products.

The underlying construct, injunctive norm, derives from the injunctive normative belief and the motivation to comply with referent others. To assess the injunctive normative belief strength, participants were asked to rate how much they felt the listed person/s thought they *should not* (-3) or *should* (+3) smoke an e-cigarette in the next 30 days using statements, such as: "My friends think that (*I should not* or *I should*) use e-cigarettes in the next 30 days." To assess motivation to comply with referent others, participants were asked to rate how much they disagreed (-3) or agreed (+3) with the statements, such as, "When it comes to matters like using e-cigarettes, I want to do what my friends think I should do." The statements included responses elicited during Phase 1 as those who approve or disapprove of you using an e-cigarette. A measure of participants' salient injunctive norms was then derived by calculating the cross products of the injunctive normative beliefs and the motivation to comply with referent others. The total salient injunctive norm measure consisted of twenty cross products.

The underlying construct of descriptive norms derives from descriptive normative belief and identification to referent others who perform the behavior. To assess the descriptive normative belief strength, participants were asked to rate how *false* (-3) or *true* (+3) they

believed the statements to be, using statements, such as, "Fraternity members will use e-cigarettes in the next 30 days." To assess the identification with referent others, participants were asked to rate how much they wanted to be like the listed person/s using statements, such as, "When it comes to matters of using e-cigarettes, how much do you want to be like fraternity members" Responses were measured on a seven-point *not at all* (-3) or *very much* (+3) scale. The statements included responses elicited during phase 1 as those most likely and least likely to use e-cigarettes. A measure of participants' salient descriptive norms was then derived by calculating the cross products of descriptive normative beliefs and the identification with the referent others. The total salient descriptive norm measure consisted of twenty-one cross products.

The underlying construct of perceived behavioral control derives from the control belief and the perceived power of the individual. To assess the control beliefs, participants were asked to rate how *unlikely* (-3) or *likely* (+3) the statements, such as the following, were: "Someone will offer me samples of e-cigarettes in the next 30 day." To assess perceived power, participants were asked to rate how much they disagreed (-3) or agree (+3) with statements, such as, "Someone offering me samples of e-cigarettes would make it easier for me to use e-cigarettes in the next 30 days." The statements included responses elicited during Phase 1 as facilitators or barriers to using e-cigarettes. A measure of participants' salient perceived behavioral control was then derived by calculating the cross products of control beliefs and the perceived power respectfully of each circumstance. The total salient perceived behavioral control measure consisted of twenty-one cross products.

Measures Phase 2

During Phase 2, measures for global construct of the RAA were introduced as one

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measurement scale, and the measures refined from Phase 1 were further assessed as separate measurement scale. Direct RAA items measuring the three global constructs (attitude, perceived norm, and PBC) were adapted from previous validated measures (Eggleston et al., 2011; Geshnizjani et al., 2013; Hinsz & Nickell, 2015; Sable, Schwartz, Kelly, Lisbon, & Hall, 2006; Septimus, 2011; Sheats et al., 2013; Yzer et al., 2015). The global constructs consisted of a four-item measure of intention to use e-cigarettes in the next 30 days for recreational use, an 11-item measure of attitude, a 12-item measure of perceived norm (eight-item injunctive norms and four-item descriptive norms), and a five-item measure of perceived behavioral control (See Appendix 2: Validated Measure Underlying and Global Constructs). All items were measured under the context of recreational use of e-cigarettes by using the phrase "just because I want to do it." It is advised to use a minimum of three measures to assess TPB constructs (Francis et al., 2004), thus this study sought to follow parallel guidelines for the RAA constructs.

The global construct of attitude included an 11-item measure that included the statement: "Me using an e-cigarette in the next 30 days, just because I want to do it is…" Responses were evaluated on a seven-point (-3 to +3) scale with bipolar options, such as, *bad-good*, *harmful-beneficial, unnecessary-necessary*. The measured variable of attitude was computed by taking the average of the eleven responses. The underlying constructs of attitude in Phase 2 were measured as mentioned in Phase 1.

The global construct for social norms included a twelve item measure that was broken into injunctive norms (eight items) and descriptive norms (four items). The global injunctive norms included the statements: "Most people who are important to me (*approve of me using/think I should use/support me using/want me to use*) an e-cigarette in the next 30 days" and "My closest friends (*approve of me using/think I should use/support me using/want me to use*) an

e-cigarette in the next 30 days." Responses were on a seven-point *strongly disagree* (-3) or

strongly agree (+3) scale, and the measured variable of injunctive norm was computed by taking

the average of the eight responses. The global construct of descriptive norms included the

statements: "Most people who are important to me (*will use/will buy*) an e-cigarette in the next

30 days" and "My closest friends (*will use/will buy*) an e-cigarette in the next 30 days."

Responses were on a seven-point *strongly disagree* (-3) or *strongly agree* (+3) scale. The

measured variable of descriptive norms was computed by taking the average of the four

responses. For the global construct of social norms (both injunctive and descriptive norms), the

average of all twelve items was computed. The underlying constructs for both injunctive and

descriptive norms were constructs for Phase 2 as mentioned in Phase 1 of this study.

The global construct of perceived behavioral control included a five-item measure that

included three statements including "Using an e-cigarette in the next 30 days, just because I want

to do it is (*difficult – easy/ up to me – not up to me/ not at all under my control – under my

control*)". Two other statements measuring the perceived behavioral control were also included

(See Appendix 2). Response options were on a seven-point (-3 to +3) bipolar scale. The

measured variable of perceived behavioral control was computed by taking the average of the

five responses. The underlying constructs for perceived behavioral control were measured as

mentioned earlier in Phase 1.

Behavioral intention was measured by asking participants how much they agreed with to

the statement "I (*want/intent/plan/am willing*) to use e-cigarettes in the next 30 days, just because

I want to do it."   Responses were on a seven-point *strongly disagree* (-3) or *strongly agree* (+3)

bipolar scale.

Analytic Methods Study 1

To accomplish aim 1, Phase 1 used a principles component analysis (PCA), using IMB SPSS Statistics 23, to extract factors loadings and evaluate the developed items. Extracted factors used an oblique rotation, and the reliability of items in each factor was examined using Cronbach's alpha (α). During the PCA, items that did not load significantly on a factor, or items that cross-loaded on more than one factor (within 0.1 points) were removed. Guided by theory (Fishbein, 2008) and the rationalization of the scale development, the items measuring the underlying constructs loaded onto eight factors. With evidence that factor solutions can be determined with small sample sizes (less than 50 participants) if the structure exemplifies high factors loadings (e.g., .8 and above) and high communalities (e.g., .60 to .80), the sample size was set for no more than 50 participants (de Winter, Dodou, & Wieringa, 2009; Gaskin & Happell, 2014). Pearson correlations were calculated to test for rotation method of the PCA. Factors retained in the model were based on (1) the underlying constructs of the RAA, (2) scree test, and (3) eigenvalue greater than one (Cattell, 1966). The cut-off score for salient item loading was set at 0.4 (Raubenheimer, 2004).

Analytic Methods Study 2

To complete aim one, Phase 2 evaluated the measurement model and structure model. IMB SPSS Statistics 23 was used for analysis in both Phase 1 and 2. After the PCA in Phase 1, the refined structure of the underlying measures was applied to the measurement model. The exploratory factor analysis (EFA) of the measurement model, employed principal's axis factoring due its ability to recover weak factor loadings (de Winter & Dodou, 2012), to validate the underlying measures and explore the measurement model of the global factors. For aim two, SEM, using M*plus*, was employed to test the structural model of the latent factors of underlying

constructs to predict the global constructs, and the global constructs to predict intention of e-cigarette use in the next 30 days (see *Figure 1*. Proposed Path Model of RAA Constructs and Intention to Use E-cigarette). Underlying latent constructs in the higher order model fixed variance to 1.0 before prediction of the global latent construct. Model goodness-of-fit statistics were calculated using chi-square of model fit (χ^2), Root Mean Square Error of Approximation (RMSEA), Standardized Root Mean Square Residual (SRMR), Tucker Lewis Index (TLI), and comparative fit index (CFI).

While guidelines have been provided for interpreting model fit statistics, there are currently no definitive cut-off values for interpretation (Fan, Thompson, & Wang, 1999). Chi-square statistics measures the difference between the expected and observed covariance (Hu & Bentler, 1999). When significance is found in the chi-square test, it indicates a difference in the observed and expected values, suggesting the model may not be correct; however, chi-square tests are sensitive to large sample sizes (Hu & Bentler, 1995). Literature regarding RMSEA and SRMR suggests acceptable model fit can be interpreted at scores of .08 and below, and scores of .06 and below indicate "close" fit (Hu & Bentler, 1995). CFI and TLI scores above .90 are suggested by some to be acceptable, and scores above .95 are considered to be good model-fit (Hu & Bentler, 1999; Kline, 2005).

Results

Phase 1

As seen in Table 1, 57.1% (n=28) of the participants had tried conventional cigarette in their lifetime, and of those, six (21.4%) had used cigarettes in the past 30 days. The majority of participants (77.6%) had heard of e-cigarettes, and 36.7% (n=18) of participants had tried an e-

cigarette in their lifetime. Of those who had ever tried e-cigarettes, 2.0% (n=1) participants had used e-cigarettes in the past 30 days.

For the PCA, we anticipated that items would form four different factors (attitudes, injunctive norms, descriptive norms, and PBC). As seen in Table 2: PCA from Pilot Sample, the oblique solution instead fell onto eight factors. Of the original 81 cross products from Phase 1, 42 cross products were removed that did not load significantly, that cross-loaded strongly on more than one factor, or that loaded on a factor not predicted by the theory. Of the remaining 39 cross products, nine cross products fell onto the two factors that made up attitude (advantages, α=.78; disadvantages, α=.96), 12 cross products fell onto the two factors that made up injunctive norms (approving referents, α=.84; disapproving referents, α=.95), 11 cross products fell onto the two factors that made up descriptive norms (most likely to use, α=.93; least like to use, α=.89), and seven cross products fell onto the two factors that made up perceived behavioral control (facilitating factors, α=.91; inhibiting factors, α=.88). The modified measures used in study 2 can be found in Appendix 2.

Phase 2

As seen in Table 1, 43.2% (n=216) of the participants had tried conventional cigarette in their lifetime, and of those, 56 (25.9%) had used cigarettes in the past 30 day. The majority of participants (91.8%) had heard of e-cigarettes, and 40.5% (n=202) of participants had tried an e-cigarette in their lifetime. Of those who had ever tried e-cigarettes, 14.4% (n=29) participants had used e-cigarettes in the past 30 days.

Measurement model. The measurement model, of the underlying construct measures, revealed that all items modified in Phase 1 significantly loaded onto their identified factor,

except descriptive norm, "Most people who quit smoking cigarettes". As seen in Table 3: Measurement Model of Underlying Measures, loadings indicated two factors loaded on each construct, as seen in Phase 1. After removing this item, there were no cross-loadings, and the final eight-factor model explained 64.8% of the variance. Three percent (n=23) of the non-redundant residuals were less than .05.

An EFA of the global constructs revealed that there were items that cross-loaded with other factors or did not load significant with any factor. For intention, the item measuring willingness to use e-cigarettes, did not load strongly enough with the other items within the measure. For attitude, the items measuring how *harmful/beneficial*, *unnecessary/necessary*, and *useless/useful*, loaded strongly (within .1) with other factors. For the construct, PBC, the items measuring confidence to use e-cigarettes and how sure one felt they could learn how to use e-cigarettes did not load significantly with any factor. After removing these six items, the global constructs loaded on the expected four factors: intention (α=.95), attitude (α=.96), social norms (α=.97), and perceived behavioral control (α=.78). All items measuring intention, attitude, and social norms (injunctive and descriptive norms) all loaded greater than .4 on their respective factor (See Table 4: Measurement Model of Global Measures).

Path analysis. To measure the global measures' prediction of intention, we used a path model described above. Goodness-of-fit was calculated with a model χ^2 (554) = 2112.69 (*p*<.001), RMSEA=0.077, CFI=.906, TLI=.899, and SRMR=.154. The final model was modified to include the individual items' contribution to the underlying salient construct, and the underlying prediction of the global constructs (the 26 remaining direct items of the RAA). Non-significant paths were removed from the model.

During the path model, items measuring the disadvantages and advantages of e-cigarettes significantly predicted the underlying construct, attitude. Only the items measuring those who thought you *should not* use e-cigarettes significantly predicted the underlying construct of injunctive norms; thus, all items measuring those who think you *should* use e-cigarettes were removed from the final path. The latent variable for injunctive norms was bypassed to only include referents who thought someone should not use e-cigarettes (disapproving referents). Items measuring those most likely and least likely to use e-cigarettes both significantly predicted the underlying construct, descriptive norms. Items measuring facilitators and barriers both significantly predicted the underlying construct, PBC.

The underlying constructs, attitude (β=.42; p<.001) and injunctive norm (those who think you should not use e-cigarettes; β=.20; p<.001), significantly predicted their respective global measures. The underlying construct of perceived behavioral control negatively predicted its' global measure (β=-.44; p<.001). As seen in *Figure 2*. Final Path Model of RAA Constructs and Intention to Use E-cigarette, the global construct of attitude (β=.27; p<.001) and injunctive norms (β=.58; p<.001) indicated prediction of intention to use e-cigarettes in the next 30 days, while the global constructs of descriptive norms and perceived behavioral control were not significant predictors; thus they were removed from the final model. The underlying salient attitude measure explained 20% (p<.01) of the total variance of the global attitude measure. The item comprising those who think one *should not* use e-cigarettes explained 4.0% (p<.05) of the total variance of the global injunctive norm measure. The items comprising both the global attitude measure and the global injunctive norm measure explained 42.4% (p<.001) of the total variance of intention to use e-cigarettes.

Discussion

By developing a quantitative measure, using the salient consequences, referent, and circumstances, and refining the measure through the use of a pilot sample, we were able to complete aim one. This allowed us to provide evidence of a reliable and valid measure of the salient constructs. During the PCA, used in Phase 1, the underlying construct items fell onto eight factors, instead of the expected four factors. This was explained by one of two hypotheses. Either the factor loadings are representative of the wording of the items, through the process by which the items were developed during a previous phase of research (cite), or the responses differ between users and non-users, creating the division between factors on each construct. Moreover, the items were developed as followed: (1) attitudes were developed from the perceived <u>advantages</u> and <u>disadvantages</u> of using e-cigarettes, (2) injunctive norms were developed from the perceived referents who think <u>one should</u> or <u>should not</u> use e-cigarettes (3) descriptive norms were developed from perceived referents <u>most likely</u> and <u>least likely</u> to use and (4) perceived behavioral control was developed from the perceived <u>facilitators</u> and <u>barriers</u> of e-cigarettes use. Thus, the eight factors may indicate the underlying constructs of consequences, referents, and circumstances, and the hierarchy model demonstrates the process of the scale development. Using the underlying items in the final model, indicated their representation of their respective salient construct. However, discrepancies exist between the items of the underlying constructs and the global construct. For example, descriptive norms are defined and measured by the global constructs as referent other similar to the individual, and the referent others' likelihood of using or buying an e-cigarette. However, the guidelines for developing the underlying measures current state to have participants list those most likely and least likely to use e-cigarettes, and then asking the participant to rate how much they want to be

like the listed referent. This difference in terminology includes referents with whom the participant does not identify in the overall scale; thus those with whom the participant does not identify are not descriptive norms of the referent.

Although the underlying constructs of attitude, injunctive norm, and perceived behavioral control significantly predicted their respective global measure, the underlying construct of perceived behavioral control negatively predicted the global construct of perceived behavioral control. The items measuring the underlying construct for perceived behavioral control demonstrate external influences (e.g., e-cigarettes being cheap, being offered samples), while the item measuring the global construct for perceived behavioral control demonstrates self-efficacy (i.e., under my control/not under my control). Such difference may be a result of our sample that primarily did not intend to use e-cigarettes, and they felt their behavior was in their control.

The underlying construct for descriptive norms did not significantly predict the global construct for descriptive norms. As explained earlier, this fundamental problem may be caused by the process by which the items were developed. Moreover, due to the large number of people within the sample that had never used e-cigarettes (59.5%), did not use e-cigarettes in the past 30 days (94.2%), or did not report any intention to use e-cigarette (85.8%), we hypothesize that our sample did not identify with a population that would use e-cigarettes. The salient descriptive norms items described people who college students believed to use or not use e-cigarettes; while the global measures of descriptive norms measured how much a person 'like me' or a 'close friend' would use or buy e-cigarettes. A different sample that more closely identifies as an e-cigarette user or with friends who use e-cigarettes may find these salient descriptive norms to better predict the global descriptive norms. Additionally, future development of the underlying

construct of descriptive norms may see, to remove items not specific to the population of interest, thus creating descriptive norms with whom the participant identifies.

Although only a small portion of the sample indicated intention to use e-cigarettes, the majority of the sample who currently use or had tried e-cigarettes were also smokers of conventional cigarettes. Moreover, most of those who had tried e-cigarettes did not continue to use; with only three participants (0.6%) indicating that they had used e-cigarettes every day in the past 30 days. Such findings of discontinuation are consistent with previous studies (Trumbo & Harper, 2015a). Additionally, the mean age that participants tried e-cigarettes for the first time in our study was 18.4 years of age (mode= 18 years). While tobacco prevention primarily focuses on youth, due to the 88% of all regular adult smokers who begin smoking before the age of 18 (USDHHS, 2012), prevention efforts should take into consideration the increased age of onset for e-cigarettes. This may be due to the age of the user at the time that e-cigarettes became available or popular in the U.S. Extending the age of legal availability to e-cigarettes may help reduce youth and young adult incidence of e-cigarettes and conventional cigarette use. Such prevention efforts have been seen in state policies, such as Hawaii where the age of purchase for all tobacco products (including e-cigarettes) was increased during 2015 to 21 years (Dobbs et al., 2016). Such policies may influence youth and young adults to refrain from exposure to nicotine long enough to prevent uptake or addiction.

By completing aim two, testing the construct validity of the RAA, we were able to expand upon Trumbo and Harper's (2015a) study of the TRA, and provide additional insight to the potential theoretical explanation of e-cigarette use among college students. Consistent with Trumbo and Harper's study, we found that attitudes significantly predict behavioral intention; however, by using the RAA, we found that injunctive norms could also be a potential influence

of intention to use e-cigarettes. Understanding social dynamics of college students and the influence of attitudes and salient referents may help us better understand behavioral intention of e-cigarette use. As mentioned by Trumbo and Harper (2015a, p.169), 'persuasive marketing' may be influencing college students' attitudes and perceived norms of e-cigarettes, with strategies previously seen with conventional cigarettes and tobacco (Biener & Albers, 2004). With only eight states including e-cigarettes in their state-wide smoke-free policies by November 15, 2015 (Dobbs et al., 2016), e-cigarettes may be becoming more common, influencing people's attitudes and perceived norms toward the behavior.

Limitations

Due to convenience sampling and a cross-sectional research design, no generalizations or causal inferences can be made. All measures consisted of self-reported items that may have resulted in bias. By only using college students, this study provides a narrow scope for e-cigarette use that may not be a model representation for e-cigarette patterns. Moreover, the RAA was developed to analyze behaviors that result in a positive health outcome (i.e., eating more green leafy vegetables, using a condom during intercourse). By using the RAA to predict what we are interpreting to be a negative health behavior, we are not using the RAA in its intended form. As mentioned earlier, the majority of the sample did not use e-cigarettes or had intention to use e-cigarettes. A sample with a larger population of those with intention to use e-cigarettes may report different findings. Such differences may help to explain the model-fit statistic calculation (SRMR=.154). While other model-fit statistics were acceptable, this value did not meet cutoff standards, and thus, findings should be interpreted with caution. Model-fit may be improved with the further analysis and refinement of measures.

Conclusion and Future Implications

As e-cigarette use among youth and young adults continues to increase, the need to better understand the behavioral influences is important. As researchers begin to better understand the health implications of e-cigarette use, the use of validated measures (such as this RAA e-cigarette scale) will help researchers provide direct recommendations for prevention programs, policies, and procedures. The influence of attitude on behavioral intention indicates a need for education regarding e-cigarettes that could influence beliefs and perceived potential outcomes of performing the behavior. As of 2015, Wyoming was the only state in the U.S. that had passed a law requiring state funding to develop and distribute an evidence-based media campaign regarding the potential health implications of e-cigarettes use (Dobbs et al., 2016). Improving health communication and health advocacy efforts may influence college students' attitudes, and thus behavioral intention to use e-cigarettes. A better understanding of the referent others who may influence college students' intention to use e-cigarettes may help health education specialists create educational material regarding the health implications of e-cigarette use. If peers, parents, or other social circles of college students influence intention to use e-cigarettes, then tailoring education to these sources may have a greater impact on behavior change than only targeting the student. The future inclusion of the measures validated in this study with other samples may help explain uptake of e-cigarettes, in additional populations. This study provides one of the first models using the RAA to predict behavioral intention of e-cigarette use. With this theory still in its infancy, future research is encouraged to further explore the RAA's application to e-cigarette use, and other behaviors, to better understand the theoretical implications of this framework.

Acknowledgements

Table 1: Demographics

	Phase 1: Pilot	Phase 2
	n (%)	*n* (%)
Phase 1: Pilot Sample	49 (100)	499 (100)
Gender		
Male	17 (34.7)	114 (22.8)
Female	32 (65.3)	385 (77.2)
Race/Ethnicity		
White	38 (88.4)	399 (80.0399)
African American	3 (6.1)	28 (5.6)
Hispanic	4 (8.2)	33 (6.6)
Asian	1 (2.0)	15 (3.0)
Other/More than one race	3 (6.1)	24 (4.8)
Mean Age, Years (SD)	21.94 (2.8)	20.38 (1.6)
Grade Classification		
Freshmen	0 (0.0)	133 (22.6)
Sophomore	7 (14.3)	130 (26.1)
Junior	10 (20.4)	123 (24.6)
Senior	27 (55.1)	119 (23.8)
Graduate Student	5 (10.2)	13 (2.6)
Law Student	0 (0.0)	1 (0.2)
Cigarette and E-Cigarette Use		
Cigarette- Ever Use	28 (57.1)	216 (43.3)
Cigarette- Past 30 days	6 (12.2)	56 (11.2)
Heard of e-cigarettes	38 (77.6)	458 (91.8)
E-cigarette- Ever Use	18 (36.7)	202 (40.5)
E-cigarettes- Past 30 days	1 (2.0)	29 (5.8)

Table 2: PCA from Pilot Sample

	Factor 1	Factor 2	Factor 3	Factor 4	Factor 5	Factor 6	Factor 7	Factor 8
Attitudes								
Relieve stress						0.825		
Feel more relaxed						0.759		
Cause less harm to my body						0.736		
Stay awake and alert						0.713		
More harm to my body			-0.935					
Cause damage to my lungs			-0.932					
Experience unknown side effects of e-cigarettes			-0.893					
Smell bad			-0.781					
Experience a bad taste			-0.917					
Injunctive Norms								
People who already use e-cigarettes							0.679	
Fraternity members							0.775	
People trying to "fit in"							0.700	
People at parties							0.878	
My parents	0.924							
My friends	0.877							
My religious organization	0.741							
My mentors	0.740							
My significant other	0.915							
Health officials	0.830							
My employer/s and colleague/s	0.671							
Health conscious people	0.830							
Descriptive Norms								
Most fraternity members		0.583						
Most freshmen		0.852						
Most people who regularly attend parties		0.845						
Most people who drink		0.964						
Most students who know others who use e-cigarettes		0.932						
Most people who want to "fit in"		0.761						
Most athletes					0.755			

Table 2: PCA from Pilot Sample Cont.

	Factor 1	Factor 2	Factor 3	Factor 4	Factor 5	Factor 6	Factor 7	Factor 8
Most students who DO NOT drink alcohol					0.893			
Most people who are confident					0.617			
Most people who quit smoking cigarettes					0.853			
PBC								
Someone offering me samples of e-cigarettes				-0.806				
E-cigarettes being cheap				-0.781				
Being around people who use e-cigarettes				-0.824				
A friend offering their e-cigarette to me to try				-0.893				
Caring about what my family and friends think								0.785
Respecting myself								0.884
Not buying an e-cigarette								0.618
% Variance	19.99	16.42	12.01	10.14	7.15	6.74	5.47	3.72
Cronbach's α	0.95	0.93	0.96	0.91	0.89	0.783	0.84	0.88

Table 3: Measurement Model of Underlying Measures

	Factor 1	Factor 2	Factor 3	Factor 4	Factor 5	Factor 6	Factor 7	Factor 8
Attitude								
Relieve stress					0.943			
Feel more relaxed					0.892			
Cause less harm to my body					0.472			
Stay awake and alert					0.724			
More harm to my body			0.516					
Cause damage to my lungs			0.833					
Experience unknown side effects of e-cigarettes			0.844					
Smell bad			0.796					
Experience a bad taste			0.888					
Injunctive Norm								
People who already use e-cigarettes							0.524	
Fraternity members							0.773	
People trying to "fit in"							0.827	
People at parties							0.797	
My parents	0.809							
My friends	0.636							
My religious organization	0.849							
My mentors	0.933							
My significant other	0.828							
Health officials	0.866							
My employer/s and colleague/s	0.861							
Health conscious people	0.859							
Descriptive Norm								
Most fraternity members		0.727						
Most freshmen		0.782						
Most people who regularly attend parties		0.912						
Most people who drink		0.848						
Most students who know others who use e-cigarettes		0.637						
Most people who want to "fit in"		0.619						

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Table 3: Measurement Model of Underlying Measures (Cont.)

	Factor 1	Factor 2	Factor 3	Factor 4	Factor 5	Factor 6	Factor 7	Factor 8
Most students who DO NOT drink alcohol								0.966
Most people who are confident								0.611
PBC								
Someone offering me samples of e-cigarettes				0.888				
E-cigarettes being cheap				0.644				
Being around people who use e-cigarettes				0.668				
A friend offering their e-cigarette to me to try				0.899				
Caring about what my family and friends think						0.800		
Respecting myself						0.950		
Not buying an e-cigarette						0.611		
% Variance	22.29	10.15	8.27	6.74	6.34	4.17	3.98	2.88
Cronbach's α	.95	.90	.88	.85	.83	.83	.83	.85

Table 4: Measurement Model of Global Measures

	Factor1	Factor2	Factor3	Factor4
I want				0.795
I intend				0.935
I plan				0.975
Bad/Good		0.716		
Foolish/Wise		0.666		
Negative/Positive		0.709		
Stressful/Relaxing		0.851		
Not enjoyable/Enjoyable		0.953		
Unfavorable/Favorable		0.945		
Unpleasant/Pleasant		0.952		
Annoying/Pleasing		0.852		
Most people who are important to me				
approve of me using	0.805			
think I should use	0.860			
support me using	0.833			
want me to use	0.869			
My closest friends				
approve of me using	0.777			
think I should use	0.928			
support me using	0.875			
want me to use	0.909			
Most people like me will use	0.732			
Most people like me will buy	0.790			
My closest friends will use	0.845			
My closest friends will buy	0.848			
Difficult/Easy			0.420	
Not up to me/Up to me			0.976	
Not at all under my control/Under my control			0.956	
% Variance	52.85	11.94	6.52	4.57
Cronbach's α	.97	.96	.78	.95
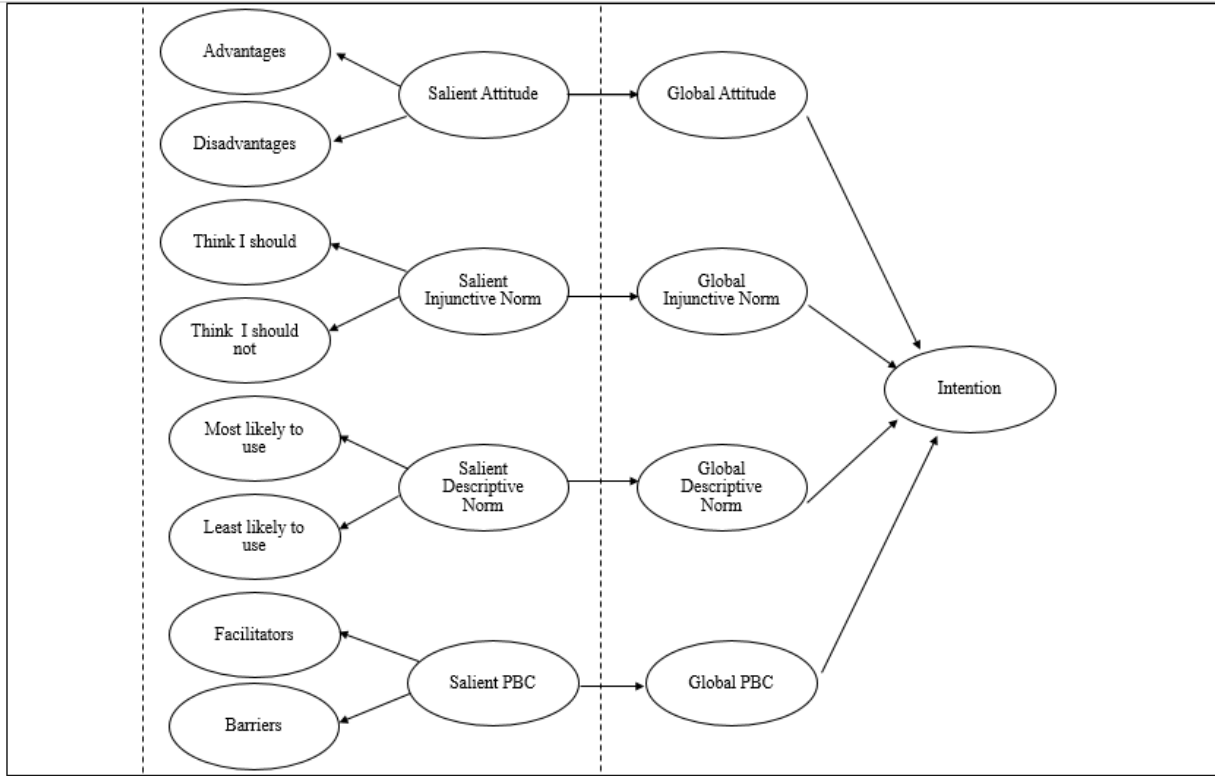
Note. Dotted line represents measurement model of the underlying constructs.

Figure 1. Proposed Path Model of RAA Constructs and Intention to Use E-cigarette
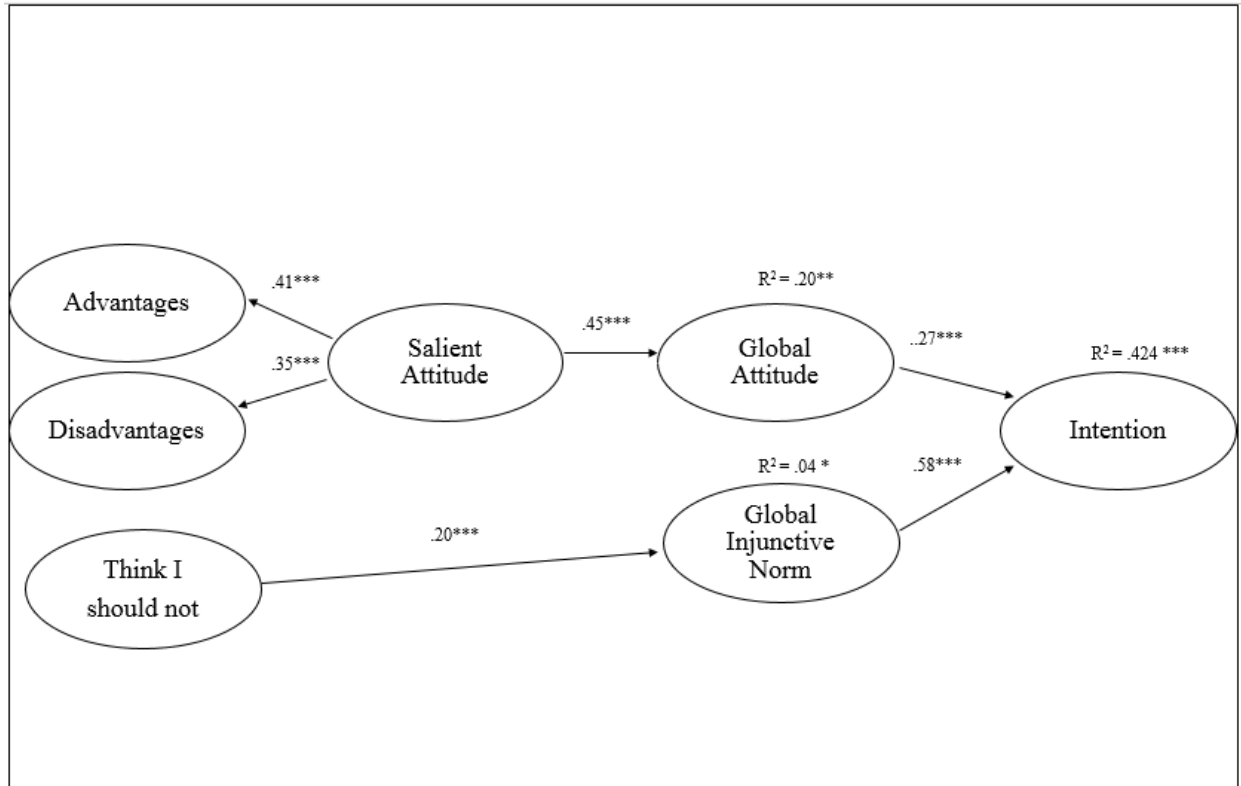
Note. Standardized coefficients (***p<.001, **p<.01, *p<.05).

Figure 2. Final Path Model of RAA Constructs and Intention to Use E-cigarette

Appendix 1: PILOT Study Underlying Constructs

Behavioral Belief

For the following statements, please select how much you agree or disagree with each statement.

Disagree: __-3__:__-2__:__-1__:__0__:__1__:__2__:__3__: Agree

A. I will **relieve stress** as a result of using e-cigarettes in the next 30 days**.**
B. I will **feel more relaxed** as a result of using e-cigarettes in the next 30 days.
C. I will **NOT use regular cigarettes** as a result of using e-cigarettes in the next 30 days.
D. I will **smell good** as a result of using e-cigarettes in the next 30 days.
E. I will **experience a good taste** as a result of using e-cigarettes in the next 30 days.
F. I will **satisfy a curiosity** as a result of using e-cigarettes in the next 30 days.
G. I will **fit in/look cool** as a result of using e-cigarettes in the next 30 days.
H. I will **cause less harm to my body, compared to a regular cigarettes,** as a result of using e-cigarettes in the next 30 days.
I. I will **stay awake and alert** as a result of using e-cigarettes in the next 30 days.
J. I will **smoke in public, where I normally could not smoke,** as a result of using e-cigarettes in the next 30 days.
K. I will **get addicted to nicotine** as a result of using e-cigarettes in the next 30 days.
L. I will **use regular cigarettes** as a result of using e-cigarettes in the next 30 days.
M. I will **more harm to my body, compared to regular cigarettes,** as a result of using e-cigarettes in the next 30 days.
N. I will **cause damage to my lungs** as a result of using e-cigarettes in the next 30 days.
O. I will **experience unknown side effects of e-cigarettes** as a result of using e-cigarettes in the next 30 days.
P. I will **feel judged by others who do not approve of smoking** as a result of using e-cigarettes in the next 30 days.
Q. I will **spend money** as a result of using e-cigarettes in the next 30 days.
R. I will **smell bad** as a result of using e-cigarettes in the next 30 days.
S. I will **experience a bad taste** as a result of using e-cigarettes in the next 30 days.

Outcome Evaluation

For the following statements, please select how bad or good you believe the statement to be.

Bad: __-3__:__-2__:__-1__:__0__:__1__:__2__:__3__: Good

A. **Feeling stress relief** is…
B. **Feeling relaxing** is…
C. **NOT using regular cigarettes** is…
D. **Smelling good** is…
E. **Experiencing a good taste** is…
F. **Satisfying a curiosity** is…
G. **Fitting in/looking cool** is…
H. **Causing less harm to my body, compared to regular cigarettes,** is…
I. **Staying awake and alert** is…
J. **Smoking in public, where I normally could not smoke** is…
K. **Getting addicted to nicotine** is…
L. **Using regular cigarettes** is…
M. **Causing more harm to my body, compared to regular cigarettes,** is…
N. **Damaging my lungs** is…
O. **Experiencing unknown side effects of e-cigarettes** are…
P. **Feeling judged by others who do not approve of smoking** is…
Q. **Spending money** is…
R. **Smelling bad** is…
S. **Experiencing a bad taste** is…

Injunctive Normative Belief

For the following statement, please select how much the listed person/s think that you should not or you should smoke an e-cigarette in the next 30 days.

I should not: __-3__ : __-2__ : __-1__ : __0__ : __1__ : __2__ : __3__ : I should

A. **Current smokers** think that_____ use e-cigarettes in the next 30 days.
B. **People who already use e-cigarettes** think that_____ use e-cigarettes in the next 30 days.
C. **Smokers trying to quit** think that_____ use e-cigarettes in the next 30 days.
D. **Fraternity members** think that_____ use e-cigarettes in the next 30 days.
E. **Sorority members** think that_____ use e-cigarettes in the next 30 days.
F. **E-Cigarette, vape and juice shops** think that_____ use e-cigarettes in the next 30 days.
G. **People trying to "fit in"** think that_____ use e-cigarettes in the next 30 days.
H. **People at parties** think that_____ use e-cigarettes in the next 30 days.
I. **My family** thinks that_____ use e-cigarettes in the next 30 days.
J. **My parents** think that_____ use e-cigarettes in the next 30 days.
K. **My friends** think that_____ use e-cigarettes in the next 30 days.
L. **My religious organization** thinks that_____ smoke e-cigarettes in the next 30 days.
M. **My mentors (i.e. teachers, coaches, advisors)** think that_____ smoke e-cigarettes in the next 30 days.
N. **My significant other (boyfriend/girlfriend/fiancé)** thinks that_____ smoke e-cigarettes in the next 30 days.
O. **Health officials (i.e. doctors, nurses)** think that_____ smoke e-cigarettes in the next 30 days.
P. **Non-smokers** think that_____ smoke e-cigarettes in the next 30 days.
Q. **Those who do not use e-cigarettes** think that_____ smoke e-cigarettes in the next 30 days.
R. **Everyone I know** thinks that_____ smoke e-cigarettes in the next 30 days.
S. **My employer/s and colleague/s** think that_____ smoke e-cigarettes in the next 30 days.
T. **Health conscious people** think that_____ smoke e-cigarettes in the next 30 days.

Motivation to Comply with Referent Other

For the following statements, please select how much you disagree or agree with the statement.

Disagree: __-3__ : __-2__ : __-1__ : __0__ : __1__ : __2__ : __3__ : Agree

   A. When it comes to matters like using e-cigarettes, I want to do what **current smokers** think I should do.

   B. When it comes to matters like using e-cigarettes, I want to do what **people who already use e-cigarettes** think I should do.

   C. When it comes to matters like using e-cigarettes, I want to do what **smokers trying to quit** think I should do.

   D. When it comes to matters like using e-cigarettes, I want to do what **fraternity members** think I should do.

   E. When it comes to matters like using e-cigarettes, I want to do what **sorority members** think I should do.

   F. When it comes to matters like using e-cigarettes, I want to do what **e-cigarette, vape and juice shops** think I should do.

   G. When it comes to matters like using e-cigarettes, I want to do what **people trying to "fit in"** think I should do.

   H. When it comes to matters like using e-cigarettes, I want to do what **people at parties** think I should do.

   I. When it comes to matters like using e-cigarettes, I want to do what **my family** thinks I should do.

   J. When it comes to matters like using e-cigarettes, I want to do what **my parents** think I should do.

   K. When it comes to matters like using e-cigarettes, I want to do what **my friends** think I should do.

   L. When it comes to matters like using e-cigarettes, I want to do what **religious organization** thinks I should do.

   M. When it comes to matters like using e-cigarettes, I want to do what **my mentors (i.e. teachers, coaches, advisors)** think I should do.

   N. When it comes to matters like using e-cigarettes, I want to do what **my significant other (boyfriend/girlfriend/fiancé)** thinks I should do.

   O. When it comes to matters like using e-cigarettes, I want to do what **health officials (i.e. doctors, nurses)** think I should do.

   P. When it comes to matters like using e-cigarettes, I want to do what **non-smokers** think I should do.

   Q. When it comes to matters like using e-cigarettes, I want to do what **those who do not use e-cigarettes** think I should do.

   R. When it comes to matters like using e-cigarettes, I want to do what **everyone I know** thinks I should do.

   S. When it comes to matters like using e-cigarettes, I want to do what **my employer/s and colleague/s** think I should do.

   T. When it comes to matters like using e-cigarettes, I want to do what **health conscious people** think I should do.

Descriptive Normative Belief

For the following statements, please select how false or true you belief the statement to be.

        False: __-3__ : __-2__ : __-1__ : __0__ : __1__ : __2__ : __3__ : True

A. **Most fraternity members** will use an e-cigarette in the next 30 days.
B. **Most sorority members** will use an e-cigarette in the next 30 days.
C. **Most freshmen** will use an e-cigarette in the next 30 days.
D. **Most people who regularly attend parties** will use an e-cigarette in the next 30 days.
E. **Most people who drink** will use an e-cigarette in the next 30 days.
F. **Most students who know others who use e-cigarettes** will use an e-cigarette in the next 30 days.
G. **Most people who already smoke cigarettes** will use an e-cigarette in the next 30 days.
H. **Most people who want to "fit in"** will use an e-cigarette in the next 30 days.
I. **Most people with low self-esteem** will use an e-cigarette in the next 30 days.
J. **Most people who are stressed** will use an e-cigarette in the next 30 days.
K. **Most upperclassmen (i.e. juniors, seniors)** will use an e-cigarette in the next 30 days.
L. **Most pre-professional students (i.e. health related majors)** will use an e-cigarette in the next 30 days.
M. **Most athletes** will use an e-cigarette in the next 30 days.
N. **Most people with asthma** will use an e-cigarette in the next 30 days.
O. **Most people who are affiliated with religious organizations** will use an e-cigarette in the next 30 days.
P. **Most people with a family history of smoking related illness** will use an e-cigarette in the next 30 days.
Q. **Most students who DO NOT regularly attend parties** will use an e-cigarette in the next 30 days.
R. **Most students who DO NOT drink alcohol** will use an e-cigarette in the next 30 days.
S. **Most people who are more educated** will use an e-cigarette in the next 30 days.
T. **Most people who are confident** will use an e-cigarette in the next 30 days.
U. **Most people who quit smoking cigarettes** will use an e-cigarette in the next 30 days.

Identification with Referent Other

For the following statements, please select if you do Not At All want to be like or would Very Much want to be like the listed person/s.

Not At All: __-3__:__-2__:__-1__:__0__:__1__:__2__:__3__: Very Much

A. When it comes to matters of using e-cigarettes, how much do you want to be like **fraternity members**?
B. When it comes to matters of using e-cigarettes, how much do you want to be like **sorority members**?
C. When it comes to matters of using e-cigarettes, how much do you want to be like **freshmen**?
D. When it comes to matters of using e-cigarettes, how much do you want to be like **people who regularly attend parties**?
E. When it comes to matters of using e-cigarettes, how much do you want to be like **people who drink**?
F. When it comes to matters of using e-cigarettes, how much do you want to be like **who know others who use e-cigarettes**?
G. When it comes to matters of using e-cigarettes, how much do you want to be like **people who already smoke cigarettes**?
H. When it comes to matters of using e-cigarettes, how much do you want to be like **people who want to "fit in"**?
I. When it comes to matters of using e-cigarettes, how much do you want to be like **people with low self-esteem**?
J. When it comes to matters of using e-cigarettes, how much do you want to be like **people who are stressed**?
K. When it comes to matters of using e-cigarettes, how much do you want to be like **upperclassmen (i.e. juniors, seniors)**?
L. When it comes to matters of using e-cigarettes, how much do you want to be like **pre-professional students (i.e. health related majors)**?
M. When it comes to matters of using e-cigarettes, how much do you want to be like **athletes**?
N. When it comes to matters of using e-cigarettes, how much do you want to be like **people with asthma**?
O. When it comes to matters of using e-cigarettes, how much do you want to be like **people who are affiliated with religious organizations**?
P. When it comes to matters of using e-cigarettes, how much do you want to be like **people with a family history of smoking related illness**?
Q. When it comes to matters of using e-cigarettes, how much do you want to be like **students who DO NOT regularly attend parties**?
R. When it comes to matters of using e-cigarettes, how much do you want to be like **students who DO NOT drink alcohol**?
S. When it comes to matters of using e-cigarettes, how much do you want to be like **students who are more educated**?
T. When it comes to matters of using e-cigarettes, how much do you want to be like **students who are confident**?
U. When it comes to matters of using e-cigarettes, how much do you want to be like **people who want to quit smoking cigarettes**?

Control Belief

For the following statements, please select how unlikely or likely you believe it is that you will do the following in the next 30 days.

Unlikely: __-3__:__-2__:__-1__:__0__:__1__:__2__:__3__: Likely

A. **I will go to a bar** in the next 30 days.
B. **I will go to a party** in the next 30 days.
C. **I will go to places that sell e-cigarettes** in the next 30 days.
D. **E-cigarette use will be allowed on campus** in the next 30 days.
E. **Someone will offer me samples of e-cigarettes** in the next 30 days.
F. **E-cigarettes will be cheap** in the next 30 days.
G. **I will be around people using e-cigarettes** in the next 30 days.
H. **A friend will offer their e-cigarette to me to try** in the next 30 days.
I. **I will get drunk** in the next 30 day.
J. **I will be stressed** in the next 30 days.
K. **E-cigarettes will be expensive** in the next 30 days.
L. **I will care about my health** in the next 30 days.
M. **It will be illegal to use e-cigarettes on campus** in the next 30 days.
N. **I will have a lack of access to e-cigarettes** in the next 30 days.
O. **I will not hang around people who smoke e-cigarettes** in the next 30 days.
P. **I will care about what my family and friends think** in the next 30 days.
Q. **I will respect myself** in the next 30 days.
R. **I will not buy an e-cigarette** in the next 30 days.
S. **I will not hang out with people who are partying** in the next 30 days.
T. **I will not hang out with people who are going to bars** in the next 30 days.
U. **I will smoke regular cigarettes** in the next 30 days.

Perceived Power

For the following statements, please how much you disagree or agree with each statement.

Disagree: __-3__ : __-2__ : __-1__ : __0__ : __1__ : __2__ : __3__ : Agree

A. **Going to a bar would make it easier for me to use e-cigarettes in the next 30 days.**
B. **Going to a party would make it easier for me to use e-cigarettes in the next 30 days.**
C. **Going to places that sell e-cigarettes would make it easier for me to use e-cigarettes in the next 30 days.**
D. **E-cigarette use being allowed on campus would make it easier for me to use e-cigarettes in the next 30 days.**
E. **Someone offering me samples of e-cigarettes would make it easier for me to use e-cigarettes in the next 30 days.**
F. **E-cigarettes being cheap would make it easier for me to use e-cigarettes in the next 30 days.**
G. **Being around people who use e-cigarettes would make it easier for me to use e-cigarettes in the next 30 days.**
H. **A friend offering their e-cigarette to me to try would make it easier for me to use e-cigarettes in the next 30 days.**
I. **Getting drunk would make it easier for me to use e-cigarettes in the next 30 days.**
J. **Getting stressed would enable me to use an e-cigarette in the next 30 days.**
K. **E-cigarettes being expensive would make it easier for me to use e-cigarettes in the next 30 days.**
L. **Caring about my health would make it easier for me to use e-cigarettes in the next 30 days.**
M. **It being illegal to use e-cigarettes on campus would make it easier for me to use e-cigarettes in the next 30 days.**
N. **A lack of access to e-cigarettes would make it easier for me to use e-cigarettes in the next 30 days.**
O. **Not hanging out with people who use e-cigarettes would make it easier for me to use e-cigarettes in the next 30 days.**
P. **Caring about what my family and friends think would make it easier for me to use e-cigarettes in the next 30 days.**
Q. **Respecting myself would make it easier for me to use e-cigarettes in the next 30 days.**
R. **Not buying an e-cigarette would make it easier for me to use e-cigarettes in the next 30 days.**
S. **Not hanging out with people who are partying would make it easier for me to use e-cigarettes in the next 30 days.**
T. **Not hanging out with people who are going to bars would make it easier for me to use e-cigarettes in the next 30 days.**
U. **Smoking regular cigarettes would make it easier for me to use e-cigarettes** in the next 30 days.

Appendix 2: Validated Measure Underlying and Global Constructs

Behavioral Belief

For the following statements, please select how much you agree or disagree with each statement.

Disagree: __-3__ : __-2__ : __-1__ : __0__ : __1__ : __2__ : __3__ : Agree

A. I will **relieve stress** as a result of using e-cigarettes in the next 30 days**.**
B. I will **feel more relaxed** as a result of using e-cigarettes in the next 30 days.
C. I will **cause less harm to my body, compared to a regular cigarettes,** as a result of using e-cigarettes in the next 30 days.
D. I will **stay awake and alert** as a result of using e-cigarettes in the next 30 days.
E. I will **more harm to my body, compared to regular cigarettes,** as a result of using e-cigarettes in the next 30 days.
F. I will **cause damage to my lungs** as a result of using e-cigarettes in the next 30 days.
G. I will **experience unknown side effects of e-cigarettes** as a result of using e-cigarettes in the next 30 days.
H. I will **smell bad** as a result of using e-cigarettes in the next 30 days.
I. I will **experience a bad taste** as a result of using e-cigarettes in the next 30 days.

Outcome Evaluation

For the following statements, please select how bad or good you believe the statement to be.

Bad: __-3__ : __-2__ : __-1__ : __0__ : __1__ : __2__ : __3__ : Good

A. **Feeling stress relief** is…
B. **Feeling relaxing** is…
C. **Causing less harm to my body, compared to regular cigarettes,** is…
D. **Staying awake and alert** is…
E. **Causing more harm to my body, compared to regular cigarettes,** is…
F. **Damaging my lungs** is…
G. **Experiencing unknown side effects of e-cigarettes** are…
H. **Smelling bad** is…
I. **Experiencing a bad taste** is…

Injunctive Normative Belief

For the following statement, please select how much the listed person/s think that you should not or you should smoke an e-cigarette in the next 30 days.

I should not: __-3__ : __-2__ : __-1__ : __0__ : __1__ : __2__ : __3__ : I should

A. **People who already use e-cigarettes** think that_____ use e-cigarettes in the next 30 days.
B. **Fraternity members** think that_____ use e-cigarettes in the next 30 days.
C. **People trying to "fit in"** think that_____ use e-cigarettes in the next 30 days.
D. **People at parties** think that_____ use e-cigarettes in the next 30 days.
E. **My parents** think that_____ use e-cigarettes in the next 30 days.
F. **My friends** think that_____ use e-cigarettes in the next 30 days.
G. **My religious organization** thinks that_____ smoke e-cigarettes in the next 30 days.
H. **My mentors (i.e. teachers, coaches, advisors)** think that_____ smoke e-cigarettes in the next 30 days.
I. **My significant other (boyfriend/girlfriend/fiancé)** thinks that_____ smoke e-cigarettes in the next 30 days.
J. **Health officials (i.e. doctors, nurses)** think that_____ smoke e-cigarettes in the next 30 days.
K. **My employer/s and colleague/s** think that_____ smoke e-cigarettes in the next 30 days.
L. **Health conscious people** think that_____ smoke e-cigarettes in the next 30 days.

Motivation to Comply with Referent Other

For the following statements, please select how much you disagree or agree with the statement.

Disagree: __-3__ : __-2__ : __-1__ : __0__ : __1__ : __2__ : __3__ : Agree

A. When it comes to matters like using e-cigarettes, I want to do what **people who already use e-cigarettes** think I should do.
B. When it comes to matters like using e-cigarettes, I want to do what **fraternity members** think I should do.
C. When it comes to matters like using e-cigarettes, I want to do what **people trying to "fit in"** think I should do.
D. When it comes to matters like using e-cigarettes, I want to do what **people at parties** think I should do.
E. When it comes to matters like using e-cigarettes, I want to do what **my parents** think I should do.
F. When it comes to matters like using e-cigarettes, I want to do what **my friends** think I should do.
G. When it comes to matters like using e-cigarettes, I want to do what **religious organization** thinks I should do.
H. When it comes to matters like using e-cigarettes, I want to do what **my mentors (i.e. teachers, coaches, advisors)** think I should do.

I. When it comes to matters like using e-cigarettes, I want to do what **my significant other (boyfriend/girlfriend/fiancé)** thinks I should do.
J. When it comes to matters like using e-cigarettes, I want to do what **health officials (i.e. doctors, nurses)** think I should do.
K. When it comes to matters like using e-cigarettes, I want to do what **my employer/s and colleague/s** think I should do.
L. When it comes to matters like using e-cigarettes, I want to do what **health conscious people** think I should do.

Descriptive Normative Belief

For the following statements, please select how false or true you belief the statement to be.
False: __-3__ : __-2__ : __-1__ : __0__ : __1__ : __2__ : __3__ : True

A. **Most fraternity members** will use an e-cigarette in the next 30 days.
B. **Most freshmen** will use an e-cigarette in the next 30 days.
C. **Most people who regularly attend parties** will use an e-cigarette in the next 30 days.
D. **Most people who drink** will use an e-cigarette in the next 30 days.
E. **Most students who know others who use e-cigarettes** will use an e-cigarette in the next 30 days.
F. **Most people who want to "fit in"** will use an e-cigarette in the next 30 days.
G. **Most athletes** will use an e-cigarette in the next 30 days.
H. **Most students who DO NOT regularly attend parties** will use an e-cigarette in the next 30 days.
I. **Most students who DO NOT drink alcohol** will use an e-cigarette in the next 30 days.
J. **Most people who are confident** will use an e-cigarette in the next 30 days.
K. **Most people who quit smoking cigarettes** will use an e-cigarette in the next 30 days.

Identification with Referent Other

For the following statements, please select if you do Not At All want to be like or would Very Much want to be like the listed person/s.
Not At All: __-3__ : __-2__ : __-1__ : __0__ : __1__ : __2__ : __3__ : Very Much

A. When it comes to matters of using e-cigarettes, how much do you want to be like **fraternity members**?
B. When it comes to matters of using e-cigarettes, how much do you want to be like **freshmen**?
C. When it comes to matters of using e-cigarettes, how much do you want to be like **people who regularly attend parties**?
D. When it comes to matters of using e-cigarettes, how much do you want to be like **people who drink**?
E. When it comes to matters of using e-cigarettes, how much do you want to be like **who know others who use e-cigarettes**?
F. When it comes to matters of using e-cigarettes, how much do you want to be like **people who want to "fit in"**?
G. When it comes to matters of using e-cigarettes, how much do you want to be like **athletes**?
H. When it comes to matters of using e-cigarettes, how much do you want to be like **students who DO NOT regularly attend parties**?
I. When it comes to matters of using e-cigarettes, how much do you want to be like **students who DO NOT drink alcohol**?
J. When it comes to matters of using e-cigarettes, how much do you want to be like

students who are confident?

K.   When it comes to matters of using e-cigarettes, how much do you want to be like **people who want to quit smoking cigarettes**?

Control Belief

For the following statements, please select how unlikely or likely you believe it is that you will do the following in the next 30 days.

Unlikely: __-3__ : __-2__ : __-1__ : __0__ : __1__ : __2__ : __3__ : Likely

A. **Someone will offer me samples of e-cigarettes** in the next 30 days.
B. **E-cigarettes will be cheap** in the next 30 days.
C. **I will be around people using e-cigarettes** in the next 30 days.
D. **A friend will offer their e-cigarette to me to try** in the next 30 days.
E. **I will care about what my family and friends think** in the next 30 days.
F. **I will respect myself** in the next 30 days.
G. **I will not buy an e-cigarette** in the next 30 days.

Perceived Power

For the following statements, please select how much you disagree or agree with each statement.

Disagree: __-3__ : __-2__ : __-1__ : __0__ : __1__ : __2__ : __3__ : Agree

A. **Someone offering me samples of e-cigarettes would make it easier for me to use e-cigarettes in the next 30 days.**
B. **E-cigarettes being cheap would make it easier for me to use e-cigarettes in the next 30 days.**
C. **Being around people who use e-cigarettes would make it easier for me to use e-cigarettes in the next 30 days.**
D. **A friend offering their e-cigarette to me to try would make it easier for me to use e-cigarettes in the next 30 days.**
E. **Caring about what my family and friends think would make it easier for me to use e-cigarettes in the next 30 days.**
F. **Respecting myself would make it easier for me to use e-cigarettes in the next 30 days.**
G. **Not buying an e-cigarette would make it easier for me to use e-cigarettes in the next 30 days.**

Global Measures

Intent

For the following statements, please select how much you strongly disagree or strongly agree with each statement.

Strongly Disagree: __-3__ : __-2__ : __-1__ : __0__ : __1__ : __2__ : __3__ : Strongly Agree

    A. I **want** to use e-cigarettes in the next 30 days, just because I want to do it.
    B. I **intend** to use e-cigarettes in the next 30 days, just because I want to do it.
    C. I **plan** to use e-cigarette in the next 30 days, just because I want to do it.
    D. I **am willing** to use e-cigarette in the next 30 days, just because I want to do it.

Attitude

Please select a response that most closely explains your belief.

Me using an e-cigarette in the next 30 days, just because I want to do it is…
    A. Bad: __-3__ : __-2__ : __-1__ : __0__ : __1__ : __2__ : __3__ : Good
    B. Harmful: __-3__ : __-2__ : __-1__ : __0__ : __1__ : __2__ : __3__ : Beneficial
    C. Unnecessary: __-3__ : __-2__ : __-1__ : __0__ : __1__ : __2__ : __3__ : Necessary
    D. Useless: __-3__ : __-2__ : __-1__ : __0__ : __1__ : __2__ : __3__ : Useful
    E. Foolish: __-3__ : __-2__ : __-1__ : __0__ : __1__ : __2__ : __3__ : Wise
    F. Negative: __-3__ : __-2__ : __-1__ : __0__ : __1__ : __2__ : __3__ : Positive
    G. Stressful: __-3__ : __-2__ : __-1__ : __0__ : __1__ : __2__ : __3__ : Relaxing
    H. Not enjoyable: __-3__ : __-2__ : __-1__ : __0__ : __1__ : __2__ : __3__ : Enjoyable
    I. Unfavorable: __-3__ : __-2__ : __-1__ : __0__ : __1__ : __2__ : __3__ : Favorable
    J. Unpleasant: __-3__ : __-2__ : __-1__ : __0__ : __1__ : __2__ : __3__ : Pleasant
    K. Annoying: __-3__ : __-2__ : __-1__ : __0__ : __1__ : __2__ : __3__ : Pleasing

Social Norms

For the following statements, please indicate how much you strongly disagree or strongly agree with each statement.

Strongly Disagree: ___-3___:___-2___:___-1___:___0___:___1___:___2___:___3___: Strongly Agree

A. Most people who are important to me **approve of me using** an e-cigarette in the next 30 days, just because I want to do it.
B. Most people who are important to me **think I should use** an e-cigarette in the next 30 days, just because I want to do it.
C. Most people who are important to me **support me using** an e-cigarette in the next 30 days, just because I want to do it.
D. Most people who are important to me **want me to use** an e-cigarette in the next 30 days, just because I want to do it
E. My **closest friends approve of me using** an e-cigarette in the next 30 days, just because I want to do it.
F. My **closest friends think I should use** an e-cigarette in the next 30 days, just because I want to do it.
G. My **closest friends support me using** an e-cigarette in the next 30 days, just because I want to do it.
H. My **closest friends want me to use** an e-cigarette in the next 30 days, just because I want to do it.
I. Most people like me **will use** e-cigarettes in the next 30 days, just because they want to do it.
J. Most people like me **will buy** e-cigarettes in the next 30 days, just because they want to do it.
K. My **closest friends will use e-cigarettes in the next 30 days**, just because they want to do it.
L. My **closest friends will buy e-cigarettes in the next 30 days**, just because they want to do it.

PBC

Please select a response that most closely explains your belief.

Using an e-cigarette in the next 30 days, just because I want to do it, is…
- A. Difficult__-3__:__-2__:__-1__:__0__:__1__:__2__:__3__: Easy
- B. Up to me__-3__:__-2__:__-1__:__0__:__1__:__2__:__3__: Not Up to Me
- C. Not at all under my control: __-3__:__-2__:__-1__:__0__:__1__:__2__:__3__: Under my control
- D. I am confident that I can use an e-cigarette, just because I want to do it, in the next 30 days.
   Strongly Disagree: __-3__:__-2__:__-1__:__0__:__1__:__2__:__3__: Strongly Agree

- E. There are certain necessary things to know about how to put together e-cigarettes before using them. How sure are you that you could learn how to use an e-cigarette, just because you want to do it, in the next 30 days?
   Very Unsure: __-3__:__-2__:__-1__:__0__:__1__:__2__:__3__: Very Sure

CHAPTER 6: REFLECTION AND FURTHER PLANS

Conception of my Dissertation

When I was four years old, my mother taught health courses at a local community college. To prepare for her classes, she would practice presenting to my older brother (seven years old at the time) and me. Although much of what she said was just words at the time, one presentation she gave changed my life. To teach her students that cigarette smoke was harmful, she put a cigarette in a cork and put the cork in the head of a two liter coke bottle. After lighting the cigarette, she squeezed the coke bottle, demonstrating a person inhaling a cigarette. I saw the smoke enter the bottle, as well as go into the air, comprehending that smoke entered the persons' lungs. This awareness caused a lasting impact on my view of cigarettes and tobacco.

Later in high school, a few other students and I formed what we called the De Queen High School Anti-Tobacco Coalition, as a project for our Environmental and Spatial Technology (EAST) Lab class. In retrospect, I wish we had called it the Tobacco-Free Coalition. We created a survey, with the help of a graduate student who had graduated from our high school. For our project, we distributed our survey to sixth through twelfth grade students in our school district. Our findings indicated that most students in our district began using tobacco in the eighth grade. We then developed and presented a PowerPoint presentation and gave presentations about the harmful effects of tobacco to middle school students in the seventh and eighth grade. Our project won national recognition at our national EAST conference, and my junior year, I represented my high school in Sacramento, California, at the EAST Lab west coast national conference.

My passion for smoke-free environments later developed when I was in college, when I created the University of Arkansas Anti-Tobacco Coalition, a student organization that helped support the campus during the enactment of the campus tobacco-free policy. Again, I wish I had

used Tobacco-Free instead of Anti-Tobacco to provide a more positive recognition of our purpose. Our faculty advisor, Dr. Ed Mink, introduced me to the Northwest Arkansas Tobacco-Free Coalition (NWATFC), an organization where I later worked as project coordinator. My tenure as project coordinator was during an exciting time for the coalition. In May of 2011, we presented a policy initiative to the city council attempting to make all bars smoke-free in Fayetteville, Arkansas. The policy failed to meet enough votes to be passed, but the experience inspired me to return to graduate school and pursue my Master's in Science in community health promotion. My background with tobacco advocacy led to the interest of my thesis, which examined smoking prevalence among different types of smokers (daily smokers, social smokers, and chipper smokers). At my defense, Dr. Kristen Jozkowski said something that yet again changed the course of my path. She mentioned that tobacco is a saturated field, and she asked if I was interested in research regarding e-cigarettes. I realized that studying e-cigarettes today would be as if I had begun studying conventional cigarettes in 1950; thus my focus shifted.

With little literature regarding e-cigarettes, I found it difficult to pin-point an exact focus for my dissertation. I had tossed around ideas, but the direction for the design of my study came from Dr. Bart Hammig on the afternoon after I defended my comprehensive exams. He mentioned a multi-phase study to help explain e-cigarette use among high school students. Later, Dr. Hammig, Dr. Blunt, and I submit a proposal to Arkansas Bio-Science Institute (ABI) for funding to examine salient beliefs of high school students regarding e-cigarettes. Due to trouble of recruiting high school students, and in lieu time, the study population changed to college students during the fall of 2015. After reading an article by Trumbo and Harper (2015a) regarding the construct validity of the TRA, as it applies to e-cigarette use, I decided to use my dissertation as an opportunity to examine this concept to the TPB.

During a pre-proposal presentation, Dr. Kristen Jozkowski pointed out that findings from Trumbo and Harper's study made it ideal to instead use the RAA theoretical framework. Trumbo and Harper (2015a) found that attitudes influenced intention to use e-cigarettes among young adults, but social norms did not significantly influence intention; however, the TRA and TPB only account for injunctive norms. Descriptive norms were not introduced to the theory until the development of the RAA. Allowing a closer view at social norms (by using both injunctive and descriptive norms) would allow for a better understanding of the influencing factors on college students' intention to use e-cigarettes. With the RAA and e-cigarette literature both still in their infancy, this study seemed to be appropriate both in context as well in the theoretical framework.

Methodologically and Theoretical Contribution of the Study

As literature examining e-cigarette use among priority populations (high school students and young adults) is emerging, I hope that my findings from this study will allow others to better understand the array of factors influencing behavior. Current literature has examined e-cigarette use by either using qualitative methods (i.e., focus groups, interviews) or quantitative methods; however, no current studies were found that utilized the benefits of a mixed methods analysis when exploring e-cigarette use. Methodologically, this study provides the first scale development providing a measure of RAA items, regarding e-cigarette use, in the language of the population of interest (college students). Findings allow for the explanation of both underlying and global constructs, along with the first analysis of the influence of descriptive norms and PBC on intention to use e-cigarettes. Although findings from this study did not indicate significance of either descriptive norms or PBC on intention, the development of these scales provide measures for others to further explore other populations in the future. Theoretically, this is the first study to test the construct validity of the RAA in regards to e-cigarette use.

Trumbo and Harper's (2013) study was the first attempt to examine e-cigarette use from a theoretical lens. They later followed this study with representative samples (2015a, 2015b) of the items developed in their initial study (2013). Besides their contribution, no other studies were found using theory to help explain e-cigarette behavior. With e-cigarettes research only being sold in the U.S. for the past nine years, their existence in public health text books is rare. I hope that my dissertation will hopefully provide a valid example of the use of theories to better explain behavioral intent and behavior of e-cigarette use among college students. It is my hope that this study will provide insight to those who educate others in public health and future health educators regarding the theoretical examination of e-cigarettes using the RAA.

I believe results from this study will be applicable for those working to prevent youth and young adults from use e-cigarettes, as well as useful to better explain theory application to public health students. In my previous role as project coordinator at the NWATFC, I saw the need for studies to help educators tailor their prevention programs for youth and young adults. Without these studies, health educators are using outdated information on which to educate children, parents, and policy makers. I believe educators need to focus prevention funding and efforts toward those most at risk, meaning youth and young adults for e-cigarette exposure. Educating people about the potential health implications of e-cigarettes may help those at risk make more educated decisions regarding their health.

Connection between Dissertation and Research Trajectory

Through the use of additional items beyond the aim of my dissertation and questions that emerged from the findings of this study, I believe I have created a research agenda that I will continue to purse. Much like Trumbo and Harper, I would like to seek funding from the National Institute of Health (NIH) to distribute the measure I developed to a representative sample of

young adults. Over the next year, I plan to submit a proposal to the NIH, using the direct items created in this study. Using these findings, I will be able to make more generalizable statements to the U.S. young adult population. Additional studies that I would like to pursue based on my findings include additional examination of students' perceptions to findings through focus groups, further analysis of brand preference of e-cigarettes, and developing an item regarding the information and information channels employed by college students. In the following paragraphs, I will explain each of these pursuits further and provide justification for such pursuit.

Using the RAA constructs to understand behavioral intention of using e-cigarettes, I plan to use focus groups to ask participants for their explanation to such findings. This idea came from Yzer et al.'s (2015) study, where they employed a third phase after a RAA scale develop using first the elicitation procedure and then developing a quantitative measure. They used a third phase, which employed focus groups that allowed participants to provide meaningful and actionable insights to findings from the previous study. Using a similar phase from my findings would allow further exploration of the items developed during the first two phases and validation of their application to other populations besides University of Arkansas students.

Brand preference was an additional question included in both the qualitative and quantitative phases of this study that was not analyzed in this dissertation. Brands were elicited during Phase 1, and during Phase 2, participants provided brands of which they had heard, had used, and preferred. Brand preference of e-cigarettes can be further explored through focus groups of e-cigarette users, refinement of the measure, and distribution to a representative sample. I plan to further refine the list of e-cigarette brands for the potential inclusion of this measure in the NYTS and/or the NATS. Currently, the NYTS and the NATS both ask about brand preference of cigarettes, but no item currently exists that focuses on brand preference of e-

cigarettes. With literature regarding the marketing costs spent by specific brands (Richardson et al., 2014), I am curious if use of such products is consistent with the funding spent by e-cigarette companies (i.e., blu e-cigarettes).

Finally, to better understand what people have heard about e-cigarette and where they are getting their information, I eliciting themes by asking participants three to five things they had heard about e-cigarettes and three to five places that they received this information during the final survey of this study. Using these themes, I plan to develop items along with a team of experts. Such items will be tested using Index of Item Objective Congruence (IIOC) (Turner, Mulvenon, Thomas, & Balkin, 2001) values and further validity analysis. Studies understanding e-cigarettes currently use few measures, usually refined from conventional cigarette measures. Such develop through future research will allow measures specific to e-cigarettes and without bias from conventional cigarettes.

While I see my dissertation as the foundation for future studies, I also see it as a learning experience to the research process, which will serve me well beyond just e-cigarette research. Lessons learned will assist my research trajectory as it evolves through potential collaborations with future colleagues and exposures to different research and life experiences. I hope to continue to examine e-cigarette use among youth and young adults to provide up-to-date research for health educators and those working in health advocacy and prevention. I also aspire to develop partnerships and collaborative relationships with others studying e-cigarette use, including Dr. Theodore Wagener, Assistant Professor and Associate Director for Training at Oklahoma Tobacco Research Center. Such partnerships will teach me to see perspectives beyond my own and keep a balanced approach to health and e-cigarettes' potential positive, as well as negative, implication for health.

Final Conclusions

While my research has thus far focused on understanding e-cigarette intention and behavior among college students with the intent of preventing such behavior, I cannot help but acknowledge that some students' e-cigarette behavior is an intention to quit smoking conventional cigarettes, which is a positive health behavior. I cannot avoid or dismiss that e-cigarettes may be a potential cessation method. This recognition can be seen in my dissertation, with the development of global constructs focusing on e-cigarette use for the purpose of recreation and a separate set of items focusing on e-cigarette use as an attempt to quit smoking conventional cigarettes. Reflecting on my experience, I recognize my person growth and development, through recognizing the complexity of research and health topics. Through my initial years in graduate school, I was firmly grounded in the perspective that cigarettes, e-cigarettes, and all tobacco products caused a burden on our nation and must be eliminated. Although I will always have room to grow and lessons to learn, I believe that I have developed a researcher by learning to ask questions instead of leading with the answer. However silly or remedial it may sound, I've learned to learn, and the through this process, the more I learn, less I know. I realize that I am far from a definite answer regarding e-cigarettes' implication on our society and culture, but I've become curious and intrigued to learn about this behavior through a variety of research methods and designs. I've learned that not all knowledge is taught in a classroom or comes from a textbook. Occasionally, you just need to talk to people to better understand their behavior. I appreciate the motivation that I have received from the faculty at the University of Arkansas to pursue research and lifelong learning. I've been blessed beyond measure with incredible mentors who have encouraged, challenged and taught me to be the professional I am today. I look forward to many more years of continual growth. I am ever in

debt to my faculty members and those who have unselfishly given me their time, patience,

knowledge, and expertise in order to prepare me for my next journey.

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APPENDICES

Appendix A: Recruitment Letter for Open-Ended Survey

$5 Amazon/iTunes codes for Participation in E-cigarette Open-Ended Survey

College students are needed for a one time participation in an open-ended survey regarding electronic cigarettes (e-cigarettes). Requirements for participation include current enrollment at the University of Arkansas-Fayetteville, and the student must be 18 years of age or older. They survey will ask questions about beliefs and behaviors regarding e-cigarettes. The survey will last approximately 15 to 20 minutes. The first 50 participants to take this survey will receive a $5 redeemable code to either Amazon.com or iTunes (participant is able to select). Redeemable codes will be emailed to participants once the study reaches 50 participants. Measures will be taken to protect participant's confidentiality to the extent allowed by law and University policy. Those interested can participate in the survey by clicking on the following link (click here). For questions or further details, please contact Page Daniel Dobbs at pdaniel@uark.edu for more information.

This study *has been approved by the University of Arkansas, Institutional Review Board for Human Studies, Fayetteville, AR (#15-07-024).*

Title: Young Adult E-Cigarette Exposure: Implications for Policy and Prevention

Introduction
The purpose of this form is to provide you information that may affect your decision as to whether or not to participate in this research study. The researchers performing this study can answer all your questions. Read the information below and please feel free to contact the researchers listed below with questions you might have before you decide whether or not to participate.

Purpose of the Study
This research study is about electronic cigarettes (e-cigarettes), a battery powered device that delivers aerosolized nicotine and other byproducts without combustion. The purpose of this study is to explore and validate measures that can help explain young adult attitudes, beliefs, and behaviors regarding e-cigarettes.

What will I be asked to do?
If you agree to participate in this study, you will be asked to complete a survey regarding your beliefs and behaviors regarding e-cigarettes. This survey will take approximately 15 to 20 minutes.

What are the risks involved in this study?
There are no risks involved in this study.

What are the possible benefits of this study?
The possible benefits of participation are a reflection of your behaviors and beliefs regarding e-cigarettes.

Do I have to participate?
No, your participation in this study is voluntary. You may decline to participate or to withdraw from participation at any time. Withdrawal or refusing to participate does not affect your relationship with The University of Arkansas or the researcher. You can agree to participate now and change your mind later without any penalty.

What if I do not want to participate?
If you do not want to participate, there will be no penalty.

Will there be any compensation?
Yes, the first 50 participants to take this survey will receive a $5 redeemable code to either amazon.com or iTunes. Redeemable codes will be emailed to participants once the study reaches 50 participants.

How will my privacy and confidentiality be protected if I participate in this research study?

The use of your name and email address will only be used to provide the participant with their $5 redeemable code. Your identity will not be linked to your responses. Results from the research will be reported as group data and not reported about individuals. Your contact information will be deleted following the distribution of the $5 redeemable code.

Whom to contact with questions about the study?

Prior, during or after your participation you can contact the researcher Page Daniel Dobbs at 479-575-2976 or send an email to pdaniel@uark.edu for any questions or if you feel that you have been harmed. This study has been reviewed and approved by The University Institutional Review Board and the study number is #15-07-024**.**

Whom to contact with questions concerning your rights as a research participant?

For questions or concerns about your rights as a research participant, please contact Ro Windwalker, the University's IRB Coordinator, at (479) 575-2208 or by e-mail at irb@uark.edu. Thanks for your participation!

Implied Consent
By clicking forward to this survey, you are agreeing to participate in the Young Adult E-Cigarette Exposure: Implications for Policy and Prevention Study. By clicking forward, you are acknowledging that you have read the information provided above and you decide to participate in the study. If you later decide that you wish to withdraw your participation in the study, you can leave the study at any time.

Appendix C: Open-Ended Survey

1.   What is your sex?
      a. Male
      b. Female

2.   How old are you (in years)? _____

3.   What year are you in school?
      a. Freshman
      b. Sophomore
      c. Junior
      d. Senior
      e. Graduate Student
      f. Law Student

4.   Are you Hispanic, Latino/a, or Spanish origin (one or more categories may be selected)?
      a. No, not of Hispanic, Latino, Latina, or Spanish origin
      b. Yes, Mexican, Mexican American, Chicano or Chicana
      c. Yes, Puerto Rican
      d. Yes, Cuban
      e. Yes, Another Hispanic, Latino/a or Spanish origin

5.   What race or races do you consider yourself to be? (You can CHOOSE ONE ANSWER or MORE THAN ONE ANSWER)
      a. American Indian or Alaska Native
      b. Asian
      c. Black or African American
      d. Native Hawaiian or Other Pacific Island
      e. White

6.   Have you ever tried an **electronic cigarette** or **e-cigarette** in your lifetime, even one or two puffs?
      a. Yes
      b. No

Instructions: Please take a few minutes to tell us what you think about the possibility of using an electronic cigarette (**including vape pens, eGos, Mods and other electronic smoking devices**) in the next 30 days. There are no right or wrong responses; we are merely interested in your personal opinions. In response to the questions below, please list the thoughts that come immediately to mind. Write each thought on a separate line.

7.   List the e-cigarette brands of which you have heard?

_____
_____
_____
_____

8.   When thinking about yourself as a college student, what are some **ADVANTAGES** of trying an e-cigarette (even one puff) in the next 30 days?

_____
_____
_____
_____

9.   When thinking about yourself as a college student, what are some **DISADVANTAGES** of trying an e-cigarette (even one puff) in the next 30 days?

_____
_____
_____
_____

10.   When thinking about yourself as a college student, please list the individuals or groups who would **APPROVE** or think you **SHOULD TRY** an e-cigarette (even one puff) in the next 30 days.

_____
_____
_____
_____

11.   When thinking about yourself as a college student, please list the individuals or groups who would **DISAPPROVE** or think you **SHOULD NOT TRY** an e-cigarette (even one puff) in the next 30 days.

_____
_____
_____
_____

12.   Sometimes, when we are not sure what to do, we look to see what others are doing. When thinking about yourself as a college student, please list the individuals or

groups who, during college, are **MOST** likely to try an e-cigarette (even one puff) in the next 30 days.

_____
_____
_____
_____

13.   When thinking about yourself as a college student, please list the individuals or groups who, during college, are **LEAST** likely to try an e-cigarette (even one puff) in the next 30 days.

_____
_____
_____
_____

14.   When thinking about yourself as a college student, please list any factors or circumstances that would make it **EASY** or **ENABLE** you to try an e-cigarette (even one puff) in the next 30 days.

_____
_____
_____
_____

15.   When thinking about yourself as a college student, please list any factors or circumstances that would make it **DIFFICULT** or **PREVENT** you from try an e-cigarette (even one puff) in the next 30 days.

_____
_____
_____
_____

The first 50 participants to take part in this study will receive a $5 redeemable code to either Amazon.com or iTunes. If you are one of the first 50 participants, to which would you prefer?
- o   Amazon.com
- o   iTunes

Please provide an email address to where you would like your $5 redeemable code sent.
_____

Appendix D: Results Open-Ended Survey and Code Book

What is your sex?
Male   20 (34.5%)
Female   28 (65.5%)

How old are you (in years)?
Mean= 23.4   Median= 21   Mode= 20
Std. Deviation= 5.48
Minimum=18   Maximum= 49

What year are you in school?
Freshman   6 (10.3%)
Sophomore   9 (15.5%)
Junior   13 (22.4%)
Senior   9 (15.5%)
Graduate Student 18 (31.0%)
Law Student   1 (1.7%)
Missing   2 (3.4%)

Are you Hispanic, Latino/a, or Spanish origin (one or more categories may be selected)?
No, not of Hispanic, Latino, Latina, or Spanish origin   56 (96.6%)
Yes, Mexican, Mexican American, Chicano or Chicana   2 (3.4%)
Yes, Puerto Rican   0 (0.0%)
Yes, Cuban   0 (0.0%)
Yes, Another Hispanic, Latino/a or Spanish origin   0 (0.0%)

What race or races do you consider yourself to be? (You can CHOOSE ONE ANSWER or MORE THAN ONE ANSWER)
American Indian or Alaska Native   0 (0.0%)
Asian   3 (5.2%)
Black or African American   4 (6.9%)
Native Hawaiian or Other Pacific Island   0 (0.0%)
White   51 (87.9%)

Have you ever tried an **electronic cigarette** or **e-cigarette** in your lifetime, even one or two puffs?
Yes   28 (48.3%)
No   30 (51.7%)

Instructions: Please take a few minutes to tell us what you think about the possibility of using an electronic cigarette (**including vape pens, eGos, Mods and other electronic smoking devices**) in the next 30 days. There are no right or wrong responses; we are merely interested in your personal opinions. In response to the questions below, please list the thoughts that come immediately to mind. Write each thought on a separate line.
List the e-cigarette brands of which you have heard?

I've never heard of any e-cigarettes brands.	38 (65.5%)
E-Vape	3 (5.2%)
blu	8 (13.8%)
Mark 10	1 (1.7%)
ProVari	1 (1.7%)
V2Cigs	3 (5.2%)
E-Cig	1 (1.7%)
Green Smoke	1 (1.7%)
Flo	1 (1.7%)
VaporFi	3 (5.2%)
Mig Vapor	1 (1.7%)
South Beach Smoke	1 (1.7%)
Revolver	1 (1.7%)
Vuse	3 (5.2%)
Bull Smoke	1 (1.7%)
Vapor4life	1 (1.7%)
Whitecloud	

When thinking about yourself as a college student, what are some **ADVANTAGES** of trying an e-cigarette (even one puff) in the next 30 days?

Table 4. Phase 1- Attitude, Advantages Labels

Attitude- Advantages Labels
1	None
2	Stress relief
3	Me relaxing
4	Quitting smoking
5	Good smell
6	Satisfying a curiosity
7	"Fitting-in"/ "looking cool"
8	Not using cigarettes
9	Less harm to self and the environment
10	Staying awake
11	Good taste
12	Losing weight
13	Smoking in public, where one normally could not smoke
14	Easy to use
15	Less addictive than cigarettes
16	other

Table 5. Phase 1- Attitude, Advantages

Attitude- Advantages Inter-rater reliability= .973

Part.	Illustrative Items	Abbie	Page
1	There are no advantages.	1	1
2	Using it as a replacement for "drunk smoking", since that's the only time I even consider smoking.	8	8
3	Stress relief	2	2
4	None, they are pointless	1	1
5	Quit smoking	4	4
5	Doesn't stink	5	5
5	Ease of use	14	14
6	To know that I don't want one. It's worth a try though	6	6
7	Less outside temptation, more time to concentrate on smoking cessation	4	4
8	I'd say none. It just becomes another cost to factor into an already tight budget for me	1	1
9	I don't see any	1	1
10	If a group is smoking an e-cigarette, it allows you to fit in with them if you join.	7	7
10	Is looked better upon than smoking an actual cigarette.	16	16
12	There are no advantages.	1	1
13	Fewer health concerns	9	9
13	Less addicting	15	15
14	I don't feel as if there are any	1	1
14	Would provide an eco friendly advantage...maybe	9	9
15	I cannot think of any.	1	1
16	Keeps people away from regular cigarettes	8	8
17	Quit smoking	4	4
17	Wean off of regular cigarettes and eventually not smoke at all	4	4
18	De-stress	2	2
19	helpful	4	4
19	easy to use	14	14
20	Satisfying a curiosity	6	6
20	It could also fill a social purpose if it were done with others	7	7
21	Maybe have a try	6	6
21	Cool feel	7	7
22	Join in a party	7	7
23	Some people think it is cool.	7	7
24	Nicotine might make you a little more alert, late night study sessions	10	10

Table 5. Phase 1- Attitude, Advantages Cont.

Part.	Illustrative Items	Abbie	Page
26	Just overall intriguing	6	6
26	It seems less harmful than an actual cigarette	9	9
27	Fitting in with friends who smoke.	7	7
28	I don't think there are any advantages	1	1
28	Maybe staying warm	16	16
29	Looking cool!	7	7
30	Helps not use cigarette	8	8
31	Being able to slowly take off nicotine to eventually quit smoking	4	4
32	I believe that there are no benefits	1	1
33	Legal way to relax	3	3
33	Could be a low-risk	9	9
33	Can also be used without any nicotine purely for flavor/experience.	11	11
34	You can smoke on campus (I think)	13	13
35	I don't think that there are any advantages of an e-cigarette	1	1
36	Smells good, not bad	5	5
36	It still contains nicotine	16	16
36	You can smoke in class	13	13
36	Usable in public	13	13
37	None	1	1
38	Relieve stress	2	2
38	To relax	3	3
39	None whatsoever	1	1
40	The only advantage that I can think of using an e-cig is to "look cool" in front of your friends. Although many of my friends smoke (e-cigs and otherwise), they would never pressure me to do anything because they know that I am adamant about my position on e-cigs.	7	7
41	None	1	1
42	None	1	1
43	I don't see any advantages	1	1
43	unless I was already a smoker. Then it would be a way to smoke on campus without actually smoking on campus.	13	13
44	Relaxation	3	3
44	No smoke inhalation	8	8
45	I've heard that it helps people lose weight	12	12

Table 5. Phase 1- Attitude, Advantages Cont.

Part.	Illustrative Items	Abbie	Page
46	Personally I don't think there are any advantages.	1	1
47	I like to use them to help stay awake.	10	10
48	Maybe stress relief	2	2
49	I have no advantages.	1	1
49	The only advantages I see are if you already were a smoker and wanted to quit.	4	4
50	Not really any others	1	1
50	Don't have the odor of a regular cigarette	5	5
51	None	1	1
52	If there is a level of nicotine in the e-cigarette, a buzz from one can be a nice legal substitute to alcohol or marijuana.	16	16
53	Not any. I think it's a gross habit	1	1
54	They aren't as harmful as regular cigarettes to the person smoking	9	9
54	They aren't as harmful as regular cigarettes to the people around them.	9	9
55	I think that there aren't really any advantages of trying an e-cig.	1	1
56	I would think the benefit would be less of a likelihood of producing a second hand smoke environment.	9	9
57	Does it smell the same?	5	5
57	Would I choke on the vapor?	16	16
58	It would help with stress.	2	2
58	It would help deal with the need for a cigarette since friends smoke.	8	8
58	It would be better than a cigarette when it comes to secondhand smoke.	9	9
59	There are no advantages for me because I don't regularly smoke.	1	1

When thinking about yourself as a college student, what are some **DISADVANTAGES** of trying an e-cigarette (even one puff) in the next 30 days?

Table 6. Phase 1- Attitude, Disadvantages Labels

Attitude, Disadvantages Labels	
1	Getting addicted to nicotine
2	Might lead to using "real" cigarettes
3	Harm to my body
4	Unknown side effects of cigarettes.
5	Cause me to be judged by others who do not approve of smoking
6	Cost
7	No real disadvantage
8	Bad Taste/Smell
9	You aren't allowed to use it on campus
10	Blowing up in my face
11	Other

Table 7. Phase 1- Attitude, Disadvantages

Attitude- Disadvantages: Inter-rater Reliability= .853

Part.	Illustrative Items	Abbie	Page
1	becoming addicted	1	1
1	various health issues	3	3
1	lost of respect from family and friends	5	5
2	I believe one day we will realize that these are no better for us than cigarettes.	3	3
3	More stuff to carry around	6	6
4	Addiction	1	1
4	Unknown Risk	4	4
4	Cost	6	6
5	Continuing nicotine use	1	1
5	Maintenance of device	6	6
6	No real disadvantage of trying once	7	7
6	Unless it blew up in my face	10	10
7	There are a lot of students around the smoking	11	11
8	Also might lead to "real" cigarettes.	2	2
8	Not enough is known for health concerns	4	4
8	Cost. The pen or cigarette and then the cartridges.	6	6
9	it tastes bad	8	8
10	You are looked down upon by people who don't like any kind of smoking or cigarette use at all.	5	5
10	You still have to be off campus to legally smoke one due to the smoke ban on campus.	9	9
12	It costs money that I do not have.	6	6
13	It could become addicting	1	1
13	or lead to desiring to try real cigarettes.	2	2
14	Nicotine is a very addictive drug, I am not sure but I believe that e-cigs have the same amount or possibly even more nicotine increasing my risk of dependence on an unhealthy drug.	1	1
15	One could become addicted to the nicotine inside I suppose	1	1
16	It can't be 100% healthy	3	3
17	smoking is bad for your health.	3	3
17	A disadvantage is I don't like the smell of smoke and	8	8
18	unhealthy	3	3

Table 5. Phase 1- Attitude, Disadvantages Cont.

Part.	Illustrative Items	Abbie	Page
18	Unattractive	5	5
18	irresponsible	11	11
19	nothing	7	7
20	If you enjoyed said e-cigarette and continued to use it, there could be negative health consequences.	3	3
20	I personally think you look dumb when you puff one so there could be negative social consequences as well.	5	5
20	not being able to use it on campus	9	9
21	healthy problem	3	3
22	do not	7	7
23	Possible addiction	1	1
23	Harm to the body	3	3
24	You could develop a nicotine addiction which seems tough to beat.	1	1
25	addiction	1	1
25	Lung cancer	3	3
25	expensive habit	6	6
26	unknown what it does to your health	3	3
26	Expensive	6	6
27	Harming your body	3	3
27	Harming your image.	5	5
28	Become addicted.	1	1
28	Damage lungs/breathing.	3	3
29	Unhealthy!	3	3
29	Looking unattractive	5	5
30	not being able to use it on campus	9	9
31	Can get addicted to the flavors or nicotine very quickly	1	1
31	leading to worse health possibilities	3	3
32	A single puff would lead to more and soon you would be doing more than a few puffs.	1	1
32	Trying it leads to habit	1	1
33	Possibility of becoming addicted	1	1
33	Costs associated with buying and maintaining my own ecig if I decide I like it enough to do that.	6	6
34	Not enough studies on the effects of E-cigarettes to tell how badly you are hurting your body.	3	3
35	Addictive behavior	1	1

Table 5. Phase 1- Attitude, Disadvantages Cont.

Part.	Illustrative Items	Abbie	Page
35	Disadvantages include negative effects to your health (tobacco and nicotine inhalation)	3	3
35	Threat to your health and a baby's if you are pregnant or breastfeeding	3	3
35	Increased risk of cancer	3	3
35	Judgement from others like myself who do not approve of smoking.	5	5
35	Unnecessary cost	6	6
35	Bad breath	8	8
36	I don't smoke, so I am not dependent on nicotine intake.	1	1
36	Some professors may not allow it.	9	9
37	Getting addicted to tobacco	1	1
37	Bad reputation of ecigs	5	5
38	gross	11	11
39	They cause cancer	3	3
39	You'll look like a tool.	5	5
40	you could get addicted if you use the ones that have nicotine and you are using them on a consistent basis	1	1
40	you could look trashy to others if smoking in public	5	5
41	PLUS risk of lung and mouth fungal infections from deeply inhaling repeatedly from the same devices without cleaning it.	3	3
41	Same problems as smoking any kind of tobacco	3	3
42	Possible addiction.	1	1
42	Less money for college.	6	6
43	getting addicted	1	1
43	research does not currently know what the long term effects are of e-cigarettes.	4	4
43	it would be a burden on my budget	6	6
44	Unknown side effects of e-cigarettes.	4	4
44	Having the negative stigma of being a smoker.	5	5
44	Paying for something that isn't a necessity.	6	6
45	I don't know much about them, but I'm assuming it is not healthy due to the fact that it is going into your lungs	3	3
46	You could become addicted.	1	1
46	It is a drug.	11	11

Table 5. Phase 1- Attitude, Disadvantages Cont.

Part.	Illustrative Items	Abbie	Page
47	Introduction of unknown chemicals.	4	4
48	What if I end up liking it?	1	1
48	coughing	3	3
48	sickly cloying vapor	8	8
48	takes time	6	6
49	Inhaling chemicals. We do not know the damage these do	4	4
50	Just as addictive as regular cigarettes	1	1
51	You are breathing in something other than oxygen which can damage your body. Yes, there is not tar, but it's still not oxygen	3	3
52	They likely have adverse health effects that have not been fully discovered, yet. Hell, they are probably just as bad as regular cigarettes and we are all too stupid to look deeper into it. Doctors used to smoke when they were treating patients, so humans don't have a great track record.	4	4
53	You look dumb	5	5
53	You aren't supposed to do it on campus.	9	9
54	They still can cause nicotine addiction	1	1
55	I think that the disadvantages are that it can cause harm to my body, but they are not as harmful as a traditional cigarette.	3	3
56	I can't see, from that standpoint, a real disadvantage to trying an e-cig.	7	7
57	It's still a cigarette. It can still do damage to your lungs	3	3
58	Dangerous to health when compared to not smoking at all.	3	3
58	Expensive.	6	6
58	Smells awful.	8	8
59	Maybe I would get addicted if I tried an e-cigarette	1	1

When thinking about yourself as a college student, please list the individuals or groups who would **APPROVE** or think you **SHOULD TRY** an e-cigarette (even one puff) in the next 30 days.

Table 8. Phase 1- Injunctive Norm, Approve Labels

Injunctive Norm, Approve Labels
1   Current Smokers
2   People who already use e-cigarettes
3   Smokers trying to quit
4   No one
5   Parents
6   My Friends
7   Sorority students
8   Fraternity students
9   Companies trying to sell e-cigs
10   People trying to "fit in"
11   People at parties
12   Those who like sweet things
13   Other

Table 9. Phase 1- Injunctive Norm, Approve

Injunctive Norm Approve Inter-rater Reliability= .883

Part.	Illustrative Items	Abbie	Page
1	Other smokers	1	1
2	I can't really think of anyone who would encourage me to vape.	4	4
2	You would get made fun of at a frat house for vaping.	13	13
2	Maybe the more "hipster" side of campus.	13	13
3	No one (I have no intent to smoke in the next 30 days)	4	4
4	People who already use e-cigarettes	2	2
5	Smoking cessation groups	3	3
5	Friends	6	6
6	The people who work at "juice shops". I haven't met very many ecig users	9	9
7	Father and mother	5	5
7	Me	13	13
8	Smokers trying to quit	3	3
8	People trying to "fit in" because they see all the vape shops around campus/Fayetteville	10	10
9	Other college students	13	13
9	People who regularly party	11	11
10	My roommates who are fellow college students would approve of me smoking an e-cigarette.	13	13
10	Usually at a party or social gathering, people are smoking an e-cigarette or other smoking devices and will ask if anyone wants to join.	11	11
12	Cigarette lobby/industry.	9	9
13	Sorority students	7	7
13	Fraternity students	8	8
14	maybe the individuals who use them already	2	2
14	I have no idea	4	4
15	No one I know would want me to start smoking of any kind	4	4
16	Groups?	13	13
17	People who currently smoke would be probably approve of me trying an e-cigarette.	1	1
18	I don't think anyone would approve	4	4
18	unless they already use them.	2	2
19	good	13	13
20	E-cigarette users	2	2
20	E-cigarette dispensers would approve and encourage you to try e-cigarettes.	9	9
21	none	4	4

Table 7. Phase 1- Injunctive Norm, Approve Cont.

Part.	Illustrative Items	Abbie	Page
22	none	4	4
23	Current smokers	1	1
23	Fraternities	8	8
24	Maybe someone trying to quit cigs but I'm not sure how successful those people are.	3	3
24	I don't approve of anyone trying one just to try it.	13	13
25	Fraternity boys.	8	8
25	Dumbasses.	13	13
26	People who already smoke	1	1
27	Others who smoke.	1	1
28	All of my friends would approve.	6	6
28	A handful of my friends would encourage.	6	6
29	Most guy friends I know.	6	6
31	Only the companies trying to sell e-cigs, juice, or get me addicted to nicotine products	9	9
32	Individuals with an e-cigarette	2	2
32	as well as students that smoke actual cigarettes that are trying to stop	3	3
33	Friends	6	6
34	Those who are already using them that think they are better for your health.	2	2
35	People who already smoke	1	1
35	Those who believe that e-cigarette second-hand smoke is less dangerous than that of traditional cigarettes	2	13
36	People who smoke	1	1
36	Some friends	6	6
36	Adventurers	13	13
37	Nobody. Why should anyone use them?	4	4
38	a smoker	1	1
39	Maybe frat boys	8	8
39	I'm really not sure. People who use them are goofy to me.	13	13
40	some friends	6	6
40	fraternities	8	8
40	people at parties who are smoking	11	11
41	People who believe that vaping is better than smoking and either regret giving up smoking or wish to trade smoking for vaping, or wish to try to use vaping to quit smoking	3	3
41	Those who care about their image	10	10
41	Gum chewers	13	13

Table 7. Phase 1- Injunctive Norm, Approve Cont.

Part.	Illustrative Items	Abbie	Page
41	Kids who have never smoked	13	13
42	A couple of my friends would approve me trying an e-cig	6	6
43	People that already smoke	1	1
44	Smokers	1	1
44	current e-cigarette users	2	2
45	My friends from high school	6	6
45	Probably friends on campus,	6	6
45	People I work with	13	13
46	I don't think anyone should approve of smoking.	4	4
47	Persons trying to stop smoking cigarettes.	3	3
48	none	4	4
49	People who smoke cigarettes now and are trying to quit	3	3
50	People who already use them	2	2
51	No one	4	4
52	but I also know some high level students and athletes who indulge in e-cigarette use.	13	13
52	They are generally people I'd prefer not to associate with	13	13
53	Maybe frat guys	8	8
54	No one	4	4
59	People who use e-cigarettes	2	2
59	College students	13	13

When thinking about yourself as a college student, please list the individuals or groups who would **DISAPPROVE** or think you **SHOULD NOT TRY** an e-cigarette (even one puff) in the next 30 days.

Table 10. Phase 1- Injunctive Norm, Disapprove Labels

Injunctive Norm- Disapprove Labels

1	Family
2	Parents
3	Friends/Peers
4	Church members
5	Mentors (i.e. teachers, coaches, advisors)
6	Significant other (i.e. Boyfriend/Girlfriend/Fiancé)
7	Health official (i.e. doctors, nurses)
8	Fraternity members
9	Nobody
10	Nothing/not sure
11	Non Smokers/ non-e-cigarette users
12	Just about everyone I know
13	Students who wouldn't like to smell like smoke
14	Students who focus on their academics/conscious of their reputation
15	Health conscious people
16	Pregnant women
17	Colleagues and employer
18	Sorority members
19	Other

Table 11. Phase 1- Injunctive Norm, Disapprove

Injunctive Norm- Disapprove Inter-rater Reliability .857

Part.	Illustrative Items	Abbie	Page
1	Family	1	1
1	Friends	3	3
1	Advisors	5	5
1	Health officials	7	7
1	Colleagues	17	17
2	family	1	1
2	teachers	5	5
2	Fraternities	8	8
2	sororities	18	18
3	No one (I'm an adult and it's my business what I do or don't do)	9	9

Table 9. Phase 1- Injunctive Norm, Disapprove Cont.

Part.	Illustrative Items	Abbie	Page
4	BCM	4	4
4	Nonsmokers	11	11
4	SGA,	3	3
5	Family	1	1
5	Stamp out smoking	15	15
6	Just about everyone	12	12
7	nobody	9	9
8	any budget conscious person	19	19
8	Anyone who already dislikes smoking	19	19
9	My parents	2	2
9	Nurses	7	7
9	Doctors	7	7
10	My family would disapprove of me smoking due to them not being big fans of the action.	1	1
10	I feel many females in sororities would disapprove of me smoking an e-cigarette.	18	18
12	Family who wouldn't like the smoke/smell around the area.	1	1
12	Friends who wouldn't like the smoke/smell around the area.	3	3
12	My students who wouldn't like smoke/smell around the area.	13	13
13	Any Christian groups on campus	4	4
14	Parents	2	2
14	friends	3	3
14	coaches	5	5
15	family	1	1
15	pretty much all of my friends	3	3
16	Lots of people	12	12
17	People who don't smoke who likely disapprove of me trying a cigarette.	11	11
18	My family	1	1
18	friends would disapprove	3	3
19	nothing	10	10
20	Non-e-cigarette users	11	11
20	health conscious people would disapprove of trying e-cigarettes.	15	15
21	none	10	10
22	none	10	10
23	Immediate family	1	1
23	Friends	3	3
23	Church members	4	4

Table. 9. Phase 1- Injunctive Norm, Disapprove Cont.

Part.	Illustrative Items	Abbie	Page
25	My coach.	5	5
26	Church groups	4	4
27	My family.	1	1
27	My friends	3	3
28	My family would disapprove.	1	1
29	My family.	1	1
29	My girlfriend	6	6
31	Family	1	1
31	Parents	2	2
31	Friends	3	3
31	Almost everyone close to me	12	12
32	Students who focus on their academics rather than experimenting with cigarettes and other substances	14	14
33	Parents	2	2
34	My parents think I should stop smoking altogether.	2	2
34	Classmates who already quit smoking.	19	19
34	Probably my employer	17	17
35	My family	1	1
35	Most of my peers (non-smokers)	3	3
35	Most members of my church	4	4
36	Family	1	1
36	Some friends	3	3
36	boyfriend	6	6
37	Everybody	12	12
37	Anybody who doesn't want to devalue their reputation	14	14
38	parents	2	2
38	friends	3	3
38	roommate	3	3
39	Probably everybody but the ones who currently use them.	11	11
40	Not sure	10	10
42	One friend of mine would disapprove	3	3
43	My current friend group	3	3
44	Church groups	4	4
44	Non-smokers.	11	11
45	My parents	2	2
45	My church	4	4
46	Everyone.	12	12
47	Persons who have never smoked before.	11	11

Table 9. Phase 1- Injunctive Norm, Disapprove Cont.

Part.	Illustrative Items	Abbie	Page
48	parents	2	2
48	friends	3	3
48	mentors	5	5
49	People who don't already smoke	11	11
49	People who value their health	15	15
49	Pregnant women	16	16
50	My family	1	1
50	majority of my friends	3	3
50	My boyfriend	6	6
51	Parents	2	2
51	Finance	6	6
51	Everyone I know	12	12
51	Coworkers	17	17
52	My parents	2	2
52	my friends	3	3
52	my fiancé	6	6
52	They are generally people that I'd likely want to spend time with and expose myself to.	19	19
53	Teachers	5	5
54	My parents	2	2
54	my friends	3	3
54	my fiancé	6	6
59	My family	1	1
59	All of my peers	3	3
59	Future employers	17	17

Sometimes, when we are not sure what to do, we look to see what others are doing. When thinking about yourself as a college student, please list the individuals or groups who, during college, are **MOST** likely to try an e-cigarette (even one puff) in the next 30 days.

Table 12. Phase 1- Descriptive Norm, Most Likely Labels

Descriptive Norm- Most Likely Labels	
1	Greek Life
2	Freshmen
3	Students who know others that use e-cigarettes
4	People who regularly attend parties
5	People who drink
6	People that already smoke cigarettes
7	People in stress
8	College dropouts
9	People with low self esteem
10	Someone who wants to "fit in"
11	People who use drugs
12	Hipsters
13	Other

Table 13. Phase 1- Descriptive Norm, Most Likely

Descriptive Norm- Most Likely: Inter-rater reliability= .922

Part.	Illustrative Items	Abbie	Page
1	Those rushing a sorority or frat	1	1
1	Freshmen	2	2
1	Those that can't handle peer pressure	10	10
1	Those that can't handle the stress of college	7	7
2	Hipsters. Hippies.	12	12
3	Sorority girls	1	1
3	Frat guy	1	1
4	I know of none as this is an individual personal autonomous choice.	13	13
5	Those who know others that use them	3	3
5	Those who have been exposed to them	3	3
5	Those looking to quit smoking	13	13
6	College dropouts	8	8
7	Student union	13	13
8	Freshman. New place and want to try new things or impress certain people	2	2
9	People who party.	4	4
9	People who already do other substances.	11	11
9	People who are rebellious or hipster	12	12
10	men joining into fraternities	1	1
10	Freshmen	2	2
12	Current smokers.	6	6
13	Fraternity students	1	1
13	Sorority students	1	1
14	Fraternity groups	1	1
15	People that already smoke real cigarettes	6	6
16	Non Greek	13	13
17	Perhaps freshman who are away from home for the first time are likely to try an e-cigarette if they see many of their peers smoking e-cigarettes.	2	2
17	Individuals who already smoke are likely to try an e-cigarette.	6	6
18	I would think those who are susceptible to slip-ups when under stress	7	7
19	good	13	13
20	people willing to try new things	13	13
20	probably people who party more.	4	4
20	The people most likely to try e-cigarettes are likely people that engage in other similar practices like drinkers	5	5
20	The people most likely to try e-cigarettes are likely people that engage in other similar practices like smokers	6	6

Table 11. Phase 1- Descriptive Norm, Most Likely Cont.

Part.	Illustrative Items	Abbie	Page
22	very unique	13	13
23	Fraternities	1	1
23	Sororities	1	1
23	Athletes	13	13
24	Young impressionable freshman	2	2
25	People with low self esteem	9	9
26	Greek life	1	1
26	art majors	13	13
27	Those who want to fit in with a particular crowd.	10	10
28	Freshman trying to meet and get along with new friends.	2	2
29	Frat guys	1	1
29	Sorority girls	1	1
29	People who have roommates that use them.	3	3
30	people in stress	7	7
31	People being away from their home for the first time.	2	2
31	People feeling rejected	13	13
32	Individuals that hang out with other individuals that smoke	3	3
33	Undergrads	13	13
33	grad students	13	13
34	Smokers who have night classes or long classes. Breaks are not long enough to walk to a smoking area. With an E-cigarette, you can get a quick nicotine fix.	13	13
34	Also people living in the dorms.	13	13
35	Those who are drinking casually	5	5
35	Those who are vulnerable to peer influence	10	10
35	Those who might try other gateway drugs (maybe smoke marijuana)	11	11
35	Others who are looking for a distraction from other behaviors (e.g., smoke to suppress appetite)	13	13
36	Frat guys who smoke	1	1
36	Other smokers	6	6
37	Dropouts	8	8
38	people who drink,	5	5
38	people who smoke	6	6
38	people who do drugs	11	11
39	People who used to smoke cigarettes and would like to continue to indoors.	6	6
40	also, someone who wants to "fit in" in a group they associate themselves with	10	10

Table 11. Phase 1- Descriptive Norm, Most Likely Cont.

Part.	Illustrative Items	Abbie	Page
42	The majority of my friends already use e-cigs	3	3
43	People that hang around those who already smoke or vape	3	3
43	People that already smoke	6	6
44	People with low self-esteem.	9	9
44	Less educated individuals.	13	13
45	Those who are involved in partying	4	4
45	like sorority and fraternity members	1	1
45	Probably those who are already smoking cigarettes	6	6
46	I think freshmen are the most likely group to try smoking. Many of them are away from home for the first time and have that freedom they've never had before.	2	2
47	Students that have a group of friends who are using them.	3	3
48	department colleagues	13	13
49	People who regularly attend parties	4	4
49	People who want to look cool	10	10
50	Frat boys	1	1
51	freshmen	2	2
52	Greek life members are far more likely to fall into the rut of following the mob. The entire culture is based upon being as similar to one another as possible, and that conformity rolls over to substance abuse.	1	1
53	maybe fraternity members	1	1
54	Frat guys trying to be cool.	1	1
54	People who have smoked since high school	6	6
59	People who go out and party	4	4

When thinking about yourself as a college student, please list the individuals or groups who, during college, are **LEAST** likely to try an e-cigarette (even one puff) in the next 30 days.

Table 14. Phase 1- Descriptive Norm, Least Likely Labels

Descriptive Norm, Least Likely Labels

1	Pre-professional students
2	Upperclassmen (Junior and Seniors)
3	Greek Life
4	Athletes
5	Asthmatic people
6	Those affiliated with religious organizations
7	Individuals with a family history of negative health issues caused by smoking
8	No one that I can think of
9	More educated individuals
10	Students who do not frequently attend parties or drink alcohol
11	Non-smokers
12	Confident people happy with their group of friends and family
13	People not interested in smoking of any kind
14	Those who quit or trying to quit
15	People whose friends don't smoke
16	Other
17	Health conscious people

Table 15. Phase 1- Descriptive Norm, Least Likely

Descriptive Norm- Least Likely: Inter-Rater Reliability= .781

Part.	Illustrative Items	Abbie	Page
1	health-related majors	1	1
1	older students (over 25)	2	2
1	Confident people	12	12
2	Med majors	1	1
2	Frat boys	3	3
2	sorority girls	3	3
3	Athletes	4	4
4	None	8	8
5	Never smoked before	11	11
5	Determined to quit nicotine altogether	14	14
6	Most people	16	16
7	I think there should be no	16	16
8	Upperclassmen. Don't care because they most likely have a group they already are comfortable with and don't give a **** what people think	2	2
9	People with illnesses like asthma	5	5
9	Numbers even indicate that younger generations are smoking less as well	16	16
10	Girls going into sororities	3	3
10	people who are very involved in the church	6	6
10	most teachers	16	16
12	Health-conscious persons.	17	17
12	Poorer students who can't afford the costs.	16	16
13	Students affiliated with Christian organizations	6	6
14	Athletes	4	4
15	Those that are not interesting in smoking of any kind	13	13
16	Church	6	6
17	Individuals who have friends or family who've had negative health issues caused by smoking are probably least likely to try an e-cigarette.	7	7
18	health-conscious individuals	17	17
18	knowledgeable individuals	9	9
18	Over-achievers	16	16
19	NA	8	8

Table 13. Phase 1- Descriptive Norm, Least Likely Cont.

Part.	Illustrative Items	Abbie	Page
20	People who do not party or smoke regular cigarettes.	10	10
21	none	8	8
22	nothing	8	8
23	Pre-professional students	1	1
24	Graduate students	2	2
25	I'm not sure, it seems that people from all walks of life smoke pretty evenly.	16	16
26	Religious students	6	6
27	Those who are happy with their surrounding group of friends and family.	12	12
28	People who are confident in themselves and do not want to try.	12	12
29	People determined not to, like me.	13	13
30	people that are not in stress	16	16
31	People who have a strong sense of self need and care about their health	16	16
32	Students with a family history of some sort of health condition that developed from smoking	7	7
32	Honors college students	16	16
33	People who quit smoking a while ago	14	14
33	Nontraditional students	16	16
34	Athletes	4	4
34	Asthmatic students	5	5
34	People who have already given up smoking	14	14
34	Non-smokers	11	11
35	Those who are allergic to cigarettes	5	5
35	I would also include Mormons/members of the Church of Latter Day Saints because I think that their belief system disapproves of the use of all addictive substances/drugs	6	6
35	Tee-totalers	10	10
35	Purists (those who abstain from alcohol and all other drugs)	10	10
36	goody two shoes type people	16	16
37	Anybody in a visible leadership position	16	16
38	those who are most concerned with good grades	16	16

Table 13. Phase 1- Descriptive Norm, Least Likely Cont.

Part.	Illustrative Items	Abbie	Page
40	those who have a strong negative opinion on e-cigs	16	16
42	No one that I can think of	8	8
43	Those without friends that smoke	15	15
44	More educated individuals.	9	9
45	Health students	1	1
45	The Christian club members	6	6
46	Older, more mature students.	2	2
47	People whose friends don't use them.	15	15
48	People with lots of disease caused by smoking in their family	7	7
48	who don't even care for the smell of smoke or vapor.	16	16
49	People who don't already smoke	11	11
50	ROTC	16	16
51	junior and seniors	2	2
52	Students who did not frequently attend parties or gatherings where alcohol or drugs are being used.	10	10
53	Sorority girls	3	3
54	Health conscious people.	17	17
54	Athletes	4	4
59	People who are dedicated to their school work	16	16

When thinking about yourself as a college student, please list any factors or circumstances that would make it **EASY** or **ENABLE** you to try an e-cigarette (even one puff) in the next 30 days.

Table 16. Phase 1- PBC, Enabling Factors Labels

PBC, Enabling Factors Labels

1	Going to a bar
2	Going to a party
3	Being legal
4	Access to places that sell e-cigarettes
5	E-cigarettes access on campus
6	Someone offering samples of e-cigarettes
7	Cost
8	Having friends who use them and offer me one to try
9	Being drunk
10	Nothing
11	Lack of knowledge on the dangers of e-cigarettes
12	A smoker trying to quit real cigarettes
13	Other

Table 17. Phase 1- PBC, Enabling Factors

PBC- Enabling Factors: Inter-Rater Reliability Kappa= .778

Part.	Illustrative Items	Abbie	Page
1	Dickson St scene	1	1
1	Accessibility of parties in a college town	2	2
1	Nationwide trend toward marijuana legalization	13	13
1	Not illegal	3	3
1	Peer pressure	8	8
1	Wanting to fit in and be liked	13	13
2	Being with a group who all has them.	8	8
3	Being places that have them available	4	4
3	Cheap to purchase	7	7
3	Friends having them	8	8
4	A close friend who already uses one	8	8
4	a smoker trying to quit actual cigarettes	12	12
5	Social situations/parties	2	2
5	Availability	4	4
5	Around others who use them	8	8
6	If one of my friends really wanted to show me I'd try it	8	8
7	Parental constraints	13	13
8	None. I hate cigarettes.	10	10
9	Bars	1	1
9	Parties	2	2
9	Being surrounded by people who do it	8	8
10	Going to a party	2	2
10	asking a friend who owns a vape pen	8	8
12	If someone were to share it with others.	8	8
13	The thought that it might not have major health concerns.	11	11
14	Accessibility	4	4
14	inaccurate information	11	11
15	Friends doing it	8	8
15	People around you offering it to you	8	8
16	Going to get one	4	4

Table 15. Phase 1- PBC, Enabling Factors Cont.

Part.	Illustrative Items	Abbie	Page
18	the fact that vape shops are everywhere now	4	4
19	Good	13	13
20	It would be easier if it were offered by a friend.	8	8
21	None	10	10
22	easy to use	13	13
23	Everyone around me smoking	8	8
23	No one else present to discourage the behavior	13	13
24	Lots of kids are smoking them	8	8
25	If one of my good friends had one.	8	8
26	If someone offered a puff.	8	8
27	If a friend offered it to me.	8	8
28	If I had a friend with vape	8	8
29	Knock on my next door neighbor's room in my dorm and ask.	8	8
30	use on campus	5	5
31	The mall kiosks that occasionally show up offering you to try their e-cigs	6	6
31	Friends offering a try one.	8	8
32	The number of individuals around us that smoke e-cigs makes it easily available	8	8
33	If a friend was using one and let me try it.	8	8
34	If one of my friends had one and I wanted a "quick fix".	8	8
34	If one of my friends had one and I was out of cigarettes.	8	8
34	If one of my friends had one and I was in a place where I could not smoke.	8	8
35	Frequenting bars	1	1
35	Partying (drinking alcohol)	2	2
35	Peer influence	8	8
35	Befriending/dating someone who smokes e-cigarettes	8	8
35	Lack of knowledge on the dangers of e-cigarettes/cigarettes	11	11
36	There are shops everywhere in Fayetteville	4	4

Table 15. Phase 1- PBC, Enabling Factors Cont.

Part.	Illustrative Items	Abbie	Page
37	If the university sold them	5	5
38	when someone around me is using one and asked if I wanted to try	8	8
39	If it had cannabis oil inside, I'd probably try it.	13	13
40	parties!!	2	2
41	Nothing	10	10
42	I could go to my friend for a puff	8	8
43	if i was drunk	9	9
44	Easy access	4	4
44	Low prices of e-cigs.	7	7
44	Friends offering e-cigarettes	8	8
45	If there was someone from a store on campus talking to me about the benefits and had samples	6	6
46	If a person was to hand you one it would be easy to smoke one.	6	6
47	Sold on campus	5	5
48	Knowing someone who actively uses e-cigarettes	8	8
49	If someone handed it to me and said "try this"	6	6
50	Level of stress	13	13
51	Hanging around people that smoked e-cigarettes	8	8
51	Living with someone who smoked e-cigarettes	8	8
52	and or having an older friend offer you an e-cigarette make it easier to smoke one	8	8
52	being drunk	9	9
52	Nighttime	13	13
53	If someone had one, and asked if I wanted to try	8	8
54	If one of my friends had one,	8	8
54	but even then I don't think I would try it again.	10	10
59	Being with people who have e-cigarettes and offer it to you	8	8

When thinking about yourself as a college student, please list any factors or circumstances that would make it **DIFFICULT** or **PREVENT** you from try an e-cigarette (even one puff) in the next 30 days.

Table 18. Phase 1- PBC, Preventative Factors Labels

PBC, Preventative Factors Labels	
1	Harmful to Health
2	Lack of knowledge
3	Cost
4	Vape-free Policies
5	Lack of access to e-cigarettes
6	Not hanging around with people who smoke e-cigarettes
7	Not sure/NA
8	Caring what my family and friends think
9	Respect for myself
10	Not going out of my way to buy one.
11	Addiction
12	Other
13	Doesn't make sense

Table 19. Phase 1- PBC, Preventative Factors

PBC- Preventative Factors: Inter-Rater Reliability= .697

Part.	Illustrative Items	Abbie	Page
1	caring about my health	1	1
1	caring what my family and friends think	8	8
1	Respect for myself	9	9
2	Knowing they're not as healthy as they sound.	1	1
2	Being with people who think they're stupid.	8	8
3	Expense	3	3
3	Traveling	5	5
3	Not being near others who have them	6	6
4	health	1	1
4	Morals	9	9
5	Not informed about them	2	2
5	Cost	3	3
5	Maintenance	12	12
6	Just about every ecig commercial puts me off of what they are selling	12	12
7	Students' temptation	12	12
8	I wouldn't even if it was free	3	3
9	Smoke-free campus	4	4
9	Difficult classes that keep me from hanging out with lots of people because I am studying all the time	12	12
9	Not attending parties or bars as much or not at all due to better life choices	12	12
10	the on-campus ban of no smoking	4	4
10	my family not wanting me to	8	8
12	They are expensive	3	3
12	The smell/smoke would be unpleasant to other people around me/you.	12	8
13	I don't want to become addicted or even go near that activity.	11	11
14	I also am not in an environment in which e-cigs are an item	5	5
14	I hate cigarette and I also am a strict advocate of a drug free life.	12	12
16	Not going to get obe	13	13
17	Cost would also be preventative because buying an e-cigarette just to try it when I may not want to continue using it seems like it would be an expensive decision.	3	3
17	If I didn't know anyone who uses an e-cigarette that would prevent me from trying one because I'm not likely to go to the store to buy one just to try it.	6	6
18	I believe it is illegal on campus to use them	4	4

Table 17. Phase 1- PBC, Preventative Factors Cont.

Part.	Illustrative Items	Abbie	Page
20	A lack of access to e-cigarettes	5	5
20	and [lack of] knowledge of what to buy would prevent people from trying e-cigarettes	2	2
21	none	7	7
22	nothing	7	7
23	One friend that would speak up and say no / Comfortable setting: church, home	13	13
24	As a college student you should be using critical thinking skills and skepticisms about everything. Meaning you probably know better than to try them	11	11
25	If few of my friends had them.	13	13
26	Price of e-cigarette	3	3
27	They cost money.	3	3
28	Rules against vaping on campus.	4	4
29	If my RA was in the hallway or checked the rooms.	4	4
30	no use on campus	4	4
31	Being on campus	4	4
32	Knowing that even an e-cigarette is harmful for you.	1	1
32	Also, I have no desire to do anything that is unnecessary and can harm my body	1	1
33	If I had to go to a store and buy/sample one myself.	10	10
34	Lack of access.	5	5
34	I have cigarettes to smoke (assuming a smoking friendly environment).	12	12
35	Knowing the threat e-cigarettes pose to your health	1	1
35	Positive influence from peers/family that encourage abstinence from all tobacco products (including e-cigarettes)	8	8
36	My advisors/professors	8	8
36	my own thoughts	9	9
37	Tobacco free campus policy	4	4
38	knowing my parents would find out	8	8
39	Knowing what they are prevents me from trying them.	12	12
40	not sure	7	7
42	Nothing	7	7
43	if i was not feeling well	12	12
44	Higher prices of e-cigs.	3	3
44	Having harder access to e-cigarettes.	5	5
45	I'm not going to go into a store and go out of my own way for it.	10	10

Table 17. Phase 1- PBC, Preventative Factors Cont.

Part.	Illustrative Items	Abbie	Page
46	It's a tobacco free campus.	4	4
47	Cost	3	3
48	If it was illegal	4	4
48	and I did not know anyone who already had a set-up... that is quite unlikely.	6	6
49	My thoughts on my personal health	1	1
50	Too expensive	3	3
51	hanging around people who didn't smoke	6	6
51	not living with someone who smoked	6	6
52	Having someone offer me a drag of their e-cigarette in the middle of the day.	13	13
53	I don't own one.	10	10
54	They aren't common in my friend group	6	6
54	I wouldn't buy one.	10	10
59	If you don't hang out with people who don't have e-cigarettes, then no one will tempt you to smoke	6	6

Appendix E: Recruitment Letter for PILOT Closed-ended Survey

Multiple Drawings for Participation in E-Cigarette Survey

College students needed for a participation in a survey regarding electronic cigarettes (e-cigarettes). Requirements for participation include current enrollment at the University of Arkansas- Fayetteville and the student must be 18 years of age or older. Survey questions will ask about your attitudes, beliefs, and behaviors regarding e-cigarettes. The survey will last approximately 20-25 minutes. At the duration of the study, participants can enter their instructor's name and their student ID. The researchers will be the only people to see responses, and instructors will only be notified of students' participation for potential extra credit in the respective course. An equal opportunity for extra credit will be offered for students who choose to not participate. Those interested can participate in the survey by clicking on the following link (click here). For questions or further details, please contact Page Daniel Dobbs at pdaniel@uark.edu for more information.

This study *has been approved by the University of Arkansas, Institutional Review Board for Human Studies, Fayetteville, AR (#15-11-280).*

Appendix F: Implied Consent Form: PILOT Closed-ended Survey

Title: Young Adult E-Cigarette Exposure: Implications for Policy and Prevention

Introduction
The purpose of this form is to provide you with information that may affect your decision to participate in this research study. The researchers performing this study can answer all your questions. Read the information below and please feel free to contact the researchers listed below with questions you might have before you decide to participate.

Purpose of the Study
This research study is about electronic cigarettes (e-cigarettes), a battery powered device that delivers aerosolized nicotine and other byproducts without combustion. The purpose of this study is learn about and validate measures that can help explain young adults' attitudes, beliefs, and behaviors regarding e-cigarettes.

What am I going to be asked to do?
If you agree to participate in this study, you will be asked to complete a survey regarding your beliefs and behaviors regarding e-cigarettes. This survey will take approximately 20-25 minutes.

Are the risks involved in this study?
There are no risks involved in this study.

What are the possible benefits of this study?
The possible benefits of participation are a reflection of your behaviors and beliefs regarding e-cigarettes.

Do I have to participate?
No, your participation in this study is voluntary. You may decline to participate or to withdraw from participation at any time. Withdrawal or refusing to participate does not affect your relationship with The University of Arkansas at Fayetteville or the researcher in any way. You can agree to participate now and change your mind later without any penalty.

What if I do not want to participate?
If you do not want to participate, there will be no penalty.

Will there be any compensation?
There will be not compensation for participation in this survey. Students may receive extra credit from their instructor/professor for their participation.

How will my privacy and confidentiality be protected if I participate in this research study?
The use of instructor and student ID will only be used to inform your instructor/professor of your participation. Only the researchers conducting the study will see your responses. Results from the research will be reported as group data and not reported about individuals. Your student ID will be deleted after your instructor/professor is notified of your participation.

Whom to contact with questions about the study?
Prior, during or after your participation you can contact the researcher Page Daniel Dobbs at 479-575-2976 or send an email to pdaniel@uark.edu for any questions or if you feel that you have been harmed. This study has been reviewed and approved by The University Institutional Review Board and the study number is #15-11-280**.**

Whom to contact with questions concerning your rights as a research participant?
For questions or concerns about your rights as a research participant, please contact Ro Windwalker, the University's IRB Coordinator, at (479) 575-2208 or by e-mail at irb@uark.edu. Thanks for your participation!

Implied Consent
By clicking forward to this survey, you are agreeing to participate in the Young Adult E-Cigarette Exposure: Implications for Policy and Prevention Study. By clicking forward, you are acknowledging that you have read the information provided above and you decide to participate in the study. If you later decide that you wish to withdraw your participation in the study, you can leave the study at any time.

Appendix G: E-Cigarette Beliefs & Behaviors PILOT

The first five questions ask for some background information about you.

1. How old are you?
    _____

2. What is your sex?
    a. Male
    b. Female

3. What grade are you in?
    a. Freshman
    b. Sophomore
    c. Junior
    d. Senior
    e. Graduate Student
    f. Law Student

4. Are you Hispanic, Latino/a, or Spanish origin (one or more categories may be selected)?
    a. No, not of Hispanic, Latino, Latina, or Spanish origin
    b. Yes, Mexican, Mexican American, Chicano or Chicana
    c. Yes, Puerto Rican
    d. Yes, Cuban
    e. Yes, Another Hispanic, Latino/a or Spanish origin

5. What race or races do you consider yourself to be? (You can CHOOSE ONE ANSWER or MORE THAN ONE ANSWER)
    a. American Indian or Alaska Native
    b. Asian
    c. Black or African American
    d. Native Hawaiian or Other Pacific Island
    e. White

This section asks about your use of cigarettes.

  6. Have you ever tried a regular cigarettes in your lifetime, even one or two puffs? (*If no, please skip to question 13.*)
      a. Yes
      b. No

12a. How old (in years) were you when you smoked a regular cigarette for the first time? _____

2b. During the past 30 days, on how many days did you smoke a regular cigarettes?
      c. I did not smoke cigarettes in the past 30 days.
      d. 1 or 2 days
      e. 3 to 5 days
      f. 6 to 9 days
      g. 10 to 19 days
      h. 20 to 29 days
      i. All 30 days

This section asks about your use of tobacco.

  7. Which of the following tobacco products have you ever tried, even just one time? (*One or more answer may be selected.*)
      a. Chewing tobacco, snuff, or dip
      b. Roll-your-own cigarettes
      c. Flavored cigarettes, such as Camel Crush
      d. Clove cigars
      e. Flavored little cigars
      f. Smoking tobacco from a hookah or a water pipe
      g. Snus, such as Camel or Marlboro Snus
      h. Dissolvable tobacco products, such as Ariva, Stonewall, Camel orbs, Camel sticks, or Camel strips
      i. Some other new tobacco products not listed here
      j. I have never tried any of the products listed above or any new tobacco product

This section asks about your use of <u>electronic cigarettes</u>, also known as <u>e-cigarettes</u>.
For the sake of this study, e-cigarettes include vapor products such as vape pens, eGos, Mods, and other vaporing devices that vaporize nicotine and/or flavors.

8. Have you ever heard an **electronic cigarette** or **e-cigarette** in your lifetime?
    a. Yes
    b. No

9. At any time during the next 30 days, do you think you will use **e-cigarettes**?
    a. Definitely yes
    b. Probably yes
    c. Probably not
    d. Definitely not

10. Have you ever tried an **electronic cigarette** or **e-cigarette** in your lifetime, even one or two puffs? (*If no, please skip to question 17.*)
    a. Yes
    b. No

16a. What are some of the reasons you used an e-cigarette?

    _____
    _____
    _____

16b. During the past 30 days, on how many days did you use an **e-cigarettes**?
    c. I did not use an **e-cigarettes** in the past 30 days.
    d. 1 or 2 days
    e. 3 to 5 days
    f. 6 to 9 days
    g. 10 to 19 days
    h. 20 to 29 days
    i. All 30 days

16c. How old were you when you tried an **e-cigarette** for the first time?_____

11.   Of which e-cigarette products have you heard? (CHECK ALL THAT APPLY).
       a. I've never heard of any e-cigarette product.
       b. Cig-alikes
       c. Vape pens
       d. eGos
       e. Mods
       f. Other:_____

12.   In your lifetime, which e-cigarettes products have you tried? (CHECK ALL THAT APPLY).
       a. I've never used any e-cigarette product.
       b. Cig-alikes
       c. Vape pens
       d. eGos
       e. Mods
       f. Other:_____

13.   Of which brands of **e-cigarette** have you heard? (CHECK ALL THAT APPLY).
       a. I've never heard of any e-cigarette brands.
       b. E Vape
       c. Blu
       d. Mark 10
       e. ProVari
       f. V2 Cigs
       g. E-Cig
       h. Green smoke
       i. Flo
       j. G-Pen
       k. VaporFi
       l. Mig Vapor
       m. South Beach Smoke
       n. Revolver
       o. Vuse
       p. Bull Smoke
       q. Vapor4life
       r. Whitecloud
       s. Other_____

14.   During your lifetime, what brands of **e-cigarettes** have you used?
       a. I've never used any brand of e-cigarettes.
       b. E Vape
       c. Blu
       d. Mark 10
       e. Provari
       f. V2 Cigs
       g. E-Cig

h.   Green smoke
i.   Flo
j.   G-Pen
k.   VaporFi
l.   Mig Vapor
m.   South Beach Smoke
n.   Revolver
o.   Vuse
p.   Bull Smoke
q.   Vapor4life
r.   Whitecloud
s.   Other_____

15.   If you answered questions 18, which brand do you prefer? Please explain why you prefer this brand of e-cigarette?

_____
_____
_____

16.   Please list 3-5 things that you have heard about e-cigarettes?

_____
_____
_____
_____

17.   Please list 3-5 sources from where you get your information about e-cigarettes?

_____
_____
_____
_____

18.   For the following statements, please select how much you agree or disagree with each statement.

T. I will **relieve stress** as a result of using e-cigarettes in the next 30 days**.**
    Disagree: ___1___:___2___:___3___:___4___:___5___:___6___:___7___: Agree

U. I will **feel more relaxed** as a result of using e-cigarettes in the next 30 days.
    Disagree: ___1___:___2___:___3___:___4___:___5___:___6___:___7___: Agree

V. I will **NOT use regular cigarettes** as a result of using e-cigarettes in the next 30 days.
    Disagree: ___1___:___2___:___3___:___4___:___5___:___6___:___7___: Agree

W. I will **smell good** as a result of using e-cigarettes in the next 30 days.
    Disagree: ___1___:___2___:___3___:___4___:___5___:___6___:___7___: Agree

X. I will **experience a good taste** as a result of using e-cigarettes in the next 30 days.
    Disagree: ___1___:___2___:___3___:___4___:___5___:___6___:___7___: Agree

Y. I will **satisfy a curiosity** as a result of using e-cigarettes in the next 30 days.
    Disagree: ___1___:___2___:___3___:___4___:___5___:___6___:___7___: Agree

Z. I will **fit in/look cool** as a result of using e-cigarettes in the next 30 days.
    Disagree: ___1___:___2___:___3___:___4___:___5___:___6___:___7___: Agree

AA.   I will **cause less harm to my body, compared to a regular cigarettes,** as a result of using e-cigarettes in the next 30 days.
    Disagree: ___1___:___2___:___3___:___4___:___5___:___6___:___7___: Agree

BB.   I will **stay awake and alert** as a result of using e-cigarettes in the next 30 days.
    Disagree: ___1___:___2___:___3___:___4___:___5___:___6___:___7___: Agree

CC.   I will **smoke in public, where I normally could not smoke,** as a result of using e-cigarettes in the next 30 days.
    Disagree: ___1___:___2___:___3___:___4___:___5___:___6___:___7___: Agree

DD.   I will **get addicted to nicotine** as a result of using e-cigarettes in the next 30 days.
    Disagree: ___1___:___2___:___3___:___4___:___5___:___6___:___7___: Agree

EE. I will **use regular cigarettes** as a result of using e-cigarettes in the next 30 days.
    Disagree: ___1___:___2___:___3___:___4___:___5___:___6___:___7___: Agree

FF. I will **more harm to my body, compared to regular cigarettes,** as a result of using e-cigarettes in the next 30 days.
    Disagree: ___1___:___2___:___3___:___4___:___5___:___6___:___7___: Agree

GG.   I will **cause damage to my lungs** as a result of using e-cigarettes in the next 30

days.
Disagree: ___1___:___2___:___3___:___4___:___5___:___6___:___7___: Agree

HH.   I will **experience unknown side effects of e-cigarettes** as a result of using e-cigarettes in the next 30 days.
Disagree: ___1___:___2___:___3___:___4___:___5___:___6___:___7___: Agree

II. I will **feel judged by others who do not approve of smoking** as a result of using e-cigarettes in the next 30 days.
Disagree: ___1___:___2___:___3___:___4___:___5___:___6___:___7___: Agree

JJ. I will **spend money** as a result of using e-cigarettes in the next 30 days.
Disagree: ___1___:___2___:___3___:___4___:___5___:___6___:___7___: Agree

KK.   I will **smell bad** as a result of using e-cigarettes in the next 30 days.
Disagree: ___1___:___2___:___3___:___4___:___5___:___6___:___7___: Agree

LL.I will **experience a bad taste** as a result of using e-cigarettes in the next 30 days.
Disagree: ___1___:___2___:___3___:___4___:___5___:___6___:___7___: Agree

19.   For the following statements, please select how bad or good you believe the statement to be.

T. **Feeling stress relief** is…
    Bad: ___1___:___2___:___3___:___4___:___5___:___6___:___7___: Good

U. **Feeling relaxing** is…
    Bad: ___1___:___2___:___3___:___4___:___5___:___6___:___7___: Good

V. **NOT using regular cigarettes** is…
    Bad: ___1___:___2___:___3___:___4___:___5___:___6___:___7___: Good

W. **Smelling good** is…
    Bad: ___1___:___2___:___3___:___4___:___5___:___6___:___7___: Good

X. **Experiencing a good taste** is…
    Bad: ___1___:___2___:___3___:___4___:___5___:___6___:___7___: Good

Y. **Satisfying a curiosity** is…
    Bad: ___1___:___2___:___3___:___4___:___5___:___6___:___7___: Good

Z. **Fitting in/looking cool** is…
    Bad: ___1___:___2___:___3___:___4___:___5___:___6___:___7___: Good

AA.   **Causing less harm to my body, compared to regular cigarettes,** is…
    Bad: ___1___:___2___:___3___:___4___:___5___:___6___:___7___: Good

BB.   **Staying awake and alert** is…
    Bad: ___1___:___2___:___3___:___4___:___5___:___6___:___7___: Good

CC.   **Smoking in public, where I normally could not smoke** is…
    Bad: ___1___:___2___:___3___:___4___:___5___:___6___:___7___: Good

DD.   **Getting addicted to nicotine** is…
    Bad: ___1___:___2___:___3___:___4___:___5___:___6___:___7___: Good

EE. **Using regular cigarettes** is…
    Bad: ___1___:___2___:___3___:___4___:___5___:___6___:___7___: Good

FF. **Causing more harm to my body, compared to regular cigarettes,** is…
    Bad: ___1___:___2___:___3___:___4___:___5___:___6___:___7___: Good

GG.   **Damaging my lungs** is…
    Bad: ___1___:___2___:___3___:___4___:___5___:___6___:___7___: Good

HH.   **Experiencing unknown side effects of e-cigarettes** are…

Bad: __1__ : __2__ : __3__ : __4__ : __5__ : __6__ : __7__ : Good

II. **Feeling judged by others who do not approve of smoking** is…
Bad: __1__ : __2__ : __3__ : __4__ : __5__ : __6__ : __7__ : Good

JJ. **Spending money** is…
Bad: __1__ : __2__ : __3__ : __4__ : __5__ : __6__ : __7__ : Good

KK. **Smelling bad** is…
Bad: __1__ : __2__ : __3__ : __4__ : __5__ : __6__ : __7__ : Good

LL. **Experiencing a bad taste** is…
Bad: __1__ : __2__ : __3__ : __4__ : __5__ : __6__ : __7__ : Good

20.   For the following statement, please select how much the listed person/s think that you should not or you should smoke an e-cigarette in the next 30 days.

U. **Current smokers** think that_____ use e-cigarettes in the next 30 days.
   I should not: ___1___ : ___2___ : ___3___ : ___4___ : ___5___ : ___6___ : ___7___ : I should

V. **People who already use e-cigarettes** think that_____ use e-cigarettes in the next 30 days.
   I should not: ___1___ : ___2___ : ___3___ : ___4___ : ___5___ : ___6___ : ___7___ : I should

W. **Smokers trying to quit** think that_____ use e-cigarettes in the next 30 days.
   I should not: ___1___ : ___2___ : ___3___ : ___4___ : ___5___ : ___6___ : ___7___ : I should

X. **Fraternity members** think that_____ use e-cigarettes in the next 30 days.
   I should not: ___1___ : ___2___ : ___3___ : ___4___ : ___5___ : ___6___ : ___7___ : I should

Y. **Sorority members** think that_____ use e-cigarettes in the next 30 days.
   I should not: ___1___ : ___2___ : ___3___ : ___4___ : ___5___ : ___6___ : ___7___ : I should

Z. **E-Cigarette, vape and juice shops** think that_____ use e-cigarettes in the next 30 days.
   I should not: ___1___ : ___2___ : ___3___ : ___4___ : ___5___ : ___6___ : ___7___ : I should

AA.   **People trying to "fit in"** think that_____ use e-cigarettes in the next 30 days.
   I should not: ___1___ : ___2___ : ___3___ : ___4___ : ___5___ : ___6___ : ___7___ : I should

BB.   **People at parties** think that_____ use e-cigarettes in the next 30 days.
   I should not: ___1___ : ___2___ : ___3___ : ___4___ : ___5___ : ___6___ : ___7___ : I should

CC.   **My family** thinks that_____ use e-cigarettes in the next 30 days.
   I should not: ___1___ : ___2___ : ___3___ : ___4___ : ___5___ : ___6___ : ___7___ : I should

DD.   **My parents** think that_____ use e-cigarettes in the next 30 days.
   I should not: ___1___ : ___2___ : ___3___ : ___4___ : ___5___ : ___6___ : ___7___ : I should

EE. **My friends** think that_____ use e-cigarettes in the next 30 days.
   I should not: ___1___ : ___2___ : ___3___ : ___4___ : ___5___ : ___6___ : ___7___ : I should

FF. **My religious organization** thinks that_____ smoke e-cigarettes in the next 30 days.
   I should not: ___1___ : ___2___ : ___3___ : ___4___ : ___5___ : ___6___ : ___7___ : I should

GG.   **My mentors (i.e. teachers, coaches, advisors)** think that_____ smoke e-cigarettes in the next 30 days.
   I should not: ___1___ : ___2___ : ___3___ : ___4___ : ___5___ : ___6___ : ___7___ : I should

HH.   **My significant other (boyfriend/girlfriend/fiancé)** thinks that_____ smoke e-cigarettes in the next 30 days.
I should not: ____1___:____2___:___3___:___4___:___5___:___6___:___7___: I should

II. **Health officials (i.e. doctors, nurses)** think that_____ smoke e-cigarettes in the next 30 days.
I should not: ____1___:____2___:___3___:___4___:___5___:___6___:___7___: I should

JJ. **Non-smokers** think that_____ smoke e-cigarettes in the next 30 days.
I should not: ____1___:____2___:___3___:___4___:___5___:___6___:___7___: I should

KK.   **Those who do not use e-cigarettes** think that_____ smoke e-cigarettes in the next 30 days.
I should not: ____1___:____2___:___3___:___4___:___5___:___6___:___7___: I should

LL. **Everyone I know** thinks that_____ smoke e-cigarettes in the next 30 days.
I should not: ____1___:____2___:___3___:___4___:___5___:___6___:___7___: I should

MM.   **My employer/s and colleague/s** think that_____ smoke e-cigarettes in the next 30 days.
I should not: ____1___:____2___:___3___:___4___:___5___:___6___:___7___: I should

NN.   **Health conscious people** think that_____ smoke e-cigarettes in the next 30 days.
I should not: ____1___:____2___:___3___:___4___:___5___:___6___:___7___: I should

21.   For the following statements, please select how much you disagree or agree with the statement.

U. When it comes to matters like using e-cigarettes, I want to do what **current smokers** think I should do.
   Disagree: __1__ : __2__ : __3__ : __4__ : __5__ : __6__ : __7__ : Agree

V. When it comes to matters like using e-cigarettes, I want to do what **people who already use e-cigarettes** think I should do.
   Disagree: __1__ : __2__ : __3__ : __4__ : __5__ : __6__ : __7__ : Agree

W. When it comes to matters like using e-cigarettes, I want to do what **smokers trying to quit** think I should do.
   Disagree: __1__ : __2__ : __3__ : __4__ : __5__ : __6__ : __7__ : Agree

X. When it comes to matters like using e-cigarettes, I want to do what **fraternity members** think I should do.
   Disagree: __1__ : __2__ : __3__ : __4__ : __5__ : __6__ : __7__ : Agree

Y. When it comes to matters like using e-cigarettes, I want to do what **sorority members** think I should do.
   Disagree: __1__ : __2__ : __3__ : __4__ : __5__ : __6__ : __7__ : Agree

Z. When it comes to matters like using e-cigarettes, I want to do what **e-cigarette, vape and juice shops** think I should do.
   Disagree: __1__ : __2__ : __3__ : __4__ : __5__ : __6__ : __7__ : Agree

AA.   When it comes to matters like using e-cigarettes, I want to do what **people trying to "fit in"** think I should do.
   Disagree: __1__ : __2__ : __3__ : __4__ : __5__ : __6__ : __7__ : Agree

BB.   When it comes to matters like using e-cigarettes, I want to do what **people at parties** think I should do.
   Disagree: __1__ : __2__ : __3__ : __4__ : __5__ : __6__ : __7__ : Agree

CC.   When it comes to matters like using e-cigarettes, I want to do what **my family** thinks I should do.
   Disagree: __1__ : __2__ : __3__ : __4__ : __5__ : __6__ : __7__ : Agree

DD.   When it comes to matters like using e-cigarettes, I want to do what **my parents** think I should do.
   Disagree: __1__ : __2__ : __3__ : __4__ : __5__ : __6__ : __7__ : Agree

EE. When it comes to matters like using e-cigarettes, I want to do what **my friends** think I should do.
   Disagree: __1__ : __2__ : __3__ : __4__ : __5__ : __6__ : __7__ : Agree

FF. When it comes to matters like using e-cigarettes, I want to do what **religious organization** thinks I should do.
Disagree: ___1___ : ___2___ : ___3___ : ___4___ : ___5___ : ___6___ : ___7___ : Agree

GG.	When it comes to matters like using e-cigarettes, I want to do what **my mentors (i.e. teachers, coaches, advisors)** think I should do.
Disagree: ___1___ : ___2___ : ___3___ : ___4___ : ___5___ : ___6___ : ___7___ : Agree

HH.	When it comes to matters like using e-cigarettes, I want to do what **my significant other (boyfriend/girlfriend/fiancé)** thinks I should do.
Disagree: ___1___ : ___2___ : ___3___ : ___4___ : ___5___ : ___6___ : ___7___ : Agree

II. When it comes to matters like using e-cigarettes, I want to do what **health officials (i.e. doctors, nurses)** think I should do.
Disagree: ___1___ : ___2___ : ___3___ : ___4___ : ___5___ : ___6___ : ___7___ : Agree

JJ. When it comes to matters like using e-cigarettes, I want to do what **non-smokers** think I should do.
Disagree: ___1___ : ___2___ : ___3___ : ___4___ : ___5___ : ___6___ : ___7___ : Agree

KK.	When it comes to matters like using e-cigarettes, I want to do what **those who do not use e-cigarettes** think I should do.
Disagree: ___1___ : ___2___ : ___3___ : ___4___ : ___5___ : ___6___ : ___7___ : Agree

LL. When it comes to matters like using e-cigarettes, I want to do what **everyone I know** thinks I should do.
Disagree: ___1___ : ___2___ : ___3___ : ___4___ : ___5___ : ___6___ : ___7___ : Agree

MM.	When it comes to matters like using e-cigarettes, I want to do what **my employer/s and colleague/s** think I should do.
Disagree: ___1___ : ___2___ : ___3___ : ___4___ : ___5___ : ___6___ : ___7___ : Agree

NN.	When it comes to matters like using e-cigarettes, I want to do what **health conscious people** think I should do.
Disagree: ___1___ : ___2___ : ___3___ : ___4___ : ___5___ : ___6___ : ___7___ : Agree

22.   For the following statements, please select how false or true you belief the statement to be.

V. **Most fraternity members** will use an e-cigarette in the next 30 days.
   False: __1__ : __2__ : __3__ : __4__ : __5__ : __6__ : __7__ : True

W. **Most sorority members** will use an e-cigarette in the next 30 days.
   False: __1__ : __2__ : __3__ : __4__ : __5__ : __6__ : __7__ : True

X. **Most freshmen** will use an e-cigarette in the next 30 days.
   False: __1__ : __2__ : __3__ : __4__ : __5__ : __6__ : __7__ : True

Y. **Most people who regularly attend parties** will use an e-cigarette in the next 30 days.
   False: __1__ : __2__ : __3__ : __4__ : __5__ : __6__ : __7__ : True

Z. **Most people who drink** will use an e-cigarette in the next 30 days.
   False: __1__ : __2__ : __3__ : __4__ : __5__ : __6__ : __7__ : True

AA.   **Most students who know others who use e-cigarettes** will use an e-cigarette in the next 30 days.
   False: __1__ : __2__ : __3__ : __4__ : __5__ : __6__ : __7__ : True

BB.   **Most people who already smoke cigarettes** will use an e-cigarette in the next 30 days.
   False: __1__ : __2__ : __3__ : __4__ : __5__ : __6__ : __7__ : True

CC.   **Most people who want to "fit in"** will use an e-cigarette in the next 30 days.
   False: __1__ : __2__ : __3__ : __4__ : __5__ : __6__ : __7__ : True

DD.   **Most people with low self-esteem** will use an e-cigarette in the next 30 days.
   False: __1__ : __2__ : __3__ : __4__ : __5__ : __6__ : __7__ : True

EE. **Most people who are stressed** will use an e-cigarette in the next 30 days.
   False: __1__ : __2__ : __3__ : __4__ : __5__ : __6__ : __7__ : True

FF. **Most upperclassmen (i.e. juniors, seniors)** will use an e-cigarette in the next 30 days.
   False: __1__ : __2__ : __3__ : __4__ : __5__ : __6__ : __7__ : True

GG.   **Most pre-professional students (i.e. health related majors)** will use an e-cigarette in the next 30 days.
   False: __1__ : __2__ : __3__ : __4__ : __5__ : __6__ : __7__ : True

HH.   **Most athletes** will use an e-cigarette in the next 30 days.
   False: __1__ : __2__ : __3__ : __4__ : __5__ : __6__ : __7__ : True

II. **Most people with asthma** will use an e-cigarette in the next 30 days.
   False: __1__ : __2__ : __3__ : __4__ : __5__ : __6__ : __7__ : True

JJ. **Most people who are affiliated with religious organizations** will use an e-cigarette in the next 30 days.
False: ___1___:___2___:___3___:___4___:___5___:___6___:___7___: True

KK.   **Most people with a family history of smoking related illness** will use an e-cigarette in the next 30 days.
False: ___1___:___2___:___3___:___4___:___5___:___6___:___7___: True

LL. **Most students who DO NOT regularly attend parties** will use an e-cigarette in the next 30 days.
False: ___1___:___2___:___3___:___4___:___5___:___6___:___7___: True

MM.   **Most students who DO NOT drink alcohol** will use an e-cigarette in the next 30 days.
False: ___1___:___2___:___3___:___4___:___5___:___6___:___7___: True

NN.   **Most people who are more educated** will use an e-cigarette in the next 30 days.
False: ___1___:___2___:___3___:___4___:___5___:___6___:___7___: True

OO.   **Most people who are confident** will use an e-cigarette in the next 30 days.
False: ___1___:___2___:___3___:___4___:___5___:___6___:___7___: True

PP. **Most people who quit smoking cigarettes** will use an e-cigarette in the next 30 days.
False: ___1___:___2___:___3___:___4___:___5___:___6___:___7___: True

23. For the following statements, please select if you do Not At All want to be like or would Very Much want to be like the listed person/s.

V. When it comes to matters of using e-cigarettes, how much do you want to be like **fraternity members**?
Not At All: ___1___:___2___:___3___:___4___:___5___:___6___:___7___: Very Much

W. When it comes to matters of using e-cigarettes, how much do you want to be like **sorority members**?
Not At All: ___1___:___2___:___3___:___4___:___5___:___6___:___7___: Very Much

X. When it comes to matters of using e-cigarettes, how much do you want to be like **freshmen**?
Not At All: ___1___:___2___:___3___:___4___:___5___:___6___:___7___: Very Much

Y. When it comes to matters of using e-cigarettes, how much do you want to be like **people who regularly attend parties**?
Not At All: ___1___:___2___:___3___:___4___:___5___:___6___:___7___: Very Much

Z. When it comes to matters of using e-cigarettes, how much do you want to be like **people who drink**?
Not At All: ___1___:___2___:___3___:___4___:___5___:___6___:___7___: Very Much

AA. When it comes to matters of using e-cigarettes, how much do you want to be like **who know others who use e-cigarettes**?
Not At All: ___1___:___2___:___3___:___4___:___5___:___6___:___7___: Very Much

BB. When it comes to matters of using e-cigarettes, how much do you want to be like **people who already smoke cigarettes**?
Not At All: ___1___:___2___:___3___:___4___:___5___:___6___:___7___: Very Much

CC. When it comes to matters of using e-cigarettes, how much do you want to be like **people who want to "fit in"**?
Not At All: ___1___:___2___:___3___:___4___:___5___:___6___:___7___: Very Much

DD. When it comes to matters of using e-cigarettes, how much do you want to be like **people with low self-esteem**?
Not At All: ___1___:___2___:___3___:___4___:___5___:___6___:___7___: Very Much

EE. When it comes to matters of using e-cigarettes, how much do you want to be like **people who are stressed**?
Not At All: ___1___:___2___:___3___:___4___:___5___:___6___:___7___: Very Much

FF. When it comes to matters of using e-cigarettes, how much do you want to be like **upperclassmen (i.e. juniors, seniors)**?
Not At All: ___1___:___2___:___3___:___4___:___5___:___6___:___7___: Very Much

GG.	When it comes to matters of using e-cigarettes, how much do you want to be like **pre-professional students (i.e. health related majors)**?
Not At All: ___1___:___2___:___3___:___4___:___5___:___6___:___7___: Very Much

HH.	When it comes to matters of using e-cigarettes, how much do you want to be like **athletes**?
Not At All: ___1___:___2___:___3___:___4___:___5___:___6___:___7___: Very Much

II. When it comes to matters of using e-cigarettes, how much do you want to be like **people with asthma**?
Not At All: ___1___:___2___:___3___:___4___:___5___:___6___:___7___: Very Much

JJ. When it comes to matters of using e-cigarettes, how much do you want to be like **people who are affiliated with religious organizations**?
Not At All: ___1___:___2___:___3___:___4___:___5___:___6___:___7___: Very Much

KK.	When it comes to matters of using e-cigarettes, how much do you want to be like **people with a family history of smoking related illness**?
Not At All: ___1___:___2___:___3___:___4___:___5___:___6___:___7___: Very Much

LL.When it comes to matters of using e-cigarettes, how much do you want to be like **students who DO NOT regularly attend parties**?
Not At All: ___1___:___2___:___3___:___4___:___5___:___6___:___7___: Very Much

MM.	When it comes to matters of using e-cigarettes, how much do you want to be like **students who DO NOT drink alcohol**?
Not At All: ___1___:___2___:___3___:___4___:___5___:___6___:___7___: Very Much

NN.	When it comes to matters of using e-cigarettes, how much do you want to be like **students who are more educated**?
Not At All: ___1___:___2___:___3___:___4___:___5___:___6___:___7___: Very Much

OO.	When it comes to matters of using e-cigarettes, how much do you want to be like **students who are confident**?
Not At All: ___1___:___2___:___3___:___4___:___5___:___6___:___7___: Very Much

PP. When it comes to matters of using e-cigarettes, how much do you want to be like **people who want to quit smoking cigarettes**?
Not At All: ___1___:___2___:___3___:___4___:___5___:___6___:___7___: Very Much

24. For the following statements, please select how unlikely or likely you believe it is that you will do the following in the next 30 days.

V. **I will go to a bar** in the next 30 days.
   Unlikely: ___1___:___2___:___3___:___4___:___5___:___6___:___7___: Likely

W. **I will go to a party** in the next 30 days.
   Unlikely: ___1___:___2___:___3___:___4___:___5___:___6___:___7___: Likely

X. **I will go to places that sell e-cigarettes** in the next 30 days.
   Unlikely: ___1___:___2___:___3___:___4___:___5___:___6___:___7___: Likely

Y. **E-cigarette use will be allowed on campus** in the next 30 days.
   Unlikely: ___1___:___2___:___3___:___4___:___5___:___6___:___7___: Likely

Z. **Someone will offer me samples of e-cigarettes** in the next 30 days.
   Unlikely: ___1___:___2___:___3___:___4___:___5___:___6___:___7___: Likely

AA. **E-cigarettes will be cheap** in the next 30 days.
   Unlikely: ___1___:___2___:___3___:___4___:___5___:___6___:___7___: Likely

BB. **I will be around people using e-cigarettes** in the next 30 days.
   Unlikely: ___1___:___2___:___3___:___4___:___5___:___6___:___7___: Likely

CC. **A friend will offer their e-cigarette to me to try** in the next 30 days.
   Unlikely: ___1___:___2___:___3___:___4___:___5___:___6___:___7___: Likely

DD. **I will get drunk** in the next 30 day.
   Unlikely: ___1___:___2___:___3___:___4___:___5___:___6___:___7___: Likely

EE. **I will be stressed** in the next 30 days.
   Unlikely: ___1___:___2___:___3___:___4___:___5___:___6___:___7___: Likely

FF. **E-cigarettes will be expensive** in the next 30 days.
   Unlikely: ___1___:___2___:___3___:___4___:___5___:___6___:___7___: Likely

GG. **I will care about my health** in the next 30 days.
   Unlikely: ___1___:___2___:___3___:___4___:___5___:___6___:___7___: Likely

HH. **It will be illegal to use e-cigarettes on campus** in the next 30 days.
   Unlikely: ___1___:___2___:___3___:___4___:___5___:___6___:___7___: Likely

II. **I will have a lack of access to e-cigarettes** in the next 30 days.
   Unlikely: ___1___:___2___:___3___:___4___:___5___:___6___:___7___: Likely

JJ. **I will not hang around people who smoke e-cigarettes** in the next 30 days.

Unlikely: __1__ : __2__ : __3__ : __4__ : __5__ : __6__ : __7__ : Likely

KK.   **I will care about what my family and friends think** in the next 30 days.
   Unlikely: __1__ : __2__ : __3__ : __4__ : __5__ : __6__ : __7__ : Likely

LL. **I will respect myself** in the next 30 days.
   Unlikely: __1__ : __2__ : __3__ : __4__ : __5__ : __6__ : __7__ : Likely

MM.   **I will not buy an e-cigarette** in the next 30 days.
   Unlikely: __1__ : __2__ : __3__ : __4__ : __5__ : __6__ : __7__ : Likely

NN.   **I will not hang out with people who are partying** in the next 30 days.
   Unlikely: __1__ : __2__ : __3__ : __4__ : __5__ : __6__ : __7__ : Likely

OO.   **I will not hang out with people who are going to bars** in the next 30 days.
   Unlikely: __1__ : __2__ : __3__ : __4__ : __5__ : __6__ : __7__ : Likely

PP. **I will smoke regular cigarettes** in the next 30 days.
   Unlikely: __1__ : __2__ : __3__ : __4__ : __5__ : __6__ : __7__ : Likely

25.   For the following statements, please how much you disagree or agree with each statement.

V. **Going to a bar** would make it easier for me to use e-cigarettes in the next 30 days.
Disagree: ___1___:___2___:___3___:___4___:___5___:___6___:___7___: Agree

W. **Going to a party** would make it easier for me to use e-cigarettes in the next 30 days.
Disagree: ___1___:___2___:___3___:___4___:___5___:___6___:___7___: Agree

X. **Going to places that sell e-cigarettes** would make it easier for me to use e-cigarettes in the next 30 days.
Disagree: ___1___:___2___:___3___:___4___:___5___:___6___:___7___: Agree

Y. **E-cigarette use being allowed on campus** would make it easier for me to use e-cigarettes in the next 30 days.
Disagree: ___1___:___2___:___3___:___4___:___5___:___6___:___7___: Agree

Z. **Someone offering me samples of e-cigarettes** would make it easier for me to use e-cigarettes in the next 30 days.
Disagree: ___1___:___2___:___3___:___4___:___5___:___6___:___7___: Agree

AA.   **E-cigarettes being cheap** would make it easier for me to use e-cigarettes in the next 30 days.
Disagree: ___1___:___2___:___3___:___4___:___5___:___6___:___7___: Agree

BB.   **Being around people who use e-cigarettes** would make it easier for me to use e-cigarettes in the next 30 days.
Disagree: ___1___:___2___:___3___:___4___:___5___:___6___:___7___: Agree

CC.   **A friend offering their e-cigarette to me to try** would make it easier for me to use e-cigarettes in the next 30 days.
Disagree: ___1___:___2___:___3___:___4___:___5___:___6___:___7___: Agree

DD.   **Getting drunk** would make it easier for me to use e-cigarettes in the next 30 days.
Disagree: ___1___:___2___:___3___:___4___:___5___:___6___:___7___: Agree

EE. **Getting stressed** would enable me to use an e-cigarette in the next 30 days.
Disagree: ___1___:___2___:___3___:___4___:___5___:___6___:___7___: Agree

FF. **E-cigarettes being expensive** would make it easier for me to use e-cigarettes in the next 30 days.
Disagree: ___1___:___2___:___3___:___4___:___5___:___6___:___7___: Agree

GG.   **Caring about my health** would make it easier for me to use e-cigarettes in the

next 30 days.
Disagree: ___1__:___2__:___3__:___4__:___5__:___6__:___7___: Agree

HH.   **It being illegal to use e-cigarettes on campus** would make it easier for me to use e-cigarettes in the next 30 days.
Disagree: ___1__:___2__:___3__:___4__:___5__:___6__:___7___: Agree

II. **A lack of access to e-cigarettes** would make it easier for me to use e-cigarettes in the next 30 days.
Disagree: ___1__:___2__:___3__:___4__:___5__:___6__:___7___: Agree

JJ. **Not hanging out with people who use e-cigarettes** would make it easier for me to use e-cigarettes in the next 30 days.
Disagree: ___1__:___2__:___3__:___4__:___5__:___6__:___7___: Agree

KK.   **Caring about what my family and friends think** would make it easier for me to use e-cigarettes in the next 30 days.
Disagree: ___1__:___2__:___3__:___4__:___5__:___6__:___7___: Agree

LL.**Respecting myself** would make it easier for me to use e-cigarettes in the next 30 days.
Disagree: ___1__:___2__:___3__:___4__:___5__:___6__:___7___: Agree

MM.   **Not buying an e-cigarette** would make it easier for me to use e-cigarettes in the next 30 days.
Disagree: ___1__:___2__:___3__:___4__:___5__:___6__:___7___: Agree

NN.   **Not hanging out with people who are partying** would make it easier for me to use e-cigarettes in the next 30 days.
Disagree: ___1__:___2__:___3__:___4__:___5__:___6__:___7___: Agree

OO.   **Not hanging out with people who are going to bars** would make it easier for me to use e-cigarettes in the next 30 days.
Disagree: ___1__:___2__:___3__:___4__:___5__:___6__:___7___: Agree

For the following question, please indicate if you believe that smoking <u>a cigarette</u> should be allowed in the following locations.

26.

	ALLOWED IN ALL AREAS	ALLOWED IN DESIGNATED AREAS	NOT ALLOWED AT ALL
A. Restaurants			
B. Indoor work areas			
C. Bars and cocktail lounges			
D. Indoor sporting events			
E. Indoor shopping malls			
F. Airports			
G. Indoor concerts			
H. Indoor sporting events			
I. Outdoor sporting events			
J. College dorms			
K. On college campuses			

For the following question, please indicate if you believe that smoking <u>an e-cigarette</u> should be allowed in the following locations.

27.

	ALLOWED IN ALL AREAS	ALLOWED IN DESIGNATED AREAS	NOT ALLOWED AT ALL
A. Restaurants			
B. Indoor work areas			
C. Bars and cocktail lounges			
D. Indoor sporting events			
E. Indoor shopping malls			
F. Airports			
G. Indoor concerts			
H. Indoor sporting events			
I. Outdoor sporting events			
J. College dorms			
K. On college campuses			

If you are receiving extra credit for your participation, please include your instructor's name and student ID below.
Instructor's name: _____
Student ID #: _____

Please provide an email address where you would like the researchers to contact you if you are drawn for a $50 Walmart gift card.
Email address: _____

Appendix H: Results E-Cigarette Beliefs & Behaviors PILOT

The first five questions ask for some background information about you.

1. What is your sex?
   - Male   17 (34.7%)
   - Female   32 (65.3%)

2. How old are you?

Mean= 21.94	Median= 21	Mode=21
Std. Deviation= 2.764	Minimum= 19	Maximum=34

3. What grade are you in?
   - Freshman   0   (0%)
   - Sophomore   7 (14.3%)
   - Junior   10 (20.4%)
   - Senior   27 (55.1%)
   - Graduate Student   5 (10.2%)
   - Law Student   0   (0%)

4. Are you Hispanic, Latino/a, or Spanish origin (one or more categories may be selected)?
   - No, not of Hispanic, Latino, Latina, or Spanish origin   43 (87.8%)
   - Yes, Mexican, Mexican American, Chicano or Chicana   3   (6.1%)
   - Yes, Puerto Rican   1   (2.0%)
   - Yes, Cuban   0   (0.0%)
   - Yes, Another Hispanic, Latino/a or Spanish origin   3   (6.1%)

5. What race or races do you consider yourself to be? (You can CHOOSE ONE ANSWER or MORE THAN ONE ANSWER)
   - American Indian or Alaska Native   1   (2.0%)
   - Asian   1   (2.0%)
   - Black or African American   5   (10.2%)
   - Native Hawaiian or Other Pacific Island   0   (0.0%)
   - White   43 (87.8%)

This section asks about your use of cigarettes.

6. Have you ever tried a regular cigarettes in your lifetime, even one or two puffs? (*If no, please skip to question 13.*)

Yes   28 (57.1%)
No   21 (42.9%)

6a. How old (in years) were you when you smoked a regular cigarette for the first time?

Mean= 18   Median= 18   Mode= 18
Std. Deviation= 2.449   Minimum= 14   Maximum= 24

6b. During the past 30 days, on how many days did you smoke a regular cigarettes?

I did not smoke cigarettes in the past 30 days.	22 (44.9%)
1 or 2 days	3 (6.1%)
3 to 5 days	2 (4.1%)
6 to 9 days	0 (0.0%)
10 to 19 days	1 (2.0%)
20 to 29 days	0 (0.0%)
All 30 days	0 (0.0%)
Missing	21 (42.9%)

This section asks about your use of tobacco.

7. Which of the following tobacco products have you ever tried, even just one time? (*One or more answer may be selected.*)

Chewing tobacco, snuff, or dip	11 (22.4%)
Roll-your-own cigarettes	3 (6.1%)
Flavored cigarettes, such as Camel Crush	14 (28.6%)
Clove cigars	1 (2.0%)
Flavored little cigars	18 (36.7%)
Smoking tobacco from a hookah or a water pipe	23 (46.9%)
Snus, such as Camel or Marlboro Snus	8 (16.3%)
Dissolvable tobacco products, such as Ariva, Stonewall, Camel orbs, Camel sticks, or Camel strips	0 (0.0%)
Some other new tobacco products not listed here	2 (4.1%)
I have never tried any of the products listed above or Any new tobacco product	18 (36.7%)

This section asks about your use of <u>electronic cigarettes</u>, also known as <u>e-cigarettes</u>.
For the sake of this study, e-cigarettes include vapor products such as vape pens, eGos, Mods, and other vaporing devices that vaporize nicotine and/or flavors.

8. Have you ever heard an **electronic cigarette** or **e-cigarette** in your lifetime?
   - Yes   38 (77.6%)
   - No   11 (22.4%)

9. At any time during the next 30 days, do you think you will use **e-cigarettes**?
   - Definitely yes   0 (0.0%)
   - Probably yes   0 (0.0%)
   - Probably not   5 (10.2%)
   - Definitely not   44 (89.8%)

10. Have you ever tried an **electronic cigarette** or **e-cigarette** in your lifetime, even one or two puffs? (*If no, please skip to question 17.*)
    - Yes   18 (36.7%)
    - No   31 (63.3%)

10a.   What are some of the reasons you used an e-cigarette?

Theme	Axial Code	Participant	Quote
Peer Pressure	Friend offered	04	My friend had one
		06	My friend asked me to try it.
		13	With my buddies
		19	One person wanted me to try it-
		20	with friends
		21	Friend offered and
		22	Friends encouraged me to try
		24	If I'm out with friends.
		26	No reason, my friend had one
Curiosity	Experimentation	04	and I just tried one puff of it
		11	To taste it
		13	And I had never tried one before.
		15	A friend told me it was like an "e-hookah", and it was similar to smoking hookah. I tried it and
		17	Tried it
		21	I was curious
		26	and I took one puff to see what all the hype is about
Theme	Axial Code	Participant	Quote
		30	to "try it"

		32	Experimentation
		36	It was new
Flavors	Flavor tasted good	04	Because they said the flavor was nice.
		15	It tasted good but not something I would like to use frequently.
		19	said the flavor tasted good
		28	When the new vape pens came out I just thought it was flavored vapor
		36	and the different taste were a nice plus
		45	Because some taste good, ex. watermelon, strawberry, cotton candy flavors
Inebriated	Drunk/Drinking	13	Drunk at a party
			Use when drinking
			While drinking
Alternative to Cigarettes	Better Option than real cigarettes	24	I normally find myself with a real cigarette, so I thought this would be a better option
Other	Do not use	42	I do not use an e-cigarette

10b. During the past 30 days, on how many days did you use an **e-cigarettes**?

I did not use an **e-cigarettes** in the past 30 days.   17 (34.7%)
1 or 2 days   1 (2.0%)
3 to 5 days   0 (0.0%)
6 to 9 days   0 (0.0%)
10 to 19 days   0 (0.0%)
20 to 29 days   0 (0.0%)
All 30 days   0 (0.0%)
Missing   31 (63.3%)

10c. How old were you when you tried an **e-cigarette** for the first time?

Mean= 19.89   Median= 20.0   Mode= 20.0
Std. Deviation= 2.763   Minimum= 17   Maximum= 30

11. Of which e-cigarette products have you heard? (CHECK ALL THAT APPLY).

I've never heard of any e-cigarette product.	10 (20.4%)
Cig-alikes	4 (8.2%)
Vape pens	37 (75.5%)
eGos	2 (4.1%)
Mods	4 (8.2%)

12. In your lifetime, which e-cigarettes products have you tried? (CHECK ALL THAT APPLY).

I've never used any e-cigarette product.	27 (55.1%)
Cig-alikes	2 (4.1%)
Vape pens	17 (34.7%)
eGos	1 (2.0%)
Mods	1 (2.0%)

13. Of which brands of **e-cigarette** have you heard? (CHECK ALL THAT APPLY).

I've never heard of any e-cigarette brands.	13 (26.5%)
E Vape	20 (40.8%)
Blu	17 (34.7%)
Mark 10	1 (2.0%)
ProVari	0 (0.0%)
V2 Cigs	5 (10.2%)
E-Cig	23 (46.9%)
Green smoke	1 (2.0%)
Flo	2 (4.1%)
G-Pen	10 (20.4%)
VaporFi	2 (4.1%)
Mig Vapor	0 (0.0%)
South Beach Smoke	0 (0.0%)
Revolver	1 (2.0%)
Vuse	5 (10.2%)
Bull Smoke	0 (0.0%)
Vapor4life	7 (14.3%)
Whitecloud	1 (2.0%)

14. During your lifetime, what brands of **e-cigarettes** have you used?

I've never used any brand of e-cigarettes.	27 (55.1%)
E Vape	7 (14.3%)
Blu	5 (10.2%)
Mark 10	0 (0.0%)
ProVari	1 (2.0%)
V2 Cigs	1 (2.0%)
E-Cig	4 (8.2%)
Green smoke	0 (0.0%)
Flo	0 (0.0%)

Brand		
G-Pen	3	(6.1%)
VaporFi	0	(0.0%)
Mig Vapor	0	(0.0%)
South Beach Smoke	0	(0.0%)
Revolver	0	(0.0%)
Vuse	1	(2.0%)
Bull Smoke	0	(0.0%)
Vapor4life	0	(0.0%)
Whitecloud	0	(0.0%)

15. If you answered questions 18, which brand do you prefer? Please explain why you prefer this brand of e-cigarette?

Brand	Reason	Participant	Quote
No preference		04	I don't think I have preferred kind, because I do not smoke. I just tried one puff and it seemed kinda pointless.
		06	I don't prefer any but my friend had his and it was an e-cig so that is the one that I tried.
		17	Just tried
		18	I do not prefer any of these brands.
		22	I'm not entirely sure what I tried, but I've only smoked e-cigarettes a couple times.
		26	I do not use e-cigarettes
		28	I only tried it once so I don't prefer any of them
		30	No not "prefer" any, just wanted to try it
		32	Do not prefer any
		42	I don't use an e-cigarette
		45	Best brand
G-Pen	hurt my lungs	13	The G-pen didn't as bad so I would prefer that.
E-Vape	Only tried	15	I've only tried the e-vape once.
E-Cigs or Vape Pens	Availability	20	E cigs or vape pens because there the most around
blu	Accessibility	24	Easily accessible

16. Please list 3-5 things that you have heard about e-cigarettes?

Theme	Axial Code	Part	Quote
Avoid Smoke-Free Policies			
	Can Use Anywhere	02	People switched so they can smoke inside
		04	You can smoke them inside of public places
		13	Can use anywhere because the vapor goes away.
		24	You can use them virtually anywhere
		30	places accept it over regular cigarettes
		32	Flavors
		43	They are likely to be allowed in public whereas regular are not.
Flavors are Attractive			
	Flavors	02	They are flavored
		09	They have appealing flavors.
		48	flavored
	Taste good	10	taste good
		45	taste good
	Different Flavors	11	There are so many different flavors of juice.
		20	you can get them in different flavors
		27	I have heard that they have different flavorings.
		29	That they come in different flavors.
		43	You can purchase different flavors.
	Taste better than cigarettes	04	The flavor is better
		46	They taste better.
		19	I have heard that they taste better.
		49	Taste better
Less Harm Than Cigarettes			
	No harm	10	aren't harmful
		23	They are safe.
		29	That they weren't harmful to your body.
	No tobacco	15	I've also heard some do not contain any tobacco products,
	Healthier Than Cigarettes	01	All I know is people use e-cigarettes because it is not as toxic as regular cigarettes.
		02	"They are better for you"
		03	safer than regular cigarettes

		05	They are supposed to be better for you than regular cigarettes
		06	They aren't as bad for you as cigarettes.
		07	I have heard that they are better than smoking a real cigarette because they don't create the bad smell when you exhale.
		15	I have heard that they are a safer alternative to regular cigarettes,
		18	It is better than the traditional e-cigarettes. it is healthier for the smoker
		22	People say they're supposed to be better for you than real cigarettes.
		23	They are better for you than cigarettes,
		24	They are better than real cigarettes
		26	better for you than regular cigarettes
		27	I have heard that they are less harmful than cigarettes.
		29	That e-cigarettes are better than smoking real cigarettes.
		30	healthier for you
		31	better than real cigarettes
		32	Healthier
		33	They are healthier than regular cigarettes
		35	better than cigarettes
		37	are not as bad as normal cigs
		38	they have less cancer risk
		40	They are safer than real cigarettes,
		48	they aren't that bad for you
	Less Harm to the lungs	30	less harmful to your lungs
		31	don't hurt lungs
	Not Addictive	33	They are not addictive
Health Concern			
	Cause disease	12	May not occur to cancer but it can be heart disease, heart attack, stroke, and other ailments.
		13	They are just as bad for you as cigarettes.
		17	Cause disease
		19	there bad for you
		40	they are still bad for your health

More dangerous than cigarettes	07	I also heard that they are worse than a real cigarette, and that they have more chemicals in them.
	16	They are more dangerous than regular cigarettes.
	34	More dangerous,
	46	They're worse for you than regular cigarettes.
	49	Worse than cigs for your health
As dangerous as cigarettes	18	and other research say it can be danger as the traditional e-cigarettes.
	28	They are still tobacco
Harm to lungs	28	They are harsh on the lungs
	37	Cause lung cancer,
Addiction	12	Addiction
	13	They are very high in nicotine.
	16	They are more addictive than regular cigarettes.
	37	addictive,
	40	they are just as addicting,
Uncertainty	08	may be known to cause some health issues but not much is known yet.
	15	I'm not sure I believe either.
	27	I have heard they do not know the full effects of e-cigarettes.

Smoking Cessation

Help stop smoking cigarettes	03	help stop cigarette smoking
	04	They help you to not smoke real cigarettes because the nicotine
	06	They help you start transitioning from smoking cigarettes.
	08	Helped quit smoking.
	09	They're mainly marketed to smokers who are trying to quit, gradually.
	11	They help with reducing the use of cigarettes
	23	they help you quit,
	25	Some people use them to quit smoking
	33	They help you quit
Alternative to smoking	08	A good substitute.

		10	replacement for smoking actual cigarettes
		36	They are a good alternative to smoking
		45	replace cigs
	Does not help you stop smoking	34	and does not help you quit
Cost			
	Expensive	03	expensive
		16	They are more expensive than regular cigarettes.
	Less expensive than cigarettes	22	They're less expensive
		24	They are cheaper
		31	cheaper in long run
		48	they are not as expensive
Other			
	Nothing	39	None
		41	nothing
		14	I don't know anything about e-cigarettes.
		19	Not much else.
		47	I have never smoked an e-cigarette, so I have never been interested about any e-cigarette product.
	No Unpleasant Smell	26	not smelly
		32	No Smell
		38	They have no unpleasant smell,
	Convenience	22	They're easier to use.
		26	more convenient
	Cleaner	46	They're less messy.
		49	Cleaner
	Different nicotine amounts	20	you can get them in different nicotine amounts
		25	Some have nicotine, some don't
	Not regulated by the FDA	25	They are not regulated
		34	not federal approved,
	Water Vapor	30	water vapor
		45	Water vapor
	Other	06	Some of them used oil.

	09	They're a fad (more observational)
	11	People like to use them just to have something to do
	12	change mood
	17	Bad
	17	Don't work
	28	They are not good
	36	They could possibly cause phenomena or other urgent side effects
	36	They e-cig business is gaining popularity
	42	They're rechargeable
	42	Some Vapors are electric
	42	E-cigarettes work towards a cleaner environment
	43	They come in different sizes

17. Please list 3-5 sources from where you get your information about e-cigarettes?

Theme	Axial Code	Part	Quote
Advertisement			
		01	Advertising.
		03	advertisement
		12	store ads
		24	Flyers
		27	Other advertising
		30	road signs/billboards
		33	Advertisements
		37	ads
		42	Ad
		45	advertising
	Commercials	11	commercials
		15	Some commercials too but I don't pay too much attention to them.
		16	Commercials.
		34	TV commercials,
		36	commercials
		42	Commercials
	Gas stations	03	at gas stations
		25	advertising at gas stations

	Radio	25	Radio ads
		40	Radio,
	Internet	29	Internet pop ups.
Peers			
	Friends	02	Friends
		02	College students
		04	Friends
		06	and friends
		08	Friends
		09	My boyfriend's friends
		10	friends
		11	Friends
		13	friends who use them daily
		15	Just friends,
		16	My friend uses them.
		20	friends mostly
		22	Friends,
		24	Friends
		29	Friends.
		33	Friends
		37	friends,
		43	my friends,
		45	friends
		46	Friends who have used them.
	Peers	03	peers
		09	Boys ages 17-22
		09	High School male Track runners
		19	Peers
		24	Colleagues
		30	peers
		42	People who use them
		49	People that use them
	Word of mouth	05	Just what I have heard
		09	Strange men at the airport
		23	Word of mouth,
		31	word of mouth
		32	What I've heard and seen from people
		36	word of mouth
		38	Word of mouth
		40	word of mouth

		48	word of mouth
Vape Stores			
		06	vape stores,
		13	E-cig shop,
		20	vape shops
		31	at store
Media			
	Media	08	Media
		26	media
	Television	03	television
		04	TV
		19	TV
		22	TV
		23	television,
		27	Television
		30	television
		37	TV,
		40	Television,
		45	TV
		46	T.V.
		49	Television
	News	07	The news
		16	News.
		17	News
		35	news
		36	just regular readings of the news
	Magazine	07	And magazines.
	Movies	23	movies
	Social media	03	social media
		04	Friends
		07	I have seen things about e-cigs on twitter,
		27	Social Media
		29	Social media news feed.
	Internet	08	Internet
		10	internet
		11	internet
		12	internet sources
		13	Internet,
		19	Internet
		20	internet

		31	internet
		33	Internet
		34	Internet
		43	online
		46	Online
		49	Online
Family			
	Relatives	10	relatives
		43	My dad (he's a tobacco buyer for Sam's club/Walmart),
Education			
	School	12	From school
		18	Foundation of Public Health Class.
		25	health talks in my school
		34	teachers,
	Online Health Source	18	Researches of CDC.
		18	Some research about WHO.
	Articles	17	Online Article
		22	articles,
		30	online news articles
Other			
	Nothing	28	I don't get information about e cigarettes
		39	N/A
		41	nothing
		47	I do not know anything about e-cigarettes. I have heard of them but I have never smoked one.

18. For the following statements, please select how much you agree or disagree with each statement.

I will _____ as a result of using e-cigarettes in the next 30 days.

Disagree: __-3__ : __-2__ : __-1__ : __0__ : __1__ : __2__ : __3___ : Agree

	N	Mean	Median	Mode	Std. D	Min	Max
Relieve stress	49	-2.78	-3.00	-3	.872	-3	2
Feel more relaxed	48	-2.73	-3.00	-3	1.047	-3	3
NOT use regular cigarettes	49	-1.33	-3.00	-3	2.453	-3	3
Smell good	49	-2.27	-3.00	-3	1.524	-3	3
Experience a good taste	49	-2.18	-3.00	-3	1.629	-3	3
Satisfy a curiosity	49	-2.27	-3.00	-3	1.765	-3	3
Fit in/look cool	48	-2.58	-3.00	-3	1.252	-3	3
Cause less harm to my body, compared to a regular cigarettes,	49	-1.71	-3.00	-3	2.102	-3	3
Stay awake and alert	48	-2.60	-3.00	-3	1.067	-3	2
Smoke in public, where I normally could not smoke,	49	-2.24	-3.00	-3	1.797	-3	3
Get addicted to nicotine	49	-1.92	-3.00	-3	1.977	-3	3
Use regular cigarettes	49	-2.41	-3.00	-3	1.606	-3	3
Cause more harm to my body, compared to regular cigarettes,	47	-1.85	-3.00	-3	1.956	-3	3
Cause damage to my lungs	49	-1.65	-3.00	-3	2.156	-3	3
Experience unknown side effects	49	-1.71	-3.00	-3	2.111	-3	3
Feel judged by others who do not approve of smoking	49	-1.86	-3.00	-3	2.102	-3	3
Spend money	49	-1.86	-3.00	-3	2.217	-3	3
Smell bad	49	-2.10	-3.00	-3	1.782	-3	3
Experience a bad taste	49	-2.02	-3.00	-3	1.920	-3	3

19. For the following statements, please select how bad or good you believe the statement to be.

_____ is…

Bad: ___1__:___2__:___3__:___4__:___5__:___6__:___7___: Good

	N	Mean	Median	Mode	Std. D	Min	Max
Relieving stress	49	1.96	3.00	3	1.658	-3	3
Relaxing	49	2.27	3.00	3	1.351	-3	3
NOT using regular cigarettes	49	2.31	3.00	3	1.623	-3	3
Smelling good	49	2.41	3.00	3	1.413	-3	3
Experiencing a good taste	49	2.20	3.00	3	1.554	-3	3
Satisfying a curiosity	49	.29	0.00	0	1.744	-3	3
Fitting in/looking cool	49	-.35	0.00	0	1.843	-3	3
Causing less harm to my body, compared to regular cigarettes	48	1.48	2.00	3	1.891	-3	3
Me staying awake and alert	49	2.12	3.00	3	1.424	-3	3
Smoking in public, where I normally could not smoke	49	-1.55	-3.00	-3	1.860	-3	3
Getting addicted to nicotine	49	-2.71	-3.00	-3	.957	-3	2
Using regular cigarettes	49	-2.76	-3.00	-3	.778	-3	1
Causing more harm to my body, compared to regular cigarettes,	47	-2.64	-3.00	-3	1.031	-3	1
Damaging my lungs	49	-2.84	-3.00	-3	.657	-3	0
Experiencing unknown side effects of e-cigarettes	49	-2.78	-3.00	-3	.743	-3	0
Feeling judged by others who do not approve of smoking	49	-1.67	-3.00	-3	1.676	-3	3
Spending money	49	-1.76	-2.00	-3	1.267	-3	0
Smelling bad	49	-2.82	-3.00	-3	.667	-3	0
Experiencing a bad taste	49	-2.73	-3.00	-3	.758	-3	0

20. For the following statement, please select how much the listed person/s think that you should not or you should smoke an e-cigarette in the next 30 days.

_____ think/s that (I should/should not) use e-cigarettes in the next 30 days.

I should not: ___1__ : ___2__ : ___3__ : ___4__ : ___5__ : ___6__ : ___7___ : I should

	N	Mean	Median	Mode	Std. D	Min	Max
Current smokers	49	-1.08	-2.00	-3	1.945	-3	3
People who already use e-cigarettes	49	-.06	0.00	0	2.025	-3	3
Smokers trying to quit think	49	-1.31	-2.00	-3	2.104	-3	3
Fraternity members	49	-.53	0.00	0	2.032	-3	3
Sorority members	49	-1.45	-2.00	-3	1.838	-3	3
E-Cigarette, vape and juice shops	49	1.18	2.00	3	2.195	-3	3
People trying to "fit in"	49	-.08	0.00	0	2.050	-3	3
People at parties	49	-.02	0.00	0	2.077	-3	3
My family	48	-2.50	-3.00	-3	1.321	-3	3
My parents	49	-2.67	-3.00	-3	.899	-3	1
My friends	49	-2.31	-3.00	-3	1.262	-3	2
My religious organization	49	-2.41	-3.00	-3	1.206	-3	2
My mentors (i.e. teachers, coaches, advisors)	48	-2.50	-3.00	-3	1.052	-3	1
My significant other (boyfriend/girlfriend/fiancé)	49	-2.67	-3.00	-3	.801	-3	0
Health officials (i.e. doctors, nurses)	49	-2.71	-3.00	-3	.866	-3	0
Non-smokers	49	-2.65	-3.00	-3	1.032	-3	2
Those who do not use e-cigarettes	49	-2.51	-3.00	-3	1.063	-3	0
Everyone I know	49	-2.20	-3.00	-3	1.136	-3	0
My employer and colleagues	49	-2.35	-3.00	-3	1.110	-3	0
Health conscious people	49	-2.71	-3.00	-3	.764	-3	0

21. For the following statements, please select how much you disagree or agree with the statement.

When it comes to matters like using e-cigarettes, I want to do what _____ think/s I should do.

Disagree: __1__:__2__:__3__:__4__:__5__:__6__:__7__: Agree

	N	Mean	Median	Mode	Std. D	Min	Max
Current smokers	49	-2.71	-3.00	-3	.816	-3	0
People who already use e-cigarettes	49	-2.65	-3.00	-3	.903	-3	0
Smokers trying to quit think	49	-1.43	-3.00	-3	2.160	-3	3
Fraternity members	49	-2.53	-3.00	-3	1.260	-3	3
Sorority members	49	-2.22	-3.00	-3	1.636	-3	3
E-Cigarette, vape and juice shops	49	-2.67	-3.00	-3	.851	-3	0
People trying to "fit in"	49	-2.61	-3.00	-3	1.037	-3	1
People at parties	49	-2.47	-3.00	-3	1.192	-3	2
My family	48	1.02	3.00	3	2.547	-3	3
My parents	49	1.41	3.00	3	2.336	-3	3
My friends	48	.83	1.00	3	2.206	-3	3
My religious organization	49	.65	1.00	3	2.341	-3	3
My mentors (i.e. teachers, coaches, advisors)	49	.86	1.00	3	2.227	-3	3
My significant other (boyfriend/girlfriend/fiancé)	49	1.35	3.00	3	2.175	-3	3
Health officials (i.e. doctors, nurses)	49	1.76	3.00	3	2.006	-3	3
Non-smokers	48	.69	1.00	3	2.214	-3	3
Those who do not use e-cigarettes	48	.10	0.00	-3	2.434	-3	3
Everyone I know	48	-.21	0.00	-3	2.173	-3	3
My employer and colleagues	49	.39	0.00	3	2.206	-3	3
Health conscious people	49	1.10	2.00	3	2.094	-3	3

22. For the following statements, please select how false or true you belief the statement to be.

_____ will use an e-cigarette in the next 30 days.

False: ___1__ : ___2__ : ___3__ : ___4__ : ___5__ : ___6__ : ___7___ : True

	N	Mean	Median	Mode	Std. D	Min	Max
Most fraternity members	48	.08	0.00	0	1.944	-3	3
Most sorority members	49	-1.00	-1.00	-3	1.915	-3	3
Most freshman	49	-.16	0.00	0	1.897	-3	3
Most people who regularly attend parties	49	.10	0.00	1	2.054	-3	3
Most people who drink	49	.08	0.00	1	1.902	-3	3
Most students who know others who use e-cigarettes	49	.35	0.00	0	1.798	-3	3
Most people who already smoke cigarettes	49	.61	1.00	0	1.913	-3	3
Most people who want to "fit in"	49	.27	0.00	0	1.890	-3	3
Most people with low self-esteem	49	0.00	0.00	0	1.768	-3	3
Most people who are stressed	49	.43	0.00	0	1.708	-3	3
Most upperclassmen (i.e. juniors, seniors)	49	-.51	0.00	0	1.721	-3	3
Most pre-professional students (i.e. health related majors)	49	-1.65	-2.00	-3	1.665	-3	3
Most athletes	49	-1.61	-2.00	-3	1.579	-3	3
Most people with asthma	49	-2.20	-3.00	-3	1.414	-3	3
Most people who are affiliated with religious organizations	49	-1.67	-2.00	-3	1.463	-3	3
Most people with a family history of smoking related illness	49	-1.00	-1.00	-3	1.708	-3	3
Most students who DO NOT regularly attend parties	49	-1.22	-2.00	-3	1.771	-3	3
Most students who DO NOT drink alcohol	49	-1.29	-2.00	-3	1.720	-3	3
Most people who are more educated	49	-1.20	-2.00	-3	1.732	-3	3
Most people who are confident	49	-1.33	-1.00	-3	1.586	-3	3
Most people who quit smoking cigarettes	49	-.39	0.00	-3[a]	1.902	-3	3

23. For the following statements, please select if you do Not At All want to be like or would Very Much want to be like the listed person/s.

When it comes to matters of using e-cigarettes, how much do you want to be like _____?

Not At All: ___1__:___2__:___3__:___4__:___5__:___6__:___7___: Very Much

	N	Mean	Median	Mode	Std. D	Min	Max
Most fraternity members	47	-2.49	-3.00	-3	1.266	-3	3
Most sorority members	48	-2.27	-3.00	-3	1.300	-3	2
Most freshman	49	-2.78	-3.00	-3	.685	-3	0
Most people who regularly attend parties	49	-2.45	-3.00	-3	.980	-3	0
Most people who drink	48	-2.35	-3.00	-3	.978	-3	0
Most students who know others who use e-cigarettes	49	-2.45	-3.00	-3	.937	-3	0
Most people who already smoke cigarettes	49	-2.45	-3.00	-3	1.042	-3	0
Most people who want to "fit in"	49	-2.51	-3.00	-3	.960	-3	0
Most people with low self-esteem	49	-2.71	-3.00	-3	.736	-3	0
Most people who are stressed	49	-2.63	-3.00	-3	.929	-3	1
Most upperclassmen (i.e. juniors, seniors)	49	-1.61	-3.00	-3	2.008	-3	3
Most pre-professional students (i.e. health related majors)	49	-.69	-1.00	-3	2.347	-3	3
Most athletes	49	-1.14	-2.00	-3	2.111	-3	3
Most people with asthma	49	-1.55	-3.00	-3	1.980	-3	3
Most people who are affiliated with religious organizations	47	-.53	-1.00	-3	2.321	-3	3
Most people with a family history of smoking related illness	49	-1.41	-3.00	-3	2.130	-3	3
Most students who DO NOT regularly attend parties	49	-1.35	-2.00	-3	1.877	-3	3
Most students who DO NOT drink alcohol	48	-1.04	-1.50	-3	2.000	-3	3
Most people who are more educated	49	-.02	0.00	-3	2.385	-3	3
Most people who are confident	48	-.02	0.00	-3	2.462	-3	3
Most people who quit smoking cigarettes	49	-1.14	-2.00	-3	2.072	-3	3

24. For the following statements, please select how unlikely or likely you believe it is that you will do the following in the next 30 days.

_____ in the next 30 days.

Unlikely: __1__ : __2__ : __3__ : __4__ : __5__ : __6__ : __7___ : Likely

	N	Mean	Median	Mode	Std. D	Min	Max
I will go to a bar	49	.45	1.00	3	2.550	-3	3
I will go to a party	49	.14	0.00	3	2.407	-3	3
I will go to places that sell e-cigarettes	49	-1.86	-3.00	-3	1.926	-3	3
E-cigarette use will be allowed on campus	49	-2.10	-3.00	-3	1.517	-3	3
Someone will offer me samples of e-cigarettes	48	-2.40	-3.00	-3	1.300	-3	2
E-cigarettes will be cheap	49	-2.27	-3.00	-3	1.366	-3	3
I will be around people using e-cigarettes	49	-1.63	-3.00	-3	1.728	-3	3
A friend will offer their e-cigarette to me to try	49	-2.31	-3.00	-3	1.402	-3	2
I will get drunk	48	-.27	0.00	-3	2.403	-3	3
I will be stressed	49	1.63	3.00	3	1.867	-3	3
E-cigarettes will be expensive	49	.02	0.00	0	2.194	-3	3
I will care about my health	49	2.22	3.00	3	1.662	-3	3
It will be illegal to use e-cigarettes on campus	49	.31	0.00	3	2.320	-3	3
I will have a lack of access to e-cigarettes	49	-.86	-2.00	-3	2.300	-3	3
I will not hang around people who smoke e-cigarettes	49	.88	1.00	3	2.223	-3	3
I will care about what my family and friends think	48	2.17	3.00	3	1.667	-3	3
I will respect myself	49	2.45	3.00	3	1.385	-3	3
I will not buy an e-cigarette	49	2.43	3.00	3	1.581	-3	3
I will not hang out with people who are partying	49	-.43	-1.00	-3	2.336	-3	3
I will not hang out with people who are going to bars	49	-.94	-2.00	-3	2.249	-3	3
I will smoke regular cigarettes	49	-2.43	-3.00	-3	1.472	-3	3

25. For the following statements, please how much you disagree or agree with each statement.

_____ would make it easier for me to use e-cigarettes in the next 30 days.

Disagree: ___1__:___2__:___3__:___4__:___5__:___6__:___7___: Agree

	N	Mean	Median	Mode	Std. D	Min	Max
Going to a bar	48	-1.31	-2.50	-3	2.075	-3	3
Going to a party	48	-.85	-1.50	-3	2.352	-3	3
Going to places that sell e-cigarettes	48	-.58	-.50	-3	2.500	-3	3
E-cigarette use being allowed on campus	48	-1.38	-3.00	-3	2.059	-3	3
Someone offering me samples of e-cigarettes	48	-1.19	-3.00	-3	2.160	-3	3
E-cigarettes being cheap	47	-1.45	-3.00	-3	1.976	-3	3
Being around people using e-cigarettes	48	-1.10	-2.50	-3	2.146	-3	3
A friend offering their e-cigarette to me to try	48	-.83	-.50	-3	2.234	-3	3
Getting drunk	48	-1.25	-1.50	-3	1.874	-3	3
Getting stressed	48	-1.75	-3.00	-3	1.732	-3	3
E-cigarettes being expensive	48	-2.29	-3.00	-3	1.443	-3	3
Caring about my health	47	-2.43	-3.00	-3	1.229	-3	2
It being illegal to use e-cigarettes on campus	48	-2.58	-3.00	-3	1.145	-3	2
A lack of access to e-cigarettes	48	-2.50	-3.00	-3	1.185	-3	2
No hanging around people who smoke e-cigarettes	48	-1.96	-3.00	-3	1.868	-3	3
Caring about what my family and friends think	48	-2.15	-3.00	-3	1.571	-3	3
I will respect myself	48	-2.31	-3.00	-3	1.490	-3	3
Not buying an e-cigarette	48	-2.42	-3.00	-3	1.302	-3	3
Not hanging out with people who are partying	48	-2.27	-3.00	-3	1.216	-3	0
Not hanging out with people who are going to bars	48	-2.27	-3.00	-3	1.317	-3	2
Smoking regular cigarettes	48	-1.58	-3.00	-3	1.944	-3	3

For the following question, please indicate if you believe that smoking <u>a cigarette</u> should be allowed in the following locations.

26.	ALLOWED IN ALL AREAS	ALLOWED IN DESIGNATED AREAS	NOT ALLOWED AT ALL	TOTAL
A. Restaurants	0 (0.0%)	8 (16.3%)	40 (81.6%)	48 (100.0%)
B. Indoor work areas	0 (0.0%)	3 (6.1%)	45 (91.8%)	48 (100.0%)
C. Bars and cocktail lounges	2 (4.1%)	22 (44.9%)	24 (49.0%)	48 (100.0%)
D. Indoor sporting events	0 (0.0%)	3 (6.1%)	45 (91.8%)	48 (100.0%)
E. Indoor shopping malls	0 (0.0%)	2 (4.1%)	46 (93.9%)	48 (100.0%)
F. Airports	0 (0.0%)	4 (8.2%)	44 (89.8%)	48 (100.0%)
G. Indoor concerts	0 (0.0%)	6 (12.2%)	42 (85.7%)	48 (100.0%)
H. Indoor sporting events	0 (0.0%)	3 (6.1%)	45 (91.8%)	48 (100.0%)
I. Outdoor sporting events	0 (0.0%)	19 (38.8%)	29 (59.2%)	48 (100.0%)
J. College dorms	0 (0.0%)	4 (8.2%)	44 (89.8%)	48 (100.0%)
K. On college campuses	0 (0.0%)	11 (22.4%)	37 (75.5%)	48 (100.0%)

For the following question, please indicate if you believe that smoking <u>an e-cigarette</u> should be allowed in the following locations.

27.	ALLOWED IN ALL AREAS	ALLOWED IN DESIGNATED AREAS	NOT ALLOWED AT ALL	MISSING
A. Restaurants	3 (6.1%)	10 (20.4%)	35 (71.4%)	48 (100.0%)
B. Indoor work areas	3 (6.1%)	6 (12.2%)	39 (79.6%)	48 (100.0%)
C. Bars and cocktail lounges	6 (12.2%)	22 (44.9%)	20 (40.8%)	48 (100.0%)
D. Indoor sporting events	3 (6.1%)	8 (16.3%)	37 (75.5%)	48 (100.0%)
E. Indoor shopping malls	3 (6.1%)	7 (14.3%)	38 (77.6%)	48 (100.0%)
F. Airports	3 (6.1%)	9 (18.4%)	36 (73.5%)	48 (100.0%)
G. Indoor concerts	3 (6.1%)	11 (22.4%)	34 (69.4%)	48 (100.0%)
H. Indoor sporting events	3 (6.1%)	7 (14.3%)	38 (77.6%)	48 (100.0%)
I. Outdoor sporting events	5 (10.2%)	18 (36.7%)	25 (51.0%)	48 (100.0%)
J. College dorms	3 (6.1%)	5 (10.2%)	40 (81.6%)	48 (100.0%)
K. On college campuses	4 (8.2%)	9 (18.4%)	35 (71.4%)	48 (100.0%)

Appendix I: Recruitment Letter for Closed-ended Survey

Drawings for five $50 Walmart Gift Cards for E-Cigarette Survey

College students needed for a participation in a survey regarding electronic cigarettes (e-cigarettes). Requirements for participation include current enrollment at the University of Arkansas- Fayetteville and the student must be 18 years of age or older. Survey questions will ask about your attitudes, beliefs, and behaviors regarding e-cigarettes. The survey will last approximately 20-25 minutes. At the duration of the study, drawings will be held from the participants in the study for five $50 Walmart gift cards. The participants whose names are drawn will be notified by email. Those interested can participate in the survey by clicking on the following link (click here). For questions or further details, please contact Page Daniel Dobbs at pdaniel@uark.edu for more information.

This study *has been approved by the University of Arkansas, Institutional Review Board for Human Studies, Fayetteville, AR (#15-11-280).*

Title: Young Adult E-Cigarette Exposure: Implications for Policy and Prevention

Introduction

The purpose of this form is to provide you with information that may affect your decision to participate in this research study. The researchers performing this study can answer all your questions. Read the information below and please feel free to contact the researchers listed below with questions you might have before you decide to participate.

Purpose of the Study

This research study is about electronic cigarettes (e-cigarettes), a battery powered device that delivers aerosolized nicotine and other byproducts without combustion. The purpose of this study is learn about and validate measures that can help explain young adults' attitudes, beliefs, and behaviors regarding e-cigarettes.

What am I going to be asked to do?

If you agree to participate in this study, you will be asked to complete a survey regarding your beliefs and behaviors regarding e-cigarettes. This survey will take approximately 20-25 minutes.

Are the risks involved in this study?

There are no risks involved in this study.

What are the possible benefits of this study?

The possible benefits of participation are a reflection of your behaviors and beliefs regarding e-cigarettes.

Do I have to participate?

No, your participation in this study is voluntary. You may decline to participate or to withdraw from participation at any time. Withdrawal or refusing to participate does not affect your relationship with The University of Arkansas at Fayetteville or the researcher in any way. You can agree to participate now and change your mind later without any penalty.

What if I do not want to participate?

If you do not want to participate, there will be no penalty.

Will there be any compensation?

There will be drawings for five $50 Walmart gift cards. Those drawn will be notified via email. Students may receive extra credit from their instructor/professor for their participation.

How will my privacy and confidentiality be protected if I participate in this research study?
The use of your name and email address will be used to provide participants with their Walmart cards. Your identity will not be linked to your responses. Results from the research will be reported as group data and not reported about individuals. Your contact information will be used 30 days following the study, where the participant will have an opportunity to be drawn for the same distribution of gift cards if selected. Drawings after the second survey will not be affected by the first survey. After the second survey, your contact information will be terminated. If extra credit is offered, the use of instructor and student ID will only be used to inform your instructor/professor of your participation. Only the researchers conducting the study will see your responses. Results from the research will be reported as group data and not reported about individuals. Your student ID will be deleted after your instructor/professor is notified of your participation.

Whom to contact with questions about the study?
Prior, during or after your participation you can contact the researcher Page Daniel Dobbs at 479-575-2976 or send an email to pdaniel@uark.edu for any questions or if you feel that you have been harmed. This study has been reviewed and approved by The University Institutional Review Board and the study number is #15-11-280**.**

Whom to contact with questions concerning your rights as a research participant?
For questions or concerns about your rights as a research participant, please contact Ro Windwalker, the University's IRB Coordinator, at (479) 575-2208 or by e-mail at irb@uark.edu. Thanks for your participation!

Implied Consent
By clicking forward to this survey, you are agreeing to participate in the Young Adult E-Cigarette Exposure: Implications for Policy and Prevention Study. By clicking forward, you are acknowledging that you have read the information provided above and you decide to participate in the study. If you later decide that you wish to withdraw your participation in the study, you can leave the study at any time.

Appendix K: E-Cigarette Beliefs & Behaviors Closed-ended Survey FINAL
The first five questions ask for some background information about you.

1. What is your sex?
   a. Male
   b. Female

2. How old are you?
   _____

3. What grade are you in?
   a. Freshman
   b. Sophomore
   c. Junior
   d. Senior
   e. Graduate Student
   f. Law Student

4. Are you Hispanic, Latino/a, or Spanish origin? (*One or more categories may be selected.*)
   a. No, not of Hispanic, Latino, Latina, or Spanish origin
   b. Yes, Mexican, Mexican American, Chicano or Chicana
   c. Yes, Puerto Rican
   d. Yes, Cuban
   e. Yes, Another Hispanic, Latino/a or Spanish origin

5. What race or races do you consider yourself to be? (*One or more categories may be selected.*)
   a. American Indian or Alaska Native
   b. Asian
   c. Black or African American
   d. Native Hawaiian or Other Pacific Island
   e. White

6. Do you consider yourself to be a… (*One or more categories may be selected.*)
   b. International student
   c. Veteran
   d. NCAA athlete
   e. Commuter student
   f. Fraternity member
   g. Sorority member
   h. Student with a physical disability
   i. Non-traditional student

This section asks about your use of tobacco.

7. Have you ever tried a regular cigarettes in your lifetime, even one or two puffs?
   a. Yes
   b. No

7a. How old (in years) were you when you smoked a regular cigarette for the first time? _____

7b. During the past 30 days, on how many days did you smoke a regular cigarettes?
   a. I did not smoke cigarettes in the past 30 days.
   b. 1 or 2 days
   c. 3 to 5 days
   d. 6 to 9 days
   e. 10 to 19 days
   f. 20 to 29 days
   g. All 30 days

8. Which of the following tobacco products have you ever tried, even just one time? (*One or more answer may be selected.*)
   a. Chewing tobacco, snuff, or dip
   b. Roll-your-own cigarettes
   c. Flavored cigarettes, such as Camel Crush
   d. Clove cigars
   e. Flavored little cigars
   f. Smoking tobacco from a hookah or a water pipe
   g. Snus, such as Camel or Marlboro Snus
   h. Dissolvable tobacco products, such as Ariva, Stonewall, Camel orbs, Camel sticks, or Camel strips
   i. Some other new tobacco products not listed here
   j. I have never tried any of the products listed above or any new tobacco product

This section asks about your use of <u>electronic cigarettes</u>, also known as <u>e-cigarettes</u>.
For the sake of this study, e-cigarettes include vapor products such as vape pens, eGos, Mods, and other vaporing devices that vaporize nicotine and/or flavors.

9. Have you ever heard an **electronic cigarette** or **e-cigarette**?
   a. Yes
   b. No

10. Have you ever tried an **electronic cigarette** or **e-cigarette** in your lifetime, even one or two puffs? *(Skip pattern to 11 if answered no.)*
   a. Yes
   b. No

10a.   What are some of the reasons you used an e-cigarette?

_____

_____

_____

10b.   During the past 30 days, on how many days did you use an **e-cigarettes**?
   c. I did not use an **e-cigarettes** in the past 30 days.
   d. 1 or 2 days
   e. 3 to 5 days
   f. 6 to 9 days
   g. 10 to 19 days
   h. 20 to 29 days
   i. All 30 days

10c.   How old were you when you tried an **e-cigarette** for the first time?_____

11. Of which e-cigarette products have you heard? (CHECK ALL THAT APPLY).
    a. I've never heard of any e-cigarette product.
    b. Cig-alikes
    c. Vape pens
    d. eGos
    e. Mods
    f. Other:_____

12. In your lifetime, which e-cigarettes products have you tried? (CHECK ALL THAT APPLY).
    a. I've never used any e-cigarette product.
    b. Cig-alikes
    c. Vape pens
    d. eGos
    e. Mods
    f. Other:_____

13. Of which brands of **e-cigarette** have you heard? (CHECK ALL THAT APPLY).
    a. I've never heard of any e-cigarette brands.
    b. E Vape
    c. Blu
    d. Mark 10
    e. ProVari
    f. V2 Cigs
    g. E-Cig
    h. Green smoke
    i. Flo
    j. G-Pen
    k. VaporFi
    l. Mig Vapor
    m. South Beach Smoke
    n. Revolver
    o. Vuse
    p. Bull Smoke
    q. Vapor4life
    r. Whitecloud
    s. Other_____

14. During your lifetime, what brands of **e-cigarettes** have you used?
    a. I've never used any brand of e-cigarettes.
    b. E Vape
    c. Blu
    d. Mark 10
    e. Provari

       f. V2 Cigs
       g. E-Cig
       h. Green smoke
       i. Flo
       j. G-Pen
       k. VaporFi
       l. Mig Vapor
       m. South Beach Smoke
       n. Revolver
       o. Vuse
       p. Bull Smoke
       q. Vapor4life
       r. Whitecloud
       s. Other_____

15. If you answered questions 18, which brand do you prefer? Please explain why you prefer this brand of e-cigarette?

_____
_____
_____

16. Please list 3-5 things that you have heard about e-cigarettes?

_____
_____
_____
_____

17. Please list 3-5 sources from where you get your information about e-cigarettes?

_____
_____
_____
_____

18. For the following statements, please select how much you agree or disagree with each statement.

A. I will **relieve stress** as a result of using e-cigarettes in the next 30 days**.**
    Disagree: __1__ : __2__ : __3__ : __4__ : __5__ : __6__ : __7__ : Agree

B. I will **feel more relaxed** as a result of using e-cigarettes in the next 30 days.
    Disagree: __1__ : __2__ : __3__ : __4__ : __5__ : __6__ : __7__ : Agree

C. I will **cause less harm to my body, compared to a regular cigarettes,** as a result of using e-cigarettes in the next 30 days.
    Disagree: __1__ : __2__ : __3__ : __4__ : __5__ : __6__ : __7__ : Agree

D. I will **stay awake and alert** as a result of using e-cigarettes in the next 30 days.
    Disagree: __1__ : __2__ : __3__ : __4__ : __5__ : __6__ : __7__ : Agree

E. I will **more harm to my body, compared to regular cigarettes,** as a result of using e-cigarettes in the next 30 days.
    Disagree: __1__ : __2__ : __3__ : __4__ : __5__ : __6__ : __7__ : Agree

F. I will **cause damage to my lungs** as a result of using e-cigarettes in the next 30 days.
    Disagree: __1__ : __2__ : __3__ : __4__ : __5__ : __6__ : __7__ : Agree

G. I will **experience unknown side effects of e-cigarettes** as a result of using e-cigarettes in the next 30 days.
    Disagree: __1__ : __2__ : __3__ : __4__ : __5__ : __6__ : __7__ : Agree

H. I will **smell bad** as a result of using e-cigarettes in the next 30 days.
    Disagree: __1__ : __2__ : __3__ : __4__ : __5__ : __6__ : __7__ : Agree

I. I will **experience a bad taste** as a result of using e-cigarettes in the next 30 days.
    Disagree: __1__ : __2__ : __3__ : __4__ : __5__ : __6__ : __7__ : Agree

19. For the following statements, please select how bad or good you believe the statement to be.

A. **Feeling stress relief** is…

    Bad: ___1___ : ___2___ : ___3___ : ___4___ : ___5___ : ___6___ : ___7___ : Good

B. **Feeling relaxing** is…

    Bad: ___1___ : ___2___ : ___3___ : ___4___ : ___5___ : ___6___ : ___7___ : Good

C. **Causing less harm to my body, compared to regular cigarettes,** is…

    Bad: ___1___ : ___2___ : ___3___ : ___4___ : ___5___ : ___6___ : ___7___ : Good

D. **Staying awake and alert** is…

    Bad: ___1___ : ___2___ : ___3___ : ___4___ : ___5___ : ___6___ : ___7___ : Good

E. **Causing more harm to my body, compared to regular cigarettes,** is…

    Bad: ___1___ : ___2___ : ___3___ : ___4___ : ___5___ : ___6___ : ___7___ : Good

F. **Damaging my lungs** is…

    Bad: ___1___ : ___2___ : ___3___ : ___4___ : ___5___ : ___6___ : ___7___ : Good

G. **Experiencing unknown side effects of e-cigarettes** are…

    Bad: ___1___ : ___2___ : ___3___ : ___4___ : ___5___ : ___6___ : ___7___ : Good

H. **Smelling bad** is…

    Bad: ___1___ : ___2___ : ___3___ : ___4___ : ___5___ : ___6___ : ___7___ : Good

I. **Experiencing a bad taste** is…

    Bad: ___1___ : ___2___ : ___3___ : ___4___ : ___5___ : ___6___ : ___7___ : Good

20. For the following statement, please select how much the listed person/s think that you should not or you should smoke an e-cigarette in the next 30 days.

A. **People who already use e-cigarettes** think that_____ use e-cigarettes in the next 30 days.
    I should not: ___1___ : ___2___ : ___3___ : ___4___ : ___5___ : ___6___ : ___7___ : I should

B. **Fraternity members** think that_____ use e-cigarettes in the next 30 days.
    I should not: ___1___ : ___2___ : ___3___ : ___4___ : ___5___ : ___6___ : ___7___ : I should

C. **People trying to "fit in"** think that_____ use e-cigarettes in the next 30 days.
    I should not: ___1___ : ___2___ : ___3___ : ___4___ : ___5___ : ___6___ : ___7___ : I should

D. **People at parties** think that_____ use e-cigarettes in the next 30 days.
    I should not: ___1___ : ___2___ : ___3___ : ___4___ : ___5___ : ___6___ : ___7___ : I should

E. **My parents** think that_____ use e-cigarettes in the next 30 days.
    I should not: ___1___ : ___2___ : ___3___ : ___4___ : ___5___ : ___6___ : ___7___ : I should

F. **My friends** think that_____ use e-cigarettes in the next 30 days.
    I should not: ___1___ : ___2___ : ___3___ : ___4___ : ___5___ : ___6___ : ___7___ : I should

G. **My religious organization** thinks that_____ smoke e-cigarettes in the next 30 days.
    I should not: ___1___ : ___2___ : ___3___ : ___4___ : ___5___ : ___6___ : ___7___ : I should

H. **My mentors (i.e. teachers, coaches, advisors)** think that_____ smoke e-cigarettes in the next 30 days.
    I should not: ___1___ : ___2___ : ___3___ : ___4___ : ___5___ : ___6___ : ___7___ : I should

I. **My significant other (boyfriend/girlfriend/fiancé)** thinks that_____ smoke e-cigarettes in the next 30 days.
    I should not: ___1___ : ___2___ : ___3___ : ___4___ : ___5___ : ___6___ : ___7___ : I should

J. **Health officials (i.e. doctors, nurses)** think that_____ smoke e-cigarettes in the next 30 days.
    I should not: ___1___ : ___2___ : ___3___ : ___4___ : ___5___ : ___6___ : ___7___ : I should

K. **Everyone I know** thinks that_____ smoke e-cigarettes in the next 30 days.
    I should not: ___1___ : ___2___ : ___3___ : ___4___ : ___5___ : ___6___ : ___7___ : I should

L. **My employer/s and colleague/s** think that_____ smoke e-cigarettes in the next 30 days.
    I should not: ___1___ : ___2___ : ___3___ : ___4___ : ___5___ : ___6___ : ___7___ : I should

M. **Health conscious people** think that_____ smoke e-cigarettes in the next 30 days.
    I should not: ___1___ : ___2___ : ___3___ : ___4___ : ___5___ : ___6___ : ___7___ : I should

21. For the following statements, please select how much you disagree or agree with the statement.

A. When it comes to matters like using e-cigarettes, I want to do what **people who already use e-cigarettes** think I should do.
Disagree: __1__ : __2__ : __3__ : __4__ : __5__ : __6__ : __7__ : Agree

B. When it comes to matters like using e-cigarettes, I want to do what **fraternity members** think I should do.
Disagree: __1__ : __2__ : __3__ : __4__ : __5__ : __6__ : __7__ : Agree

C. When it comes to matters like using e-cigarettes, I want to do what **people trying to "fit in"** think I should do.
Disagree: __1__ : __2__ : __3__ : __4__ : __5__ : __6__ : __7__ : Agree

D. When it comes to matters like using e-cigarettes, I want to do what **people at parties** think I should do.
Disagree: __1__ : __2__ : __3__ : __4__ : __5__ : __6__ : __7__ : Agree

E. When it comes to matters like using e-cigarettes, I want to do what **my parents** think I should do.
Disagree: __1__ : __2__ : __3__ : __4__ : __5__ : __6__ : __7__ : Agree

F. When it comes to matters like using e-cigarettes, I want to do what **my friends** think I should do.
Disagree: __1__ : __2__ : __3__ : __4__ : __5__ : __6__ : __7__ : Agree

G. When it comes to matters like using e-cigarettes, I want to do what **religious organization** thinks I should do.
Disagree: __1__ : __2__ : __3__ : __4__ : __5__ : __6__ : __7__ : Agree

H. When it comes to matters like using e-cigarettes, I want to do what **my mentors (i.e. teachers, coaches, advisors)** think I should do.
Disagree: __1__ : __2__ : __3__ : __4__ : __5__ : __6__ : __7__ : Agree

I. When it comes to matters like using e-cigarettes, I want to do what **my significant other (boyfriend/girlfriend/fiancé)** thinks I should do.
Disagree: __1__ : __2__ : __3__ : __4__ : __5__ : __6__ : __7__ : Agree

J. When it comes to matters like using e-cigarettes, I want to do what **health officials (i.e. doctors, nurses)** think I should do.
Disagree: __1__ : __2__ : __3__ : __4__ : __5__ : __6__ : __7__ : Agree

K. When it comes to matters like using e-cigarettes, I want to do what **my employer/s and colleague/s** think I should do.
Disagree: __1__ : __2__ : __3__ : __4__ : __5__ : __6__ : __7__ : Agree

L. When it comes to matters like using e-cigarettes, I want to do what **health conscious people** think I should do.
Disagree: __1__ : __2__ : __3__ : __4__ : __5__ : __6__ : __7__ : Agree

22. For the following statements, please select how false or true you belief the statement to be.

A. **Most fraternity members** will use an e-cigarette in the next 30 days.
   False: ___1___ : ___2___ : ___3___ : ___4___ : ___5___ : ___6___ : ___7___ : True

B. **Most freshmen** will use an e-cigarette in the next 30 days.
   False: ___1___ : ___2___ : ___3___ : ___4___ : ___5___ : ___6___ : ___7___ : True

C. **Most people who regularly attend parties** will use an e-cigarette in the next 30 days.
   False: ___1___ : ___2___ : ___3___ : ___4___ : ___5___ : ___6___ : ___7___ : True

D. **Most people who drink** will use an e-cigarette in the next 30 days.
   False: ___1___ : ___2___ : ___3___ : ___4___ : ___5___ : ___6___ : ___7___ : True

E. **Most students who know others who use e-cigarettes** will use an e-cigarette in the next 30 days.
   False: ___1___ : ___2___ : ___3___ : ___4___ : ___5___ : ___6___ : ___7___ : True

F. **Most people who want to "fit in"** will use an e-cigarette in the next 30 days.
   False: ___1___ : ___2___ : ___3___ : ___4___ : ___5___ : ___6___ : ___7___ : True

G. **Most athletes** will use an e-cigarette in the next 30 days.
   False: ___1___ : ___2___ : ___3___ : ___4___ : ___5___ : ___6___ : ___7___ : True

H. **Most students who DO NOT regularly attend parties** will use an e-cigarette in the next 30 days.
   False: ___1___ : ___2___ : ___3___ : ___4___ : ___5___ : ___6___ : ___7___ : True

I. **Most students who DO NOT drink alcohol** will use an e-cigarette in the next 30 days.
   False: ___1___ : ___2___ : ___3___ : ___4___ : ___5___ : ___6___ : ___7___ : True

J. **Most people who are confident** will use an e-cigarette in the next 30 days.
   False: ___1___ : ___2___ : ___3___ : ___4___ : ___5___ : ___6___ : ___7___ : True

K. **Most people who quit smoking cigarettes** will use an e-cigarette in the next 30 days.
   False: ___1___ : ___2___ : ___3___ : ___4___ : ___5___ : ___6___ : ___7___ : True

23. For the following statements, please select if you do Not At All want to be like or would Very Much want to be like the listed person/s.

A. When it comes to matters of using e-cigarettes, how much do you want to be like **fraternity members**?
    Not At All: ___1___:___2___:___3___:___4___:___5___:___6___:___7___: Very Much

B. When it comes to matters of using e-cigarettes, how much do you want to be like **freshmen**?
    Not At All: ___1___:___2___:___3___:___4___:___5___:___6___:___7___: Very Much

C. When it comes to matters of using e-cigarettes, how much do you want to be like **people who regularly attend parties**?
    Not At All: ___1___:___2___:___3___:___4___:___5___:___6___:___7___: Very Much

D. When it comes to matters of using e-cigarettes, how much do you want to be like **people who drink**?
    Not At All: ___1___:___2___:___3___:___4___:___5___:___6___:___7___: Very Much

E. When it comes to matters of using e-cigarettes, how much do you want to be like **who know others who use e-cigarettes**?
    Not At All: ___1___:___2___:___3___:___4___:___5___:___6___:___7___: Very Much

F. When it comes to matters of using e-cigarettes, how much do you want to be like **people who want to "fit in"**?
    Not At All: ___1___:___2___:___3___:___4___:___5___:___6___:___7___: Very Much

G. When it comes to matters of using e-cigarettes, how much do you want to be like **athletes**?
    Not At All: ___1___:___2___:___3___:___4___:___5___:___6___:___7___: Very Much

H. When it comes to matters of using e-cigarettes, how much do you want to be like **students who DO NOT regularly attend parties**?
    Not At All: ___1___:___2___:___3___:___4___:___5___:___6___:___7___: Very Much

I. When it comes to matters of using e-cigarettes, how much do you want to be like **students who DO NOT drink alcohol**?
    Not At All: ___1___:___2___:___3___:___4___:___5___:___6___:___7___: Very Much

J. When it comes to matters of using e-cigarettes, how much do you want to be like **students who are confident**?
    Not At All: ___1___:___2___:___3___:___4___:___5___:___6___:___7___: Very Much

K. When it comes to matters of using e-cigarettes, how much do you want to be like **people who want to quit smoking cigarettes**?
    Not At All: ___1___:___2___:___3___:___4___:___5___:___6___:___7___: Very Much

24. For the following statements, please select how unlikely or likely you believe it is that you will do the following in the next 30 days.

A. **Someone will offer me samples of e-cigarettes** in the next 30 days.
   Unlikely: ___1___ : ___2___ : ___3___ : ___4___ : ___5___ : ___6___ : ___7___ : Likely

B. **E-cigarettes will be cheap** in the next 30 days.
   Unlikely: ___1___ : ___2___ : ___3___ : ___4___ : ___5___ : ___6___ : ___7___ : Likely

C. **I will be around people using e-cigarettes** in the next 30 days.
   Unlikely: ___1___ : ___2___ : ___3___ : ___4___ : ___5___ : ___6___ : ___7___ : Likely

D. **A friend will offer their e-cigarette to me to try** in the next 30 days.
   Unlikely: ___1___ : ___2___ : ___3___ : ___4___ : ___5___ : ___6___ : ___7___ : Likely

E. **I will care about what my family and friends think** in the next 30 days.
   Unlikely: ___1___ : ___2___ : ___3___ : ___4___ : ___5___ : ___6___ : ___7___ : Likely

F. **I will respect myself** in the next 30 days.
   Unlikely: ___1___ : ___2___ : ___3___ : ___4___ : ___5___ : ___6___ : ___7___ : Likely

G. **I will not buy an e-cigarette** in the next 30 days.
   Unlikely: ___1___ : ___2___ : ___3___ : ___4___ : ___5___ : ___6___ : ___7___ : Likely

25. For the following statements, please select how much you disagree or agree with each statement.

A. **Someone offering me samples of e-cigarettes** would make it easier for me to use e-cigarettes in the next 30 days.
Disagree: ___1___:___2___:___3___:___4___:___5___:___6___:___7___: Agree

B. **E-cigarettes being cheap** would make it easier for me to use e-cigarettes in the next 30 days.
Disagree: ___1___:___2___:___3___:___4___:___5___:___6___:___7___: Agree

C. **Being around people who use e-cigarettes** would make it easier for me to use e-cigarettes in the next 30 days.
Disagree: ___1___:___2___:___3___:___4___:___5___:___6___:___7___: Agree

D. **A friend offering their e-cigarette to me to try** would make it easier for me to use e-cigarettes in the next 30 days.
Disagree: ___1___:___2___:___3___:___4___:___5___:___6___:___7___: Agree

E. **Caring about what my family and friends think** would make it easier for me to use e-cigarettes in the next 30 days.
Disagree: ___1___:___2___:___3___:___4___:___5___:___6___:___7___: Agree

F. **Respecting myself** would make it easier for me to use e-cigarettes in the next 30 days.
Disagree: ___1___:___2___:___3___:___4___:___5___:___6___:___7___: Agree

G. **Not buying an e-cigarette** would make it easier for me to use e-cigarettes in the next 30 days.
Disagree: ___1___:___2___:___3___:___4___:___5___:___6___:___7___: Agree

26. For the following statements, please select how much you strongly disagree or strongly agree with each statement.
   A. I **want** to use e-cigarettes in the next 30 days, just because I want to do it.
      Strongly Disagree: __1__ : __2__ : __3__ : __4__ : __5__ : __6__ : __7__ : Strongly Agree
   B. I **intend** to use e-cigarettes in the next 30 days, just because I want to do it.
      Strongly Disagree: __1__ : __2__ : __3__ : __4__ : __5__ : __6__ : __7__ : Strongly Agree
   C. I **plan** to use e-cigarette in the next 30 days, just because I want to do it.
      Strongly Disagree: __1__ : __2__ : __3__ : __4__ : __5__ : __6__ : __7__ : Strongly Agree
   D. I **am willing** to use e-cigarette in the next 30 days, just because I want to do it.
      Strongly Disagree: __1__ : __2__ : __3__ : __4__ : __5__ : __6__ : __7__ : Strongly Agree

26a. (*If answered b-g on Question 7b, these will show.*)
A. I **want** to use e-cigarettes in the next 30 days, to help me quit smoking cigarettes.
      Strongly Disagree: __1__ : __2__ : __3__ : __4__ : __5__ : __6__ : __7__ : Strongly Agree
B. I **intend** to use e-cigarettes in the next 30 days, to help me quit smoking cigarettes.
      Strongly Disagree: __1__ : __2__ : __3__ : __4__ : __5__ : __6__ : __7__ : Strongly Agree
C. I **plan** to use e-cigarette in the next 30 days, to help me quit smoking cigarettes.
      Strongly Disagree: __1__ : __2__ : __3__ : __4__ : __5__ : __6__ : __7__ : Strongly Agree
D. I **am willing** to use e-cigarette in the next 30 days, to help me quit smoking cigarettes.
      Strongly Disagree: __1__ : __2__ : __3__ : __4__ : __5__ : __6__ : __7__ : Strongly Agree

27. Please select a response that most closely explains your belief.
Me using an e-cigarette in the next 30 days, just because I want to do it is…
   L. Bad: ___1___ : ___2___ : ___3___ : ___4___ : ___5___ : ___6___ : ___7___: Good
   M. Harmful: ___1___ : ___2___ : ___3___ : ___4___ : ___5___ : ___6___ : ___7___: Beneficial
   N. Unnecessary: ___1___ : ___2___ : ___3___ : ___4___ : ___5___ : ___6___ : ___7___: Necessary
   O. Useless: ___1___ : ___2___ : ___3___ : ___4___ : ___5___ : ___6___ : ___7___: Useful
   P. Foolish: ___1___ : ___2___ : ___3___ : ___4___ : ___5___ : ___6___ : ___7___: Wise
   Q. Negative: ___1___ : ___2___ : ___3___ : ___4___ : ___5___ : ___6___ : ___7___: Positive
   R. Stressful: ___1___ : ___2___ : ___3___ : ___4___ : ___5___ : ___6___ : ___7___: Relaxing
   S. Not enjoyable: ___1___ : ___2___ : ___3___ : ___4___ : ___5___ : ___6___ : ___7___: Enjoyable
   T. Unfavorable: ___1___ : ___2___ : ___3___ : ___4___ : ___5___ : ___6___ : ___7___: Favorable
   U. Unpleasant: ___1___ : ___2___ : ___3___ : ___4___ : ___5___ : ___6___ : ___7___: Pleasant
   V. Annoying: ___1___ : ___2___ : ___3___ : ___4___ : ___5___ : ___6___ : ___7___: Pleasing

27a. (*If answered b-g on Question 7b, these will show.)*
Me using an e-cigarette in the next 30 days, to help me quit smoking is…
   A. Bad: ___1___ : ___2___ : ___3___ : ___4___ : ___5___ : ___6___ : ___7___: Good
   B. Harmful: ___1___ : ___2___ : ___3___ : ___4___ : ___5___ : ___6___ : ___7___: Beneficial
   C. Unnecessary: ___1___ : ___2___ : ___3___ : ___4___ : ___5___ : ___6___ : ___7___: Necessary
   D. Useless: ___1___ : ___2___ : ___3___ : ___4___ : ___5___ : ___6___ : ___7___: Useful
   E. Foolish: ___1___ : ___2___ : ___3___ : ___4___ : ___5___ : ___6___ : ___7___: Wise
   F. Negative: ___1___ : ___2___ : ___3___ : ___4___ : ___5___ : ___6___ : ___7___: Positive
   G. Stressful: ___1___ : ___2___ : ___3___ : ___4___ : ___5___ : ___6___ : ___7___: Relaxing
   H. Not enjoyable: ___1___ : ___2___ : ___3___ : ___4___ : ___5___ : ___6___ : ___7___: Enjoyable
   I. Unfavorable: ___1___ : ___2___ : ___3___ : ___4___ : ___5___ : ___6___ : ___7___: Favorable
   J. Unpleasant: ___1___ : ___2___ : ___3___ : ___4___ : ___5___ : ___6___ : ___7___: Pleasant
   K. Annoying: ___1___ : ___2___ : ___3___ : ___4___ : ___5___ : ___6___ : ___7___: Pleasing

28. For the following statements, please indicate how much you strongly disagree or strongly agree with each statement.

M. Most people who are important to me **approve of me using** an e-cigarette in the next 30 days, just because I want to do it.
Strongly Disagree: __1__ : __2__ : __3__ : __4__ : __5__ : __6__ : __7__ : Strongly Agree

N. Most people who are important to me **think I should use** an e-cigarette in the next 30 days, just because I want to do it.
Strongly Disagree: __1__ : __2__ : __3__ : __4__ : __5__ : __6__ : __7__ : Strongly Agree

O. Most people who are important to me **support me using** an e-cigarette in the next 30 days, just because I want to do it.
Strongly Disagree: __1__ : __2__ : __3__ : __4__ : __5__ : __6__ : __7__ : Strongly Agree

P. Most people who are important to me **want me to use** an e-cigarette in the next 30 days, just because I want to do it
Strongly Disagree: __1__ : __2__ : __3__ : __4__ : __5__ : __6__ : __7__ : Strongly Agree

Q. My **closest friends approve of me using** an e-cigarette in the next 30 days, just because I want to do it.
Strongly Disagree: __1__ : __2__ : __3__ : __4__ : __5__ : __6__ : __7__ : Strongly Agree

R. My **closest friends think I should use** an e-cigarette in the next 30 days, just because I want to do it.
Strongly Disagree: __1__ : __2__ : __3__ : __4__ : __5__ : __6__ : __7__ : Strongly Agree

S. My **closest friends support me using** an e-cigarette in the next 30 days, just because I want to do it.
Strongly Disagree: __1__ : __2__ : __3__ : __4__ : __5__ : __6__ : __7__ : Strongly Agree

T. My **closest friends want me to use** an e-cigarette in the next 30 days, just because I want to do it.
Strongly Disagree: __1__ : __2__ : __3__ : __4__ : __5__ : __6__ : __7__ : Strongly Agree

U. Most people like me **will use** e-cigarettes in the next 30 days, just because they want to do it.
Strongly Disagree: __1__ : __2__ : __3__ : __4__ : __5__ : __6__ : __7__ : Strongly Agree

V. Most people like me **will buy** e-cigarettes in the next 30 days, just because they want to do it.
Strongly Disagree: __1__ : __2__ : __3__ : __4__ : __5__ : __6__ : __7__ : Strongly Agree

W. My **closest friends will use e-cigarettes in the next 30 days**, just because they want to do it.
Strongly Disagree: __1__ : __2__ : __3__ : __4__ : __5__ : __6__ : __7__ : Strongly Agree

X. My **closest friends will buy e-cigarettes in the next 30 days**, just because they want to do it.
Strongly Disagree: __1__ : __2__ : __3__ : __4__ : __5__ : __6__ : __7__ : Strongly Agree

28a. (*If answered b-g on Question 7b, these will show.*)

    A. Most people who are important to me **approve of me using** an e-cigarette in the next 30 days, help me quit smoking.
Strongly Disagree: ___1___ : ___2___ : ___3___ : ___4___ : ___5___ : ___6___ : ___7___ : Strongly Agree

    B. Most people who are important to me **think I should use** an e-cigarette in the next 30 days, to help me quit smoking.
Strongly Disagree: ___1___ : ___2___ : ___3___ : ___4___ : ___5___ : ___6___ : ___7___ : Strongly Agree

    C. Most people who are important to me **support me using** an e-cigarette in the next 30 days, to help me quit smoking.
Strongly Disagree: ___1___ : ___2___ : ___3___ : ___4___ : ___5___ : ___6___ : ___7___ : Strongly Agree

    D. Most people who are important to me **want me to use** an e-cigarette in the next 30 days, to help me quit smoking.
Strongly Disagree: ___1___ : ___2___ : ___3___ : ___4___ : ___5___ : ___6___ : ___7___ : Strongly Agree

    E. My **closest friends approve of me using** an e-cigarette in the next 30 days, to help me quit smoking.
Strongly Disagree: ___1___ : ___2___ : ___3___ : ___4___ : ___5___ : ___6___ : ___7___ : Strongly Agree

    F. My **closest friends think I should use** an e-cigarette in the next 30 days, to help me quit smoking.
Strongly Disagree: ___1___ : ___2___ : ___3___ : ___4___ : ___5___ : ___6___ : ___7___ : Strongly Agree

    G. My **closest friends support me using** an e-cigarette in the next 30 days, to help me quit smoking.
Strongly Disagree: ___1___ : ___2___ : ___3___ : ___4___ : ___5___ : ___6___ : ___7___ : Strongly Agree

    H. My **closest friends want me to use** an e-cigarette in the next 30 days, to help me quit smoking.
Strongly Disagree: ___1___ : ___2___ : ___3___ : ___4___ : ___5___ : ___6___ : ___7___ : Strongly Agree

    I. Most people like me **will use e-cigarettes in the next 30 days**, to help me quit smoking.
Strongly Disagree: ___1___ : ___2___ : ___3___ : ___4___ : ___5___ : ___6___ : ___7___ : Strongly Agree

    J. Most people like me **will buy e-cigarettes in the next 30 days**, to help me quit smoking.
Strongly Disagree: ___1___ : ___2___ : ___3___ : ___4___ : ___5___ : ___6___ : ___7___ : Strongly Agree

    K. My **closest friends will use e-cigarettes in the next 30 days**, to help me quit smoking.
Strongly Disagree: ___1___ : ___2___ : ___3___ : ___4___ : ___5___ : ___6___ : ___7___ : Strongly Agree

    L. My **closest friends will buy e-cigarettes in the next 30 days**, to help me quit smoking.
Strongly Disagree: ___1___ : ___2___ : ___3___ : ___4___ : ___5___ : ___6___ : ___7___ : Strongly Agree

29. Please select a response that most closely explains your belief.

Using an e-cigarette in the next 30 days, just because I want to do it, is…

    F. Difficult___1___:___2___:___3___:___4___:___5___:___6___:___7___Easy

    G. Up to me___1___:___2___:___3___:___4___:___5___:___6___:___7___Not Up to Me

    H. Not at all under my control: ___1___:___2___:___3___:___4___:___5___:___6___:___7___: Under my control

    I. I am confident that I can use an e-cigarette, just because I want to do it, in the next 30 days.

       Strongly Disagree: ___1___:___2___:___3___:___4___:___5___:___6___:___7___: Strongly Agree

    J. There are certain necessary things to know about how to put together e-cigarettes before using them. How sure are you that you could learn how to use an e-cigarette, just because you want to do it, in the next 30 days?

       Very Unsure: ___1___:___2___:___3___:___4___:___5___:___6___:___7___Very Sure

29a. (*If answered b-g on Question 7b, these will show.*)

Using an e-cigarette in the next 30 days, to help me quit smoking is…

    A. Difficult___1___:___2___:___3___:___4___:___5___:___6___:___7___Easy

    B. Up to me___1___:___2___:___3___:___4___:___5___:___6___:___7___Not Up to Me

    C. Not at all under my control: ___1___:___2___:___3___:___4___:___5___:___6___:___7___: Under my control

    D. I am confident that I can use an e-cigarette, to help me quit smoking, in the next 30 days.

       False: ___1___:___2___:___3___:___4___:___5___:___6___:___7___True

    E. There are certain necessary things to know about how to put together e-cigarettes before using them. How sure are you that you could learn how to use an e-cigarette, to help you quit smoking, in the next 30 days?

       Very Unsure: ___1___:___2___:___3___:___4___:___5___:___6___:___7___Very Sure

For the following question, please indicate if you believe that smoking <u>a cigarette</u> should be allowed in the following locations.

30.	ALLOWED IN ALL AREAS	ALLOWED IN DESIGNATED AREAS	NOT ALLOWED AT ALL
A. Restaurants			
B. Indoor work areas			
C. Bars and cocktail lounges			
D. Indoor sporting events			
E. Indoor shopping malls			
F. Airports			
G. Indoor concerts			
H. Indoor sporting events			
I. Outdoor sporting events			
J. College dorms			
K. On college campuses			

For the following question, please indicate if you believe that smoking <u>an e-cigarette</u> should be allowed in the following locations.

31.	ALLOWED IN ALL AREAS	ALLOWED IN DESIGNATED AREAS	NOT ALLOWED AT ALL
A. Restaurants			
B. Indoor work areas			
C. Bars and cocktail lounges			
D. Indoor sporting events			
E. Indoor shopping malls			
F. Airports			
G. Indoor concerts			
H. Indoor sporting events			
I. Outdoor sporting events			
J. College dorms			
K. On college campuses			

If you are receiving extra credit for your participation, please include your instructor's name and student ID below.

Instructor's name: _____

Student ID #: _____

Please provide an email address where you would like the researchers to contact you if you are drawn for a $50 Walmart gift card.

Email address: _____

Appendix L: Results E-Cigarette Beliefs & Behaviors Closed-ended Survey
The first five questions ask for some background information about you.

1. What is your sex?

Male	114 (22.5%)
Female	385 (77.2%)
Total	499 (100.0%)

2. How old are you?

Mean= 20.38   Median= 20.00   Mode=19
Std. Deviation= 1.564   Minimum= 18   Maximum=26

18 years	40 (8.0%)
19 years	125 (25.1%)
20 years	120 (24.0%)
21 years	103 (20.6%)
22 years	73 (14.6%)
23 years	21 (4.2%)
24 years	4 (0.8%)
25 years	10 (2.0%)
26 years	3 (0.6%)

3. What grade are you in?

Freshman	113 (22.6%)
Sophomore	130 (26.1%)
Junior	123 (24.6%)
Senior	119 (23.8%)
Graduate Student	13 (2.6%)
Law Student	1 (0.2%)

4. Are you Hispanic, Latino/a, or Spanish origin? (*One or more categories may be selected.*)

No, not of Hispanic, Latino, Latina, or Spanish origin	463 (92.8%)
Yes, Mexican, Mexican American, Chicano or Chicana	21 (4.2%)
Yes, Puerto Rican	2 (0.4%)
Yes, Cuban	2 (0.4%)
Yes, Another Hispanic, Latino/a or Spanish origin	11 (2.2%)

5. What race or races do you consider yourself to be? (*One or more categories may be selected.*)

American Indian or Alaska Native	16 (3.2%)
Asian	17 (3.4%)
Black or African American	34 (6.8%)
Native Hawaiian or Other Pacific Island	1 (0.2%)
White	449 (90.0%)

6. Do you consider yourself to be a… (*One or more categories may be selected.*)

International student	13	(2.6%)
Veteran	2	(0.4%)
NCAA athlete	27	(5.4%)
Commuter student	61	(12.2%)
Fraternity member	45	(9.0%)
Sorority member	255	(51.1%)
Student with a physical disability	2	(0.4%)
Non-traditional student	32	(6.4%)

This section asks about your use of tobacco.

7. Have you ever tried a regular cigarettes in your lifetime, even one or two puffs?

Yes	216 (43.3%)
No	283 (55.7%)
Total	499 (100.0%)

7a. How old (in years) were you when you smoked a regular cigarette for the first time?

Mean= 17.37	Median= 18.0	Mode=18
Std. Deviation= 2.078	Minimum= 9	Maximum=23

7b. During the past 30 days, on how many days did you smoke a regular cigarettes?

I did not smoke cigarettes in the past 30 days	160	(74.1%)
1 or 2 days	30	(13.9%)
3 to 5 days	9	(4.2%)
6 to 9 days	3	(1.4%)
10 to 19 days	8	(3.7%)
20 to 29 days	2	(0.9%)
All 30 days	4	(1.9%)
Total	216	(100.0%)

8. Which of the following tobacco products have you ever tried, even just one time? (*One or more answer may be selected.*)

Chewing tobacco, snuff, or dip	57	(11.4%)
Roll-your-own cigarettes	32	(6.4%)
Flavored cigarettes, such as Camel Crush	107	(21.4%)
Clove cigars	30	(6.0%)
Flavored little cigars	75	(15.0%)
Smoking tobacco from a hookah or a water pipe	136	(27.3%)
Snus, such as Camel or Marlboro Snus	36	(7.2%)
Dissolvable tobacco products, such as Ariva, Stonewall, Camel orbs, Camel sticks, or Camel strips	3	(.06)
Some other new tobacco products not listed here	22	(4.4%)
I have never tried any of the products listed above or any new tobacco product	26	(5.2%)

This section asks about your use of <u>electronic cigarettes</u>, also known as <u>e-cigarettes.</u>
For the sake of this study, e-cigarettes include vapor products such as vape pens, eGos, Mods, and other vaporing devices that vaporize nicotine and/or flavors.

9. Have you ever heard an **electronic cigarette** or **e-cigarette**?
    Yes   458 (91.8%)
    No   41   (8.2%)

10. Have you ever tried an **electronic cigarette** or **e-cigarette** in your lifetime, even one or two puffs? *(Skip pattern to 11 if answered no.)*
    Yes   202 (40.5%)
    No   297 (59.5%)

10b.   During the past 30 days, on how many days did you use an **e-cigarettes**?
    I did not use an **e-cigarettes** in the past 30 days.   170 (34.1%)
    1 or 2 days   20   (4.0%)
    3 to 5 days   4   (0.8%)
    6 to 9 days   0   (0.0%)
    10 to 19 days   1   (0.2%)
    20 to 29 days   1   (0.2%)
    All 30 days   3   (0.6%)

10c.   How old were you when you tried an **e-cigarette** for the first time?
Mean= 18.4   Median= 18.0   Mode=18
Std. Deviation= 1.797   Minimum= 14   Maximum=26

11. Of which e-cigarette products have you heard? (CHECK ALL THAT APPLY).

I've never heard of any e-cigarette product.   63 (12.6%)
Cig-alikes   40 (8.0%)
Vape pens   415 (83.2%)
eGos   41 (8.2%)
Mods   66 (13.2%)
Other: E-cig, Enos, none   3 (.06%)

12. In your lifetime, which e-cigarettes products have you used? (CHECK ALL THAT APPLY).

I've never used any e-cigarette product.   9 (1.8%)
Cig-alikes   14 (2.8%)
Vape pens   158 (31.7%)
eGos   14 (2.8%)
Mods   27 (5.4%)
Other: 14 (2.8%)
    Can't remember
    Don't know
    E-cig
    I am not sure
    I have no clue
    IDK
    No idea
    Not sure of the brand
    Not sure what it was called
    Not sure what it was called
    Unsure

13. Of which brands of **e-cigarette** have you heard? (CHECK ALL THAT APPLY).

I've never heard of any e-cigarette brands.   96 (19.2%)
E Vape   178 (35.7%)
Blu   195 (39.1%)
Mark 10   12 (2.4%)
ProVari   4 (0.8%)
V2 Cigs   20 (4.0%)
E-Cig   297 (59.5%)
Green smoke   7 (1.4%)
Flo   23 (4.6%)
G-Pen   81 (16.2%)
VaporFi   24 (4.8%)
Mig Vapor   4 (0.8%)
South Beach Smoke   3 (0.6%)
Revolver   4 (0.8%)

Vuse   46 (9.2%)
Bull Smoke   2 (0.4%)

Vapor4life   57 (11.4%)
Whitecloud   20   (4.0%)
Other: 4   (0.8%)
    I can't remember
    I don't remember what they were called
    iPV

14. During your lifetime, what brands of **e-cigarettes** have you used?

I've never used any brand of e-cigarettes.	17	(3.4%)
E Vape	33	(6.6%)
Blu	56	(11.2%)
Mark 10	3	(0.6%)
Provari	2	(0.4%)
V2 Cigs	2	(0.4%)
E-Cig	68	(13.6%)
Green smoke	1	(0.2%)
Flo	2	(0.4%)
G-Pen	23	(4.6%)
VaporFi	1	(0.2%)
Mig Vapor	0	(0.0%)
South Beach Smoke	0	(0.0%)
Revolver	1	(0.2%)
Vuse	9	(1.8%)
Bull Smoke	0	(0.0%)
Vapor4life	2	(0.4%)
Whitecloud	0	(0.0%)
Other:	35	(7.0%)
Theme "Can't remember"	23	(4.6%)
Fuchai	1	(0.2%)
Wiztech	1	(0.2%)

18. For the following statements, please select how much you agree or disagree with each statement.

I will _____ as a result of using e-cigarettes in the next 30 days.

Disagree: __-3__ : __-2__ : __-1__ : __0__ : __1__ : __2__ : __3__ : Agree

	N	Mean	Median	Mode	Std.D	Min	Max
Relieve stress	471	-2.67	-3.00	-3.00	1.096	-3.00	3.00
Feel more relaxed	471	-2.62	-3.00	-3.00	1.164	-3.00	3.00
Cause less harm to my body, compared to a regular cigarettes,	469	-1.98	-3.00	-3.00	1.785	-3.00	3.00
Stay awake and alert	470	-2.71	-3.00	-3.00	0.926	-3.00	3.00
Cause more harm to my body, compared to regular cigarettes,	470	-1.70	-3.00	-3.00	1.902	-3.00	3.00
Cause damage to my lungs	470	-0.47	-1.00	-3.00	2.591	-3.00	3.00
Experience unknown side effects	467	-0.84	-2.00	-3.00	2.416	-3.00	3.00
Smell bad	469	-1.17	-3.00	-3.00	2.333	-3.00	3.00
Experience a bad taste	471	-1.07	-3.00	-3.00	2.335	-3.00	3.00

19. For the following statements, please select how bad or good you believe the statement to be.

_____ is…

Bad: ___1__ : ___2__ : ___3__ : ___4__ : ___5__ : ___6__ : ___7___ : Good

	N	Mean	Median	Mode	Std.D	Min	Max
Relieving stress	470	2.15	3.00	3.00	1.496	-3.00	3.00
Relaxing	469	2.26	3.00	3.00	1.399	-3.00	3.00
Causing less harm to my body, compared to regular cigarettes	468	1.46	3.00	3.00	1.994	-3.00	3.00
Me staying awake and alert	470	1.91	3.00	3.00	1.610	-3.00	3.00
Causing more harm to my body, compared to regular cigarettes,	469	-2.29	-3.00	-3.00	1.527	-3.00	3.00
Damaging my lungs	468	-2.79	-3.00	-3.00	0.838	-3.00	3.00
Experiencing unknown side effects of e-cigarettes	470	-2.73	-3.00	-3.00	0.850	-3.00	3.00
Smelling bad	470	-2.71	-3.00	-3.00	0.876	-3.00	3.00
Experiencing a bad taste	468	-2.61	-3.00	-3.00	0.963	-3.00	3.00

20. For the following statement, please select how much the listed person/s think that you should not or you should smoke an e-cigarette in the next 30 days.

_____ think/s that (I should/should not) use e-cigarettes in the next 30 days.

I should not: ___1___ : ___2___ : ___3___ : ___4___ : ___5___ : ___6___ : ___7___ : I should

	N	Mean	Median	Mode	Std.D	Min	Max
People who already use e-cigarettes	459	-0.02	0.00	0.00	2.084	-3.00	3.00
Fraternity members	460	-0.81	0.00	0.00	1.838	-3.00	3.00
People trying to "fit in"	459	-0.46	0.00	-3.00	1.997	-3.00	3.00
People at parties	461	-0.60	0.00	-3.00	1.902	-3.00	3.00
My parents	461	-2.63	-3.00	-3.00	1.132	-3.00	3.00
My friends	462	-2.22	-3.00	-3.00	1.386	-3.00	3.00
My religious organization	462	-2.49	-3.00	-3.00	1.183	-3.00	3.00
My mentors (i.e. teachers, coaches, advisors)	461	-2.59	-3.00	-3.00	1.065	-3.00	3.00
My significant other (boyfriend/girlfriend/fiancé)	460	-2.39	-3.00	-3.00	1.278	-3.00	3.00
Health officials (i.e. doctors, nurses)	461	-2.64	-3.00	-3.00	1.088	-3.00	3.00
My employer and colleagues	461	-2.49	-3.00	-3.00	1.190	-3.00	3.00
Health conscious people	461	-2.66	-3.00	-3.00	1.064	-3.00	3.00

21. For the following statements, please select how much you disagree or agree with the statement.

When it comes to matters like using e-cigarettes, I want to do what _____ think/s I should do.

Disagree: ___1__:___2__:___3__:___4__:___5__:___6__:___7___: Agree

	N	Mean	Median	Mode	Std.D	Min	Max
People who already use e-cigarettes	459	-2.48	-3.00	-3.00	1.251	-3.00	3.00
Fraternity members	459	-2.53	-3.00	-3.00	1.217	-3.00	3.00
People trying to "fit in"	459	-2.55	-3.00	-3.00	1.161	-3.00	3.00
People at parties	455	-2.53	-3.00	-3.00	1.205	-3.00	3.00
My parents	459	1.12	2.00	3.00	2.240	-3.00	3.00
My friends	455	-0.04	0.00	-3.00	2.254	-3.00	3.00
My religious organization	457	0.73	1.00	3.00	2.359	-3.00	3.00
My mentors (i.e. teachers, coaches, advisors)	457	0.94	2.00	3.00	2.201	-3.00	3.00
My significant other (boyfriend/girlfriend/fiancé)	455	0.66	1.00	3.00	2.225	-3.00	3.00
Health officials (i.e. doctors, nurses)	456	1.54	3.00	3.00	2.134	-3.00	3.00
My employer and colleagues	457	0.77	1.00	3.00	2.227	-3.00	3.00
Health conscious people	456	1.06	2.00	3.00	2.153	-3.00	3.00

22. For the following statements, please select how false or true you belief the statement to be.

_____ will use an e-cigarette in the next 30 days.

False: ___1___ : ___2___ : ___3___ : ___4___ : ___5___ : ___6___ : ___7___ : True

	N	Mean	Median	Mode	Std.D	Min	Max
Most fraternity members	454	-0.07	0.00	0.00	1.884	-3.00	3.00
Most freshman	454	-0.43	0.00	0.00	1.620	-3.00	3.00
Most people who regularly attend parties	454	-0.30	0.00	0.00	1.786	-3.00	3.00
Most people who drink	455	-0.27	0.00	0.00	1.788	-3.00	3.00
Most students who know others who use e-cigarettes	454	0.31	0.00	1.00	1.781	-3.00	3.00
Most people who want to "fit in"	454	-0.09	0.00	0.00	1.784	-3.00	3.00
Most athletes	455	-1.76	-2.00	-3.00	1.414	-3.00	3.00
Most students who DO NOT regularly attend parties	457	-1.28	-1.00	-3.00	1.494	-3.00	3.00
Most students who DO NOT drink alcohol	456	-1.40	-2.00	-3.00	1.467	-3.00	3.00
Most people who are confident	457	-1.47	-2.00	-3.00	1.452	-3.00	3.00
Most people who quit smoking cigarettes	455	0.37	1.00	2.00	1.896	-3.00	3.00

23. For the following statements, please select if you do Not At All want to be like or would Very Much want to be like the listed person/s.

When it comes to matters of using e-cigarettes, how much do you want to be like _____?

Not At All: ___1__:___2__:___3__:___4__:___5__:___6__:___7___: Very Much

	N	Mean	Median	Mode	Std.D	Min	Max
Most fraternity members	446	-2.31	-3.00	-3.00	1.398	-3.00	3.00
Most freshman	447	-2.49	-3.00	-3.00	1.158	-3.00	3.00
Most people who regularly attend parties	447	-2.31	-3.00	-3.00	1.296	-3.00	3.00
Most people who drink	447	-2.28	-3.00	-3.00	1.316	-3.00	3.00
Most students who know others who use e-cigarettes	448	-2.31	-3.00	-3.00	1.313	-3.00	3.00
Most people who want to "fit in"	448	-2.35	-3.00	-3.00	1.297	-3.00	3.00
Most athletes	447	-1.22	-2.00	-3.00	2.129	-3.00	3.00
Most students who DO NOT regularly attend parties	444	-0.98	-1.00	-3.00	2.025	-3.00	3.00
Most students who DO NOT drink alcohol	447	-0.87	-1.00	-3.00	2.055	-3.00	3.00
Most people who are confident	446	-0.17	0.00	-3.00	2.353	-3.00	3.00
Most people who quit smoking cigarettes	446	-1.26	-2.00	-3.00	1.997	-3.00	3.00

24. For the following statements, please select how unlikely or likely you believe it is that you will do the following in the next 30 days.

_____ in the next 30 days.

Unlikely: __1__ : __2__ : __3__ : __4__ : __5__ : __6__ : __7__ : Likely

	N	Mean	Median	Mode	Std.D	Min	Max
Someone will offer me samples of e-cigarettes	455	-2.03	-3.00	-3.00	1.706	-3.00	3.00
E-cigarettes will be cheap	443	-1.72	-3.00	-3.00	1.649	-3.00	3.00
I will be around people using e-cigarettes	444	-1.24	-2.00	-3.00	2.075	-3.00	3.00
A friend will offer their e-cigarette to me to try	445	-1.96	-3.00	-3.00	1.751	-3.00	3.00
I will care about what my family and friends think	444	1.88	3.00	3.00	1.796	-3.00	3.00
I will respect myself	443	2.22	3.00	3.00	1.660	-3.00	3.00
I will not buy an e-cigarette	445	2.32	3.00	3.00	1.697	-3.00	3.00

25. For the following statements, please select how much you disagree or agree with each statement.

_____ would make it easier for me to use e-cigarettes in the next 30 days.

Disagree: ___1__ : ___2__ : ___3__ : ___4__ : ___5__ : ___6__ : ___7___ : Agree

	N	Mean	Median	Mode	Std.D	Min	Max
Someone offering me samples of e-cigarettes	441	-1.28	-3.00	-3.00	2.160	-3.00	3.00
E-cigarettes being cheap	441	-1.76	-3.00	-3.00	1.976	-3.00	3.00
Being around people using e-cigarettes	441	-1.32	-3.00	-3.00	2.146	-3.00	3.00
A friend offering their e-cigarette to me to try	440	-1.12	-2.00	-3.00	2.234	-3.00	3.00
Caring about what my family and friends think	440	-1.83	-3.00	-3.00	1.571	-3.00	3.00
I will respect myself	438	-1.82	-3.00	-3.00	1.490	-3.00	3.00
Not buying an e-cigarette	439	-1.76	-3.00	-3.00	1.302	-3.00	3.00

26. For the following statements, please select how much you strongly disagree or strongly agree with each statement.

I _____to use e-cigarettes in the next 30 days, just because I want to do it.

Strongly Disagree: ___1__ : ___2__ : ___3__ : ___4__ : ___5__ : ___6__ : ___7___ : Strongly Agree

	N	Mean	Median	Mode	Std.D	Min	Max
Want	438	-2.58	-3.00	-3.00	1.143	-3.00	3.00
Intent	438	-2.65	-3.00	-3.00	1.050	-3.00	3.00
Plan	438	-2.64	-3.00	-3.00	1.104	-3.00	3.00
Am willing	437	-2.35	-3.00	-3.00	1.375	-3.00	3.00

26a. (*If answered b-g on Question 7b, these will show.*)
I _____ to use e-cigarettes in the next 30 days, to help me quit smoking cigarettes.

Strongly Disagree: ___1__ : ___2__ : ___3__ : ___4__ : ___5__ : ___6__ : ___7___ : Strongly Agree

	N	Mean	Median	Mode	Std.D	Min	Max
Want	48	-2.06	-3.00	-3.00	1.535	-3.00	3.00
Intent	48	-2.10	-3.00	-3.00	1.477	-3.00	3.00
Plan	48	-2.06	-3.00	-3.00	1.508	-3.00	3.00
Am willing	48	-1.63	-3.00	-3.00	1.931	-3.00	3.00

27. Please select a response that most closely explains your belief.

Me using an e-cigarette in the next 30 days, just because I want to do it is…

: __1__ : __2__ : __3__ : __4__ : __5__ : __6__ : __7__ :

	N	Mean	Median	Mode	Std.D	Min	Max
Bad/Good	436	-2.34	-3.00	-3.00	1.235	-3.00	3.00
Harmful/Beneficial	434	-2.45	-3.00	-3.00	1.074	-3.00	3.00
Unnecessary/Necessary	435	-2.69	-3.00	-3.00	0.910	-3.00	3.00
Useless/Useful	432	-2.67	-3.00	-3.00	0.932	-3.00	3.00
Foolish/Wise	433	-2.52	-3.00	-3.00	1.065	-3.00	3.00
Negative/Positive	431	-2.45	-3.00	-3.00	1.172	-3.00	3.00
Stressful/Relaxing	432	-1.78	-2.00	-3.00	1.717	-3.00	3.00
Not enjoyable/Enjoyable	434	-2.08	-1.00	-3.00	1.568	-3.00	3.00
Unfavorable/Favorable	436	-2.22	-1.00	-3.00	1.404	-3.00	3.00
Unpleasant/Pleasant	433	-2.18	0.00	-3.00	1.464	-3.00	3.00
Annoying/Pleasing	433	-2.18	-2.00	-3.00	1.442	-3.00	3.00

27a. (*If answered b-g on Question 7b, these will show.*)

Me using an e-cigarette in the next 30 days, to help me quit smoking is…

: __1__ : __2__ : __3__ : __4__ : __5__ : __6__ : __7__ :

	N	Mean	Median	Mode	Std.D	Min	Max
Bad/Good	46	-0.11	-3.00	0.00	2.433	-3.00	3.00
Harmful/Beneficial	46	-0.11	-3.00	0.00	2.350	-3.00	3.00
Unnecessary/Necessary	46	-0.50	-3.00	0.00	2.084	-3.00	3.00
Useless/Useful	47	-0.09	-3.00	0.00	2.215	-3.00	3.00
Foolish/Wise	47	-0.53	-3.00	0.00	2.254	-3.00	3.00
Negative/Positive	46	-0.43	-3.00	0.00	2.167	-3.00	3.00
Stressful/Relaxing	46	-0.65	-2.00	-1.00	1.958	-3.00	3.00
Not enjoyable/Enjoyable	47	-0.57	-1.00	0.00	1.897	-3.00	3.00
Unfavorable/Favorable	46	-0.54	-1.00	0.00	2.073	-3.00	3.00
Unpleasant/Pleasant	46	-0.65	0.00	0.00	1.946	-3.00	3.00
Annoying/Pleasing	46	-0.70	-2.00	-0.50	1.931	-3.00	3.00

28. For the following statements, please indicate how much you strongly disagree or strongly agree with each statement.

_____ an e-cigarette in the next 30 days, just because I want to do it.

Strongly Disagree: ___1__:___2__:___3__:___4__:___5__:___6__:___7___: Strongly Agree

	N	Mean	Median	Mode	Std.D	Min	Max
Most people who are important to me							
approve of me using	427	-2.37	-3.00	-3.00	1.284	-3.00	3.00
think I should use	430	-2.53	-3.00	-3.00	1.102	-3.00	3.00
Support me using	431	-2.42	-3.00	-3.00	1.215	-3.00	3.00
Want me to use	430	-2.57	-3.00	-3.00	1.037	-3.00	3.00
My closest friends							
approve of me using	432	-2.28	-3.00	-3.00	1.369	-3.00	3.00
think I should use	432	-2.48	-3.00	-3.00	1.146	-3.00	3.00
Support me using	431	-2.32	-3.00	-3.00	1.342	-3.00	3.00
Want me to use	429	-2.48	-3.00	-3.00	1.205	-3.00	3.00
Most people like me will use	431	-2.27	-3.00	-3.00	1.410	-3.00	3.00
Most people like me will buy	431	-2.39	-3.00	-3.00	1.280	-3.00	3.00
My closest friends will use	430	-2.38	-3.00	-3.00	1.344	-3.00	3.00
My closest friends will buy	430	-2.44	-3.00	-3.00	1.237	-3.00	3.00

28a. (*If answered b-g on Question 7b, these will show.*)

_____ an e-cigarette in the next 30 days, help me quit smoking.

Strongly Disagree: __1__ : __2__ : __3__ : __4__ : __5__ : __6__ : __7__ : Strongly Agree

	N	Mean	Median	Mode	Std.D	Min	Max
Most people who are important to me							
approve of me using	48	-1.40	-2.00	-3.00	1.795	-3.00	3.00
think I should use	48	-1.23	-1.00	-3.00	1.716	-3.00	3.00
Support me using	48	-1.35	-2.00	-3.00	1.851	-3.00	3.00
Want me to use	48	-1.31	-2.00	-3.00	1.740	-3.00	3.00
My closest friends							
approve of me using	48	-1.27	-2.00	-3.00	1.759	-3.00	3.00
think I should use	48	-1.48	-2.00	-3.00	1.611	-3.00	3.00
Support me using	48	-1.40	-2.00	-3.00	1.723	-3.00	3.00
Want me to use	48	-1.45	-2.00	-3.00	1.688	-3.00	3.00
Most people like me will use	48	-1.10	-1.50	-3.00	1.882	-3.00	3.00
Most people like me will buy	47	-1.32	-2.00	-3.00	1.819	-3.00	3.00
My closest friends will use	48	-1.44	-2.00	-3.00	1.809	-3.00	3.00
My closest friends will buy	48	-1.65	-2.00	-3.00	1.631	-3.00	3.00

29. Please select a response that most closely explains your belief.

Using an e-cigarette in the next 30 days, just because I want to do it, is…

: __1__ : __2__ : __3__ : __4__ : __5__ : __6__ : __7__ :

	N	Mean	Median	Mode	Std.D	Min	Max
Difficult/Easy	425	0.03	0.00	-3.00	2.439	-3.00	3.00
Not Up to Me/Up to me	426	2.04	3.00	3.00	1.923	-3.00	3.00
Not at all under my control/Under my control	425	2.07	3.00	3.00	1.892	-3.00	3.00

I am confident that I can use an e-cigarette, just because I want to do it, in the next 30 days.

: __1__ : __2__ : __3__ : __4__ : __5__ : __6__ : __7__ :

	N	Mean	Median	Mode	Std.D	Min	Max
Strongly Disagree/Strongly Agree	429	-0.28	0.00	-3.00	2.520	-3.00	3.00

There are certain necessary things to know about how to put together e-cigarettes before using them. How sure are you that you could learn how to use an e-cigarette, just because you want to do it, in the next 30 days?

: __1__ : __2__ : __3__ : __4__ : __5__ : __6__ : __7__ :

	N	Mean	Median	Mode	Std.D	Min	Max
Very Unsure/Very Sure	425	0.13	0.00	3.00	2.399	-3.00	3.00

29a. (*If answered b-g on Question 7b, these will show.*)

Using an e-cigarette in the next 30 days, to help me quit smoking is…

:____1____:____2____:____3____:____4____:____5____:____6____:____7____:

	N	Mean	Median	Mode	Std.D	Min	Max
Difficult/Easy	46	-0.11	0.00	0.00	1.829	-3.00	3.00
Not Up to Me/Up to me	45	1.27	2.00	3.00	2.136	-3.00	3.00
Not at all under my control/Under my control	45	1.22	2.00	3.00	2.131	-3.00	3.00

I am confident that I can use an e-cigarette, to help me quit smoking, in the next 30 days.

:____1____:____2____:____3____:____4____:____5____:____6____:____7____:

	N	Mean	Median	Mode	Std.D	Min	Max
Strongly Disagree/Strongly Agree	46	-0.46	0.00	0.00	1.810	-3.00	3.00

There are certain necessary things to know about how to put together e-cigarettes before using them. How sure are you that you could learn how to use an e-cigarette, to help you quit smoking, in the next 30 days?

:____1____:____2____:____3____:____4____:____5____:____6____:____7____:

	N	Mean	Median	Mode	Std.D	Min	Max
Very Unsure/Very Sure	46	0.41	0.50	0.00	2.039	-3.00	3.00

For the following question, please indicate if you believe that smoking <u>a cigarette</u> should be allowed in the following locations.

30.	ALLOWED IN ALL AREAS	ALLOWED IN DESIGNATED AREAS	NOT ALLOWED AT ALL	TOTAL
A. Restaurants	11 (2.6%)	60 (14.0%)	357 (83.4%)	428 (100.0%)
B. Indoor work areas	9 (2.1%)	28 (6.6%)	389 (91.3%)	426 (100.0%)
C. Bars and cocktail lounges	25 (5.9%)	176 (41.2%)	226 (52.9%)	427 (100.0%)
D. Indoor shopping malls	12 (2.8%)	36 (8.4%)	379 (88.8%)	427 (100.0%)
E. Airports	12 (2.8%)	56 (13.1%)	358 (84.0%)	426 (100.0%)
F. Indoor concerts	18 (4.2%)	63 (14.8%)	346 (81.0%)	427 (100.0%)
G. Indoor sporting events	9 (2.1%)	47 (11.0%)	371 (86.9%)	427 (100.0%)
H. Outdoor sporting events	35 (8.2%)	180 (42.3%)	211 (49.5%)	426 (100.0%)
I. College dorms	11 (2.6%)	37 (8.7%)	378 (88.7%)	426 (100.0%)
J. On college campuses	15 (3.5%)	112 (26.3%)	299 (70.2%)	426 (100.0%)

For the following question, please indicate if you believe that smoking <u>an e-cigarette</u> should be allowed in the following locations.

31.	ALLOWED IN ALL AREAS	ALLOWED IN DESIGNATED AREAS	NOT ALLOWED AT ALL	TOTAL
A. Restaurants	19 (4.5%)	103 (24.2%)	304 (71.4%)	426 (100.0%)
B. Indoor work areas	23 (5.4%)	75 (17.6%)	328 (77.0%)	426 (100.0%)
C. Bars and cocktail lounges	61 (14.3%)	199 (46.5%)	168 (39.3%)	428 (100.0%)
D. Indoor shopping malls	29 (6.8%)	81 (19.0%)	317 (74.2%)	427 (100.0%)
E. Airports	19 (4.5%)	90 (21.3%)	313 (74.2%)	422 (100.0%)
F. Indoor concerts	40 (9.4%)	109 (25.6%)	276 (64.9%)	425 (100.0%)
G. Indoor sporting events	25 (5.9%)	95 (22.4%)	305 (71.8%)	425 (100.0%)
H. Outdoor sporting events	64 (15.0%)	196 (45.9%)	167 (39.1%)	427 (100.0%)
I. College dorms	36 (8.5%)	75 (17.6%)	315 (73.9%)	426 (100.0%)
J. On college campuses	40 (9.4%)	133 (31.2%)	253 (59.4%)	426 (100.0%)

Appendix M: Recruitment Letter for Closed-ended Survey Follow-Up

Drawings for five $50 Walmart Gift Cards for Re-Participation in E-Cigarette Survey

Participants who took part in a survey regarding electronic cigarettes (e-cigarettes) use one month ago are needed for participation in another survey regarding e-cigarettes. Requirements for participation include current enrollment at the University of Arkansas- Fayetteville, 18 years of age or older, and participation in the e-cigarette survey one month ago. Survey questions will ask about your attitudes, beliefs, and behaviors regarding e-cigarettes. The survey will last approximately 20-25 minutes. At the duration of the study, drawings will be held from the participants in the study for five $50 Walmart gift cards. Drawings are not connected with the first survey, so even if your name was drawn for a gift card for participating in the study last month, you can be drawn again for a gift card by completing the current survey. The participants whose names are drawn will only be taken from participation in the current survey and will be notified by email. Those interested can participate in the survey by clicking on the following link (click here). For questions or further details, please contact Page Daniel Dobbs at pdaniel@uark.edu for more information.

This study *has been approved by the University of Arkansas, Institutional Review Board for Human Studies, Fayetteville, AR (#15-11-280).*

Appendix N: Implied Consent Form: Closed-ended Survey Follow-Up
Title: Young Adult E-Cigarette Exposure: Implications for Policy and Prevention
Introduction
The purpose of this form is to provide you with information that may affect your decision to participate in this research study. The researchers performing this study can answer all your questions. Read the information below and please feel free to contact the researchers listed below with questions you might have before you decide to participate.

Purpose of the Study
This research study is about electronic cigarettes (e-cigarettes), a battery powered device that delivers aerosolized nicotine and other byproducts without combustion. The purpose of this study is learn about and validate measures that can help explain young adults' attitudes, beliefs, and behaviors regarding e-cigarettes.

What am I going to be asked to do?
If you agree to participate in this study, you will be asked to complete a survey regarding your beliefs and behaviors regarding e-cigarettes. This survey will take approximately 20-25 minutes.

Are the risks involved in this study?
There are no risks involved in this study.

What are the possible benefits of this study?
The possible benefits of participation are a reflection of your behaviors and beliefs regarding e-cigarettes.

Do I have to participate?
No, your participation in this study is voluntary. You may decline to participate or to withdraw from participation at any time. Withdrawal or refusing to participate does not affect your relationship with The University of Arkansas at Fayetteville or the researcher in any way. You can agree to participate now and change your mind later without any penalty.

What if I do not want to participate?
If you do not want to participate, there will be no penalty.

Will there be any compensation?
There will be drawings for five $50 Walmart gift cards at the duration of the study. Those drawn will be notified via email. Drawings are not connected with the first survey, so even if your name was drawn for a gift card for participating in the study last month, you can be drawn again for a gift card by completing the current survey. The participants whose names are drawn will only be taken from participation in the current survey and will be notified by email.

How will my privacy and confidentiality be protected if I participate in this research study?
The use of your name and email address will be used to provide participants with their Walmart gift cards. Your identity will not be linked to your responses. Results from the research will be reported as group data and not reported about individuals. Your contact information will be used 30 days following the study, where the participant will have an opportunity to be drawn for the same distribution of gift cards if selected. After the second survey, your contact information will be terminated.

How will my privacy and confidentiality be protected if I participate in this research study?
The use of your name and email address will only be used to provide participants with their Walmart gift cards. Your identity will not be linked to your responses. Results from the research will be reported as group data and not reported about individuals. Your contact information will be terminated following the study.

Whom to contact with questions about the study?
Prior, during or after your participation you can contact the researcher Page Daniel Dobbs at 479-575-2976 or send an email to pdaniel@uark.edu for any questions or if you feel that you have been harmed. This study has been reviewed and approved by The University Institutional Review Board and the study number is #15-11-280**.**

Whom to contact with questions concerning your rights as a research participant?
For questions or concerns about your rights as a research participant, please contact Ro Windwalker, the University's IRB Coordinator, at (479) 575-2208 or by e-mail at irb@uark.edu. Thanks for your participation!

Implied Consent
   By clicking forward to this survey, you are agreeing to participate in the Young Adult E-Cigarette Exposure: Implications for Policy and Prevention Study. By clicking forward, you are acknowledging that you have read the information provided above and you decide to participate in the study. If you later decide that you wish to withdraw your participation in the study, you can leave the study at any time.

Appendix O: IRB Protocol Form 15-07-024

UNIVERSITY OF ARKANSAS

February 18, 2016

MEMORANDUM

TO: Page Daniel Dobbs
               Bart Hammig
               Heather Blunt
               Abbie Sudduth

FROM: Ro Windwalker
               IRB Coordinator

RE: PROJECT MODIFICATION

IRB Protocol #:   15-11-280

Protocol Title: *Young Adult E-Cigarette Exposure: Implication for Policy and Prevention*

Review Type: ☐ EXEMPT   ☒ EXPEDITED   ☐ FULL IRB

Approved Project Period: Start Date: 02/14/2016 Expiration Date: 11/09/2016

Your request to modify the referenced protocol has been approved by the IRB. **This protocol is currently approved for 625 total participants.** If you wish to make any further modifications in the approved protocol, including enrolling more than this number, you must seek approval *prior to* implementing those changes. All modifications should be requested in writing (email is acceptable) and must provide sufficient detail to assess the impact of the change.

Please note that this approval does not extend the Approved Project Period. Should you wish to extend your project beyond the current expiration date, you must submit a request for continuation using the UAF IRB form "Continuing Review for IRB Approved Projects." The request should be sent to the IRB Coordinator, 109 MLKG Building.

For protocols requiring FULL IRB review, please submit your request at least one month prior to the current expiration date. (High-risk protocols may require even more time for approval.) For protocols requiring an EXPEDITED or EXEMPT review, submit your request at least two weeks prior to the current expiration date. Failure to obtain approval for a continuation *on or prior to* the currently approved expiration date will result in termination of the protocol and you will be required to submit a new protocol to the IRB before continuing the project. Data collected past the protocol expiration date may need to be eliminated from the dataset should you wish to publish. Only data collected under a currently approved protocol can be certified by the IRB for any purpose.

If you have questions or need any assistance from the IRB, please contact me at 109 MLKG Building, 5-2208, or irb@uark.edu.

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Appendix P: IRB Protocol Approval 15-11-280

UNIVERSITY OF ARKANSAS

Office of Research Compliance
Institutional Review Board

November 11, 2015

MEMORANDUM

TO: Page Daniel Dobbs
                Bart Hammig
                Heather Blunt
                Abbie Sudduth

FROM: Ro Windwalker
                IRB Coordinator

RE: New Protocol Approval

IRB Protocol #: 15-11-280

Protocol Title: *Young Adult E-Cigarette Exposure: Implications for Policy and Prevention*

Review Type: ☐ EXEMPT   ☒ EXPEDITED   ☐ FULL IRB

Approved Project Period: Start Date: 11/11/2015 Expiration Date: 11/09/2016

Your protocol has been approved by the IRB. Protocols are approved for a maximum period of one year. If you wish to continue the project past the approved project period (see above), you must submit a request, using the form *Continuing Review for IRB Approved Projects*, prior to the expiration date. This form is available from the IRB Coordinator or on the Research Compliance website (https://vpred.uark.edu/units/rscp/index.php). As a courtesy, you will be sent a reminder two months in advance of that date. However, failure to receive a reminder does not negate your obligation to make the request in sufficient time for review and approval. Federal regulations prohibit retroactive approval of continuation. Failure to receive approval to continue the project prior to the expiration date will result in Termination of the protocol approval. The IRB Coordinator can give you guidance on submission times.

This protocol has been approved for 475 participants. If you wish to make *any* modifications in the approved protocol, including enrolling more than this number, you must seek approval *prior to* implementing those changes. All modifications should be requested in writing (email is acceptable) and must provide sufficient detail to assess the impact of the change.

If you have questions or need any assistance from the IRB, please contact me at 109 MLKG Building, 5-2208, or irb@uark.edu.

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Appendix Q: IRB Protocol Modification 15-11-280

UNIVERSITY OF ARKANSAS

Office of Research Compliance
Institutional Review Board

February 18, 2016

MEMORANDUM

TO: Page Daniel Dobbs
Bart Hammig
Heather Blunt
Abbie Sudduth

FROM: Ro Windwalker
IRB Coordinator

RE: PROJECT MODIFICATION

IRB Protocol #: 15-11-280

Protocol Title: *Young Adult E-Cigarette Exposure: Implication for Policy and Prevention*

Review Type: ☐ EXEMPT ☒ EXPEDITED ☐ FULL IRB

Approved Project Period: Start Date: 02/14/2016 Expiration Date: 11/09/2016

Your request to modify the referenced protocol has been approved by the IRB. **This protocol is currently approved for 625 total participants.** If you wish to make any further modifications in the approved protocol, including enrolling more than this number, you must seek approval *prior to* implementing those changes. All modifications should be requested in writing (email is acceptable) and must provide sufficient detail to assess the impact of the change.

Please note that this approval does not extend the Approved Project Period. Should you wish to extend your project beyond the current expiration date, you must submit a request for continuation using the UAF IRB form "Continuing Review for IRB Approved Projects." The request should be sent to the IRB Coordinator, 109 MLKG Building.

For protocols requiring FULL IRB review, please submit your request at least one month prior to the current expiration date. (High-risk protocols may require even more time for approval.) For protocols requiring an EXPEDITED or EXEMPT review, submit your request at least two weeks prior to the current expiration date. Failure to obtain approval for a continuation *on or prior to* the currently approved expiration date will result in termination of the protocol and you will be required to submit a new protocol to the IRB before continuing the project. Data collected past the protocol expiration date may need to be eliminated from the dataset should you wish to publish. Only data collected under a currently approved protocol can be certified by the IRB for any purpose.

If you have questions or need any assistance from the IRB, please contact me at 109 MLKG Building, 5-2208, or irb@uark.edu.

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Appendix R: IRB Protocol Modification 15-11-280

UNIVERSITY OF ARKANSAS

Office of Research Compliance
Institutional Review Board

March 30, 2016

MEMORANDUM

TO: Page Daniel Dobbs
               Bart Hammig
               Heather Blunt
               Abbie Sudduth

FROM: Ro Windwalker
               IRB Coordinator

RE: PROJECT MODIFICATION

IRB Protocol #:   15-11-280

Protocol Title: *Young Adult E-Cigarette Exposure: Implication for Policy and Prevention*

Review Type: ☐ EXEMPT ☒ EXPEDITED ☐ FULL IRB

Approved Project Period: Start Date: 03/28/2016 Expiration Date: 11/09/2016

Your request to modify the referenced protocol has been approved by the IRB. **This protocol is currently approved for 1,625 total participants.** If you wish to make any further modifications in the approved protocol, including enrolling more than this number, you must seek approval *prior to* implementing those changes. All modifications should be requested in writing (email is acceptable) and must provide sufficient detail to assess the impact of the change.

Please note that this approval does not extend the Approved Project Period. Should you wish to extend your project beyond the current expiration date, you must submit a request for continuation using the UAF IRB form "Continuing Review for IRB Approved Projects." The request should be sent to the IRB Coordinator, 109 MLKG Building.

For protocols requiring FULL IRB review, please submit your request at least one month prior to the current expiration date. (High-risk protocols may require even more time for approval.) For protocols requiring an EXPEDITED or EXEMPT review, submit your request at least two weeks prior to the current expiration date. Failure to obtain approval for a continuation *on or prior to* the currently approved expiration date will result in termination of the protocol and you will be required to submit a new protocol to the IRB before continuing the project. Data collected past the protocol expiration date may need to be eliminated from the dataset should you wish to publish. Only data collected under a currently approved protocol can be certified by the IRB for any purpose.

If you have questions or need any assistance from the IRB, please contact me at 109 MLKG Building, 5-2208, or irb@uark.edu.

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Contact Information:
Monica "Page" Daniel Dobbs

EDUCATION

2013-2016   **Doctor of Philosophy (PhD)**
Community Health Promotion
Department of Health, Human Performance and Recreation
College of Education and Health Professions
University of Arkansas; Fayetteville Arkansas
Dissertation Title: *"Young Adult E-Cigarette Exposure: Implications for Policy and Prevention"*

2011-2013   **Masters of Science (MS)**
Community Health Promotion
Department of Health, Human Performance and Recreation
College of Education and Health Professions
University of Arkansas; Fayetteville Arkansas
Thesis Title: *"Cues and Deterrent to Smoking: A Comparison of Different Types of Smokers."*

2005-2009   **Bachelor of Science (BS)**
Food Science
Department of Food Science
Dale Bumper's School of Agriculture
University of Arkansas; Fayetteville Arkansas

ACADEMIC APPOINTMENTS

Summer 2015   **Graduate Research Assistant**
Dr. Bart Hammig
College of Education and Health Professions
University of Arkansas; Fayetteville, Arkansas
- Large dataset analysis
- Regression using STATA MP 11 software

Summer 2013   **Graduate Research Assistant**
Dr. Michelle Grey
College of Education and Health Professions
University of Arkansas; Fayetteville, Arkansas
- Applied for grant funding for bar worker health study

- Osteoporosis education intervention study using Health Belief Model

Summer 2013   **Graduate Research Assistant**
-Present   Age-Friendly Fayetteville
                   College of Education and Health Professions
                   University of Arkansas; Fayetteville, Arkansas
- Led community 7 engagement programs and promotion
- Led 3 focus groups
- Assisted in creation of survey instrument for city-wide data collection

Summer 2012   **Instructor**
-Present   Health, Human Performance, and Recreation Department
                   College of Education and Health Professions
                   University of Arkansas; Fayetteville, Arkansas
- Have taught 14 face-to-face courses
- Have taught 6 online courses
- Have taught 2 internship/applied courses

FUNDING AND AWARDS

External Funding Applied

2013   **Co-Principle Investigator**
               Bar Worker Health and Qir Quality of Smoking Venues
               $56,944
               Arkansas Blue and You Foundation Grant

2011   **Co-Principle Investigator**
               Project Right Choice
               $4,977
               Walmart Foundation

External Funding Awarded

2015 (June)   **Co-Principle Investigator**
                  "Young Adult E-Cigarette Exposure: Implications for Policy and Prevention"
                  $12,681
                  Arkansas Biosciences Institute (ABI)

2011   **Principle Investigator**
               $55,500
               Fiscal Agency: Northwest Arkansas Tobacco Free Coalition
               Funding Agency: Minority Initiative Sub Grant Recipient Office
               (MISGRO) at the University of Arkansas at Pine Bluff

Internal Funding Awarded

2015   **Principle Investigator**

Behaviors and Perceptions of Drug Use on the University of Arkansas
Campus: A Focus Group Study
$500
Northwest Arkansas Tobacco & Drug-Free Coalition

2015   **Graduate School Travel Grant**
Smoking Bystander Intervention Self-Efficacy Scale Development
$1,100
University of Arkansas

2014   **Graduate School Travel Grant**
E-Cigarette use and Perception of Harm in Adolescents
$1,100
University of Arkansas

2014   **Graduate School Travel Grant**
$1,100
University of Arkansas

2013- Present   **Graduate Teaching Assistantship**
$12,000 annually
University of Arkansas

2013- Present   **Doctoral Fellowship Academy**
$10,000 annually
University of Arkansas

<u>Awards</u>
2016   **Community Health Promotion Major**
Outstanding Doctoral Student of the Year
2014   **Community Health Promotion Major**
Outstanding Doctoral Student of the Year
2012   **Community Health Promotion Major**
Outstanding Master's Student of the Year

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PUBLICATIONS AND PRESENTATIONS
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<u>Publication</u>
Daniel Dobbs, M. P., Hammig, B., Sudduth, A. (2016). Update to Youth Access Laws
        Regarding Electronic Cigarettes. *Preventative Medicine*, 88, 90-94.

<u>Manuscripts Under Review</u>
Daniel Dobbs, M. P., Hammig, B., & Henry, L. J. Adolescent Electronic Cigarette Use

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and Perception of Addiction and Harm.

Daniel Dobbs, M. P., Henry, L. J., Matlock, K. Cues and Deterrents of Different Types of Smokers.

Hammig, B., **Daniel-Dobbs, P.**, Blunt-Vinti, H. Electronic Cigarette Initiation among Minority Youth in the United States.

Manuscripts in Preparation

Daniel Dobbs, M. P., Hammig, B. Influencing Factors to Quit Smoking and Stages of Change in U.S. Youth.

Rolfe, D. **Daniel Dobbs, M. P.** Marijuana use among College Students: A Focus Group Study.

Daniel Dobbs, M. P., Rolfe, D. College students' perceptions of E-cigarettes: A Focus Group Study.

Daniel Dobbs, M. P., Hammig, B., Blunt, H. D. Jozkowski, K. N., Henry, L. J., Gorman, D., Perceptions of E- Cigarettes among College Students: A Qualitative Analysis.

Daniel Dobbs, M. P., Hammig, B., Blunt, H. D. Jozkowski, K. N., Henry, L. J., Gorman, D., Factors Influencing College Students' Intention to Try E-cigarettes: A Reasoned Action Approach

Executive Report

Daniel Dobbs, M. P., Rolfe, D. (November, 2015). *Behaviors and Perceptions of Drug Use on the University of Arkansas Campus: A Focus Group Study.* Focus Group Study for the Northwest Arkansas Tobacco and Drug-Free Coalition.

Refereed Presentations

Daniel Dobbs, M. P., Blunt-Vinti, H. D., Jozkowski, K., Hammig, B., Sudduth, A. (2016, October/November). *E-cigarette Use among College Students: A Pilot Sample Scale Development using the Reasoned Action Approach*. To be presented at the 144th American Public Health Association Annual Meeting, Denver, CO.

Daniel Dobbs, M. P., Rolfe, D. (2016, October/November). *College Students' Perception of Marijuana, Cigarettes, and E-Cigarettes: A Focus Group Study*. To be presented at the 144th American Public Health Association Annual Meeting, Denver, CO.

Daniel Dobbs, M. P., Blunt-Vinti, H. D., & Henry, L. J. (2015, November). *Smoking Bystander Intervention Self-Efficacy Scale Development*. The 143nd American Public Health Association Annual Meeting. Chicago, IL.

Daniel, M. P., & Hammig, B. (2014, November). *E-Cigarette use and Perception of Harm in Adolescents*. The 142nd American Public Health Association Annual Meeting. New Orleans, LA.

Daniel, M. P., & Hammig, B. (2014, November). *E-Cigarette use and Perception of Harm in Adolescents*. University of Arkansas Abstract to Contract Poster Competition. Fayetteville, AR.

Daniel, M. P. (2014, April). *Closing the Gap for Social Smokers: Comprehensive Smoke-Free Policies*. Arkansas Health Disparities Conference. Fayetteville, AR.

Daniel, M. P. (2013, April). *Body Image and Older Women: Staying Sexy While Aging*. Arkansas Health Disparities Conference. Springdale, AR.

Daniel, M. P. (2012, April). *Childhood Poverty in Arkansas and Northwest Arkansas*. Arkansas Health Disparities Conference. Fayetteville, AR.

Invited Presentations
Daniel Dobbs, M. P. (2016, April). Update to Youth Access Laws
Regarding Electronic Cigarettes. University of Arkansas Associated Student Government RED Talk. Fayetteville, AR.

Daniel Dobbs, M. P. (2016, March). *Article Review*. PBHL 4643: Multicultural Health. Fayetteville, AR.

Daniel Dobbs, M. P. (2016, February). *Alcohol and E-Cigarette Use among College Students.* University of Arkansas Tri Delta Sorority. Fayetteville, AR.

Daniel Dobbs, M. P., Rolfe, D. (2016, February). *Behaviors and Perceptions of Drug Use on the University of Arkansas Campus: A Focus Group Study.* Northwest Arkansas Tobacco and Drug-Free Coalition monthly meeting. Fayetteville, AR.

Daniel Dobbs, M. P., Blunt, H., Hammig, B. (2015, September). *Young Adult E-Cigarette Exposure: Implications for Policy and Prevention*. Health, Human Performance, and Recreation Seminar. Fayetteville, AR.

Daniel Dobbs, M. P. (2015, August). *Nutrition and Health & Stress and Health*. PEAC 1621: Fitness Concepts. Fayetteville, AR.

Daniel, M. P., & Hammig, B. (2014, October). *E-Cigarette use and Perception of Harm in Adolescents*. Health, Human Performance, and Recreation Seminar. Fayetteville, AR.

Daniel, M. P. (2013, November). *Applied Health Behavior Theory: Diffusion of Innovation Theory*. CHLP 4603: Health Behavior: Theories and Application. Fayetteville, AR

Daniel, M.P. (2012, October). *Tobacco Burden in Arkansas*. CHLP 1103: Personal Health and Safety. Fayetteville, AR.

Media Reference
Eley, A. (2014, December 17). Risks Assessed as E-Cigarettes Trend. *Razorback Reporter*. Available at: http://razorbackreporter.uark.edu/2014/12/risks-assessed-ecigarettes-trend/

College of Education and Health Professions, University of Arkansas. (2015, September 16). Doctoral Student to Present Research on E-Cigarettes. Available at http://coehp.uark.edu/colleague/hhpr/page-daniel-dobbs.php

TEACHING EXPERIENCE

Year	Semester	Role	# Students	Course #	Course Title
2016	Spring	Co- Instructor	38	PBHL 4043	Internship in Public Health
2015	Fall	Instructor of record	32	PBHL 4043	Internship in Public Health
2015	Spring	Instructor of record	50	PBHL 1103	Personal Health and Safety
		Co- Instructor	54	PBHL 4043	Internship in Public Health
2014	Fall	Instructor of record	54	PBHL 3643	Public Health Planning and Evaluation
2014	Summer	Instructor of record	25	CHLP 1103	Personal Health and Safety *Online*
2014	Spring	Instructor of record	45	CHLP 2662	Terminology for Health Professions *Online*
		Instructor of record	43	CHLP 2662	Terminology for Health Professions *Online*
2013	Fall	Instructor of record	44	CHLP 2662	Terminology for Health Professions *Online*

		Instructor of record	45	CHLP 2662	Terminology for Health Professions *Online*
		Instructor of record	44	CHLP 2662	Terminology for Health Professions *Online*
2013	Spring	Instructor of record	25	PEAC 1621	Fitness Concepts
		Instructor of record	25	PEAC 1621	Fitness Concepts
		Instructor of record	26	PEAC 1621	Fitness Concepts
		Instructor of record	25	PEAC 1391	Fitness Walking
		Instructor of record	28	PEAC 1391	Fitness Walking
		Instructor of record	27	PEAC 1391	Fitness Walking
2012	Fall	Instructor of record	29	PEAC 1621	Fitness Concepts
		Instructor of record	29	PEAC 1621	Fitness Concepts
		Instructor of record	29	PEAC 1621	Fitness Concepts
		Instructor of record	28	PEAC 1391	Fitness Walking
		Instructor of record	34	PEAC 1391	Fitness Walking
		Instructor of record	24	PEAC 1391	Fitness Walking

PUBLIC HEALTH EXPERIENCE

March 2014 -August 2014 **Research Associate**
Public Health Consulting, L.L.C
Saddlebrook, MO
- Community Health Assessment of Christian Country
- Evaluation of Cox Monett Asthma Program, a grant funded program for elementary students.

February 2012 – Sept. 2012 **Account Manager/Intern**
Champions for Kids
Fayetteville, AR
- Manager of account activity and mobilization of SIMPLE Service projects for Coca Cola, Abbott Nutrition, All You Magazine, and Disney
- Increased social media interaction by 30% within the first month of employment

October 2010 – August 2011 **Project Coordinator**
NWA Tobacco Free Coalition
Community Clinic; Springdale, AR
- Presented at 28 community forums, booths, and service organization presentations to more than 2,500 attendants about the health and economic impact of tobacco and secondhand smoke
- Awarded $55,500 in funding from the Minority Initiative Sub Grant Recipient Office (MISGRO) at the UofA at Pine Bluff to educate minority populations in Benton and Washington County

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PROFESSIONAL MEMBERSHIP AND SERVICE

2014-Present   **American Public Health Association (APHA)**
- Abstract Reviewer for Alcohol, Tobacco and Other Drugs (ATOD) section

2015-Present   **Smoke-Free Fayetteville**
Smoke-Free Bar Advocate
- Led 3 community engagement activities
- Engage college students in community advocacy

2015-Present   **American Heart Association Grass Roots Advocacy Board**
Advocating for healthy legislation in the state of Arkansas and in communities in Northwest Arkansas
- Executive board of leaders advocating for smoke-free bars
- Measure community readiness for initiative implementation

2015- Present   **Tri Delta Sorority**
Central District Officer
- Advise collegians and advisors at Louisiana State University
- Systems Development and Management
House Corporation, National Housing Endowment Fund Chair
- *Received $5,000 from NHEF House Corporation 2014*
- *Received $6,000 from NHEF House Corporation 2015*
- *Received $3,000 from NHEF House Corporation 2016*

2012-2013   **Cross Church Fayetteville**
Nursery Volunteer
- Bridge relationships with community members
- Assist with systems organization of children and parents

2010-Present   **Washington County Hometown Health Initiative**
Member
- Collaborate with community organizations
- Cultivate relationships with internship site preceptors

2008-2011   **Northwest Arkansas Tobacco and Drug-Free Coalition**
Member
- Conducted focus group study for needs assessment
- Presented findings in a final report and invited presentation