Associations among Smoking, Vaping, Psychopathology, and Identity

Jacqueline A. Beretsky

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ASSOCIATIONS AMONG SMOKING, VAPING, PSYCHOPATHOLOGY, AND IDENTITY

by

JACQUELINE A. BERETSKY

A thesis submitted in partial fulfillment of the requirements
for the Honors in the Major Program in Psychology
in the College of Sciences
and in The Burnett Honors College
at the University of Central Florida
Orlando, Florida

Summer Term, 2020

Thesis Chair: Dr. Steven L. Berman, Ph.D.
ABSTRACT

Although there has been progress in trying to decrease the use of cigarette smoking, a new method of smoking has evolved which is rapidly increasing, namely vaping. Adolescents who participate in smoking are more likely to increase smoking frequency if they believed that it is self-defining (“I smoke cigarettes” versus “I am a smoker”). While there has been evidence to support the claim that internal motives for smoking are correlated with smoker identity development, there has been none, to our knowledge, found for vaping identity. Due to the similarities of smoking and vaping, it is important to discover whether those who vape also have an identity similar to those who smoke. In other words, with vaping being a new technology, do users identify themselves as “I am a vaper” or “I vape e-cigarettes”? The way in which users identify themselves may have important implications for intervention efforts.

Further, smoking is a type of substance abuse, and substance abuse, primarily alcohol, has been linked to identity status, identity distress, and psychopathology. Smoking has been linked to alcohol use and abuse, but it is unclear if smoking is related to similar identity and adjustment variables, particularly internalizing symptoms, in the same way as alcohol use. Thus, the purpose of this study was to explore the associations between smoking, vaping, identity, and psychopathology.

Using college student participants ($N = 303$) who completed anonymous online surveys for course credit, four hypotheses were tested, but none was confirmed. Possible reasons for the lack of significant findings are discussed. Despite the lack of findings in regard to the relationship among the study variables, the new concept and measure of vaping identity proposed in this thesis appear to be a potentially valid and useful avenue for future research.
DEDICATIONS

For my Father, who has persistently shown me to strive to be the best. Thank you for pushing me
to never give up, caring in a countless of ways, and providing me with an endless amount of support.

For my Mother, who has shown me that a graceful growth can emerge from a dark despair.
Thank you for demonstrating pure strength, bravery, and for never giving up on me.

For my Sister, who has shown me a different perspective of accomplishments. Thank you for not allowing comparisons between us to create an obstacle between our relationship. We’re different in a variety of ways, but you’ll always be my amazing, little sister.

For Joey, who has been my solid rock for the past two years. Thank you for striving to make me laugh when I’m stressed, sad, or mad. Your love has pushed me to complete this thesis, even on days when I thought I couldn’t.

For my late Grandfather, Irwin, who is one of the main reasons why I want to pursue my Ph.D. in Psychology. Thank you for showing me how being intelligent, dedicated, and persistent can take you a long way. I hope to one day become a Dr. Beretsky, just like you.
ACKNOWLEDGEMENTS

I would like to thank my Thesis Chair, Dr. Steven Berman, for taking a chance on me when I thought nobody would. You have been the starting point of milestones that I have created since pursing an undergraduate thesis. Thank you for believing in me, providing me with valuable knowledge, and being patient when I had no research experience two years ago. Your leadership is something that I will carry on while I, hopefully, attend graduate school and for the remainder of my time.

I would also like to thank my Committee Member, Dr. Shahram Ghiasinejad, for assisting with the development of this thesis in a variety of ways. Thank you for providing me with knowledge in Statistics, which will be incredibly useful in Graduate school. Due to COVID-19, I was never able to meet and thank you in person. However, I am forever grateful for your demonstration in empathy, creativity, and becoming a member of this thesis.
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INTRODUCTION

Smoking tobacco has been a desired activity for over 2,000 years. It was first discovered around 1531 and became global by the 1700s (Cancer Council, 2013). Presently, 34.3 million adults smoke cigarettes. Cigarette smoking contributes to the death of approximately 480,000 people who pass away from a related disease (Centers for Disease Control and Prevention, 2019). While there has been progress in trying to decrease the use of cigarette smoking, a new method of smoking has evolved – Vaping. The use of vaping increased from 7 million to 41 million in just a matter of seven years (Jones, 2019). With smoking already being an international crisis, it is concerning when the use of vaping is also rising exponentially.

Smoking

Smoking is the act of inhaling the smoke of burned tobacco (Leone, Landini, & Leone, 2010). The most conventional products that are used for smoking encompass cigarettes (a roll of tobacco), cigars (a roll of tobacco that is thicker and larger than a cigarette), pipes (contains a bowl and mouthpiece used to inhale burning loose-leaf tobacco), and hookahs (a single or multi-stemmed instrument for vaporizing and smoking tobacco). Nicotine is one of the chemical ingredients in cigarettes and e-cigarettes that contain nitrogen. The tobacco plant is what commonly produces nicotine. This specific chemical produces adrenaline through the stimulation of the adrenal glands. This process activates the entire body, generating an increase in heart rate, breathing activity, and blood pressure (Felman, 2018). More importantly, nicotine is what causes addiction to smoking and creates difficulties for someone to quit due to withdrawal symptoms. Withdrawal symptoms may include anxiety, depression, and irritability.
**Vaping**

Vaping, as defined by Richter (2017), is the process of using an e-cigarette (another term for electronic cigarette), or other similar devices, in order to inhale and exhale vapor. This vapor contains nicotine, just like a typical cigarette. A few examples of vaping devices include vape pen (smaller, tubular pen shaped device), vape mod (has a large battery capacity that can be recharged), and electronic cigarette (most basic with a small battery and disposable cartridges). The chemical contained in the e-liquid nicotine (the cartridge to insert into an e-cigarette) are propylene glycol/vegetable glycerin, distilled water, artificial flavoring, and nicotine. The propylene glycol/vegetable glycerin holds the nicotine and flavoring in suspension (Lisko, Tran, Stanfill, Blount, & Watson, 2015). Some of the popular flavorings for e-cigarettes, include mango, cool mint, and crème brûlée (Mann, 2018). The origin of e-cigarettes began with Hon Lik. In 2003, he was able to successfully create an e-cigarette. This idea came from his father, a heavy cigarette smoker, who passed away from lung cancer. E-cigarettes were originally created as a substitute for smoking cigarettes. The replacement was aimed towards adults who had a burdensome time trying to abstain from smoking cigarettes. It was thought to be safer and harmless due to the replacement of the burning tobacco/paper with heated, steamed, flavored air (Lisko et al., 2015). However, it became more than just that. A company created a type of e-cigarette called Juul, in 2015. The company created a variety of flavors that could enhance the users’ experience with the Juul. However, this creation became dangerously popular for adolescents. The American Academy of Family Physicians reported that 63% of Juul users were between the ages of 15-24, and they didn’t realize the vaping product contained 5% of nicotine, which is double the amount of most e-cigarettes.
**Smoker Identity**

Hertel and Mermelstein (2016) discovered that adolescents who participate in smoking are more likely to increase smoking frequency if they believed that it is self-defining (“I smoke cigarettes” versus “I am a smoker”). Those who identified themselves as a smoker ended up becoming regular smokers. This study corresponds with Bems (1972) Self-Perception Theory. This theory explains how an individual evolves the perception that a behavior is defining the individual, rather than the environment, as a focal point for the behavior. It has been found that behavior can be attributed to either internal causal attributions or external causal attributions. Internal attributions are when the behavior is believed to be elicited from the individuals themselves, whereas, external attributions are when the behavior is believed to be caused by the environment. Hertel and Mermelstein (2016) found that people who smoke might be more likely to identify themselves as a smoker if there are more internal causal attributions and less external causal attributions. While there has been evidence to support the claim that internal motives for smoking are correlated with smoker identity development, there has been none, to our knowledge, found for vaping identity. Due to the similarities of smoking and vaping, it is important to try and discover if those who vape also have an identity similar to those who smoke. In other words, with vaping being a new technology, do users identify themselves as “I am a vaper” or “I vape e-cigarettes”? The way in which users identify themselves may have important implications for intervention efforts.

**Identity Status**

Vaping identity, especially in late adolescence and early adulthood, may also be related to identity development in general. Erikson (1956) was one of the first to propose a life-span model of human development. His model introduces eight successive psychosocial stages. Each
stage is associated with an inherent conflict or crisis that the individual attempts to resolve before proceeding to the next development. In the fifth stage, usually experienced in late adolescence or emerging adulthood the individual confronts the psychosocial crisis of identity versus role confusion. James Marcia (1966), who operationalized Erikson’s (1958) notion of identity formation, has defined four identity statuses: identity diffusion (low level of exploration and commitment), identity foreclosure (low level of exploration, but a high level of commitment), moratorium (high level of exploration, but a low level of commitment), and identity achievement (high level of exploration and commitment). Those in identity diffusion have not considered their identity and lack any significant life goals. Those in identity foreclosure passively accept what has been taught to them (by friends, family, etc.) and accept their identity without exploring other options. Those in moratorium are in the midst of an “identity crisis” where they continuously explore different values, beliefs, goals, and ideas without actually committing to an identity just yet. Those in identity achievement have explored different values, beliefs, goals, and ideas and were able to decide what was important to them in order to create their identity. There has been some research done on these four identity statuses and substance abuse. White (2000) found that those in identity diffusion tend to have the most problematic behavior, such as poor work-related behavior, criminal behavior, develop substance abuse, and engage in risky sexual practices. Schnekloth, Puswella, and Struessel (1997) also discovered that first-year college students with a diffused identity participate in higher levels of alcohol use. Smoking is considered another type of substance abuse, and while an association has been found between diffused identity and alcohol use, there has not been any research done on which identity status(es) might be associated with smoking/vaping, another type of substance abuse.
**Psychopathology**

Nicotine dependence has been found to be associated with psychopathological symptoms. These psychopathological symptoms include depression and anxiety. Specifically, Slomp, Bara, Picharski, and Cordeiro (2019) discovered that adolescents who smoked had anxiety and depressive symptoms and performed lower in school, as compared to non-smokers. Regarding gender, female adolescents disclosed suicidal ideation (thinking about suicide) more than male adolescents, who smoked. Paus, Keshavan, and Giedd (2008) found that the peak age of emergence of psychopathology or psychiatric disorders is adolescence. There has been similar research done on adolescents who vape. Leventhal (2016) found that depression, panic disorder, and anhedonia (inability to experience pleasure) were more prominent in e-cigarette users than non-users. With the existing rise in adolescents who engage in vaping, it is important to understand the underlying consequence of it. Due to the brain rapidly developing during the adolescent years, those who become smokers are more prone to psychopathological symptoms than those who are non-smokers, although a cause and effect relationship (i.e., one causes the other) has not yet been determined.

**Identity Distress**

Identity Distress, as defined by the American Psychiatric Association (1980), refers to the “severe subjective distress regarding inability to reconcile aspects of the self into a relatively coherent and acceptable sense of self.” (p.65). Wiley and Berman (2013) researched the relationship between identity distress with psychopathological problems among adolescents. They discovered a correlation between severity of psychopathological symptoms and higher levels of identity distress. The majority of their samples were in the diffused or foreclosed status. Their findings are consistent with previous research that have found that those with a diffused
identity status tend to have more psychological problems (Archer, 2008; Vleioras & Bosma, 2005). On the other hand, those who have an identity commitment (i.e., the foreclosed and achieved statuses) experience fewer psychological symptoms (Crocetti et al., 2008; Kroger, 2007; Luyckx et al., 2005). Research has shown that those with identity commitment are emotionally stable, adjusted, and have a higher well-being. Scott and colleagues (2014) also found that identity distress was positively associated with age, posttraumatic stress disorder symptoms, and internalizing problems. As mentioned previously, psychopathology and smoking are linked. (Slomp et al., 2019). Furthermore, there has also been research on identity distress and substance abuse. Mester (2011) found some evidence that linked drinking, inversely, to identity commitment and directly correlated with identity exploration, identity distress, and psychological symptoms. This study suggests that smoking (another type of substance abuse) may also be linked with identity distress.

**Rationale**

As discussed above, smoker identity is related to greater smoking, but we do not know if vaper identity is related to greater vaping and/or smoking. Further, smoking is a type of substance abuse, and substance abuse, primarily alcohol, has been linked to identity status, identity distress, and psychopathology. Smoking has been linked to alcohol use and abuse, but it is unclear if smoking is related to the identity and adjustment variables, particularly internalizing symptoms, in the same way as alcohol use. Thus, the purpose of this study is to explore the links between smoking, vaping, identity, and psychopathology.

**Hypotheses**

1) Those who vape will have lower average smoker identity scores than cigarette smokers.

2) Smokers and vapers will have higher identity distress scores than those who do not.
3) Smokers and vapers will have higher internalizing symptom scores than those who do not.

4) Those who smoke/vape, but are in the diffused or moratorium identity status, will have lower smoker identity scores than those in the achieved and foreclosed identity status.
METHODS

Participants

This study included 303 participants of which 68.3% were female, 30.7% were male, 0.7% were transgender \((n=2)\), and 0.3% were Other \((n=1)\). Grade distribution included 44.6% first year students, 22.1% second year students, 19.1% third year students, 12.9% fourth year students, 0.7% non-degree seeking students, 0.3% graduate students, and 0.3% other. The ethnic/racial distribution was 53.1% White, non-Hispanic; 21.8% Hispanic or Latinx; 9.2% Black, non-Hispanic; 8.9% Asian or Pacific Islander; and 6.9% identified as mixed or other. The ages of the participants ranged from 18 to 57 years with a mean of 20.04 and standard deviation of 4.06.

Measures

*Smoking Identity Scale* (Dupont et al., 2015) questionnaire. The Smoking Identity Scale (SIS) contains a total of six questions. Each question is rated on a 4-point Likert Scale (completely disagree, somewhat disagree, somewhat agree, completely agree). Two of the questions, from the Richmond Motivation Test (Richmond RL, Kehoe LA, & Webster IW, 1993), were added to the questionnaire: “Have you thought about quitting within the next month?” and “Do you think you will be an ex-smoker in 6 months’ time?”. This was added to determine if there is an association with less self-confidence in quitting. The Cronbach’s alpha of the SIS was calculated as .79 with no redundant questions (Dupont et al., 2015). In this study, the Cronbach’s alpha was .61.

*Vaping Identity Scale* questionnaire. The Vaping Identity Scale contains six questions. Each question will be rated on a 4-point Likert Scale (completely disagree, somewhat disagree, somewhat agree, completely agree). Created for this study, this measure asks the same questions
as the Smoking Identity Scale, however all words associated with “smoking” were switched to “vaping”. The internal consistency for this scale has not been previously identified yet. In this study, the Chronbach’s alpha was .80.

Nicotine Dependence Survey (Fagerstrom, 1991). This survey assesses the intensity of physical addition to nicotine. It was designed to provide an ordinal measure of nicotine dependence related to cigarette smoking. The survey contains six questions such as, “How soon after you wake up do you smoke your first cigarette?” and “Which cigarette would you hate most to give up?” The yes/no answer choices are scored as 0 or 1 and the multiple-choice items are scored from a total of 0-10. For example, for the first question “How soon after you wake up do you smoke your first cigarette?”, contains these answer responses (in this order): Within 5 minutes, 6 to 30 minutes, 31 to 60 minutes, after 60 minutes. The value of these answer choices start at 3 and decrease all the way to 0 (in the same order). The higher the total score, the more intense the patient’s physical dependence on nicotine. This scale has a reported internal consistency Cronbach’s alpha of .83 (Fagerstrom, 1991). In this study, the Chronbach’s alpha was .80.

Ego Identity Process Questionnaire (Balistreri, Busch-Rossnagle, & Geisinger, 1995) will be used to classify participants’ identity status. Participants will be asked to rank (1 = strongly disagree, 2 = disagree, 3 = slightly disagree, 4 = slightly agree, 5 = agree, and 6 = strongly agree) each statement. There is a total of 32 statements in the scale. This questionnaire contains two subscales, identity exploration and identity commitment. Balistreri and colleagues (1995) reported the exploration subscale had a Cronbach’s alpha of .86 with a test-retest reliability of .76, and the commitment subscale had a Cronbach’s alpha of .80 with a test-retest reliability of .90. The subscales were created in order to assign participants into one of four
identity statuses as defined by Marcia (1966). Participants with low scores on exploration and commitment are classified as diffused, low in exploration but high in commitment as foreclosed, high in exploration but low in commitment classified as moratorium, and high in both exploration and commitment are classified as achieved. In this study, the Chronbach’s alpha for both Identity Exploration and Identity Commitment was .71.

Identity Distress Survey (Berman, Montgomery, & Kurtines, 2004). The Identity Distress Survey is a 10-item measure used to assess overall identity discomfort. The Identity Distress Survey measures discomfort in terms of the time frame experienced, severity, and interference in daily functioning regarding the following domains: religion, sexual orientation, goals, career choices, values, group affiliation, and friendships. Participants are asked to rank their discomfort on a 5-point Likert scale (1=not at all, 2=mild, 3=moderate, 4=severe, and 5=very severely) on the aforementioned domains. Internal consistency has been reported as .84 with test-retest reliability of .82, and the survey has demonstrated convergent validity with other measures of identity development (Berman et al., 2004). In this study, the Chronbach’s alpha was .78.

Brief Symptom Index-18 (Derogotis, 2000). The BSI-18 is a self-report measure that consists of 18-items assessing psychological symptoms. The test measures three primary symptom dimensions: Depression, Anxiety, and Somatization. It was designed to provide an overview of a patient’s symptoms and their intensity at a specific point in time. Participants are asked to rate (1=not at all, 2=a little bit, 3=moderately, 4=quite a bit, and 5=extremely) each symptom that best describes how much that problem has distressed or bothered them during the past seven days. The internal consistency reliability (Cronbach’s alpha) was calculated as .89 (Derogotis, 2000). In this study, the Chronbach’s alpha was .93.
**Procedure**

The project was first sent to the University of Central Florida’s Institutional Review Board (IRB) for approval of the study. Following the IRB’s approval, it was submitted to the SONA System Coordinator for an additional approval. Participants were recruited through the UCF Psychology Participant Recruitment System (aka, SONA). The SONA system is designed to accommodate students who are seeking to be involved in a psychology study as a participant. The student received SONA hours which is either required for a course or assists with a course credit. Participants enrolled in courses that require research participation received credit for completing the survey. An alternative assignment was given to any students who did not want to participate but still wanted course credit. The amount of credit the participant received was determined by the SONA guidelines. Following the participants reading of the Explanation of Research, they were directed to the survey. For the participants that declined to participate after reading the Explanation, they were redirected to the end of the survey where no data was collected or given credit.
RESULTS

Preliminary and Descriptive Analyses

The maximum and minimum scores, along with the mean and standard deviation for all scales, are presented in Table 1, frequency of smoking (e-cigarettes, cigarettes, and other tobacco products) are presented in Table 2, and a correlation matrix for all measures is presented in Table 3. All measures were assessed for differences based on demographic variables. Based on t-test analyses, the only gender differences were found on the specific scales of identity exploration, identity distress, and internalizing symptoms. With regard to identity exploration, measured by the Ego Identity Process Questionnaire, females scored significantly higher on Identity Exploration, \( t(298) = -2.48, p = .014 \). In regard to identity distress, measured by the Identity Distress Survey, females scored significantly higher on Identity Distress \( t(298) = -3.17, p = .002 \). In regards to internalizing symptoms, measured by the Brief Symptom Index-18, the females scored significantly higher on Internalizing Symptoms \( t(298) = -4.20, p < .001 \).

A one-way Analysis of Variances (ANOVA) was conducted for ethnic and grade differences. Regarding ethnic differences, the ANOVA was significant only for frequency of smoking nicotine products other than cigarettes and e-cigarettes \( F(4, 298) = 3.38, p = .010 \). A least squared difference (LSD) post hoc analysis showed that our “mixed or other” ethnic group reported significantly higher usage than all of the other ethnic groups except the “Asian or Pacific Islander” group \( p = .002 \). The “Asian or Pacific Islander” group was not significantly different from any other group. No differences were found for grade, and age did not significantly correlate with any of the measures.
Main Analyses

Hypothesis 1

To determine if those who vape would have lower average smoker identity scores than cigarette smokers, we had to construct two groups – those who smoke, but do not vape and those who vape, but do not smoke. For purposes of group formation, anybody that smoked/vaped a few times a month or more were considered to be smokers/vapers. As can be seen in Table 4, out of 8 people who qualified as cigarette smokers, only 3 of them did not vape. This was not a large enough sample to analyze group differences, so this hypothesis could not be tested.

Hypothesis 2

To determine if smokers and vapers would have higher identity distress scores than those who do not, a $t$-test was conducted comparing the identity distress scores of non-smokers to a combined group of vapers, smokers, and participants who used other nicotine products. However, there was no significant difference. Thus, this hypothesis was not confirmed.

Hypothesis 3

To determine if smokers and vapers would have higher internalizing symptom scores than those who do not, a $t$-test was conducted comparing the internalizing symptom scores of non-smokers to a combined group of vapers, smokers, and participants who used other nicotine products. However, again there was no significant difference. Thus, this hypothesis was also not confirmed.

Hypothesis 4

To determine if those who smoke/vape, but are in the diffused or moratorium identity status, would have lower smoker identity scores than those in the achieved and foreclosed identity status, we performed a ONEWAY ANOVA with identity status groups as the
independent variable and smoker identity score as the dependent variable. No significant
differences were found between identity status groups on smoker identity (nor vaper identity),
thus this hypothesis, too, was not confirmed.
DISCUSSION

As mentioned previously, vaping is a new phenomenon that is becoming an upward trend. This was also shown with the participants in our study. In our study, 24% of the participants vaped (at least occasionally) whereas only 9% smoked other nicotine products and 5% smoked cigarettes. This is in line with recent studies that indicate that vaping has doubled since 2017 (Cullen et al., 2018). In 2018, 20.8% of high schoolers vaped versus 11.7% in 2017. This is a 78% increase of vaper users in high school, which is also approximately 3.05 million American high school students. For middle school, there was a 48% increase in vaper use, which is about 570,000 students (Cullen et al., 2018). As discussed in previous studies by Jones (2019), the use of vaping has increased from 7 million to 41 million in just seven years. The numbers in this study concur with previous studies that suggest that while smoking is in decline, vaping is on the rise.

In our study, one of our hypotheses was that those who vape will have lower average smoker identity scores than cigarette smokers. However, due to the small sample size of those who vaped or smoked, we were not able to analyze the data. Future studies should use larger samples in order to get more smokers and vapers. They might also attempt to recruit from areas where participants are more likely to smoke or vape, such as rural areas, bars, or rehab facilities.

Previous research has shown that drinking was linked to identity commitment, which is directly related to identity exploration, identity distress, and psychopathological symptoms (Mester, 2011). This suggested that smoking and vaping may also be linked to identity distress, since smoking and drinking are linked. In addition, Slomp, Bara, Picharski, and Cordeiro (2019) found that adolescents who smoked cigarettes had more psychopathology symptoms, such as anxiety and depression, than non-smokers. Additionally, this suggested to us that vapers might
also experience more psychopathology symptoms than those who are non-smokers. In our study, we hypothesized that smokers and vapers would have higher identity distress and higher internalizing scores than non-smokers/vapers. However, we found no significance differences between these two groups. One of the possibilities for this is that we did not have a big enough sample size. If we had more smokers and vapers, we may have been able to find significant differences. Another possibility is the awareness difference between smoking and vaping. Most people are aware of the detrimental effects of smoking, which is perhaps why those who are depressed or suicidal are more likely to smoke cigarettes. However, vaping may not be linked to psychopathology symptoms because young people are not using it to self-medicate the way people often do with cigarettes. Those under the age of 30 are less likely than older individuals to believe vaping is harmful to one’s health (Schaeffer, 2019). Future studies should look at the mindset of how students view vaping and smoking and whether they recognize the relative dangers of each one.

Schnekloth, Puswella, and Strussel (1997) found that first-year college students with a diffused identity participated in higher levels of alcohol use. Similar to alcohol, smoking and vaping are another type of substance abuse, so we presumed that this would hold true for smoking and vaping as well. For our last hypothesis, we proposed that those who smoke/vape, but are in the diffused or moratorium identity status, would have lower smoker identity scores than those in the achieved and foreclosed identity status. After testing, we found that there was no significant difference between identity status groups on smoker identity, vaper identity, or even smoking/vaping frequency. One of the reasons why we found no significance, again, could be due to our small sample size of smokers and vapers. Another possibility is that there is simply
no relationship between vaping and smoking and identity variables, but this contradicts previous studies, so more research needs to be conducted before this idea can be fully accepted.

Despite our lack of confirmation of any of our hypotheses, we found that vaping was significantly correlated with nicotine dependence and vaping identity. We constructed the Vaping Identity scale which had a Chronbach’s alpha of .80. This scale was based off of the Smoking Identity Scale (Dupont et al., 2015) which had a Chronbach’s alpha of .61. We believe that this new scale might be a useful construct for future studies, and might be related to prevention and intervention efforts.

**Limitations of the Study and Future Research**

As with every other research that is conducted, our study also had limitations that should be discussed. The survey was distributed through an online platform to 303 qualified participants. Our original number was 325 participants, but a number were removed due to being completed in less than 5 minutes, suggesting that they were not even reading the questions, but rather were answering randomly in order to receive their course credit. Being an online survey with no validity scales, the accuracy of the data set cannot be fully verified. Future studies might want to replicate this study in a variety of formats (in person survey, interview format, not for credit) and add validity scales to improve accuracy of responses. In addition, it would be helpful to have a larger and more diverse pool of participants. Future studies might want to replicate this study by recruiting a larger amount of participants from a variety of demographics, such as age, ethnicity, and grade.

The order of the study is another issue that could be re-considered. It is possible that the order in which the surveys were presented may have swayed the participants to answer in a particular manner. Multiple order of presentation and counterbalancing the order could control
for such effects. Finally, it should be kept in mind that all analyses were correlational in nature so no causal explanations should be assumed. For instance, we cannot tell if vaping behavior increases vaper identity or if vaper identity increases vaping behavior, or even if they are both influenced by a third factor. We only know that they are related. Using longitudinal studies to track participants from a young to an older age to see how their smoking/vaping behavior changes, along with their identity formation, would determine the direction of influence between variables.

Despite these limitations, this study has added to our knowledge base on the association between smoking, vaping, identity, and psychopathology, and given us a new potentially useful construct of vaper identity. Further study is clearly needed in order to elaborate on these preliminary findings. The result of such studies could help in developing prevention and intervention programs aimed at decreasing smoking and vaping.
Appendix A: IRB Approval Letter
EXEMPTION DETERMINATION

March 16, 2020

Dear Steven Berman:

On 3/16/2020, the IRB determined the following submission to be human subjects research that is exempt from regulation:

<table>
<thead>
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<th>Type of Review:</th>
<th>Initial Study</th>
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<tbody>
<tr>
<td>Title:</td>
<td>Smoking and Vaping Identity</td>
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<tr>
<td>Investigator:</td>
<td>Steven Berman</td>
</tr>
<tr>
<td>IRB ID:</td>
<td>STUDY00001559</td>
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<tr>
<td>Funding:</td>
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<td>• IRB Berman 1559 Explanation of Research2 (1).pdf, Category: Consent Form;</td>
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<tr>
<td>• IRB Berman 1559 HRP-255 - FORM - Request for Exemption 3_13_20-1.docx, Category: IRB Protocol;</td>
</tr>
<tr>
<td>• Surveys.docx, Category: Survey / Questionnaire;</td>
</tr>
</tbody>
</table>

This determination applies only to the activities described in the IRB submission and does not apply should any changes be made. If changes are made, and there are questions about whether these changes affect the exempt status of the human research, please submit a modification request to the IRB. Guidance on submitting Modifications and Administrative Check-in are detailed in the Investigator Manual (HRP-103), which can be found by navigating to the IRB Library within the IRB system. When you have completed your research, please submit a Study Closure request so that IRB records will be accurate.

If you have any questions, please contact the UCF IRB at 407-823-2901 or irb@ucf.edu. Please include your project title and IRB number in all correspondence with this office.

Sincerely,

Kamilla C. Birkbeck
Designated Reviewer
Appendix B: Explanation of Research
EXPLANATION OF RESEARCH

Title of Project: Smoking Identities and Vaping

Principal Investigator: Jacqueline Beretsy

Faculty Supervisor: Steven Berman

You are being invited to take part in a research study. Whether you take part is up to you.

The purpose of this research is to explore the links between smoking, vaping, identity, and psychopathology. You will be asked to complete a survey through the SONA system for course credit. The expected duration of your participation is approximately 30 minutes to complete survey.

No personal information will be collected beyond the basic demographic information collected at the beginning of the survey. If you are not eligible to complete this survey, contact your respective professor to discuss alternative options for credit.

You must be 18 years of age or older to take part in this research study.

**ATTENTION:** This survey contains questions that may cause you to reflect on past emotional events. If answering these questions has caused you to experience any kind of distress or made you feel uncomfortable in any way, please contact the UCF Counseling and Psychological Services at (407) 823-2811.

**Study contact for questions about the study or to report a problem:** If you have questions, concerns, or complaints please feel free to reach out to: Jacqueline Beretsy, Undergraduate student, at jackie.beretsy@knights.ucf.edu. Or contact Dr. Steven Berman, Faculty Supervisor, Department of Psychology, at (407) 708-2827 / steven.berman@ucf.edu

**IRB contact about your rights in this study or to report a complaint:** If you have questions about your rights as a research participant, or have concerns about the conduct of this study, please contact Institutional Review Board (IRB), University of Central Florida, Office of Research, 12201 Research Parkway, Suite 501, Orlando, FL 32826-3246 or by telephone at (407) 823-2901, or email irb@ucf.edu.
Appendix C: Descriptive Statistics
Table 1: Descriptive Statistics

<table>
<thead>
<tr>
<th></th>
<th>Minimum</th>
<th>Maximum</th>
<th>Mean</th>
<th>Standard Deviation</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Vaper Frequency</strong></td>
<td>1.00</td>
<td>5.00</td>
<td>1.57</td>
<td>1.18</td>
</tr>
<tr>
<td><strong>Smoker Frequency</strong></td>
<td>1.00</td>
<td>5.00</td>
<td>1.09</td>
<td>0.44</td>
</tr>
<tr>
<td><strong>Other Nicotine Products Frequency</strong></td>
<td>1.00</td>
<td>5.00</td>
<td>1.17</td>
<td>0.60</td>
</tr>
<tr>
<td><strong>Nicotine Dependence</strong></td>
<td>0.00</td>
<td>10.00</td>
<td>0.57</td>
<td>1.74</td>
</tr>
<tr>
<td><strong>Vaper Identity</strong></td>
<td>1.00</td>
<td>3.83</td>
<td>1.12</td>
<td>0.32</td>
</tr>
<tr>
<td><strong>Smoker Identity</strong></td>
<td>1.00</td>
<td>3.83</td>
<td>1.12</td>
<td>0.28</td>
</tr>
<tr>
<td><strong>Identity Exploration</strong></td>
<td>38.00</td>
<td>88.0</td>
<td>61.20</td>
<td>9.12</td>
</tr>
<tr>
<td><strong>Identity Commitment</strong></td>
<td>41.00</td>
<td>86.0</td>
<td>58.85</td>
<td>8.06</td>
</tr>
<tr>
<td><strong>Identity Distress</strong></td>
<td>1.00</td>
<td>4.43</td>
<td>2.25</td>
<td>0.73</td>
</tr>
<tr>
<td><strong>Internalizing Symptoms</strong></td>
<td>0.00</td>
<td>3.56</td>
<td>0.74</td>
<td>0.72</td>
</tr>
</tbody>
</table>
Appendix D: Tobacco Usage Frequencies
Table 2: Smoking Frequencies

<table>
<thead>
<tr>
<th>Frequency</th>
<th>Vaper Frequencies</th>
<th>Smoker Frequencies</th>
<th>Other Tobacco Frequencies</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>N</td>
<td>%</td>
<td>n</td>
</tr>
<tr>
<td>Daily</td>
<td>20</td>
<td>6.6</td>
<td>1</td>
</tr>
<tr>
<td>A few times a week</td>
<td>13</td>
<td>4.3</td>
<td>2</td>
</tr>
<tr>
<td>A few times a month</td>
<td>15</td>
<td>5.0</td>
<td>5</td>
</tr>
<tr>
<td>A few times a year</td>
<td>25</td>
<td>8.3</td>
<td>7</td>
</tr>
<tr>
<td>Not at all</td>
<td>230</td>
<td>75.9</td>
<td>288</td>
</tr>
</tbody>
</table>
Appendix E: Correlational Matrix
Table 3: Correlation Matrix

<table>
<thead>
<tr>
<th>Variables</th>
<th>1</th>
<th>2</th>
<th>3</th>
<th>4</th>
<th>5</th>
<th>6</th>
<th>7</th>
<th>8</th>
<th>9</th>
</tr>
</thead>
<tbody>
<tr>
<td>1. Vaper Frequency</td>
<td>-</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
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<tr>
<td>2. Smoker Frequency</td>
<td>.23**</td>
<td>-</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>3. Other Nicotine Products</td>
<td>.21**</td>
<td>.39**</td>
<td>-</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Frequency</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>4. Nicotine Dependence</td>
<td>.76**</td>
<td>.19**</td>
<td>.13*</td>
<td>-</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>5. Vaper Identity</td>
<td>.58**</td>
<td>.11</td>
<td>.07</td>
<td>.44**</td>
<td>-</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>6. Smoker Identity</td>
<td>.11</td>
<td>.29**</td>
<td>.26**</td>
<td>.23**</td>
<td>.32**</td>
<td>-</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>7. Identity Exploration</td>
<td>.07</td>
<td>.05</td>
<td>-.02</td>
<td>.02</td>
<td>.01</td>
<td>.11</td>
<td>-</td>
<td></td>
<td></td>
</tr>
<tr>
<td>8. Identity Commitment</td>
<td>-.04</td>
<td>-.05</td>
<td>-.05</td>
<td>-.05</td>
<td>.01</td>
<td>-.04</td>
<td>.10</td>
<td>-</td>
<td></td>
</tr>
<tr>
<td>9. Identity Distress</td>
<td>.01</td>
<td>.11*</td>
<td>-.05</td>
<td>.02</td>
<td>-.02</td>
<td>.09</td>
<td>.32**</td>
<td>-.24**</td>
<td>-</td>
</tr>
<tr>
<td>10. Internalizing Symptoms</td>
<td>.09</td>
<td>.06</td>
<td>.00</td>
<td>.11</td>
<td>.06</td>
<td>.11</td>
<td>.32**</td>
<td>-.22**</td>
<td>.60**</td>
</tr>
</tbody>
</table>

Note: * p < .05; ** p < .001
Appendix F: Crosstab Comparison of Smoker and Vaper Frequencies
Table 4: Crosstab Comparison of Smoker and Vaper Frequencies

<table>
<thead>
<tr>
<th>How often do you smoke regular cigarettes?</th>
<th>How often do you smoke e-cigarettes? (Vaping)</th>
<th>Daily</th>
<th>A few times a week</th>
<th>A few times a month</th>
<th>A few times a year</th>
<th>Never at all</th>
<th>Total</th>
</tr>
</thead>
<tbody>
<tr>
<td>Daily</td>
<td>0</td>
<td>0</td>
<td>0</td>
<td>0</td>
<td>0</td>
<td>1</td>
<td>1</td>
</tr>
<tr>
<td>A few times a week</td>
<td>0</td>
<td>0</td>
<td>0</td>
<td>0</td>
<td>2</td>
<td>2</td>
<td>2</td>
</tr>
<tr>
<td>A few times a month</td>
<td>3</td>
<td>2</td>
<td>0</td>
<td>0</td>
<td>0</td>
<td>5</td>
<td>5</td>
</tr>
<tr>
<td>A few times a year</td>
<td>2</td>
<td>1</td>
<td>1</td>
<td>2</td>
<td>1</td>
<td>7</td>
<td>7</td>
</tr>
<tr>
<td>Never at all</td>
<td>15</td>
<td>10</td>
<td>14</td>
<td>23</td>
<td>226</td>
<td>288</td>
<td></td>
</tr>
<tr>
<td>Total</td>
<td>20</td>
<td>13</td>
<td>15</td>
<td>25</td>
<td>230</td>
<td>303</td>
<td></td>
</tr>
</tbody>
</table>
Appendix G: Survey
BACKGROUND QUESTIONNAIRE:

**SEX:** Indicate your gender
- Male
- Female
- Transgender
- Other (explain)

**AGE:** Type your age

**EDUCATION:** Indicate year in school
- Freshman
- Sophomore
- Junior
- Senior
- Non-degree Seeking
- Graduate Student
- Other

**ETHNICITY:** Select the ethnic/racial identifier that best describes you:
- White, non-Hispanic
- Black, non-Hispanic
- Hispanic or Latino/a
- Asian or Pacific Islander
- Native American or Alaskan Native

Mixed ethnicity or Other (Specify):____________________

How often do you smoke e-cigarettes? (vaping)
- Daily
- A few times a week
- A few times a month
- A few times a year
- Not at all

How often do you smoke regular cigarettes?
- Daily
- A few times a week
- A few times a month
- A few times a year
- Not at all
How often do you consume other nicotine-containing products? (pipes, cigars, chewing tobacco, etc.)

- Daily
- A few times a week
- A few times a month
- A few times a year
- Not at all

**CIGARETTE SMOKING IDENTITY SCALE:** For the following six statements, please decide how much you agree or disagree with each, using the following scale. Please bubble in the appropriate number on the enclosed answer sheet.

<table>
<thead>
<tr>
<th>1</th>
<th>2</th>
<th>3</th>
<th>4</th>
</tr>
</thead>
<tbody>
<tr>
<td>Completely Disagree</td>
<td>Somewhat Disagree</td>
<td>Somewhat Agree</td>
<td>Completely Agree</td>
</tr>
</tbody>
</table>

1. I feel like smoking cigarettes characterizes me as a person.
2. I can’t begin to imagine myself without cigarettes in my life.
3. I think others couldn’t imagine me without cigarettes in my life.
4. I am afraid if I don’t smoke cigarettes, I won’t be the same.
5. If I quit smoking cigarettes, I will have to give up a part of myself.
6. Smoking cigarettes is a part of me.

**VAPING IDENTITY SCALE:** For the following six statements, please decide how much you agree or disagree with each, using the following scale. Please bubble in the appropriate number on the enclosed answer sheet.

<table>
<thead>
<tr>
<th>1</th>
<th>2</th>
<th>3</th>
<th>4</th>
</tr>
</thead>
<tbody>
<tr>
<td>Completely Disagree</td>
<td>Somewhat Disagree</td>
<td>Somewhat Agree</td>
<td>Completely Agree</td>
</tr>
</tbody>
</table>

1. I feel like vaping characterizes me as a person.
2. I can’t begin to imagine myself without vaping products in my life.
3. I think others couldn’t imagine me without vaping products in my life.
4. I am afraid if I don’t vape, I won’t be the same.
5. If I quit vaping, I will have to give up a part of myself.
6. Vaping is a part of me.
NICOTINE DEPENDENCE SURVEY: Begin the survey by answering the following question below:

1. **How soon after you wake up do you smoke, vape, or otherwise consume nicotine?**
   - Within 5 minutes
   - 6 to 30 minutes
   - 31 to 60 minutes
   - After 60 minutes
   - I do not smoke/vape/consume nicotine

2. **Do you find it difficult to refrain from smoking/vaping/consuming nicotine in places where it is forbidden** (e.g. in church, at the library, in the cinema)?
   - No
   - Yes
   - I do not smoke/vape/consume nicotine

3. **Which nicotine product would you hate most to give up?**
   - The first one in the morning
   - Any other
   - I do not smoke/vape/consume nicotine

4. **How many times per day do you smoke/vape/consume nicotine?**
   - 0
   - 10 or less
   - 11 to 20
   - 21 to 30
   - 31 or more

5. **Do you smoke/vape/consume nicotine more frequently during the first hours after waking than during the rest of the day?**
   - No
   - Yes
   - I do not smoke/vape/consume nicotine

6. **Do you smoke/vape/consume nicotine when you are so ill that you are in bed most of the day?**
   - No
   - Yes
   - I do not smoke/vape/consume nicotine

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EGO IDENTITY PROCESS QUESTIONNAIRE: For the following 32 statements, please decide how much you agree or disagree with each, using the following scale. Please bubble in the appropriate number on the enclosed answer sheet.

<p>| | | | | | |</p>
<table>
<thead>
<tr>
<th></th>
<th></th>
<th></th>
<th></th>
<th></th>
<th></th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>2</td>
<td>3</td>
<td>4</td>
<td>5</td>
<td>6</td>
</tr>
<tr>
<td>Strongly Disagree</td>
<td>Disagree</td>
<td>Slightly Disagree</td>
<td>Slightly Agree</td>
<td>Agree</td>
<td>Strongly Agree</td>
</tr>
</tbody>
</table>

1. I have definitely decided on the occupation I want to pursue.
2. I don’t expect to change my political principles and ideals.
3. I have considered adopting different kinds of religious beliefs.
4. There has never been a need to question my values.
5. I am very confident about which kinds of friends are best for me.
6. My ideas about men’s and women’s roles have never changed as I became older.
7. I will always vote for the same political party.
8. I have firmly held views concerning my role in my family.
9. I have engaged in several discussions concerning behaviors involved in dating relationships.
10. I have considered different political views thoughtfully.
11. I have never questioned my views concerning what kind of friend is best for me.
12. My values are likely to change in the future.
13. When I talk to people about religion, I make sure to voice my opinion.
14. I am not sure about what type of dating relationship is best for me.
15. I have not felt the need to reflect on the importance I place on my family.
16. Regarding religion, my views are likely to change in the near future.
17. I have definite views regarding the ways in which men and women should behave.
18. I have tried to learn about different occupational fields to find the one best for me.
19. I have undergone several experiences that made me change my views on men’s and women’s roles.
20. I have re-examined many different values in order to find the ones which are best for me.
21. I think that what I look for in a friend could change in the future.
22. I have questioned what kind of date is right for me.
23. I am unlikely to alter my vocational goals.
24. I have evaluated many ways in which I fit into my family structure.
25. My ideas about men’s and women’s roles will never change.
26. I have never questioned my political beliefs.
27. I have had many experiences that led me to review the qualities that I would like my friends to have.
28. I have discussed religious matters with a number of people who believe differently than I do.
29. I am not sure that the values I hold are right for me.
30. I have never questioned my occupational aspirations.
31. The extent to which I value my family is likely to change in the future.
32. My beliefs about dating are firmly held.
IDENTITY DISTRESS SURVEY: To what degree have you recently been upset, distressed, or worried over any of the following issues in your life? (Please select the appropriate response, using the following scale).

<table>
<thead>
<tr>
<th>None at all</th>
<th>Mildly</th>
<th>Moderately</th>
<th>Severely</th>
<th>Very Severely</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>2</td>
<td>3</td>
<td>4</td>
<td>5</td>
</tr>
</tbody>
</table>

___1. Long term goals? (e.g., finding a good job, being in a romantic relationship, etc.)
___2. Career choice? (e.g., deciding on a trade or profession, etc.)
___3. Friendships? (e.g., experiencing a loss of friends, change in friends, etc.)
___4. Sexual orientation and behavior? (e.g., feeling confused about sexual preferences, intensity of sexual needs, etc.)
___5. Religion? (e.g., stopped believing, changed your belief in God/religion, etc.)
___6. Values or beliefs? (e.g., feeling confused about what is right or wrong, etc.)
___7. Group loyalties? (e.g., belonging to a club, school group, gang, etc.)
___8. Please rate your overall level of discomfort (how bad they made you feel) about all the above issues as a whole.
___9. Please rate how much uncertainty over these issues as a whole has interfered with your life (for example, stopped you from doing things you wanted to do, or being happy)
___10. How long (if at all) have you felt upset, distressed, or worried over these issues as a whole? (Use rating scale below)

<table>
<thead>
<tr>
<th>Never or less than a month</th>
<th>1 to 3 months</th>
<th>3 to 6 months</th>
<th>6 to 12 months</th>
<th>More than 12 months</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>2</td>
<td>3</td>
<td>4</td>
<td>5</td>
</tr>
</tbody>
</table>

BSI 18 - Below is a list of problems people sometimes have. Read each one carefully and fill in the circle that best describes how much that problem has distressed or bothered you during the PAST 7 DAYS including today.

1. Faintness or dizziness  
2. Feeling no interest in things  
3. Nervousness or shakiness inside  
4. Pains in heart or chest  
5. Feeling lonely  
6. Feeling tense or keyed up  
7. Nausea or upset stomach  
8. Feeling blue  
9. Suddenly scared for no reason  
10. Trouble getting your breath  
11. Feelings of worthlessness
12. Spells of terror or panic
13. Numbness or tingling in parts of your body
14. Feeling hopeless about the future
15. Feeling so restless you couldn’t sit still
16. Feeling weak in parts of your body
17. Thoughts of ending your life
18. Feeling fearful


