

*The Relationship of Parental Communication and Emerging Adulthood Risky Behaviors of
Binge Drinking and Vaping*

An Honors Thesis (PSYS 499)

by

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Abstract

Past research regarding parental communication and risk-taking behaviors largely focuses on risk-taking behaviors happening during adolescence, more specifically, the focus has largely been on sexual risk-taking behaviors. The current research examines this relationship of quality parental communication and risk-taking behaviors but shifts the focus to risk-taking behaviors happening in a different developmental period—emerging adulthood. The risk-taking behaviors examined in the present study are risky drinking behaviors, such as binge drinking and the risk-taking behavior of vaping, as they have not been extensively researched in the past. The present study's objective was to determine whether quality parental communication happening during adolescence would be related to risk-taking behaviors happening in emerging adulthood.

Specifically, it was hypothesized that quality parent-adolescent communication would have a negative relationship with both alcohol use and the use of electronic cigarettes during emerging adulthood. Participants completed measures of parent-adolescent communication as well as measures regarding their current drinking and vaping habits and correlation and regression analysis were conducted. The results of these analysis indicated that quality parental communication during adolescence had a significant negative correlation with alcohol use in emerging adulthood, but no correlation was found for quality parental communication and vaping habits.

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Process Analysis Statement

Determining a research question for my Honors Thesis was a more difficult and complex task than I first thought it would be. My interests started out very broad. I was interested in risk taking behaviors and I have always been interest in the adolescent population. I brought these interests to my thesis advisor, Dr. Diaz, and she asked me a few questions that would help me uncover a specific research question. First, we discussed the large obstacles that would exist collecting data from an adolescent population and decided that collecting data from college students would be a lot more realistic for an undergraduate thesis. Next, she asked me to do some research on risk taking behaviors that impact college aged students. I spent time sifting through research articles and determining what risk-taking behaviors have been studied in the past and which ones were especially relevant for college aged people.

I found that alcohol consumption was commonly investigated and a regularly occurring behavior in college students, so I knew I wanted that to be one of my study's focus. One risk-taking behavior that I saw left out of research was vaping, which is another way to say the use of electronic cigarette devices. I knew from personal experience that vaping was becoming more and more relevant among emerging adults (those aged between 18 and 25.) From research and personal observations, I knew these two behaviors could be very risky and have the potential to cause many problems in the lives of the people who do them as well as in the lives of the people around them. Hence, I began thinking of factors that could potentially be related to, or even predict the occurrence or non-occurrence of these risk-taking behaviors.

Trying to connect my interest in adolescence, I began thinking of occurrences that happen during this life stage that may have some relationship to later risk-taking behaviors in emerging adulthood. I first thought of the relationship the adolescent has with their parent but, after

looking at past studies and speaking with my advisor, I narrowed it down further and decided to focus on the communication between the parent and adolescent, specifically the quality of their communication.

Next, I began a bibliography, annotating and summarizing several research articles for each of my factors of interest—drinking, vaping, and parental communication. Delving into the literature and educating myself about each of these factors and how they have been examined in past research was an essential and informative part of the honors thesis process. Writing a detailed bibliography helped me organize my knowledge and identify how I could use this past research to inform my research question. The extensive bibliography process also helped me identify gaps in the literature and helped me further narrow down my research question. Indeed, I noticed that most of the research on parental communication and risk-taking behaviors largely focused on sexual risk-taking behaviors during adolescence. Although not the same, the link between parental communication and this risk-taking behavior made me wonder if risky drinking and vaping use would continue as one got older. Specifically, I questioned whether parental communication during adolescence would continue to have a relationship with risk taking behaviors in emerging adulthood. And thus, my research question was born.

I hypothesized that parent-adolescent communication would be negatively correlated to emerging adulthood risk taking behaviors of risky drinking and vaping. This means I thought that the greater quality of parental communication during adolescence, the less likely that individual would be to engage in risky drinking or vaping later in life. I then pulled the relevant information from my bibliography to write an introduction section and literature review. For the lit review, I ended up diving further into the research and finding more relevant articles to inform

my study. I tried to find studies that had similar elements as the type of study I had envisioned for my hypotheses.

During my literature review, I also started to look for what scales and measures previous researchers had used to test their research questions. I knew I needed a valid and reliable way to measure parental communication, risky drinking, and vaping. I found the Parent-Adolescent Communication Scale and the Alcohol Use Disorders Identification Test, both of which have been used for several years in multiple reputable studies. Finding a measure for vaping was a bit difficult because vaping is a relatively new activity that some engage in and has yet to be thoroughly studied. I found several measures for smoking tobacco cigarettes, which led me to a researcher who had developed a vaping measure from a previous tobacco smoking measure.

After receiving feedback on my introduction, literature review, and chosen measures, and conducting revision after revision in attempts to make my project the best it could be, I began thinking more seriously about the methods of my project, or how I wanted to go about answering my research question. I had the measures I wanted to use, and, from there, I decided I would administer the questions from the measures in a survey I built through Qualtrics, which is a web-based software that can be used to distribute surveys. I added demographic questions to my survey and then manually typed in all the questions from the Parent-Adolescent Communication Scale, Alcohol Use Disorders Identification Test, and E-Cigarette Dependency Scale. I also had to decide what population I wanted to send this survey out to after it was completed. I determined that I wanted my inclusion criteria to be people who were between the ages of 18-25 so that I would only be collecting data from emerging adults. I also only wanted to collect data from those who were currently living away from their parent or guardian, such as in a campus dorm or an apartment or house separate from their parents. I made sure to add questions at the

beginning of my survey to check for this and if they selected that they did not meet one of these requirements, they would be excluded and sent to the end of the survey.

Because I would be collecting data from human participants, I needed to receive approval for my study through the Institutional Review Board, or IRB. I completed my IRB application and attached several documents, explaining my study to the IRB in detail. After they had all the information they needed, my study was approved, and I began collecting data. I posted my completed Qualtrics survey on several social media pages, including Reddit and Facebook pages, as well as posting my survey to Ball State's Psychological Science SONA data pool, in order to get as many participants as I could. I found survey exchange groups on Facebook that I actively posted and reposted on for several weeks.

During the process of data collection, I was also making revisions to the sections of my thesis I had written, as well as writing my methods section. I worked with my advisor to determine what analyses we should run after we have collected all the data. I used correlation analyses for Parent-Adolescent Communication Scale scores and Alcohol Use Disorder Identification Test scores as well as for Parent-Adolescent Communication Scale scores and E-Cigarette Dependency Scale scores. Correlation analyses would show if a relationship existed between two factors, whether it is a positive or negative relationship, and how strong it is. My advisor also recommended that, if a correlation was found on either of these, we run a regression analysis, which shows whether factors help predict the variance in another factor in a significant way.

Once I received 142 responses on my survey, I decided to stop data collection because my goal was to end with around 100 usable participants. Once I stopped data collection, I transferred all the data from Qualtrics to SPSS, a popular statistical software platform for

running analysis. I then went through the process of data cleaning and removing participants who may have not answered all the questions or did not meet the inclusion criteria. After the data was cleaned, I began refreshing myself on how SPSS works, how to run analysis, and how to view the output of those analyses. I read and watched online tutorials and asked professors to watch me walk through the process and make sure I was running through everything correctly. Next, I used my cleaned data to run my analysis and began interpreting my data. I then viewed the output of my statistics and turned numbers into words as I wrote my results section and reported my findings.

Next, I wrote my discussion section where I discussed my interpretations of my results specifically what the results could mean, implications and limitations of the study, as well as suggestions for future research. I presented a five-minute talk of my thesis at the Ball State Symposium along with a PowerPoint I used in lieu of a typical poster. There, I summed up my procedure and findings and shared it with my class and everyone who attended the Ball State symposium.

This project has been very important to me because not only has it consumed a lot of my time this past year, but also because it shows my ability to conduct research in a way I will likely do in graduate school and beyond. I walked through each step of the research process from beginning to end. I was guided by my thesis advisor, but I was not given any answers, only pointed in the right direction. This project shows my ability to think critically and to think as a researcher and my ability to use the scientific method. Problem solving, time management, and attention to detail are all skills I had to engage in. Although it was extremely challenging at times and there were many late nights, I am happy I have walked through this process to demonstrate my capability as an Honors Psychology student.

As I look back on my project, there are several things I notice now that could have been improved. I think this is an important part of the process and shows that I have learned and grown from this experience. I notice some errors and I think about how I can avoid making similar mistakes in the future. I am sure this will continue to happen as I engage in more research and move along further in my career, but I have realized that mistakes don't have to be a bad thing because they can teach you and encourage you to become a better version of yourself in the future.

The importance and value of receiving constructive feedback is another lesson I have learned from this project. If I send someone a draft, and they give it back to me all marked up with lots of corrections and suggestions, I now know that this is actually a good thing and by no means indicates that it was not a good draft. Having a lot of suggestions can mean that the bones are good but there is room to make it clearer and more informative or that there is a better way to convey the intended message.

The biggest thing I learned from the completion of this thesis were surprisingly not the results of the study. Getting an answer to my research question was great, but the biggest take away was not the outcome, but the process itself. Having gone through the steps of independent research from the very start of developing a question important enough to ask, to running and interpreting the final analysis, I feel as though I am a more marketable, more competent student and professional. I have a better understanding of how research is conducted and the various functions it can serve. Now, when I read research articles, I have a can see a clearer picture of how their results were found and new ideas on how to replicate studies. The process of completing a senior honors independent research project has been one I won't soon forget and has allowed me to not only showcase my skills but sharpen them along the way

Introduction

Several studies report a negative relationship between parent-adolescent communication and adolescent risky decision making (Clawson & Reece-Webber, 2003; Yang, 2007; Litrownik et al., 2000). The literature also suggests that parent-adolescent communication could serve as a protective factor against certain risk-taking behaviors during adolescence (Guilamo-Ramos et al., 2006; Miller & Whitaker 2000). However, it is important to examine how early communication relates to risky behaviors happening after the adolescent has left the home and transitioned into emerging adulthood. One risk-taking behavior with limited research on its relationship with parental communication, despite its growing popularity, is vaping, or the use of electronic cigarette devices. Risky drinking is another relevant topic for emerging adults because it can be heightened during this age period (Delucchi et al., 2008; Gfroerer et al., 2011). Hence, the present study examined how communication with their parents while an adolescent related to later risk-taking behaviors of vaping and risky drinking in emerging adulthood.

Risky Behavior: Binge Drinking

Binge drinking is a dangerous risk-taking behavior that is present on college campuses across the US (cite). The National Institute of Alcohol Abuse and Alcoholism (NIAAA) defines binge drinking as the consumption of five or more drinks (for males) or four or more drinks (for females) within a two-hour period. According to a survey issued by the NIAAA (2007), two out of five college students reported binge drinking at least one time in the last two weeks. The same survey reported that 1,825 18 to 25-year-olds die from alcohol-related unintended injuries every year and more than 690,000 report being assaulted by another student who had been drinking. While some may “mature out” of unhealthy drinking patterns after they leave school, others do not (Vergas et al., 2013), leaving them at risk for developing serious alcohol use problems during

adulthood (Prince et al. 2019). Jennison (2004) investigated the short and long-term effects of binge drinking in college and found that those who participated in binge drinking frequently were three times more likely to have alcohol-related problems during college (i.e. missing class, lower grades, and/or problems with relationships due to drinking) and more likely to meet the criteria for alcohol dependence or abuse after leaving college.

Binge drinking can also have negative cognitive and general health impacts. Binge drinkers have been observed to have spatial working memory and pattern recognition impairments compared to those who only socially drink or do not drink at all (Weissenborn & Duka, 2003). Okoro et al. (2004) found that binge drinkers were more likely to report their health being “fair” or “poor” compared to non-binge-drinkers as well as report more sick days per month than non-binge drinkers. Because of the dangers of binge drinking, it is important that researchers identify possible antecedents of such behaviors.

Risky Behavior: Vaping

Another current fad taking college students by storm is vaping, and a growing body of literature suggests it is also linked to negative outcomes (Cobb et al., 2010; Grana et al., 2014; Hwang et al., 2016; Cho & Palik, 2016; Yuan et al., 2015; National Academies of Sciences, Engineering, and Medicine, 2018). According to a survey from the University of Michigan done in 2019, the percentage of high school students who have vaped nicotine has doubled since 2017, showing a dramatic rise in popularity and relevance. This survey demonstrated a rising rate of vape use each year of high school, with about 25% of seniors reporting vape use in the last 30 days. These statistics indicate that vaping is a growing problem in adolescence.

There are many common misconceptions about electronic cigarettes (also known as e-cigarettes) and much of the population remains uninformed about the health risks vaping can have. Sanders-Jackson and colleagues (2015) investigated the knowledge young adults have on the dangers of vaping and found that 37% of participants stated that they didn't know whether some e-cigarettes contain nicotine, and 48% stated that they did not know whether e-cigarettes contain any harmful chemicals. In addition to misinformation surrounding vaping, e-cigarettes contain concerning levels of carcinogens, and the long-term health effects of inhaling the primary ingredients of the e-liquid is unknown (Cobb et al., 2010; Grana et al., 2014). Indeed, E-cigarette usage is associated with the development of respiratory health problems and the weakening of the pulmonary immune function (Hwang et al., 2016; Cho & Palik, 2016). Continued use of e-cigarettes also is associated with increased heart rate and diastolic blood pressure that can result in life-long cardiovascular issues (Yan & Ruiz, 2015).

One of the most concerning health effects of vaping are the long term-effects that nicotine in these devices have on brain development and behavior. Since the brain is still developing past adolescence and into the early 20's age range (Sowell et al., 1999; Sowell et al., 2001), even low doses of nicotine can cause cognitive issues such as problems with mood and attention (Yuan et al., 2015; National Academies of Sciences, Engineering, and Medicine, 2018) as well as a greater vulnerability to more problematic use in the future (Kendler et al., 2014). Many e-cigarette varieties actually give a higher dosage of nicotine than a typical combustible cigarette (Fadus et al., 2019). Because of the mix of dangers that come with vaping and the misinformation that surrounds its health risks, it is important for researchers to identify effective sources that may inform and deflect adolescents and emerging adults from e-cigarette use.

Parent-Adolescent Communication's Effect on Risk-Taking Behaviors

Parents' communication levels with their adolescent can be an important factor in an adolescent's decision-making process. Clawson and Reece-Webber (2003) found that parents who have had multiple conversations about sexual topics with their adolescent children, such as condom use, STD's, and contraceptive options, made it less likely that their adolescent would report sexual risk-taking behaviors in late adolescence. Researchers in another study looked at the frequency of parental communication and the adolescent's perception of their parent and found that adolescents that reported frequent communication with their parent as well as perceiving their parent to be trustworthy and having some level of expertise were less likely to participate in risky behaviors such as smoking and premature sex (Guilamo-Ramos et al., 2006). Miller and Whitaker (2000) found that adolescents who had sexual communication with a parent were more likely to list a parent as the best source of information about sex compared to those adolescents who listed their peers as the best source for information. This is important to know because if adolescents are not informed about risky behaviors, they will be more likely to seek that information elsewhere, making them more vulnerable to conforming to peer norms and participating in those risky behaviors (Miller & Whitaker, 2000).

The majority of the research regarding parental communication and risk-taking behavior has focused on sexual risk-taking behaviors with few exceptions. Yang (2007) found that among female African American participants, the adolescent's perception of open communication had a negative relationship with adolescent alcohol use. Among Latino adolescents, higher parental-communication was associated with lower levels of substance abuse (Litrownik et al., 2000). Although the risk-taking behaviors studied have not been widely varied, the connection between parent-adolescent communication and risk-taking have an important relation that should be

investigated further to determine possible protective factors against risky behaviors.

Furthermore, most studies have examined communication and risk-taking behaviors during adolescence, but none have investigated the link between parent-adolescent communication and risk-taking behaviors occurring in emerging adulthood. This is important to study because these risk-taking behaviors can be very relevant during this time, possibly due to brain development, social pressure, or stress (Reid & Carey, 2018; Reynolds et al., 2009; Russel et al., 2017) and identifying an antecedent to these behaviors could potentially reduce the occurrence of them.

Current Research

Past studies have shown the harmful effects of binge drinking (Prince et al. 2019; Jennison, 2000; Weissenborn & Duka, 2003; Okoro et al. 2004) and vaping (Cobb et al., 2010; Grana et al., 2014; Hwang et al., 2016; Cho & Palik, 2016; Yuan et al., 2015; National Academies of Sciences, Engineering, and Medicine, 2018) as well as that increased effective parental communication may have a negative relationship with various risk-taking behaviors in adolescence (Clawson & Reece-Webber, 2003; Guilamo-Ramos et al., 2006; Miller and Whitaker 2000; Yang, 2007; Litrownik et al., 2000). The present research investigates whether the relationship between the quality of parental communication and risk-taking behavior will continue to have a negative relationship in emerging adulthood when the child has moved out of the home and has begun their transition into emerging adulthood. Specifically, this study will look into the behaviors of risky drinking and vaping and how the level of quality parental communication during adolescence is related to the occurrence of these behaviors later in life. It is hypothesized that emerging adults who had greater quality parent-adolescent communication will be less likely to participate in risky drinking and in the use of electronic cigarettes than their peers who did not have healthy parental communication during their adolescence. Therefore,

parental communication and risky behaviors of vaping and alcohol use will have a negative relationship.

Method

Participants

This sample was recruited through a campus-wide online participant recruitment software (SONA), where participants received 0.5 research credits for participation, postings to social media sites, including Reddit and Facebook, and by word of mouth. This study was approved by the University's Institutional Review Board, and all subjects completed informed consent. Data was collected from 142 participants, however, participants currently living with their parents were excluded as well as anyone below the age of 18 or above the age of 25, leaving 98 viable participants.

Participants were young adults, ranging in age from 18-25 ($M = 21.6$, $SD = \#$), currently living away from their parents. The convenience sample primarily consisted of white ($N = 68$, 69%) females ($N = 74$ 75%). Other participants reported being Asian ($N = 20$, 20%), Black or African American ($N = 2$, 2%), Native Hawaiian ($N = 2$, 2%), and ($N = 6$, 6%) other. Regarding gender, the sample also included males ($N = 21$ 21%), transgender female ($N = 1$, 1%), and some who selected "other" ($N = 2$, 2%).

Measures

Parent-Adolescent Communication Scale Parent-adolescent communication was measured by The Parent-Adolescent Communication Scale (PACS) $\alpha = .935$ (Barnes and Olsen, 1985). The PACS consists of twenty questions measuring the quality of parent-adolescent communication and is scored on a 5 point Likert scale of (1)= Strongly Disagree to (5)=Strongly

Agree. The PACS has two subscales, The Open Family Communication (OFC) subscale $\alpha = .938$ assesses for quality in open communication, free expression, and understanding in parent-adolescent interactions (e.g., “When I ask questions, I get honest answers from my primary parent/guardian”). Higher scores for this subscale indicate better parent-adolescent communication. The Problems in Family Communication (PFC) $\alpha = .855$ subscale measures barriers to healthy parent-adolescent communication such as hesitancy to disclose concerns and feelings about certain subjects and negative feelings about communication (e.g., “I don’t think I can tell my primary parent/guardian how I feel about some things”). Lower scores for this subscale indicate better parent-adolescent communication. Participants would then be asked “Has your primary parent/guardian ever talked to you about the dangers of drinking?” (yes or no) “Has your primary parent/guardian ever talked to you about the dangers of using electronic cigarettes or other vape devices?” (yes or no)

Alcohol Use Disorders Identification Test Alcohol use and binge drinking was assessed with The Alcohol Use Disorders Identification Test (AUDIT) $\alpha = .872$. This scale, developed by the World Health Organization (WHO) consists of ten questions assessing alcohol consumption, drinking behaviors, and alcohol-related problems. Participants were provided with a chart illustrating what a standard drink looks like for different alcoholic beverages as many of the questions ask about numbers of drinks (e.g. How many drinks containing alcohol do you have on a typical day when you are drinking?). Scores of 0 to 7 indicate low risk, 8 to 15 indicate increasing risk, 16 to 19 indicate higher risk, 20 or more indicates possible dependence.

E-cigarette Dependence Scale Vaping/E-cigarette use was evaluated using the E-cigarette Dependence Scale (EDS) $\alpha = .974$. For this study, we used the 8-item version of this scale as results show that it is just as valid and reliable as the 22-item version (Morean et. al.,

2019). Questions relating to e-cigarette usage (e.g. I find myself reaching for my e-cigarette without thinking about it) are scored on a scale of (0) = never, to (4) = almost always) with higher scores indicating higher dependence on electronic-cigarettes. Participants will also be asked, “how many days in the last two weeks have you used an electronic cigarette or other vaping device?”

Procedure

Data was collected via a Qualtrics survey. Prior to answering any research questions, participants were asked to read an informed consent, and asked whether they accepted or did not accept. Those who accepted were then taken to the survey. Participants were first surveyed about their basic demographics. Next, participants were asked to think back to when they were their 13-17-year-old living with their primary parent(s)/guardian(s) and answer the next questions accordingly. The parent-adolescent communication scale will then be administered followed by vaping and binge drinking scales.

Results

Preliminary independent samples t-test were conducted to compare the mean scores for Alcohol Use Disorder Identification Test (AUDIT) and Parent Adolescent Communication Scale (PACS) between males and females. Results were non-significant $p > .179$. Additionally, an independent samples t-test was conducted to compare the mean scores for E-Cigarette Dependency Scale (EDS) between males and females. Results were also not significant $t(88) = 1.01, p = .313$.

Pearson’s r correlation was run to examine the relationship between age and AUDIT scores. A moderately significant positive relationship was found $r(98) = .22, p = .034$. A

Pearson's r correlation was also run to examine age's relationship with PACS and EDS scores. No significant relationship was found, $p < .155$.

Hypothesis One: *Parent-adolescent communication will be negatively correlated with participation in risky drinking.*

To examine the relationship between parent-adolescent communication and risky drinking, a Pearson's r correlation analysis was run. A moderate negative correlation was found between PACS and AUDIT scores, $r(96) = -.21, p = .043$ supporting Hypothesis One. A Pearson's r correlation analysis was also run for risky drinking and each subscale of the PACS. A moderate negative correlation was found between Open Family Communication (OFC) and AUDIT score, $r(95) = -.21, p = .045$. The positive correlation found between Problem Family Communication (PFC) and AUDIT scores approached significance $r(95) = .17, p = .099$.

A regression analysis was run to test if OFC and PFC scores significantly predicted participants AUDIT scores. Results were not significant $F(2,92) = 2.149, p = .122$

Hypothesis Two: *Parent-adolescent communication will be negatively correlated with participation in vaping*

To examine the relationship between parent-adolescent communication and vaping, a Pearson's r correlation between PACS scores and EDS scores was run. No significant correlation was found between PACS and EDS scores, $r(96) = -.13, p = .229$. Pearson's r correlations were then run for EDS scores and each subscale of the PACS, PFC ($r(93) = -.06, p = .561$) and OFC ($r(93) = -.16, p = .125$) and results were insignificant. Thus, Hypothesis Two was not supported.

A regression analysis was run to test if OFC and PFC scores significantly predicted EDS scores. Results were not significant $F(2, 90) = 1.382, p = .256$

Table 1

Descriptive Statistics of Measures

	N	Cronbach's alpha	Minimum	Maximum	Mean	Std. Deviation
PACS	98	.935	25	98	62.776	15.827
OFC	98	.938	11	50	33.490	9.472
PFC	98	.855	11	46	30.714	7.798
AUDIT	98	.874	0	26	5.979	6.028
EDS	93	.974	0	32	3.645	7.538

Discussion

Prior research has demonstrated a significant relationship between parent-adolescent communication and certain adolescent risk-taking behaviors but mostly risky sexual behaviors, underage drinking, and cigarette use (Litrownik et al., 2000; Yang, 2007; Guilamo-Ramos et al., 2006). However, no research has been conducted to see if this relationship between parent-adolescent communication and risk-taking behaviors continues to exist after the adolescent has transitioned into emerging adulthood and moved out of the parent's home. In addition, certain

risk-taking behaviors, that have become more relevant such as vaping, have also been largely left out of the literature. Therefore, this study aimed to investigate the relationship of parent-adolescent communication and the risky behaviors of drinking and vaping during emerging adulthood. It was hypothesized that a negative correlation would be found between parent-adolescent communication and drinking habits as well as a negative correlation between parent-adolescent communication and vaping habits.

Only one hypothesis was partially supported as a significant negative relationship was found between parent-adolescent communication and risky drinking habits. This means that those who reported higher quality of parental communication during their adolescence were less likely to report engaging in risky drinking during emerging adulthood. The negative relationship found between parent-adolescent communication and emerging adulthood risky drinking is supportive of past research that found a link between parental communication and underage drinking habits (Litrownik et al., 2000; Yang, 2007) and shows that this relationship can continue even after the child grows into early adulthood. Strong parental communication during adolescence may be a protective factor for risky drinking.

Examining PACS individual components resulted in a negative relationship being found between OFC and AUDIT score and a positive relationship being found between PFC and AUDIT, further supporting the notion that healthy parent-adolescent communication could be a protective factor in risk taking behaviors and problematic parent-adolescent communication could be a risk-factor to certain risky behaviors such as the one examined in this study.

Interestingly, the regression model was not significant suggesting other factors may also be in important way to better understand this risky behavior in college students. Possible reasons that the second hypothesis was not significant could be due to limitations of the study but could

also be that vaping is a rather new phenomena and more research needs to be done regarding motivations and antecedents of the behavior.

Given that risky drinking during college can have both short and long-term negative consequences (Jennison, 2004; Okoro et al., 2004; Prince et al., 2019; Weissenborn & Duka, 2003), identifying a protective factor may be an important step in in developing early interventions.

Limitations & Future Directions

This study was not without limitations This study was conducted during the Covid-19 global pandemic and drinking and vaping behaviors may have been affected as evidence suggest that these behaviors are influenced by stress (Temmen & Crockett, 2020; Jamieson & Mendes, 2016). The sample size used was rather small and consisted of a disproportionate number of females compared to other genders. The sample size was also predominantly white so results may not generalize to other populations with different characteristics. The majority of the sample did not report any vaping habits and the small sample of vapers could be one reason no significant relationship was found between parent-adolescent communication and vaping. Participants were asked to think back to their adolescence and answer questions about how the quality of their parental communication was during that time which could be a limitation to this study because, over time, memory of the communication quality could experience decay of misinformation. Additionally, the scale used to measure parent-adolescent communication (PACS) only measured the quality of communication and did not specify communication surrounding any specific topic, such as the risk-taking behaviors examined in this study.

Future researchers examining similar research questions should use a larger, more diverse sample to account for different gender, racial, and other cultural identities as people with different backgrounds may have different parent-child dynamics that could impact risk-taking behaviors. For instance, in some cultures, communication between a parent and their child is minimal or even ridged while in other, it is more likely to be open and looser. Longitudinal studies would also be a better research design because memory of the type of communication happening during one's adolescent can fade change or fade by the time that person reached emerging adulthood. Specifically, researchers are suggested to administer the Parent-Adolescent Communication scale, or another similar measure, during adolescence and then, years later, survey participants on their risk-taking behaviors. Future research may also want to examine different types of communication such as parent-adolescent communication surrounding specific topics. For example, communication regarding the risks of drinking or vaping may have a stronger correlation with the occurrence of those specific risk-taking behaviors.

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Office of Research Integrity
 Institutional Review Board (IRB)
 2000 University Avenue
 Muncie, IN 47306-0155
 Phone: 765-285-5052
 Email: orihelp@bsu.edu

DATE: February 10, 2021

TO: Audrey Hasser

FROM: Ball State University IRB

RE: IRB protocol # 1697253-1

TITLE: The Relationship of Parental Communication and Emerging Adulthood Risky Behaviors of Binge Drinking and Vaping

SUBMISSION TYPE: New Project

DECISION: APPROVED

PROJECT STATUS: EXEMPT

DECISION DATE: February 10, 2021

REVIEW TYPE: Exempt Review

The designated reviewer for the Institutional Review Board (IRB) reviewed your protocol and determined the procedures you have proposed are appropriate for exemption under the federal regulations. As such, there will be no further review of your protocol, and you are cleared to proceed with the procedures outlined in your protocol. As an exempt study, there is no requirement for continuing review. Your protocol will remain on file with the IRB as a matter of record. All research under this protocol must be conducted in accordance with the approved submission and in accordance with the principles of the Belmont Report.

Exempt Categories:

	<p>Category 1: Research conducted in established or commonly accepted educational settings, that specifically involves normal educational practices that are not likely to adversely impact students' opportunity to learn required educational content or the assessment of educators who provide instruction. This includes most research on regular and special education instructional strategies, and research on the effectiveness of or the comparison among instructional techniques, curricula, or classroom management methods.</p>
x	<p>Category 2: Research that only includes interactions involving educational test (cognitive, diagnostic, aptitude, achievement), survey procedures, interview procedures, or observation of public behavior (including visual or auditory recording) if at least one of the following criteria is met: (i) The information obtained is recorded by the investigator in such a manner that the identity of the human subjects cannot readily be ascertained, directly or through</p>

	<p>identifiers linked to the subjects; (ii) Any disclosure of the human subjects' responses outside the research would not reasonably place the subjects at risk of criminal or civil liability or be damaging to the subjects' financial standing, employability, educational advancement, or reputation; or (iii) The information obtained is recorded by the investigator in such a manner that the identity of the humans subjects can readily be ascertained, directly or through identifiers linked to the subjects, and an IRB conducts a limited IRB review to make the determination required by 46.111(a)(7).</p>
	<p>Category 3: Research involving benign behavioral interventions in conjunction with the collection of information from an adult subject through verbal or written responses (including data entry) or audiovisual recording if the subject prospectively agrees to the intervention and information collection and at least one of the following criteria is met: (A) The information obtained is recorded by the investigator in such a manner that the identity of human subjects cannot be readily ascertained, directly or through identifiers linked to the subjects; (B) Any disclosure of the human subjects' responses outside the research would not reasonably place the subjects at risk of criminal or civil liability or be damaging to the subjects' financial standing, employability, educational advancement, or reputation; or (C) The information obtained is recorded by the investigator in such a manner that the identity of the human subjects can be readily ascertained, directly or through identifiers linked to the subjects, and an IRB conducts a limited IRB review to make the determination required by 46.111(a)(7).</p>
	<p>Category 4: Secondary research for which consent is not required.</p>
	<p>Category 5: Research and demonstration projects that are conducted or supported by a Federal department or agency, or otherwise subject to the approval of department or agency heads, and that are designed to study, evaluate, improve, or otherwise examine public benefit or service programs, including procedures for obtaining benefits or services under those programs, possible changes in or alternatives to those programs or procedures, or possible changes in methods or levels of payment for benefits or services under those programs.</p>
	<p>Category 6: Taste and food quality evaluation and consumer acceptance studies, (i) if wholesome foods without additives are consumed or (ii) if a food is consumed that contains a food ingredient at or below the level found to be safe, by the Food and Drug Administration or approved by the Environmental Protection Agency or the Food Safety and Inspection Service of the U.S. Department of Agriculture.</p>
	<p>Category 7: Storage or maintenance for secondary research for which broad consent is required: Storage or maintenance of identifiable private information or identifiable biospecimens for potential secondary research use if an IRB conducts a limited IRB review and makes the determinations required by 46.111(a)(8).</p>
	<p>Category 8: Secondary research for which broad consent is required: Research involving the use of identifiable private information or identifiable biospecimens for secondary research use, if the following criteria are met: (1) Broad consent for the storage, maintenance, and secondary research use of the identifiable private information or identifiable biospecimens was obtained in accordance with §46.116(a)(1) through (4), (a)(6), and (d); (2) Documentation of informed consent or waiver of documentation of consent was obtained in accordance with §46.117; and (3) An IRB conducts a limited IRB review and makes the determination required by §46.111(a)(7) and makes the determination that the research to be conducted is within the scope of the broad consent referenced in paragraph (d)(8)(i) of this section; and (iv) The investigator does not include returning individual research results to participants as part of the study plan. Note: This provision does not prevent an investigator from abiding by any legal requirements to return individual research results.</p>

Ball State Specific Exempt Categories

	<p>Category 9: Research involving publicly observable online behavior. Any online behavior that requires a person's permission to access is considered private and does not fall under this category. Information that cannot be accessed by the general population would also be considered private.</p>
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Category 10: Research involving BSU students who are under 18 but have legal authority over their FERPA protected information. Only studies that fall into another exempt category except for sampling from BSU students who are under 18 can be considered exempt in this category.

Editorial Notes:

1. approved.

While your project does not require continuing review, it is the responsibility of the P.I. (and, if applicable, faculty supervisor) to inform the IRB if the procedures presented in this protocol are to be modified or if problems related to human research participants arise in connection with this project. **Any procedural modifications must be evaluated by the IRB before being implemented, as some modifications may change the review status of this project.** Please contact Sena Lim at (765)285-5034 or slim2@bsu.edu if you are unsure whether your proposed modification requires review or have any questions. Proposed modifications should be addressed in writing and submitted electronically to the IRBNet as a "Modification/Amendment" for review. Please reference your IRB protocol number 1697253-1 in any communication to the IRB regarding this project.

In the case of an adverse event and/or unanticipated problem, you will need to submit written documentation of the event to IRBNet under this protocol number and you will need to directly notify the Office of Research Integrity (<http://www.bsu.edu/irb>) **within 5 business days**. If you have questions, please contact Sena Lim at (765)285-5034 or slim2@bsu.edu.

Reminder: Even though your study is exempt from the relevant federal regulations of the Common Rule (45 CFR 46, subpart A), Ball State has elected to hold you accountable to these regulations to encourage best research practices. You and your research team are not exempt from ethical research practices and should therefore employ all protections for your participants and their data which are appropriate to your project.