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SMOKING BEHAVIOR AND MORAL IDENTITY IN MALAYSIAN YOUTH: IS GENDER A MODERATOR OR A PREDICTOR?

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ABSTRACT

The role of gender in psychosocial development and health outcome is undeniable. This study aims to investigate the role of gender in two conditions, whether it as a moderator to the link between moral identity (internalization and symbolization) and smoking behavior; or if it is a single predictor or a co-predictor with moral identity in predicting smoking behavior. To examine this, 388 youths (61% female) who met the inclusion criteria participated in this online cross-sectional study. Participants were asked to rate their emotional responses ranging from unpleasant to pleasant whilst viewing images of smoking behavior. Participants were also instructed to provide their socio-demographic information and fill in the Moral Identity Scale. Gender had no moderation effect on the link between moral identity (symbolization and internalization) and smoking behavior, instead, gender (whether alone or in combination with internalization) was shown to directly predict smoking behavior. The implications for social health interventions and programs are highlighted by the findings.

Contribution/Originality: The paper's primary contribution is the discovery that gender is a significant biological factor (whether alone or in combination with moral identity internalization) that predicts (but not moderates) smoking behavior. This study uses a specific approach (i.e., visualization of images) to capture the valence of the emotional tendency to smoke.

1. INTRODUCTION

The World Health Organization attributes a high number of deaths (more than 7 million every year) to tobacco use (World Health Organization, 2017). Tobacco use is the leading cause of preventable disease and its use usually begins during adolescence. It is reported that about 46% of smokers began smoking between the ages of 18 and 20 (Nazary et al., 2010). From the 2019 United States census, it was estimated that about eight million (53%) high school students admitted that they have tried a tobacco product (Wang et al., 2019).

Malaysia, where tobacco use places a significant burden on the economy and on public health, is no exception. According to a recent report, smoking incurs RM275.3 billion (US$69.4 billion) in losses of productivity as estimated from the gross domestic product (GDP) per equivalent full-time worker in Malaysia (Tan, Zomer, Owen, Chin, & Liew, 2020). Like other countries in the world, the growing industry of tobacco and nicotine products in Malaysia has become challenging with the increasing prevalence of smoking among adolescents (Chun, 2020; Puteh et al., 2018; Yusof, Zin, Idris, & Mohammad, 2019). This socio-economic scenario concerning smoking urges a

holistic understanding of smoking behavior from various social groups in Malaysia, including approaching the 'hard to reach' groups (i.e. homosexual men) in order to develop a strategic health plan (Lim et al., 2020).

Gender is a biological factor that plays an important role in human physiology and disease development that interplay with genetic, epigenetic and hormonal conditions. Gender is also an important factor that can determine patterns of behavior and how people interact in society (Clayton, 2016; Mauvais-Jarvis et al., 2020). Meanwhile, in the conceptualization of moral identity, gender has been pointed out as a crucial biological determinant among young people, especially adolescents (Hardy et al., 2013). From this viewpoint, controlling the gender factor in analyses has been rigorously undertaken in order to achieve a better understanding of diverse health issues (Moreau, 2019; Schiebinger, Leopold, & Miller, 2016). With regard to gender analysis, many psycho-social studies of clinical and non-clinical samples have pointed out gender as a significant moderator. For example, gender was found as a moderator of the relationship between losing one's job and well-being in a sample of Romanian cancer patients (Kallay, Degi, & Pintea, 2017). The role of gender as a moderator was also seen in a sample of patients with post-traumatic stress disorder (PTSD) in which gender (and family support) moderated the association of trauma on PTSD symptoms (Kliewer et al., 2021). In this study, males benefited most from family support in high traumatic stress situations, while females benefited most when no family members were lost or injured.

Gender has also been shown in research to play a moderating role in smoking behavior. For example, Luk & Tsoh (2010) found that the role of gender moderates the association between smoking status and other psychological parameters, such as depression. This study reported that current smokers have a higher level of depression than either former smokers or non-smokers. Meanwhile Lee & Oh (2019), in their study on vaping behavior, found that females who had never smoked were significantly less likely to ever vape than males who had never smoked.

Aside from examining gender's moderating effect, a direct analysis of gender's effect on smoking behavior has also been reported. Chen et al. (2017) proposed a difference in nicotine level in a sample of smokers, with male smokers exhibiting significantly higher cotinine levels than female smokers. Mansour (2017), on the other hand, claimed that being male increased the likelihood of smoking by up to seven times more than being female. This fact could be related to the suggestion that gender is a significant predictor of physical problems (concerning physical health impact) associated with smoking, with males being less affected by physical factors than females (Sweis, 2018). Recent studies have showcased the significant effect of gender on risky behavior other than smoking (Greaves, 2020; Hemsing & Greaves, 2020). In some cases, risky adolescent behavior may be unexpected. For example, Mathijssen, Rozema, Hiemstra, Jansen, & Oers (2021) discovered that females have a higher level of sensation seeking than males. Sensation seeking, alternatively referred to as thrill seeking or excitement seeking, is a proclivity for pursuing novel and unusual sensations, feelings, and experiences that is most prevalent in the adolescent age group.

Many interventions have been implemented, primarily aimed at adolescents, in order to prevent risk-taking behaviours at an early stage and to raise a new generation with strong moral values (e.g., Plotnikoff et al., 2019). Risk-taking behavior (i.e., binge-drinking, illicit drug use, risky sexual behavior and risky driving) was found to have a negative effect on the construction of positive identity (Schwartz et al., 2010). Therefore, preventing risk-taking behavior is crucial in order to develop maturity and moral identity, which are necessary elements in the development of mental and psychological well-being of this upcoming generation (Hardy et al., 2013).

New trends in moral psychology begin to surface and moral identity started to be explained as a fundamental basis of human development (Hardy & Carlo, 2011). In fact, Blasi's Self Model, which explains conceptual morals by linking moral judgment and action, has had a strong influence on our understanding of moral identity (Blasi, 1993; Jennings, Mitchell, & Hannah, 2015). According to Aquino & Reed (2002), moral identity is central to one's sense of self. This concept of self-importance considers moral self-conceptions in order to explain moral conduct.

Moral identity is conceptualized in terms of moral development and identity construction, which serve as a foundation for the link between moral reasoning and moral behavior. This moral identity conceptualization, in reality, is accepted as a trait-like tendency that consists of two perspectives of morality – explicit sense of identity and implicit sense of identity. Explicit sense is the manifestation of moral behavior in an individual, according to their internal or intrinsic value (Hardy & Carlo, 2011). Within this perspective, two domains of moral identity (internalization and symbolization) were suggested, indicating equal importance of the proscriptive moral outcomes (Boegershausen, Aquino, & Reed, 2015).

An interplay between morality, identity and addiction has been given much attention in recent studies (e.g., Earp, Skorburg, Everett, & Savulescu, 2019). Being addicted to a particular substance has a significant impact on the moral character of an addict, who frequently deviates from their true selves. Addiction is viewed not only as a moral failure but also as a failure to meet financial obligations (Cox & Jakes, 2017; Thirlway, 2019). From the neuroethics point of view, addiction is debated as a matter of not only moral failure but also a matter of brain disease that needs to be properly modeled in public education (Heather, 2017). In the current era of electronic cigarettes, the social stigma of moral deviance does not appear to be negotiated. They retained their identity as a smoker and were unable to change the impact of smoking on their social and cultural prominence (Lucherini, Rooke, & Amos, 2018, 2019; Tokle & Pedersen, 2019).

Based on the above background, this study put forwards important justifications and knowledge gaps surrounding the issues of gender, moral identity and smoking behavior as follows:

1. Gender is the biological variable that plays an important role in psychosocial development, and its implication on diverse health contexts has been proven in many previous reports (e.g., Matud, López-Curbelo, & Fortes, 2019). The connection between moral issues and risk-taking behavior, such as smoking, has to be analyzed by considering the factor of gender. In eastern cultures, such as Malaysia, smoking behavior has a strong linkage with masculinity among males that may differ from western cultures (Kodriati, Pursell, & Hayati, 2018). In terms of moral behavior, the role of gender has been highlighted in order to better understand moral foundation and cognition (Baez et al., 2017; Niazi, Inam, & Akhtar, 2020). However, the role of gender, specifically at the intrinsic or internal level (referred to as internalization) and at the external value or action level (referred to as symbolization), as well as its interaction with smoking behavior, is under-reported and insufficient.

2. We measure behavior related to the risk of smoking by quantifying the valence domain of emotion that was captured through the visualization approach. Valence is a fundamental structure of human emotion in the circumplex model of affect that is characterized by the continuum of pleasantness and unpleasantness triggered by an event or an object (Russell, 1991). There is a dearth of visualization approaches for quantifying specific emotional domains of valence, particularly in the context of smoking behavior research. This approach is highly suggested in order to enhance the emotional sensitivity to detect one's intrinsic tendency towards risky behavior as well as immoral behavior. The emotion dimension has been studied widely in the field of psychology to explain many aspects of human functioning. For instance, Lau & Wu (2012) examined the construct of youth development from their emotional competence. Meanwhile, in moral psychology research, the judgment of morals (e.g., telling right from wrong) was suggested as a matter of affective intuition and emotion (Greene & Haidt, 2002). In smoking behavior research, emotional symptoms and other related variables (such as conduct problems and hyperactivity) were viewed as relevant factors that can contribute to behavior related to smoking (Giannakopoulos, Tzavara, Dimitrakaki, Kolaitis, & Rotsika, 2010). Visualization is suggested as a good approach in understanding perception (e.g., Brosch, 2018; Pearson, 2019). Indeed, visualization and living creatures should be viewed as a single entity. Living creatures (human and animal) utilize visualization substantially in their lives to synthesize information from their environments to survive. The process of visualization entails not only the use of physical eyes but also bio-psychological factors which considering the elements of biological (i.e., genetics, biochemical) and psychological (i.e., feelings, behaviours, personality).

Through the above-mentioned approach, this study generates one important research question: How does the role of gender explain the link between moral identity (internalization and symbolization) and behavior related to the risk of smoking? Is gender a moderator or a direct predictor? In addition to this, we also want to know if internalization and symbolization are moral constructs that produce similar psycho-moral outcomes (as they should) or vice versa from this gender analysis.

2. RESEARCH METHOD

2.1. Study Participants and Procedure

Due to the restrictions during the Covid-19 pandemic as outlined by the government, including not allowing face-to-face contact and any form of assembly, this study collected cross-sectional data from the participants who were invited to take part in this study through an online survey. Potential participants were informed about the study through an advertisement circulated on social media. Using convenient sampling, 388 participants (Mean of age = 22±1.7; and female = 62%) who met the inclusion criteria (i.e., no vision problems or had any background of psychological abnormality) consented to participate in the study. Research information sheets that contain detailed information on research procedures and objectives were distributed to all participants. The procedure of the study was carried out according to the ethical guidelines in the study protocol, as approved by the Ethics Committee. A major part of the study required participants to view and react to emotional visual images, thus participants with visual impairments were reminded to use glasses or contact lenses whilst viewing the images. Participants were also reminded that they could withdraw from the study at any point before submitting their answers.

In this study, participants were also required to provide socio-demographic information and complete two measures. First, they completed an emotional rating on the Self-Assessment Manikin (SAM) scale (Bradley & Lang, 1994) (see Figure 1) based on ten images of behavior related to smoking, and second, they completed the eight items on moral scale (three items of internalization and five items of symbolization).

2.2. Image of Smoking Behavior

A collection of ten images that show the activity of cigarette smoking (tobacco) and e-cigarette vaping were shown to the participants. These images were free from copyrights collected from the internet. Three academicians—two psychologists and one public health expert—determined the validity of the images for the purpose of the study. These evaluators judged the content of the images based on four Likert options to determine the Content Validity Index (CVI), as suggested by Davis (1992), and are as follows: 1 = not relevant, 2 = somewhat relevant, 3 = quite relevant (X) and 4 = highly relevant (X). Only items with scores of 3 and 4 were included in calculating the CVI for each individual image using the formula as below:

$$\frac{\text{Number of X}}{\text{Number of Evaluators}}$$

All images indicate a value of one that accords to the requirement of the CVI to have such a value for the acceptable content validity. Meanwhile, the internal consistency was good (Cronbach's alpha of 0.97). Technical bias was controlled as much as possible by considering the brightness and size of the presented images.

2.3. Self-Assessment Manikin Scale

The Self-Assessment Manikin scale is effective, low cost and widely used (Bradley & Lang, 1994; Bynion & Feldner, 2017; Geethanjali, Adalarasu, Hemapraba, Kumar, & Rajasekeran, 2017). It was used in this study to measure the valence—a specific domain of emotion that explains one's internal affective state, whether positive (attraction) or negative (rejection), that is triggered by the stimulus from the environment. The level of valence was

determined through the self-rating of a single measure of a pleasant–unpleasant continuum that ranges from one (that indicates unpleasant emotion or unhappiness) to nine (that indicates pleasant emotion or happiness) (see Figure 1).

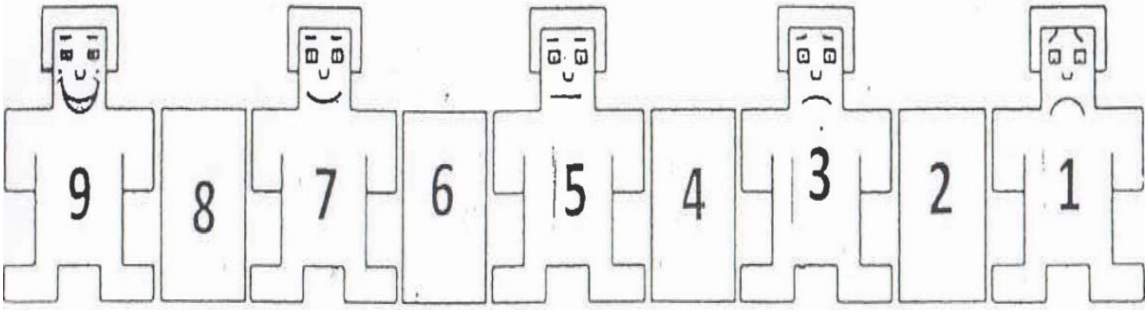

Figure-1. Emotional continuum of Self-Assessment Manikin (SAM) for valence.

2.4. Moral Identity Scale

The Moral Identity Scale was used to measure the internalization (an intrinsic value that is central to the participant's self-concept, e.g., "*It would make me feel good to be a person who has these characteristics*") and symbolization (an external value through displaying a social identity based on moral traits, e.g., "*I often wear clothes that identify me as having these characteristics*") (Aquino & Reed, 2002). Five items of the symbolization domain were retained in analysis; meanwhile, two out of the five items of internalization were dropped due to low factor loading (item number 4: "*I would be ashamed to be a person who had these characteristics*" = 0.15; and item number 7: "*Having these characteristics is not really important to me*" = 0.23). Both domains indicated acceptable internal consistencies (Cronbach's alphas were 0.81 for internalization and 0.75 for symbolization). Participants were asked to visualize the following positive characteristics in their mind that might describe a person: *caring, compassionate, fair, friendly, generous, helpful, hardworking, honest and kind*, and respond to the items using a 7-point Likert scale ranging from 1 (completely disagree) to 7 (completely agree). The construct validity of the scale can be obtained from the original articles (Aquino & Reed, 2002).

2.5. Statistical Analysis

Statistical Package for the Social Sciences (SPSS) Version 23 was used to analyze the data. Two main analyses were performed:

1. Separate moderation analyses were performed to determine the role of gender as a moderator for two domains of moral identity, i.e., the link between internalization and smoking behavior, and the link between symbolization and smoking behavior. Through this analysis, gender data was transformed into dummy variables (0 = male and 1 = female). The interaction variables, i.e., gender and internalization, and gender and symbolization, were created as the third variables in the hierarchical regression model for each analysis.
2. A multiple linear regression was carried out to determine gender as a direct predictor (single or co-predictor with moral identity) in predicting smoking behavior.

3. RESULTS

Table 1 depicts the intercorrelation between smoking behavior, internalization and symbolization. A strong negative correlation was found between internalization and smoking behavior ($r = -0.16$, $p < 0.01$). However, a weak negative correlation was exhibited by symbolization and smoking valence ($r = -0.10$, $p < 0.05$).

Table 1. Pearson's correlation (r) of smoking valence with Internalization and Symbolization.

	Smoking valence (Mean = 23.03; SD = 17.48)
Internalization (Mean = 18.46; SD = 2.98)	-0.16**
Symbolization (Mean = 24.24; SD = 6.08)	-0.10*

Note: *p < 0.05; **p < 0.01; SD: Standard Deviation.

A hierarchal regression analysis was performed to determine the moderating effect of gender on the link between smoking behavior (dependent variable) and internalization (independent variable). There was no interaction effect between gender and internalization (R^2 change = 0.00, ns) (see Table 2). Likewise, an interaction effect of gender on the link between symbolization (dependent variable) and smoking behavior (independent variable) was not found (R^2 change = 0.00, ns) (see Table 3).

Table 2. The moderating effect of gender on the link between internalization and smoking behavior.

	R^2	R^2 Change	Standardized Coefficient Beta	Significant F-change
Gender (moderator)	0.11	0.11	-0.37	P < 0.001
Internalization (independent variable)	0.13	0.02	-0.16	P < 0.01
Gender X internalization	0.13	0.00	0.06	ns

ANOVA: df = 3; F = 19.48; p < 0.001

Table 3. The moderating effect of gender on the link between symbolization and smoking behavior.

	R^2	R^2 Change	Standardized Coefficient Beta	Significant F-change
Gender (moderator)	0.11	0.11	-0.42	P < 0.001
Symbolization (independent variable)	0.12	0.10	-0.12	P < 0.05
Gender X symbolization	0.12	0.00	0.11	ns

ANOVA: df = 3; F = 17.80; p < 0.001.

Further analysis using linear regression was performed for the gender variable through the stepwise method. The variables of gender, internalization and symbolization were modeled as predictors of smoking behavior (see Table 4). Gender indicated a significant impact on the model in predicting smoking behavior. The single predictor of gender explained 11% of the variance in model 1 [F (1, 386) = 47.42, p < 0.001]. However, the R^2 increased to 13% in model 2 when gender was combined with internalization [F (2, 385) = 29.06, p < 0.001]. Males displayed a significantly higher mean of smoking valence (mean = 30.51; SD = 19.98) compared to females (mean = 18.57; SD = 14.07) – (t = 6.87, p < 0.001). The symbolization variable was excluded from the model.

Table 4. Prediction of gender, internalization and symbolization on smoking valence.

	R^2	Standardized Coefficient Beta	df	F	*p*-value
Model 1: Gender	0.11	-0.33	1	47.42	0.00*
Model 2: Gender, Internalization	0.13	-0.32, -0.15	2	29.06	0.00*

Note: Symbolization (excluded; beta in = -0.32); *p < 0.001.

4. DISCUSSION

This study highlights two important findings. First, gender is not a moderator between moral identity (neither internalization nor symbolization) and risk smoking behavior; however, gender is a significant predictor of the risk of smoking behavior; and second, the prediction of gender on smoking behavior increases when gender is combined with internalization. This is not the case for symbolization, which, even when combined with gender, does not predict smoking behavior.

Our finding is in line with previous studies that pointed out gender as a factor that carries different risk perceptions and moral ideals. Earlier studies claim that males have lower moral ideals than females (Hardy, Walker, Olsen, Woodbury, & Hickman, 2014; Reniers, Murphy, Lin, Bartolomé, & Wood, 2016). Reniers et al. (2016) found that males perceive risk-taking behaviors as less risky than women, which could be explained by the lower

sensitivity of males to the negative outcomes of risk-taking behavior. Another study reported that adolescent males exhibited an increase in the pattern of risk-taking as a result of psychological stress, meanwhile, adolescent females exhibited the opposite. This was claimed based on the cortisol levels in males caused by stressful situations that were associated with greater stress-induced risk-taking (Daughters, Gorka, Matusiewicz, & Anderson, 2013). In another example of risk-taking behavior, such as risky driving behavior, Barr Jr et al. (2015) reported that males had a lower tendency to wear seatbelts compared to females. Meanwhile, in a study by Victor, Sansosti, Bowman, & Hariri (2015) on risky sexual behavior, the interaction between the amygdala, ventral striatum activation, and the number of sexual partners over time was found, in which females indicated relatively increased amygdala activation compared to males. Another study used functional magnetic resonance imaging (fMRI) to observe brain activity during risky tasks and reported that the neural activity was different between males and females. Male brains displayed less activation than female brains, especially in the right insula and the bilateral orbitofrontal cortex while they were performing tasks that required them to choose a safe option (small and guaranteed monetary reward) and a risky option (larger rewards but with a higher chance of losing money) (Lee, Chan, Leung, Fox, & Gao, 2009). This finding was strengthened by another report on brain research in which it was claimed that the gender difference in performing decision-making tasks was reflected in the activation differences in the orbitofrontal cortex, dorsolateral prefrontal cortex, and in the serotonergic and left–right hemispheric activity in males and females (van den Bos, Homberg, & de Visser, 2013).

This current finding reported a high score for smoking valence in males compared to females. This can be expected, as some societies (such as in Malaysia) accept smoking behavior as a symbol of masculinity (Kodriati et al., 2018). Even though there is an increasing trend of female smokers around the world, the percentage of male smokers who are long-term smokers and those who embrace new trends of smoking, such as the use of e-cigarettes, is still high (Eisenbaum, DiNitto, & Bishop-Fitzpatrick, 2018; Puteh et al., 2018). Masculinity is generally defined as the quality of manliness, as manifested by a man's characteristics and habits that society deems appropriate for a man. Masculinity is also associated with personality traits, such as independence and competitiveness, role behaviors, such as being a primary provider and taking the initiative, and physical traits, such as muscularity. Since the early 1980s, gender studies have used the concept of masculinity to explain men's power over women as well as men's health behaviors and violence (Kimmel, Hearn, & Connell, 2005). Many studies on men's health-seeking behavior show that masculine thoughts are reflected in their behavior (e.g. Parent, Hammer, Bradstreet, Schwartz, & Jobe, 2018; Seidler, Dawes, Rice, Oliffe, & Dhillon, 2016). Kodriati et al. (2018) went into great detail about masculine thoughts, particularly in relation to men's smoking habits. Meanwhile, in a study among 703 adult males in Poland, masculinity and sexual traits (heterosexuality) were related to their addictive behavior of smoking (Czaderny, 2020). The level of masculinity at baseline (during adolescent age) explained the smoking behavior in one prospective cohort study of 10,480 female and 10,263 male adolescents to assess whether gender expression as an adolescent (as determined by the degree to which an individual's behaviors were typical of their gender) was associated with health behaviors and outcomes in adulthood (Shakya et al., 2019).

Smoking has also been linked to immoral behavior in males, such as bullying (Aho, Koivisto, Paavilainen, & Joronen, 2019). In recent studies, researchers have looked into the issue of smoking behavior from the perspective of gender identity, which is an important viewpoint to understand the complexity of gender role in smoking behavior (e.g., Wang et al., 2019; Wheldon, Watson, Fish, & Gamarel, 2019).

In our study, the trait of internalization was found to have a significant role alongside gender in predicting smoking behavior. Our findings also agree with those of Patrick, Bodine, Gibbs, & Basinger (2018), who found that moral identity predicts most types of prosocial behavior. We found that individuals with higher levels of internalization reported lowered levels of smoking behavior, which is a negative pattern of association. Even though symbolization failed to predict smoking behavior, a weak zero-order correlation exists between these two variables ($r = -0.10$, $p < 0.05$). This pattern of discovery is not uncommon. Although internalization and symbolization

should be expected to indicate the positive trend of correlation under the construct of moral identity, as suggested by Aquino & Reed (2002), it is possible that these two features will be nonconforming (Gotowiec & Mastrigt, 2019; Winterich, Aquino, Mittal, & Swartz, 2013). Although our focus is specific to smoking behavior, and to some extent, smoking behavior is labeled as 'bad' behavior in a health-focused society, an extensive report on the role of moral identity in predicting unacceptable moral behavior has provided valuable insight into the psycho-moral perspective on smoking behavior. For example, Hardy, Bean, & Olsen (2015) found that moral identity and its interaction with moral disengagement predicted aggression. Moral identity also exhibited significant prediction capabilities of aggression and rule-breaking when interacting with self-regulation. Hardy et al. (2014) conceptualized moral identity as a moral ideal self – a salient element in the concept of moral identity and found that moral identity predicted altruism (characterized by unselfish concern for other people) and aggression (Hardy et al., 2014). In this case, we have proven that moral identity (internalization) has a significant connection with smoking behavior. This might explain the previous argument on how antisocial deviance was implicated in smoking behavior (Weiss, Nguyen, Trung, Ngo, & Lau, 2019).

5. CONCLUSION

Gender (whether alone or in combination with an internalization trait) indicates a direct association with smoking behavior. Males exhibit a greater proclivity for smoking behavior, which may be explained by their masculinity. In addition, gender appears to construct internalization in a different way than symbolization. Community-level smoking behavior programs are emphasized for young adults and further research is recommended to elucidate the role of gender in relation to internalization and symbolization traits for a variety of other risky behaviors.

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REFERENCES

Aho, H., Koivisto, A.-M., Paavilainen, E., & Joronen, K. (2019). The relationship between peer relations, self-rated health and smoking behaviour in secondary vocational schools. *Nursing Open*, *6*(3), 754-764. Available at: https://doi.org/10.1002/nop2.260.

Aquino, K., & Reed, A. (2002). The self-importance of moral identity. *Journal of Personality and Social Psychology*, *83*(6), 1423–1440.

Baez, S., Flichtentrei, D., Prats, M., Mastandueno, R., García, A. M., Cetkovich, M., & Ibáñez, A. (2017). Men, women…who cares? A population-based study on sex differences and gender roles in empathy and moral cognition. *PLoS One*, *12*(6), e0179336. Available at: https://doi.org/10.1371/journal.pone.0179336.

Barr Jr, G. C., Kane, K. E., Barraco, R. D., Rayburg, T., Demers, L., Kraus, C. K., . . . Kane, B. G. (2015). Gender differences in perceptions and self-reported driving behaviors among teenagers. *The Journal of Emergency Medicine*, *48*(3), 366-370. e363. Available at: https://doi.org/10.1016/j.jemermed.2014.09.055.

Blasi, A. (1993). The development of moral identity: Some implications for moral functioning. In G. Noam, & T. Wren (Eds.), The moral self (pp. 99–122). Cambridge: MA: MIT Press.

Boegershausen, J., Aquino, K., & Reed, A. (2015). Moral identity. *Current Opinion in Psychology*, *6*(1), 162-166.

Bradley, M. M., & Lang, P. J. (1994). Measuring emotion: The self-assessment manikin and the semantic differential. *Journal of Behavior Therapy and Experimental Psychiatry*, *25*(1), 49-59. Available at: https://doi.org/10.1016/0005-7916(94)90063-9.

Brosch, R. (2018). What we 'see'when we read: Visualization and vividness in reading fictional narratives. *Cortex*, *105*, 135-143. Available at: https://doi.org/10.1016/j.cortex.2017.08.020.

Bynion, T.-M., & Feldner, M. T. (2017). *Self-assessment manikin. In Zeigler-Hill & T. K. Shackelford (Eds.), Encyclopedia of personality and individual differences*. Switzerland: Springer International Publishing.

Chen, A., Krebs, N. M., Zhu, J., Sun, D., Stennett, A., & Muscat, J. E. (2017). Sex/gender differences in cotinine levels among daily smokers in the pennsylvania adult smoking study. *J Womens Health*, *26*(11), 1222-1230. Available at: https://doi.org/10.1089/jwh.2016.6317.

Chun, J. (2020). Public health threat of tobacco and substance use in asia: An introduction to the theme issue. *J Psychoactive Drugs*, *52*(1), 1-4. Available at: https://doi.org/10.1080/02791072.2020.1717686.

Clayton, J. A. (2016). Studying both sexes: A guiding principle for biomedicine. *Federation of American Societies for Experimental Biology Journal*, *30*(2), 519-524. Available at: https://doi.org/10.1096/fj.15-279554.

Cox, S., & Jakes, S. (2017). Nicotine and e-cigarettes: Rethinking addiction in the context of reduced harm. *International Journal of Drug Policy*, *44*(1), 84-85. Available at: https://doi.org/10.1016/j.drugpo.2017.03.009.

Czaderny, K. (2020). Adolescent personality risk factors for tobacco smoking and alcohol misuse in adult men. *Substance Use & Misuse*, *55*(10), 1567-1574. Available at: https://doi.org/10.1080/10826084.2020.1741635.

Daughters, S. B., Gorka, S. M., Matusiewicz, A., & Anderson, K. (2013). Gender specific effect of psychological stress and cortisol reactivity on adolescent risk taking. *Journal of Abnormal Child Psychology*, *41*(5), 749-758. Available at: https://doi.org/10.1007/s10802-013-9713-4.

Davis, L. L. (1992). Instrument review: Getting the most from your panel of experts. *Applied Nursing Research*, *5*(4), 194–197. Available at: https://doi.org/10.1016/s0897-1897(05)80008-4.

Earp, B. D., Skorburg, J. A., Everett, J. A., & Savulescu, J. (2019). Addiction, identity, morality. *AJOB Empirical Bioethics*, *10*(2), 136-153.

Eisenbaum, E., DiNitto, D. M., & Bishop-Fitzpatrick, L. (2018). Gender differences in tobacco use among US special olympics athletes. *Disability and Health Journal*, *11*(3), 466-470. Available at: https://doi.org/10.1016/j.dhjo.2018.01.005.

Geethanjali, B., Adalarasu, K., Hemapraba, A., Kumar, S. P., & Rajasekeran, R. (2017). Emotion analysis using SAM (Self-Assessment Manikin) scale. *Biomedical Research*, *28*(0970-938X), 18-24.

Giannakopoulos, G., Tzavara, C., Dimitrakaki, C., Kolaitis, G., & Rotsika, V. (2010). Emotional, behavioural problems and cigarette smoking in adolescence: Findings of a Greek cross-sectional study. *BMC Public Health*, *10*(1), 57. Available at: https://doi.org/10.1186/1471-2458-10-57.

Gotowiec, S., & Mastrigt, S. (2019). Having versus doing: The roles of moral identity internalization and symbolization for prosocial behaviors. *Asian Journal of Social Psychology*, *159*(1), 75-91. Available at: https://doi.org/10.1080/00224545.2018.1454394.

Greaves, L. (2020). Missing in action: Sex and gender in substance use research. *International Journal of Environmental Research and Public Health*, *17*(7), 2352. Available at: https://doi.org/10.3390/ijerph17072352.

Greene, J., & Haidt, J. (2002). How (and where) does moral judgment work? *Trends in Cognitive Sciences*, *6*(12), 517-523. Available at: https://doi.org/10.1016/s1364-6613(02)02011-9.

Hardy, S. A., Francis, S. W., Zamboanga, B. L., Kim, S. Y., Anderson, S. G., & Forthun, L. F. (2013). The roles of identity formation and moral identity in college student mental health, health-risk behaviors, and psychological well-being. *Journal of Clinical Psychology*, *69*(4), 364–382. Available at: https://doi.org/10.1002/jclp.21913.

Hardy, S. A., Walker, L. J., Olsen, J. A., Woodbury, R. D., & Hickman, J. R. (2014). Moral identity as moral ideal self: Links to adolescent outcomes. *Developmental Psychology*, *50*(1), 45-57. Available at: https://doi.org/10.1037/a0033598.

Hardy, S. A., Bean, D. S., & Olsen, J. A. (2015). Moral identity and adolescent prosocial and antisocial behaviors: Interactions with moral disengagement and self-regulation. *Journal of Youth and Adolescence*, *44*(8), 1542-1154. Available at: https://doi.org/10.1007/s10964-014-0172-1.

Hardy, S. A., & Carlo, G. (2011). Moral identity: What is it, how does it develop, and is it linked to moral action? *Child Development Perspectives*, *5*(3), 212-218. Available at: https://doi.org/10.1111/j.1750-8606.2011.00189.x.

Heather, N. (2017). Q: Is addiction a brain disease or a moral failing? A: Neither. *Neuroethics*, *10*(1), 115-124. Available at: https://doi.org/10.1007/s12152-016-9289-0.

Hemsing, N., & Greaves, L. (2020). Gender norms, roles and relations and cannabis-use patterns: A scoping review. *International Journal of Environmental Research and Public Health*, *17*(3), 947. Available at: https://doi.org/10.3390/ijerph17030947.

Jennings, P. L., Mitchell, M. S., & Hannah, S. T. (2015). The moral self: A review and integration of the literature. *Journal of Organizational Behavior*, *36*(S1), S104-S168. Available at: https://doi.org/10.1002/job.1919.

Kallay, E., Degi, C. L., & Pintea, S. (2017). Are male cancer patients more affected by losing their jobs than female patients? Gender as a moderator of the relation-ship between losing the job and well-being in a sample of Romanian cancer patients. *J BUON*, *22*(5), 1345-1351.

Kimmel, M. S., Hearn, J., & Connell, R. W. (2005). *Handbook of studies on men and masculinities*. New York: Sage Publications.

Kliewer, W., Kheirallah, K. A., Cobb, C. O., Alsulaiman, J. W., Mzayek, F., & Jaddou, H. (2021). Trauma exposure and post-traumatic stress symptoms among Syrian refugee youth in Jordan: Social support and gender as moderators. *International Journal of Psychology*, *56*(2), 199-207. Available at: https://doi.org/10.1002/ijop.12695.

Kodriati, N., Pursell, L., & Hayati, E. N. (2018). A scoping review of men, masculinities, and smoking behavior: The importance of settings. *Global Health Action*, *11*(sup3), 1589763. Available at: https://doi.org/10.1080/16549716.2019.1589763.

Lau, P. S., & Wu, F. K. (2012). Emotional competence as a positive youth development construct: A conceptual review. *Scientific World Journal*, 975189.

Lee, J., & Oh, M. (2019). The moderating effect of gender on the association between E-cigarette use and smoking status: A cross-sectional study. *Addictive Behaviors*, *93*, 108-114. Available at: https://doi.org/10.1016/j.addbeh.2019.01.038.

Lee, T. M., Chan, C. C., Leung, A. W., Fox, P. T., & Gao, J.-H. (2009). Sex-related differences in neural activity during risk taking: An fMRI study. *Cerebral Cortex*, *19*(6), 1303-1312. Available at: https://doi.org/10.1093/cercor/bhn172.

Lim, S. H., Daghar, L., Bullen, C., Faiz, H. M., Akbar, M., Amer Nordin, A. S., & Yee, A. (2020). Tobacco use and cessation among a national online sample of men who have sex with men in Malaysia. *Asia Pacific Journal of Public Health*, *32*(8), 414-417. Available at: https://doi.org/10.1177/1010539520965370.

Lucherini, M., Rooke, C., & Amos, A. (2018). E-cigarettes, vaping and performativity in the context of tobacco denormalisation. *Sociology of Health & Illness*, *40*(6), 1037-1052. Available at: https://doi.org/10.1111/1467-9566.12741.

Lucherini, M., Rooke, C., & Amos, A. (2019). "They're thinking, well it's not as bad, I probably won't get addicted to that. But it's still got the nicotine in it, so…": Maturity, Control, and Socializing: Negotiating Identities in Relation to Smoking and Vaping—A Qualitative Study of Young Adults in Scotland. *Nicotine and Tobacco Research*, *21*(1), 81-87. Available at: https://doi.org/10.1093/ntr/ntx245.

Luk, J. W., & Tsoh, J. Y. (2010). Moderation of gender on smoking and depression in Chinese Americans. *Addictive Behaviors*, *35*(11), 1040-1043. Available at: https://doi.org/10.1016/j.addbeh.2010.06.021.

Mansour, A. Y. (2017). Predictors of smoking among saudi dental students in Jeddah. *American Journal of Health Behavior*, *41*(3), 329-337. Available at: https://doi.org/10.5993/ajhb.41.3.12.

Mathijssen, J. J. P., Rozema, A. D., Hiemstra, M., Jansen, M. W. J., & Oers, J. A. M. (2021). Stability of and change in substance use risk personality: Gender differences and smoking cigarettes among early adolescents. *Addictive Behaviors Reports*, *14*, 100360. Available at: https://doi.org/10.1016/j.abrep.2021.100360.

Matud, M. P., López-Curbelo, M., & Fortes, D. (2019). Gender and psychological well-being. *International Journal of Environmental Research and Public Health*, *16*(19), 3531.

Mauvais-Jarvis, F., Merz, N. B., Barnes, P. J., Brinton, R. D., Carrero, J.-J., DeMeo, D. L., . . . Klein, S. L. (2020). Sex and gender: Modifiers of health, disease, and medicine. *The Lancet*, *396*(10250), 565-582.

Moreau, C. (2019). Gender performance and adolescent health trajectories. *Lancet Child Adolesc Health*, *3*(8), 512-513. Available at: https://doi.org/10.1016/s2352-4642(19)30163-4.

Nazary, A. A., Ahmadi, F., Vaismondi, M., Kaviani, K., Arezomandi, M., & Faghihzadeh, S. (2010). Smoking among male medical sciences students in Semnan, Islamic Republic of Iran. *EMHJ-Eastern Mediterranean Health Journal*, *16*(2), 156-161. Available at: https://doi.org/10.26719/2010.16.2.156.

Niazi, F., Inam, A., & Akhtar, Z. (2020). Accuracy of consensual stereotypes in moral foundations: A gender analysis. *PLoS One*, *15*(3), e0229926. Available at: https://doi.org/10.1371/journal.pone.0229926.

Parent, M. C., Hammer, J. H., Bradstreet, T. C., Schwartz, E. N., & Jobe, T. (2018). Men's mental health help-seeking behaviors: An intersectional analysis. *American Journal of Men's Health*, *12*(1), 64-73. Available at: https://doi.org/10.1177/1557988315625776.

Patrick, R. B., Bodine, A. J., Gibbs, J. C., & Basinger, K. S. (2018). What accounts for prosocial behavior? Roles of moral identity, moral judgment, and self-efficacy beliefs. *The Journal of Genetic Psychology*, *179*(5), 231-245. Available at: https://doi.org/10.1080/00221325.2018.1491472.

Pearson, J. (2019). The human imagination: the cognitive neuroscience of visual mental imagery. *Nature Reviews Neuroscience*, *20*(10), 624-634. Available at: https://doi.org/10.1038/s41583-019-0202-9.

Plotnikoff, R. C., Costigan, S. A., Kennedy, S. G., Robards, S. L., Germov, J., & Wild, C. (2019). Efficacy of interventions targeting alcohol, drug and smoking behaviors in university and college students: A review of randomized controlled trials. *Journal of American College Health*, *67*(1), 68-84. Available at: https://doi.org/10.1080/07448481.2018.1462821.

Puteh, S. E. W., Manap, R. A., Hassan, T. M., Ahmad, I. S., Idris, I. B., Sham, F. M., . . . usoff, M. Z. M. (2018). The use of e-cigarettes among university students in Malaysia. *Tobacco Induced Diseases*, *16*, 57.

Reniers, R. L., Murphy, L., Lin, A., Bartolomé, S. P., & Wood, S. J. (2016). Risk perception and risk-taking behaviour during adolescence: The influence of personality and gender. *PLoS One*, *11*(4), e0153842. Available at: https://doi.org/10.1371/journal.pone.0153842.

Russell, J. A. (1991). Culture and the categorization of emotions. *Psychological Bulletin*, *110*(3), 426–450. Available at: https://doi.org/10.1037/0033-2909.110.3.426.

Schiebinger, L., Leopold, S. S., & Miller, V. M. (2016). Editorial policies for sex and gender analysis. *Lancet London, England*, *388*(10062), 2841-2842. Available at: https://doi.org/10.1016/s0140-6736(16)32392-3.

Schwartz, S. J., Forthun, L. F., Ravert, R. D., Zamboanga, B. L., Umaa-Taylor, A. J., Filton, B. J., . . . Vernon, M. (2010). Identity consolidation and health risk behaviors in college students. *American Journal of Health Behavior*, *34*(2), 214-224. Available at: https://doi.org/10.5993/ajhb.34.2.9.

Seidler, Z. E., Dawes, A. J., Rice, S. M., Oliffe, J. L., & Dhillon, H. M. (2016). The role of masculinity in men's help-seeking for depression: A systematic review. *Clinical Psychology Review*, *49*, 106-118.

Shakya, H. B., Domingue, B., Nagata, J. M., Cislaghi, B., Weber, A., & Darmstadt, G. L. (2019). Adolescent gender norms and adult health outcomes in the USA: A prospective cohort study. *The Lancet Child & Adolescent Health*, *3*(8), 529-538. Available at: https://doi.org/10.1016/s2352-4642(19)30160-9.

Sweis, N. J. (2018). Smoking behavior among Jordanians: Physical, psychological, social, and economic reasons. *Value in Health Regional Issues*, *16*, 5-8. Available at: https://doi.org/10.1016/j.vhri.2017.09.003.

Tan, Q. Y., Zomer, E., Owen, A. J., Chin, K. L., & Liew, D. (2020). Impact of tobacco use on health and work productivity in Malaysia. *Tobacco Control*, *29*(1), 111-117. Available at: https://doi.org/10.1136/tobaccocontrol-2018-054677.

Thirlway, F. (2019). Nicotine addiction as a moral problem: Barriers to e-cigarette use for smoking cessation in two working-class areas in Northern England. *Social Science & Medicine*, *238*, 112498. Available at: https://doi.org/10.1016/j.socscimed.2019.112498.

Tokle, R., & Pedersen, W. (2019). "Cloud chasers" and "substitutes": e-cigarettes, vaping subcultures and vaper identities. *Sociology of Health & Illness*, *41*(5), 917-932. Available at: https://doi.org/10.1111/1467-9566.12854.

van den Bos, R., Homberg, J., & de Visser, L. (2013). A critical review of sex differences in decision-making tasks: Focus on the Iowa Gambling Task. *Behavioural Brain Research*, *238*, 95-108. Available at: https://doi.org/10.1016/j.bbr.2012.10.002.

Victor, E. C., Sansosti, A. A., Bowman, H. C., & Hariri, A. R. (2015). Differential patterns of amygdala and ventral striatum activation predict gender-specific changes in sexual risk behavior. *Journal of Neuroscience, 35*(23), 8896-8900. Available at: https://doi.org/10.1523/jneurosci.0737-15.2015.

Wang, T. W., Gentzke, A. S., Creamer, M. R., Cullen, K. A., Holder-Hayes, E., Sawdey, M. D., Neff, L. J. (2019). Tobacco product use and associated factors among middle and high school students - United States. *MMWR Surveill Summ, 68*(12), 1-22. Available at: https://doi.org/10.15585/mmwr.ss6812a1.

Weiss, B., Nguyen, T., Trung, L., Ngo, V., & Lau, A. (2019). Tobacco smoking and antisocial deviance among vietnamese, vietnamese American and European-American adolescents. *Journal of Abnormal Child Psychology, 47*(1), 59-69. Available at: https://doi.org/10.1007/s10802-018-0416-8.

Wheldon, C. W., Watson, R. J., Fish, J. N., & Gamarel, K. (2019). Cigarette smoking among youth at the intersection of sexual orientation and gender identity. *LGBT Health, 6*(5), 235–241. Available at: https://doi.org/10.1089/lgbt.2019.0005.

Winterich, K. P., Aquino, K., Mittal, V., & Swartz, R. (2013). When moral identity symbolization motivates prosocial behavior: The role of recognition and moral identity internalization. *Journal of Applied Psychology, 98*(5), 759-770 Available at: https://doi.org/10.1037/a0033177.

World Health Organization. (2017). *WHO report on the global tobacco epidemic*. Geneva: World Health Organization.

Yusof, N. A., Zin, F. M., Idris, N. S., & Mohammad, R. (2019). Alternative tobacco products use among late adolescents in Kelantan, Malaysia. *Korean Journal of Family Medicine, 40*(4), 254-260. Available at: https://doi.org/10.4082/kjfm.18.0016.