



Salud y drogas

ISSN: 1578-5319

jagr@umh.es

Instituto de Investigación de
Drogodependencias
España

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Salud y drogas, vol. 17, núm. 2, 2017, pp. 159-167

Instituto de Investigación de Drogodependencias

Alicante, España

Available in: <http://www.redalyc.org/articulo.oa?id=83952052015>

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BROADENING THE EVIDENCE FOR THE THEORY OF PLANNED BEHAVIOR: PREDICTING HEAVY EPISODIC DRINKING IN ARGENTINEAN FEMALE AND MALE YOUTH

AMPLIANDO LA EVIDENCIA PARA LA TEORÍA DE LA CONDUCTA PLANEADA: PREDICCIÓN DEL CONSUMO EPISÓDICO DE ALCOHOL EN JÓVENES MUJERES Y VARONES DE ARGENTINA

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Abstract

Introduction. Although the Theory of Planned Behavior has successfully been applied to explain heavy episodic drinking, recent reviews have identified gaps in the literature like the role of gender and scarce research from non English speaking countries. **Objective.** We aim to broaden the evidence for the Theory of Planned Behavior by evaluating the capacity of the model to predict heavy episodic drinking in Argentinean female and male youth. **Methods.** Multiple linear and logistic regressions were performed. **Results.** Attitude was the main predictor of heavy episodic drinking intention; there were gender differences, among women perceived behavioral control and subjective norm were also predictors of heavy episodic drinking intentions. The intention was the main predictor of heavy episodic drinking for both genders, while perceived behavioral control was also a predictor among women. **Conclusions.** Theory of Planned Behavior allows us to better understand the motivational variables related to heavy episodic drinking intention and performance, and thus, to design appropriate prevention interventions.

Keywords: *Theory of Planned Behavior, gender, heavy episodic drinking, university students, Argentina.*

Resumen

Introducción. La Teoría del Comportamiento Planeado ha sido exitosamente aplicada para explicar el consumo episódico de alcohol, sin embargo revisiones recientes han identificado ciertos vacíos en la literatura, como el rol del género y la escasa investigación en países de habla no inglesa. **Objetivo.** El objetivo de este estudio fue ampliar la evidencia de la Teoría de la Conducta Planeada, y evaluar la capacidad del modelo para predecir el consumo episódico de alcohol en jóvenes mujeres y varones. **Metodología.** El análisis se realizó mediante regresiones múltiples y logísticas. **Resultados.** La actitud fue el principal predictor de la intención de consumo. Se encontraron diferencias según el género: entre las mujeres el control conductual percibido y la norma subjetiva fue también predictor de la intención. La intención fue el principal predictor del consumo para ambos géneros, mientras que el control conductual también lo fue en mujeres. **Conclusiones.** La Teoría del Comportamiento Planeado nos permite entender mejor los aspectos motivacionales relacionados con la intención y el consumo excesivo de alcohol episódico y así poder diseñar intervenciones de prevención apropiadas.

Palabras clave: *Teoría de la Conducta Planeada, género, consumo episódico de alcohol, estudiantes universitarios, Argentina.*

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Heavy Episodic drinking (HED) i.e. the consumption of high amounts of alcohol in a short period of time is a severe public health problem in college students (Wechsler, Lee, Kuo, & Lee, 2000). Is a widespread practice among young people in many countries, with a high prevalence among college students (Karam, Kypri, & Salamoun, 2007), including Argentina (Cremonte, Conde, & Remaggi, 2009). Defined as a pattern of consumption that leads to a blood alcohol concentration of 0.8 g/l in a single occasion (National Institute of Alcohol Abuse and Alcoholism, 2004), is related to physical, psychological and social problems such as violence, traffic injuries, unplanned pregnancy, sexually transmitted diseases, alcohol dependence, and harm to others, among others (Obot & Room, 2005). Most of the research carried out in this topic focused in the characteristics of consumers according to socio-demographic variables. While recognizing their relevance, there is a limitation in the possibility of intervening on them. Therefore, is important to identify modifiable factors, such as cognitive-motivational aspects (Oei & Morawska, 2004). A model with empirical evidence to study health behaviors determinants is the Theory of Planned Behavior (TPB).

TPB (Ajzen, 1991) proposes that closest determinant of behavior is the intention. Intention captures the willingness of the person to perform that behavior, thus considering the motivational factors that influence a specific behavior. In turn, the intention is determined by attitudes, subjective norms and perceived behavioral control. Attitude is the overall positive or negative evaluation of performing the behavior and reflects individual factors. Subjective norm refers to the social influence, it is the perceived social pressure to perform or not a particular behavior of significant others and personal motivation to agree to these reviews. Perceived behavioral control reflects the perception of the presence of factors that facilitate or difficult the realization of the behavior, and comprises both, personal conviction of having volitional control in the performance and confidence in the abilities to perform the behavior. The perception of behavioral control can also act directly on the behavior.

This model has been used successfully in predicting a variety of behaviors, including alcohol consumption (Ajzen, 2002; Armitage & Conner, 2001, McEachan, Taylor, Harrison, Lawton, Gardner, & Conner, 2016). The use of TPB in relation to HED is recent in college students

populations, explaining to a high degree HED intention, and a good fit in the prediction of HED behavior (Collins, Witkiewitz, & Larimer, 2011; Cooke, Sniehotta, & Schüz, 2007; Dempster, Marley, & Newell, 2004; Elliott & Ainsworth, 2012; Jamison & Myers, 2008; Johnston & White, 2003; Norman, 2011; Norman & Conner, 2006; Norman, Armitage, & Quigley, 2007; Todd & Mullan, 2011;). The model also contributed to identify factors (like the perception of social pressure to HED) to effectively intervene on (Ajzen, 2015; French & Cooke, 2012). However, the relative importance of each factor in determining both the intention and behavior has varied according to the studied groups (Ajzen, 2001; Ajzen, 2005). Therefore, to determine the weight of the variables in predicting certain behaviors of particular groups, it is important to conduct specific studies. Nevertheless, in our context there is still a gap on reports of HED and its prediction by TPB in college students. Research in relation to the TPB and HED is mostly developed in English-speaking countries, and studies in Latin America are scarce (Lichtenberger, Conde, & Peltzer, 2013). Therefore, this study will also provide information for the design of preventive measures for this consumption pattern; a significant contribution in relation to the predictive power of the theory in different contexts than where it has been studied.

Three main reasons justify this study. First, in a recent review by Cooke, Dahdah, Norman & French (2016) where the evidence regarding TPB in relation to alcohol drinking was examined, the authors identified gaps in the literature about the role of gender in relation to TPB. In the alcohol field to this day, only two studies have examined gender issues in male and female samples, Zimmermann & Sieverding (2010) and more recently, Barratt & Cooke (2016).

Second, the same review (Cooke, et al., 2016) indicates that research comes almost exclusively from English speaking countries (UK and USA), while research from other drinking contexts is scarce or even absent. Argentina has a wet drinking culture, drinking is widespread, socially accepted and integrated into daily life; given the social nature of both, drinking and gender roles in relation to drinking, research from other contexts is needed to broaden the evidence supporting the model. Third, there has been some debate and even contradictory results regarding the measures used. Specifically, to where social norms should be considered

as descriptive, prescriptive, or both; and to where perceived behavioral control being controllability or self-efficacy. In this study a psychometrically sound measure is used and which evaluates both dimensions of social norms and perceived control.

Thus, in this paper we aim to determine the weight of attitude, subjective norm and perceived behavioral control in explaining HED intention and the weight of intention and perceived behavioral control in predicting university students' HED in a wet, non English speaking culture, considering gender differences.

METHOD

This is a non-experimental, longitudinal study. We assessed university students at two-times, a month apart.

Time 1 included the TPB assessment while in Time 2 past month HED was measured. We collected data in 2011, in a city of Argentina.

Participants

Inclusion criteria were students who were enrolled in regular courses in the degrees of Psychology and Occupational Therapy who voluntarily agree to participate. Exclusion criteria were passive learners, listeners and participants older than 24 years. Students (N = 754) were asked to complete a structured self-administered questionnaire at the beginning of mandatory courses. Of these, 500 (66%) answered the second structured self-administered questionnaire. Only five chose not to participate in the study. Descriptive data is presented in Table 1.

Table 1. Sample characteristics of university students

Variables	Time 1			Time 2		
	%	M(DS)	95% CI	%	M(DS)	95% CI
Gender						
Female	84		81-86	85		81-88
Male	16		14-19	15		12-19
Age		20.58(1.63)	20.47-20.69		20.54(1.64)	20.40-20.69
Past month CEEA	44		41-47	39		34-43

Note. CI = Confidence Interval.

Instruments

Theory of Planned Behavior (TPB). We used a questionnaire previously developed on the basis of analogous studies and tested in a similar sample of students (Peltzer, Brandariz, Biscarra, Lichtenberger, & Cremona, 2011). The questionnaire's items all measured TPB variables directly. This type of measurement has probed adequate to study the variables that predict intention and behavior (Francis, Eccles, Johnston, Walker, Grimshaw, Foy & Bonetti, 2004). Also, the same level of compatibility among object, action, context and time was taken into account for the development of items (Ajzen, 2002; Francis et al 2004): drinking five or more drinks in a same occasion during the last month.

The questionnaire had a 5-point Likert-type response, and inverted items included to examine response bias. The variables included were:

- Intention, 3 items about disposition for HED ($\alpha = .76$). Intention is considered as the motivational dimension that leads the individual to perform a given behavior, and comprises items addressing the predisposition to carry the behavior.
- Subjective norm, 7 items. It reflects the perception of approval of the behavior (HED). It gathers items from the two dimensions of subjective norms: injunctive and descriptive norms, with questions about the opinion of

significant others (parents, friends, partners, etc.) and their behaviors ($\alpha = .81$).

- Perceived behavioral control, 6 items. This variable refers to the perception of control over the behavior, comprising the dimensions of controllability and self-efficacy. Controllability was evaluated by asking participants if the performance of the HED depended on them or on factors beyond their control. Self-efficacy included questions on how difficult it was to perform the behavior and how much confidence they had to perform the behavior ($\alpha = .81$).
- Attitude. It refers to the positive or negative evaluations about performing the behavior. This scale had 8 pairs of opposing adjectives (semantic differential) that include instrumental items (e. g. useful /useless), feelings and experiences regarding HED (e.g. pleasant/unpleasant) and overall evaluation (e. g. good/bad) ($\alpha = .90$).

Alcohol consumption measures. Quantity of habitual alcohol intake was assessed as a quantitative variable, measured in number of standard drinks (i. e. any alcoholic beverage containing about 11 gr of absolute alcohol) consumed per occasion. For HED we used an equivalent measure: five or more drinks or standard units in a single occasion (National Institute of Alcohol Abuse and Alcoholism, 2004) anytime during the past month (qualitative dichotomous variable = yes/no). To evaluate this variable we asked whether they had consumed five or more drinks in a single occasion during the past month.

Socio-demographic variables. Gender and age (in years).

Procedure

We treated data anonymously and confidentially. We did not ask any information that would allow identification of the participants. Requesting a personal code (only known by those who completed the questionnaire) we related Time 1 and Time 2 questionnaires. Researchers were present during the self administration of questionnaires to answer questions. Previous to the administration, we explained the

objectives and scope of the investigation to the participants. We delivered a sheet with information about places where they could find help for alcohol-related problems and how to contact the researchers. This study was approved by the Ethics Committee of the National Epidemiology Institute.

Data Analysis

First, we ensured the quality of the data detecting outliers and missing data in the main variables and deleting them. To assess the presence of bias in the sample selection, we used significance tests in socio-demographic and alcohol consumption variables (X^2 for qualitative and Kruskal-Wallis H test for quantitative variables) comparing Time 1 and Time 2 respondents. Inverted items were re-coded and scores for each scale were calculated. To perform linear regression analysis we evaluated that the data did not violate assumptions of linearity (Cook's distance and graph Normal Probability) and multicollinearity (Pallant, 2010). We determined predictors of HED intention (Time 1 respondents) with multiple linear regression analyses (predictors included in the block = attitude, subjective norm and perceived behavioral control, plus quantity of alcohol habitual consumption as control). For the prediction of HED (baseline = yes), we performed a logistic regression including intention and perceived behavioral control in the block (Time 2 respondents). These analyses were conducted for all respondents and repeated afterward separately for women and men. For processing and analyzing data we used SPSS 12.0 for Windows.

RESULTS

Time 1 and Time 2 Data Comparison

Gender conformation was similar in both time frames ($X^2 = 1.84$, $p > .05$). Age distribution did not show statistically significant differences ($H = 0.83$, $p > .05$). This was also true for the number of standard units consumed per occasion ($H = 0.85$, $p > .05$) and BD in the last month ($X^2 = .08$, $p > .05$).

Prediction of HED Intention (n = 754)

Preliminary analyses showed that data was suitable for multiple linear regression analysis. No greater deviations from normal data were observed in the graph

Normal Probability (P-P Plot) of the standardized residuals (Cook's distance < 1). Collinearity statistics did not suggest multicollinearity (Tolerance>.10, FIV < 10). Results showed a significant correlation ($p < .01$) of .64, and the model predicted 41% of HED intention variability. Attitude, subjective norm, and perceived behavioral control were significant in explaining HED intention.

Gender comparison in the prediction of HED intention. Tests for data normality, linearity, and multicollinearity showed that it did not violate necessary

assumptions for regression analysis (Cook's distance < 1, Tolerance>.10, FIV < 10). For women, the correlation was significant ($p < .01$, .65) and the model explained 42% of HED intention variability. Attitude, subjective norm, and perceived behavioral control were predictors of HED intention. For men, the correlation was significant ($p < .01$, 0.59) and the model explained 34% of HED intention variability; nevertheless, only attitude was a significant predictor (Table 2).

Table 2. Prediction of binge drinking intention by attitude, subjective norms and perceived behavioral control in university students

Predictors	Intention of binge drinking					
	Total (N=754)		Female (n=630)		Male (n=123)	
	B	95% CI	B	95% CI	B	95% CI
Attitude	.16**	.12-.20	.15**	.10-.20	.20**	.08-.32
Subjective norms	.07**	.03-.11	.07**	.02-.11	.11	-.02-.24
Perceived behavioral control	.06**	.02-.10	.07**	.03-.12	-.05	-.20-.09
R^2	.41		.32		.42	
F	128.71		111.70		15.37	

Note. CI = Confidence Interval. Quantity of alcohol consumption was included as control variable on each model

* $p < .05$ ** $p < .01$

Table 3. Prediction of binge drinking behavior by intention and perceived behavioral control in university students

Predictors	Binge drinking behavior					
	Total (n=500)		Female (n=422)		Male (n=77)	
	OR	95% CI	OR	95% CI	OR	95% CI
Intention	1.28**	1.19-1.38	1.28**	1.17-1.40	1.31**	1.10-1.57
Perceived behavioral control	1.13**	1.08-1.19	1.15**	1.09-1.21	1.09	.97-1.23
Nagelkerke R^2	.34		.35		.31	

Note. CI = Confidence Interval.

* $p < .05$ ** $p < .01$

Prediction of BD Behavior (n = 500)

Global statistics for the model were satisfactory (Hosmer-Lemeshow = .30, $X^2 = 9.49$). The model explained 34% of the variance observed in HED behavior. Both the intention and perceived control were significant even when controlling their mutual effects (Table 3). Intention predicted at least 19% of the variance in HED behavior while perceived control at least 8%.

Gender comparison in the prediction of HED behavior. Model fit was better for males (Hosmer-Lemeshow = .94, $X^2 = 2.88$) than females (Hosmer-

Lemeshow = .10, $X^2 = 13.23$). Nevertheless, both intention and perceived behavioral control were significant for women, and only the intention was significant for men on the prediction of HED (Table 3). Intention predicted at least 17% for females and 10% for males of the HED variance while perceived behavioral control at least 9% in females.

DISCUSSION

In this study we applied TPB to predict HED behavior among university students of Mar del Plata. The model was successful in predicting intention of HED and the actual HED behavior, and when repeating analysis separately for women and men, predictors showed differences, highlighting the need for gender-specific studies.

As in previous studies addressing HED prediction (Collins et al., 2011; Cooke et al., 2007; Dempster et al., 2004; Elliott & Ainsworth, 2012; Jamison & Myers, 2008; Johnston & White, 2003; Norman, 2011; Norman et al., 1998; Norman & Conner, 2006; Norman et al., 2007; Todd & Mullan, 2011; Wall et al., 1998), attitude was an important predictor of the intention of the HED. This indicates that when HED is positively valued, it directly influences intention, or how much effort students are willing to make to perform the behavior. Moreover, attitude was the only variable that significantly contributed to the prediction of HED intention among men. This could mean that the more individual aspects would have a leading role as determinants of the intention among men.

Subjective norm and perceived behavioral control were also determinant among women's intention of HED; meaning that together with the positive ratings there are aspects of social pressure and perceived behavioral control influencing the intention of HED. Social norm is one of the variables that has often been indicated as one of the weakest within the model (Hagger, 2015). Few studies have established the social norm as a predictor of HED intention (Norman, 2011). Significant others' pressure (such as family and friends) or the presumption of their HED approval, is believed to be related to future alcohol consumption (Johnston & White, 2003). Influence of peers and family is an important predictor of intention, especially when it comes to public performed behaviors (Jamison & Myers, 2008). The few found studies that addressed social norm and its relationship with HED by gender indicated that it is mostly a predictor of intention among men (Jamison & Myers, 2008; Wall et al., 1998); only Zimmerman in 2010 studying men and women samples has found that social norm predicts HED intention among women. Our results indicated that social norm would have no effect on men's intention; however HED intention increases when perceived social influence

does among women. A plausible interpretation is that in our culture there is an increased dependence on significant others, which affects the intention in women. Alcohol consumption could be a socialization enabler for women looking for acceptance of their environment (Alonso Castillo et al., 2011). Furthermore, the relevance of descriptive norms in intention would be stronger among young adults, indicating that this group is particularly sensitive to the perceived social norms pressure (Rivis & Sheeran, 2003). In the university years, young students face contact with new pairs and the need to establish new friendships. Imitate the behaviors of peers may be an attempt to gain a place as a group member. This finding highlights the significance of images associated to peers' consumption, especially among women (Conroy & de Visser, 2016; Zimmermann, Kohlmann, Monter & Ameis, 2016), and would add support to measures aiming to limit exposure to advertising.

The perception of behavioral control was predictive of HED intention only among women. This variable has proved to be a predictor of HED intention (, Hagger, Wong & Davey, 2015, Barrat & Coke, 2016; Johnston & White, 2003), in some cases reversely when self-efficacy was included (Norman & Conner, 2006). Thus, positive relationship found in our study for women might seem contradictory, because it is possible to think that greater possibility to control consumption would decrease the intention (Norman, 2011; Norman et al., 2007). However, when people believe they have control over the behavior could be more likely for them to perform it (Ajzen, 2001; Ajzen, 2005). These individuals may have unclear perceptions of their control over alcohol consumption, and an unrealistic vision of the possibility of control (Wolfe & Higgins, 2008). Therefore, a positive relationship between perceived behavioral control and intention can be expected in behaviors assessed positively (Eagly & Chaiken, 1993), as HED in our study.

On the other hand, intention was the main predictor of HED behavior for both men and women. Intention has been shown to be one of the most consistent predictors of behavior in general and HED in particular (Armitage & Conner, 2001; Hagger, 2015; McEachan et al. 2016). We found that perceived behavioral control predicted behavior among women, contrary to other studies that found it as predictor for both men and women (Barrat & Cooke, 2016) suggesting also their positive influence on

behavior. Additionally, including a measure of controllability alongside self-efficacy when evaluating perception of behavioral control indicates that female students do not perceive barriers to HED or, when they do, they believe it is possible to overcome them. As a practical implication of findings along this line, interventions aimed to modify perceived control have been developed (Hagger, Wong & Davey 2015).

Limitations

Despite having an important sample loss between the first and second evaluation (likely due to student dropout) the composition of both subsamples (i.e. those who completed only the first questionnaire and those who completed the second) was similar, with no statistical differences found. A second limitation is that not all University Departments were represented, since participants were only from the Health Sciences Department, which limits the generalization of results to other students.

A last limitation relates to the measurement of perceived social norms and perceived behavioral control. Although the measures used had high reliability scores, those variables were measured unidimensionally, thus the relative weight of descriptive and prescriptive norms and of controllability and self efficacy could not be established. Further studies aiming to clarify the role of both dimensions within social norms and behavioral control are clearly needed.

Conclusions

On one side, these results contribute to validate the model in relation to a risk behavior such as HED, in a distinct cultural milieu from those usually studied. On the other, differences found between men and women regarding determinants of the intention and of the HED behavior highlight the importance of further studying these topics.

Our findings indicate a good performance of the model to explain the episodic consumption of high doses of alcohol in a youth population from a wet drinking culture, in a low middle income country. The present study was performed in a sample of university students with different characteristics (drinking practices and beliefs regarding consumption) from those that had traditionally been studied, establishing the validity of the

Planned Behavior Theory for predicting both, the actual behavior of HED and the intention to perform it.

Additionally, it gives empirical support to the differences in the model by gender. Our results indicated the differential role of subjective norms and perception of behavioral control among men and women, contributing to covering an identified gap in the literature (Cooke et al, 2016).

From a health policies perspective, our results show the importance of TPB in the study of HED. This alcohol consumption pattern affects mostly young students leaving them highly exposed to severe negative consequences. TPB allows us to better understand the motivational variables related to HED intention and performance, and thus, to design appropriate prevention interventions. The role of the attitude in determining the intention implies that the student's positive valuation of HED is an essential aspect of this behavior. Therefore, interventions focused in changing such valuation (highlight the negative consequences associated with HED) are expected to have a high impact.

In the case of perceived behavioral control, contextual changes to make HED opportunities more difficult may be useful (e. g. banning especial offers or Happy Hours). Alternatively, skills to refuse overconsumption could be improved. Another form of intervention that is currently most often used in primary health care is brief intervention (Babor & Higgins-Biddle, 2000). This practice has a motivational character, so knowing the variables associated with HED provides us with additional resources to increase the motivational level for commitment to it.

From a health research perspective, this study has enabled the design of an appropriate instrument for assessing motivational determinants of HED. However, aspects related to specific beliefs have been conflicting. Additionally, young people beliefs about HED are not the same as for alcohol effects in general. These issues are left for future research.

Acknowledgements

Financial support for research and preparation of the manuscript was provided by the Ramón Carillo-Arturo Oñativia Research Grant, from the National Ministry of Health. Funding sources had no involvement

in the study design, collection, analysis or interpretation of data, writing the manuscript, and the decision to submit the manuscript for publication.

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