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Discriminant Profile of Young Adulthood Driving Behavior among Brazilian Drivers

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Abstract. The aim of this article was to describe the driving behavior profile of drivers aged 18 to 25 years old. Four hundred young adults were interviewed, 320 (80%) of them male and 80 (20%) female. Cluster analysis identified a group characterized by sensation-seeking behavior (Cluster 1), a group that did not show any risky driving behavior (Cluster 2), and a group engaged in transgressive behavior and driving under the influence of alcohol and/or drugs (Cluster 3). Discriminant analysis classified successfully and correctly 81.3% of the young adults into their original profiles. *Function 1* distinguished cluster 1 from clusters 2 and 3, on the basis of the following factors: higher frequency of alcohol consumption, intrusive behavior, and motorcycle riding, as well as younger age, more aggressive behavior, and lower education level. *Function 2* distinguished cluster 3 from cluster 1 and 2, especially as to higher amounts of alcohol consumption, higher frequency of marijuana use and delinquent behavior, larger number of traffic tickets and motor vehicle accidents, higher paternal education level, which were the variables with discriminant values above .20. Characteristics of vulnerability were identified, especially those related to alcohol consumption, drug use, and externalizing issues.

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The rate of fatal motor vehicle collisions involving adolescents and young adults has increased significantly over the past few decades, and is now the second leading cause of death among male adolescents, according to World Health Organization data (Organización Mundial de la Salud, 2002). These high rates occur in Brazil and developed countries alike, and are considered a worldwide phenomenon. In the United States, youths are involved in traffic collisions three to four times as often as the rest of the population. Motor vehicle crashes are the leading cause of death in this age range (Insurance Institute for Highway Safety, 2007). In Brazil, a survey conducted by the Rio Grande do Sul State Department of Transportation (Detran-RS) found that young men between the ages of 18 and 24 feature the highest rates of fatal collisions and victims (Departamento de Trânsito do Rio Grande do Sul, 2010). The issue is compounded, in the Brazilian scenario, by low investment in public policies and scientific studies focused on preventing motor vehicle accidents in the youth population (Dotta-Panichi & Wagner, 2006).

The extent of this phenomenon has led to research on the psychosocial variables associated with risky driving behavior in the adolescent and young adult population. Some hypotheses suggest that adolescence itself, a process that culminates in the development of a personal identity and the transition from childhood to adulthood, is involved. Adolescence is an expected, predictable life crisis plagued by biological and psychosocial changes, and is also regarded as a period of great vulnerability, risk taking, and experimentation (Steinberg, 2008). Peer influence; oppositional, competitive, and rebellious behavior; and the need to affirm oneself sexually are all features that express teenage angst, and are mainly observed in adolescents' relationships within their group of peers. Motor vehicles are considered a means of socialization, and driving, a rite of passage that marks the transition from adolescence to adulthood; both may thus represent an easy way of compensating for insecurities, uncertainty, and poor self-esteem (Dotta-Panichi & Wagner, 2006). This issue is compounded by social depictions that associate vehicles with status, comfort, power (Souza, 2001), wish fulfillment, freedom, recklessness, and excitement (Correia, 2000). Indeed, a recent study showed that high-risk behavior and motor vehicle accident rates are highest among young adults who are unable to find effective strategies to successfully complete the identity-building process — that is, those who find it difficult to take on adult roles and attitudes and complete the developmental tasks associated with the passage into adulthood (Bingham, Shope, Zakrajsek, & Raghunathan, 2008).

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Many factors are associated with traffic accidents in the youth population. The literature provides evidence, for instance, that male adolescents underestimate risk and drive even more recklessly than women (Elliot, Shope, Raghunathan, & Waller, 2006; Marín-Léon & Vizzoto, 2003; Romano, Kelley-Baker, & Voas, 2008; Tsai, Anderson, & Vaca, 2008) and older drivers (Hatfield & Fernandes, 2009; Laapotti & Keskinen, 2008; Neyens & Boyle, 2008; Schmid Mast, Sieverding, Esslen, Graber, & Jäncke, 2008). The high rate of motor vehicle crash fatalities among male adolescents, found in many cultures, corroborates these findings.

Certain personality traits are also associated with risky driving behaviors among teenagers and young adults (Braitman, Kirley, McCartt, & Chaudhary, 2008; Dahlen, Martin, Ragan, & Kuhlman, 2005; Dunlop & Romer, 2010; Hatfield & Fernandes, 2009; King & Parker, 2008; Schmid Mast et al.; 2008; Sommer et al., 2008; Zakletskaia, Mundt, Balousek, Wilson, & Fleming, 2009). Research conducted over the past few decades has shown that one trait consistently associated with high-risk driving is sensation seeking, which is characterized by a preference for new experiences and a willingness to take risks (Jonah, 1997; Patil, Shope, Raghunathan, & Bingham, 2006; Van Beurden, Zask, Brooks, & Dight, 2005). Other such traits include aggressiveness, hostility (Patil et al., 2006), a greater tolerance of delinquent behavior, and antisocial motivation (Bingham & Shope, 2004; Shope & Bingham, 2008). Studies propose that these personality traits affect young drivers' attitudes towards behavior at the wheel (Ulleberg & Rundmo, 2003).

So-called situational variables—day of the week, time of the day, and presence or absence of passengers in the vehicle—are also associated with accidents in this population. Studies carried out over the past decade have shown that the rate of motor vehicle crashes is significantly higher on weekends (Cvijanovich, Cook, Mann, & Dean, 2001; Schwing & Kamerud, 1988). Both the number of crashes and their severity increase after nightfall (Rice, Peek-Asa, & Kraus, 2003; Williams, 2003). Data suggest that the presence of passengers significantly increases collision risk among novice drivers (Allen & Brown, 2008; Chen, Baker, Braver, & Li, 2000; Shope, 2006; Simons-Morton, Lerner, & Singer, 2005; Williams, 2001) proportionally to the number of occupants in the vehicle. Some studies also suggest that the presence of passengers can be a risk factor depending on the age and gender of the occupant (Arnett, Offer, & Fine, 1997; Assailly, 1997). Young drivers behave more recklessly when they have friends as passengers, and more prudently when their parents are in the vehicle (Arnett et al., 1997). Peer influence, peer pressure, and risky behavior models found within the peer group strongly change young drivers' behavior.

As far as influence of the family environment is concerned, research assessing the relationship between parenting practices and risky driving behavior among youths has been on the rise in past decades. Some studies have shown that lax parental attitudes towards alcohol consumption and low parental monitoring and control (Chen, Grube, Nygaard, & Miller, 2008; Hartos, Simons-Morton, Beck, & Leaf, 2005; Simons-Morton, Hartos, Leaf, & Preusser, 2006; Simons-Morton & Ouimet, 2006; Simons-Morton, Ouimet, & Catalano, 2008), as well as parental approval of risk behavior and the presence of risk models in parent behavior, are associated with greater exposure to risky driving (Assailly, 1997, Taubman-Ben-Ari, Mikulincer, & Gillath, 2005; Wilson, Meckle, Wiggins, & Cooper, 2006). These studies show that parent involvement in teenagers' lives, with active monitoring and no excessive permissiveness, tends to have a positive impact on risk prevention attitudes; fewer adolescents with such parents are involved in motor vehicle accidents (Bingham & Shope, 2006) and fewer engage in high-risk situations such as drinking and driving (Sabel, Bensley, & Van Eenwyk, 2004).

Through a review of the main factors that contribute to risky driving behavior, the present study seeks to ascertain which aspects distinguish young adults by this behavior, including individual challenges (gender, internalizing and externalizing problems) and family-related aspects (parenting styles, education practices, and family stressors throughout the life cycle). This study defined risky driving behavior as a pattern of intentional behaviors that endanger the welfare of drivers themselves and of others, including: a) transgressive behavior directed at the rules of the road (moving violations); b) driving under the influence of intoxicating substances, both legal and illicit; and c) reckless driving behavior (sensation seeking) (Martín, Martínez, Martínez, Martín, & Martín, 1996).

Method

The study followed a quantitative, correlational cross-sectional design aimed at identifying the associations between a series of independent variables chosen from a review of the literature (gender, age, internalizing issues, externalizing issues, parenting styles, family stressors throughout the development period) and the dependent variable risky driving behavior.

Participants

The study sample comprised 400 young adults between the ages of 18 and 25: 320 male (80%) and 80 female (20%). Of these, 291 (72.8%) were college students, and 109 (27.3%) attended secondary and vocational schools

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in the city of Porto Alegre, Brazil. Mean age was 20.88 (*SD* = 2.2).

We used an intentional sampling strategy, with the only criterion for inclusion being the use of a motor vehicle (automobile or motorcycle) as the habitual means of transport. Among the study participants, 74.1% drove a car as their main mode of transport, whereas 9.4% rode a motorcycle, and 16.5% used both means of transport. Mean time as a driver was 3.98 years (*SD* = 2.7).

Procedures and Instruments

Initially, risk factors associated with risky driving behavior were identified in the literature (Dotta-Panichi & Wagner, 2006). Subsequently, a scale-based instrument was constructed to measure each independent and dependent variable included in the study. Instruments were designed, validated and tested in a pilot study involving 88 participants. Results showed adequate measures of internal consistency for each one of the chosen instruments, as described below:

Part 1–Personal and family data

This instrument collected data on age, gender, education level, and personal income, as well as information on each participant's family (family structure, number of siblings, number of people living with the participant, marital status, and parental occupation and education level).

Part 2–Alcohol consumption and drug use/family stressors

This questionnaire, based on the model proposed by Martínez, López, and Carrasco (1997), was designed to identify alcohol and drug use. The questionnaire included also questions on the occurrence of certain family stressors (such as parental discord, separation, and alcohol and drug use) throughout the development period.

Part 3–Risky Driving Behavior Questionnaire (Martín et al., 1996)

This questionnaire was translated and adapted to the purposes of this study, under the guidance of one of the original authors (Martín et al., 1996). The translation into Portuguese was carried out by an experienced sworn translator in Spanish and evaluated by three bilingual reviewers, experts in the field of psychology, who certified that the Portuguese version of the instrument did not cause semantic damage in the gathering of the information included in the questionnaire. Pilot testing of the scale yielded an internal consistency measure of .75. The instrument, an 11-item scale, was designed to measure self-reported engagement in risky driving behaviors over the 12 months preceding the study. Besides that, the questionnaire included questions on the frequency of motor vehicle use and the number, type, and severity of moving violations and traffic accidents.

Part 4–Parental Authority Questionnaire (PAQ) (Buri, 1991)

This scale was based on the theoretical model proposed by Baumrind (1971), and its objective is to measure parental authority as permissive, authoritarian, and authoritative/flexible. The instrument is made up of 30 items, administered once for each parent, which yield scores for each of the three defined parenting styles. This study used the Portuguese version of the scale, whose translation and adaptation were carried out by Boeckel and Castella Sarriera (2005). Several studies conducted during validation of the PAQ prove its psychometric consistency, and it is now considered a valid measuring tool for the assessment of parenting styles within the framework of Baumrind's model (Buri, 1991). Internal consistency measurements obtained after pilot testing (maternal permissive, .72; maternal authoritative, .87; maternal authoritarian, .82; paternal permissive, .55; paternal authoritative, .89; paternal authoritarian, .86) show that the instrument was a good measurement tool for the assessment of parental disciplinary styles, except for identifying permissive parenting by fathers. Analysis of this subscale warrants further caution, despite the small number of questionnaire items associated with this factor.

Part 5–Young Adult Self Report (YASR) (Achenbach, 2000)

The YASR is a self-administered behavioral inventory widely used as a scoring tool for behavior issues. The present study used seven dimensions of the instrument to measure emotional and behavioral issues (withdrawal, somatic complaints, anxiety/depression, delinquent behavior, aggressive behavior, intrusiveness, and attention disorders), which, as a group, gave internalizing and externalizing issue scores for the sample. Pilot study of the Report for detection of these issues yielded a Cronbach's alpha of .87 and .80 respectively, which shows that the YASR is an adequate measuring tool for the assessment of internalizing and externalizing issues.

After the instrument had been constructed and the pilot study had been conducted, educational institutions were contacted and informed on the project. Those that agreed to participate in the survey should provide a period of 45 minutes for the instruments' application.

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Participants answered the questionnaire in the classroom, through voluntary acceptance, after signing an informed consent form.

Results

Cluster analysis was performed in order to identify risk profiles of different driving behaviors. This was followed by discriminant analysis, which allowed us to describe the association between the profiles (Clusters) and the independent variables, yielding the discriminant profile of the groups obtained through cluster analysis.

Classification of Risky Driving Behavior (Dependent Variable)–Cluster Analysis

Factor analysis identified three factors that explained 55.4% of the variance found in the 11-item instrument–*factor 1*: rule-breaking; *factor 2*: sensation-seeking behavior; and *factor 3*: driving under the influence of alcohol or drugs (Table 1). Factors 1, 2, and 3 explained 20.2%, 19.4%, and 15.8% of total questionnaire variance, respectively. This factor analysis showed the same dimensions found in the original instrument (Martín et al., 1996). Analysis of the mean factor scores for each cluster enabled the use of a cluster methodology to represent the dependent variable of the study.

Cluster analysis (Table 2) revealed three individual profiles with distinct features of driving behavior. Two groups, Clusters 1 and 3, showed positive scores for high-risk driving behavior, whereas Cluster 2 had a lower rate of risky driving-associated variables.

The majority of participants (56.8% of the sample) were classified into Cluster 2, which featured the lowest rate of risky driving behavior. This group could easily represent the segment of the population that drives more prudently, that is, those who mostly respect the rules of the road. On the other hand, 43.2% of the sample—the sum of participants in Cluster 1 and 3—engaged in behaviors that deviated from the rules and could be considered moving violations. These two groups, found to intentionally pursue traffic risks, were classified as follows (Table 2):

- Cluster 1: Individuals engaged in sensation-seeking behavior while driving, which amounted to 17.5% of the sample;
- Cluster 3: Individuals engaged in rule-breaking behavior and driving under the influence of alcohol or drugs, which amounted to 25.7% of the sample.

Discriminant Analysis of Risky Driving Behavior

Discriminant analysis was performed in order to assess how the three groups were associated with

Table 1. *Factor analysis – Risky Behavior Scale*

Items	Factor 1[a]	Factor 2[b]	Factor 3[c]
Speeding	.81		
Running a red light	.73		
Running a stop sign	.53		
Wrong-way driving	.39		
Doing “donuts” or “powersliding”		.81	
Driving without a license		.74	
Street racing		.62	
Driving without a seat belt/riding without a helmet		.53	
Driving under the influence of alcohol			.58
Driving under the influence of other drugs			.71
Riding with a driver who is under the influence of intoxicating substances			.68

Note: [a] Factor 1: rule-breaking (moving violations); [b] Factor 2: reckless driving; [c] Factor 3: alcohol and/or drug use.

Table 2. *Mean factor scores for each cluster: dependent variable*

Items	Factor 1 Rule-breaking	Factor 2 Reckless driving	Factor 3 Alcohol and drug use	Participant classification
Cluster 1	−.07	1.70	.19	n = 68 (17.5%)
Cluster 2	−.45	−.41	−.25	n = 221 (56.8%)
Cluster 3	1.04	−.26	.43	n = 100 (25.7%)

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independent study variables, namely gender, age, internalizing and externalizing issues, parenting styles, and family stressors during the developmental period. Discriminant analysis consists of identifying the independent variables that best distinguish and classify the dependent variable, yielding a profile that determines which variables best differ one group from the other.

Two functions were obtained from the discriminant analysis (Table 3): *function 1* distinguishes Cluster 1, whereas *function 2* distinguishes Cluster 3. Both functions are significant and each explains part of the variance in a balanced way: the first function contributed the most (Walks' lambda, .512) to explain the discriminative power (Table 4). Table 3 shows that discriminant analysis correctly classified 81.3% of clustered cases. These data demonstrate that the independent (predictive) variables/dimensions helped establish a profile of young drivers who engage in risky driving behavior.

The profiles described in Table 5 show that participants in Cluster 1 (sensation seeking behavior) differed from the other groups by drinking more frequently, being younger, behaving more aggressively, having more driving experience, being mostly non-graduates and public or vocational school students, showing intrusive behavior, and riding scooters or motorcycles more frequently, which were considered the variables with higher discriminant rates.

Characteristics of vulnerability, especially those related to more frequent and usual alcohol consumption and to aggressive and intrusive behavior, were identified in this group (Cluster 1). Sensation-seeking behavior while driving was the factor that best described the group of students with a particular kind of education level, composed mostly of individuals who attended public schools, which generally characterizes social groups of lower socioeconomic status. The habit of performing street racing, usually riding motorcycles, typifies the risky behavior adopted by this group (*factor* 2, Table 1).

The depiction of motor vehicles as symbols of masculinity and adulthood can influence young adults' behavior on the road, leading them to adopt immature driving behaviors such as street racing and doing "donuts", which may be related to a lack of resources in their own social, family and school environments to deal effectively with the process of personality formation and transition to adulthood. This fact also reveals that community resources have not been used for creating more adaptive pathways of social insertion, especially those related to the development of a professional life project, which is generally hard in populations with low socioeconomic status.

On the other hand, occasional consumption of larger amounts of alcoholic beverages (binge drinking), marijuana use, and delinquency were the variables which best distinguish rule-breaking behavior and driving under the influence of alcohol or drugs (Cluster 3). In this group, a record of greater rates of traffic violations and motor vehicle accidents, higher parental education levels, and higher socioeconomic status were also identified. Discriminant analysis of the variables that distinguish Cluster 3 shows that this group includes college students, who have access to internships or are employed.

In conclusion, analysis revealed two groups with very distinct features regarding risky driving behavior and socio-demographic and socioeconomic variables, externalizing issues, and patterns of alcohol consumption. Cluster 2, in turn, defined by exclusion from the other groups, comprised a higher number of female young adults, and also included male drivers less engaged in risky driving behaviors and showing few psychosocial variables considered as risk predictors during their development period. Thus, Cluster 2 is distinguished by its association with protective factors and by the absence of deviant behavior.

Table 3. *Results of discriminant analysis*

Canonical discriminant functions calculated for group averages		
Cluster	Function 1	Function 2
1	1.94	−.595
2	−.647	−.411
3	.135	1.195

Note: Percentage of correctly classified cases: 81.3%.

Discussion

This study examined the associations between high-risk driving and a set of psychosocial variables well

Table 4. *Characteristics of the canonical discriminant function*

Function	Eigenvalue	Variance	Canonical function	Wilks' lambda	χ^2	*df*[a]	Sig[b]
1	.472	59.0	.566	.512	213.39	48	.000
2	.328	41.0	.497	.753	90.337	23	.000

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Table 5. *Discriminant Analysis – Structural Matrix*

Function 1[a]		Function 2[b]	
Alcohol consumption – frequency	.308	Alcohol consumption – quantity	.413
Age	–.276	Marijuana use – frequency	.407
Aggressive behavior	.263	Delinquent behavior	.373
Time of driving experience	.258	Car driving	.349
Vocation education level	.243	Number of traffic tickets	.257
Intrusive behavior	.233	Male gender	.224
Driving scooters	.168	Number of motor vehicle crashes	.215
Use of cocaine	.145	Paternal educational level	.203
Somatic symptoms	.119	Use of other drugs	.185
ADH[c] symptoms	.110	Active accidents	.178
Limits on alcohol consumption established by the father	–.106	Marital discord/ physical fights	.167
Riding motorcycles	.97	Working outside the home	.162
Maternal authoritative style	–.099	Maternal drug use – frequency	.124
Maternal authoritarian style	.094	Paternal drug use – frequency	.102
Paternal authoritative style	–.086	Maternal education level	.094
Maternal alcohol consumption – frequency	.062	Maternal permissive style	.080
Social ostracism	.057	Anxiety and depression	-.073
Introspectiveness	.055	Paternal authoritarian style	.071
Married parents	.040	Limits on alcohol consumption established by the mother	-.059
Maternal alcohol consumption – quantity	.031	Paternal drug use – quantity	.056
Maternal drug use	.027	Paternal permissive style	.039
Re-married father	–.027	Paternal alcohol consumption	.037
		Re-married mother	.016

Note: [a] Differential profile of Cluster 1 in regard to Clusters 2 and 3 – characterizes Group 1.
[b] Differential profile of Cluster 3 in regard to Clusters 1 and 2 – characterizes Group 3.
[c] ADH: Attention Deficit Hyperactivity.

known in the literature as risk predictors for the development of behavioral problems in a sample of 400 Brazilian young drivers. An unique and unusual aspect of this study was that it explored the associations of high-risk driving with a set of externalizing issues, including, for example, alcohol use, binge drinking, use of marijuana and other drugs, aggressive behavior, and delinquency; and with internalizing issues – the latter being a still very unexplored aspect in previous studies on high-risk driving, as already mentioned by Vassallo et al. (2008). To the best of the authors' knowledge, this is the first study to examine the association between high-risk driving and other behavioral problems in a sample of Brazilian youths. The findings in question will be now reviewed and discussed.

Typology of High-risk Driving

This study found that different typologies of high-risk driving (rule-breaking behavior /driving under the influence of alcohol or drugs and sensation-seeking behavior) were associated with different psychosocial variables. The differences occurred especially regarding the profile of alcohol consumption (binge drinking versus high frequency of alcohol use), socioeconomic status (high versus low), externalizing issues (delinquency versus aggressive behavior), and the type of vehicle used (car versus motorcycle) and were respectively associated with one of the subgroups (Cluster 3 and 1). These findings indicate that risky drivers are a group with a highly heterogeneous profile.

Although the results from discriminant analysis reveal distinct discriminant profiles, which corroborate the hypothesis that high-risk driving is a variable and multifactorial phenomenon, they go in the same direction as previous investigations with consistent methodologies. Such investigations show a strong association between high-risk driving in general, substance use, and antisocial behavior, with the last two elements being considered predictors of risky driving

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behavior in the studies of Shope, Lang, and Waller (1997) and Vassalo et al. (2007, 2008).

Moreover, our findings confirm results from several previous studies showing that young adults engaged in high-risk driving are usually involved in other behavioral problems as well (Shope & Bingham, 2002; Caspi et al., 1997). We can initially conclude, as also demonstrated by Vassalo et al. (2008), that high-risk driving tends to co-occur with other externalizing issues (alcohol use, marijuana use, binge drinking, and antisocial behavior) in the youth population. With regard to internalizing issues, a very weak or even negative correlation was found (Table 5), confirming the result of a previous study that similarly did not find an association between internalization issues (anxiety and depression) and high-risk driving (Vassalo et al., 2008). These findings suggest that interventions should be especially aimed at preventing externalizing issues.

It is opportune to reflect that the efforts to develop assertive behaviors in relation to peer pressure should begin early–since risk predictive factors can be detected long before risky driving behavior is established (Vassalo et al., 2007). Additionally, as data revealed that family support was less observed in the two subgroups engaged in high-risk driving (Cluster 1 and 3), although there was evidence of a lower correlation with family variables, such variables can be part of a multifactorial explanation, within a more complex understanding model, as modeling variables of high-risk driving (Binghahm & Shope, 2004). That is, among the set of elements to explain risky driving behavior, family variables could be included in a model of protective social and family support aimed at preventing adolescents and young adults from being involved in risky behaviors, as found in Cluster 2.

Finally, one can say that, although we have found correlations with others behavioral problems, confirming results from previous studies (Beirness & Simpson, 1988; Bingham & Shope, 2004; Caspi et al., 1997; Vassalo et al., 2008), it also should be considered that subgroups (Clusters) individually show association with risk factors and with different behavior patterns regarding alcohol use. These findings reinforce the supposition that, although behavioral problems share risk factors in common, they should be seen as sole phenomena (Willoughby, Chalmers, & Busseri, 2004). This should also be valid for risky driving issues, as correctly mentioned by Vassalo et al. (2008).

The findings of this study show the need of new investigations focusing on the heterogeneity of the subtypes of high-risk driving with regard to risk factors, in order to better distinguish and to define more accurately this phenomenon, since investigations that differentiate and typify the variability of risky driving behavior using a qualified methodology are still limited.

This research was an effort to examine the characteristics of subgroups of high-risk driving; however, there are certainly many limitations that should be addressed, especially the sample size of each cluster, which limited the statistical power of the presented analyses. It is also worth mentioning that differences between genders were not broadly investigated, because of the small female sample size (n = 80), and that this is a study with the limitations one would expect in a cross-sectional correlational model.

Among the limitations of this study, social desirability biases, which can be found in self-report surveys, should be referred. Concerning this aspect, it is necessary to note that the high percentage of young adults who reported to be engaged in high-risk driving (43.2%) reveals a previous and potentially serious problem associated with beliefs and attitudes towards risk perception–issues considered as predictors of high-risk driving (Ulleberg & Rundmo, 2003)–, although these variables were not measured by a specific questionnaire in our study.

Finally, it is also worth mentioning that this study was conducted with a non-random sample, which warrants appropriate caution when generalizing the results. Therefore, the need of new studies that work from a longitudinal perspective should be highlighted, in order to achieve a more powerful determination of the hypotheses observed herein regarding the subtypes of high-risk driving among young adults and their predictive factors.

To summarize identifying the association between a set of psychosocial variables and risky driving behavior, researchers support the hypothesis that such behavior is more common among young adults who are unable to find effective strategies to successfully complete the identity-building process — that is, those who find it difficult to take on adult roles, behaviors and attitudes, and complete the developmental tasks associated with the passage into adulthood (Bingham et al., 2008).

The findings of this research reveal that the factors associated with high-risk driving among young adults are multiple. The establishment of a relationship between some variables and risky driving behavior increases the chances of constituting a broader explanatory model for such behavior in the youth population. In this sense, the choice of a multivariate approach, which made it possible to identify vulnerable groups and psychosocial variables related to risk behavior, has proven to be a useful methodology for identifying definite profiles of individuals with risky driving behavior.

Our study found that the use of alcohol and other drugs and others externalizing problems (aggressiveness

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and delinquency) are the main psychosocial variables associated with risky driving. Therefore, it was shown that failures in the socialization process lead to driving behavior issues during adolescence and young adulthood, especially when the parenting model includes lack of parental monitoring or excessive permissiveness.

Under this perspective, preventive works must be carried out to detect, since childhood, behaviors that already indicate some change in temper, as well as behavioral, social competence and school adaptation problems (Vassallo et al., 2007), in order to promote early intervention, which prevents these behavior patterns to be established by the age of 18 (legal age to drive in Brazil).

Finally, one should bear in mind the limitations inherent to correlational studies such as this one, being especially cautious when making inferences about causal relationships between variables. Furthermore, it bears stressing that the groups identified in this study cannot be generalized to other contexts and age groups.

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