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Risky Driving, Mental Health, and Health-Compromising Behaviors: Risk Clustering in Late Adolescents and Adults

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Abstract

Background—Health-compromising behaviors in adolescents and adults co-occur. Because motor vehicle crashes are the leading cause of death and disability for these age groups, understanding the association between risky driving and other health compromising behaviors is critical.

Methods—We performed a secondary analysis of data from a randomized controlled trial of an intervention for participants who screened positive for risky driving and problem drinking. Using baseline data, we examined relationships among conduct behavior problems before and after age 15, depressive symptoms, sleep, problem drinking, and risky driving (hostile, reckless and drinking and driving) in late adolescents ages 18–24 (n= 110) and adults ages 25–44 (n= 202). We developed a measurement model for the entire sample using confirmatory factor analysis, which was then specified as a multi-group structural equation model.

Results—Late adolescents and adults had some similar associations for pathways through problem drinking to drinking and driving; depression to reckless driving; and conduct behavior problems after 15 to hostile driving. Late adolescents, however, had more complex relationships: depressive symptoms and conduct behavior problems before 15 were associated with more risky driving behaviors through multiple pathways and males reported more risky driving.

Conclusions—Risky driving is associated with other health-compromising behaviors and mental health factors. It is a multidimensional phenomenon more pronounced in late adolescence than adulthood. In order to promote safe driving, the findings support the need to consider behaviors that are a health threat in the late adolescent population during driving training and licensure.

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Keywords

Risky driving; health-compromising behaviors; depression; conduct behavior problems; sleep

INTRODUCTION

Health-compromising behaviors, particularly those that contribute to injury, are interrelated and rarely occur in isolation.(1–3) Adolescents and young adults may engage in behaviors associated with unintentional injury such as alcohol consumption, drug use, peer violence, distracted driving and lack of seat belt use --all targets for interventions to reduce health risk in young adulthood.(4–6) Yet, much of the intervention work designed to promote health and reduce injury is focused only on one or two risk behaviors at a time.(7, 8) Given that health-compromising behaviors may be interrelated, targeting each in isolation may limit injury prevention efforts.

Motor vehicle crashes (MVCs) are a leading cause of death and disability for adolescents and adults around the globe.(9) Risky driving involves illegal or dangerous behind-the-wheel behaviors such as distracted driving, drowsy driving, drinking and driving, aggressive maneuvers, and speeding, all of which contribute to adolescent and adult MVCs.(10–12) Risky driving, however, rarely occurs independently of other health-compromising behaviors. While there is evidence for the interplay of risky driving (e.g. speeding, drunk driving, aggressive driving) and other behaviors (e.g. underage alcohol consumption, problem drinking, and theft) in adolescents and adults (2, 13, 14), further work is needed to understand the extent of and relationships among health-compromising behaviors.

The effects of alcohol on driving behaviors are well documented.(15) Factors other than alcohol use, such as sleep and mental health, may also influence risky driving and associated injury outcomes in adolescents and adults. Poor sleep patterns such as sleep deficit and drowsy driving have been linked to MVCs.(16, 17) Depressive symptoms have been linked to driving after drinking (18, 19), and psychological distress has been associated with risky driving behaviors in late adolescents.(20) Among adolescents and young adults, conduct behavior problems such as aggression and antisocial behavior are also associated with risky driving behaviors.(21, 22) Thus, health-compromising behaviors and mental health factors co-exist with risky driving, but little is known about how multiple risks cluster together and differ at developmental stages across the life course.

Developmental changes during adolescence can influence health-compromising behaviors. (23) The trajectory of adolescent development continues into the early twenties, a time when the brain is still maturing, and individuals up to the age of 24 are still considered youth. (24) The pattern of multiple risks related to MVCs is difficult to disentangle, and yet critical as we seek to promote health. In order to determine injury prevention initiatives, we need to understand how health compromising behaviors and mental health factors relate to risky driving in both adolescents and adults.

Using data from a randomized controlled trial (RCT) of an intervention to reduce risky driving and problem drinking (25), the purpose of this secondary analysis was to examine

relationships between multiple health-compromising behaviors and mental health factors with risky driving behaviors in late adolescents (ages 18–24) and adults (ages 25–44), including conduct behavior problems before and after age 15, depressive symptoms, sleep, and problem drinking.

METHODS

Data Collection

We performed a secondary analysis of data collected from participants (ages 18–44), recruited and enrolled from a Midwestern US emergency department who: 1) screened positive for risky driving and problem drinking; and 2) were enrolled in an RCT of screening, brief intervention, and referral to treatment for risky driving and problem drinking. The University of Pennsylvania, University of Cincinnati, and Utah State University Institutional Review Boards approved study procedures. Following informed consent, we randomized participants to a brief intervention group, a contact-control group, and a no-contact control group. We reported the primary results of the intervention elsewhere.(25) For this secondary analysis, we used data from the baseline assessment of the brief intervention and contact-control groups to assess the relationship between conduct behavior problems before age 15, conduct behavior problems after age 15, depressive symptoms, sleep, problem drinking and risky driving behaviors (reckless, hostile, and drinking and driving). Participants in the no-contact control group were not interviewed at baseline and therefore did not provide data for this analysis. The study sample was further divided in two groups (based on World Health Organization [WHO] guidelines on youth and young people (24)) in order to examine differences: late adolescents age 18–24 (n= 110) and adults age 25–44 (n= 202).

Measures

We collected the original data for the RCT using a Health Interview Schedule, a modification of the WHO Composite Interview Schedule (26) with addition of the Alcohol Use Disorders Identification Test (AUDIT) (27) and a short form of the Center for Epidemiologic Studies Depression Scale (CES-D 10).(28) We used selected items and measures from the interview guide for this secondary analysis. Some constructs were measured using a single, observed variable and others were measured by multiple variables, allowing specification of a latent variable.

Conduct behavior problems before age 15 and after age 15—We used nine items based on DSM-III criteria for behaviors associated with conduct disorder before and after age 15, characterized by repetitive dissocial, aggressive, or defiant behavior.(29, 30) Participants responded “Yes” or “No” to the following items: “Skip school more than 10 times”; “Get suspended or expelled from school”; “Get arrested”; “Run away from home overnight more than once”; “Vandalize or destroy property”; “Start fires”; “Shoplift or steal”; “Have sexual intercourse with more than one person”; and “Start physical fights.” For conduct behavior problems after age 15, the item regarding sexual intercourse was excluded. These items have been used to indicate a positive history of conduct disorder if participants answered yes to three or more items.(29, 30) For our analysis, we summed items

to create a total score for 1) conduct behavior problems before age 15 and 2) conduct behavior problems after age 15.

Depressive Symptoms—We used a sum score of the 10-item Short Form of the Center for Epidemiologic Studies Depression Scale (CES-D-10) (28) to assess depressive symptoms in the last 12 months. Depressive symptoms were defined as feelings and behaviors indicative of depressed mood that may or may not meet criteria for clinical diagnosis.(28) Each item was scored 0–3 relative to days per week of symptom occurrence. Scores could range from 0 to 30, with higher scores implying more distress.

Sleep—We used two items to create a latent variable for sleep. We asked participants to respond to the following items: "In the past 12 months, on the average, how many hours of sleep have you gotten each night?" and "In the last 12 months, how often have you had difficulty getting to sleep?" For the first item participants responded with the number of hours. Response options for the second item were never, rarely, sometimes, and often. We reversed-coded answers to the second item (difficulty getting to sleep), with higher scores in the latent variable to indicate better sleep.

Problem Drinking—We measured the latent variable, problem drinking, as the total score on the AUDIT (27) and two additional survey items. Problem drinking was defined as patterns of alcohol consumption that increase the risk of negative physical, psychological, and social consequences for the user.(31) The AUDIT is used to assess alcohol intake, dependence, and adverse consequences and demonstrates good internal reliability and sensitivity and specificity for alcohol dependence. AUDIT items are scored on a 0–4 scale and totaled to determine harmful and hazardous drinking behaviors.(27) We asked two additional quantity and frequency questions: 1) Number of drinks the participant had in a typical week and 2) in a typical week, the number of times men had 5 or more drinks and women had 4 or more drinks within a six hour time period.

Risky Driving—We measured risky driving with three latent variables: drinking and driving, hostile driving, and reckless driving.

Drinking and Driving: We measured drinking and driving with three items from Donovan's Young Adult Driving questionnaire (YADQ).(32) We asked participants to report how often in the last three months they "drove within an hour after drinking 1 or 2 beers or other alcoholic beverages;" "drove when they felt high or light-headed from drinking;" or "drove when they knew their drinking had already have affected your coordination."

Hostile Driving: We measured hostile driving with two YADQ items.(32) These items assessed participants' driving aggression in the last three months. Both items assessed: "While driving, how often do you…" "Make rude gestures at drivers who do things that annoy you?" and "Yell at other drivers when they do something stupid?" Response options included very often, often, once in a while, and never. Items were reverse coded for scoring.

Reckless Driving: We measured reckless driving with five YADQ items (32). These items assessed reckless driving behaviors in the last three months. Three items assessed: "While driving, how often do you…": "Out-maneuver other drivers for the thrill of it "; "Drive dangerously because you enjoy it?"; and "Take some risks because it feels good?" Response options included very often, often, once in a while, and never. Two items assessed if the participant agreed with the statements: "It's a thrill to out-maneuver other drivers"; and "It's fun to weave through slower traffic." Response options included strongly agree, somewhat agree, somewhat disagree, and strongly disagree. Items were reverse-coded for scoring.

Data Analyses

Descriptive statistics were calculated for all study variables for the entire sample and each group separately. We used confirmatory factor analysis (CFA) to develop a measurement model for the latent constructs: sleep, problem drinking, drinking & driving, reckless driving, and hostile driving. We based the CFA on data from the entire sample of 18–44 year olds (n = 312). We computed a measure of internal consistency reliability for each construct included in the models, either Cronbach's α (for observed variables) or a composite reliability index (as a byproduct of the CFA for latent variables). After obtaining a good-fitting measurement model, we specified the CFA as a multiple-group structural equation model (SEM) to allow us to use data from the entire sample of 18–44 year olds, but to also estimate different path coefficients among our variables of interest for each group (late adolescents age 18–24 and adults age 25–44). The SEM was comprised of the following set of observed and latent variables as described previously: 1) exogenous variables: conduct behavior problems before age 15, gender, depression, and sleep; 2) intermediary variables: conduct behavior problems after age 15 and problem drinking; and 3) endogenous variables: reckless driving, hostile driving, and drinking and driving. We tested an initial multiple-group SEM and revised it into a final SEM by removing paths that were not significant in both groups. Intercepts and variances were freed. We used the CFA and SEM in order to incorporate multiple measures of each construct, outcomes that we modeled simultaneously in the two groups, and intervening variables as mediators. Non-normal variables were handled in our analyses by using the appropriate estimation algorithms for categorical data in -(i.e. WLSMV, a robust weighted least squares estimator). Mplus version 6 was used to model the data.(33)

RESULTS

Table 1 outlines the Cronbach's α and composite reliability indices in the sample. Table 2 outlines the descriptive statistics.

The CFA for the entire sample demonstrated excellent fit (CFI=.97, TLI=.97, RMSEA=.05, χ^2=244.36, df=185, p=0.002). Table 3 presents the factor loadings and variance explained in the CFA. Figure 1 depicts the initial multiple-group SEM model and the variance accounted for in problem drinking, reckless driving, hostile driving and drinking and driving (CFI=.93, TLI=.92, RMSEA=.06, χ^2=427.07, df=285, p<.001). Pathways that were not significant in both groups were dropped from the initial model to create a final parsimonious model.

Figure 2 depicts the final multiple-group SEM, which demonstrated acceptable fit (CFI = .93, TLI = .92, RMSEA = .06, χ^2=447.51, df=299, p<.001).

For both groups in the final multiple-group SEM model, conduct behavior problems before and after age 15 were associated with hostile driving. In addition, conduct behavior problems before and after age 15 were associated with drinking and driving and reckless driving, through intermediary pathways (problem drinking and depression, respectively). Women in both groups also had more depressive symptoms, which were associated with reckless driving. There were an additional 11 significant pathways in the late adolescents and two in the adults (Table 4). Conduct behavior problems before and after age 15, gender, and sleep interacted differently for late adolescent than adults. In the late adolescents, in addition to more variance explained in problem drinking, hostile driving and reckless driving, males also had a higher association with hostile and reckless driving. Conduct behavior problems before and after age 15 were associated with drinking and driving and hostile driving through the intermediary pathway of depressive symptoms. Poor sleep was associated with drinking and driving and reckless driving through problem drinking. These patterns were not significant in adults. In the adults, there were an additional two pathways that included an association of conduct behavior problems before and after age 15 with problem drinking and drinking and driving through the intermediary pathway of depression.

DISCUSSION

Our data suggest that risky driving in late adolescence, compared to adulthood, may be comprised of more complex relationships of health-compromising behaviors and mental health factors. We found both common and divergent relationships, indicating a highly complex clustering in late adolescent risky drivers that did not exist in adult risky drivers. Late adolescents had multiple factors interacting with risky driving, including gender, depressive symptoms, conduct behavior problems, sleep, and problem drinking. These factors were relevant for adults, but interacted in more complex pathways for late adolescents and were more directly tied to risky driving behaviors (as evidenced by the stronger relationship between mental health, health compromising behaviors and both problem drinking and risky driving).

Our findings also suggest that in this high-risk sample of individuals engaging in risky driving and problem drinking, patterns of risk were more pronounced in late adolescent males, who reported more problem drinking, and hostile and reckless driving, than females. Females in both groups, however, had more depressive symptoms. The relationship between gender and risky driving behaviors is not surprising.(34, 35) Our findings call further attention to the unique needs of late adolescent male and female drivers related to health compromising behaviors, mental health and risky driving. Future research would help better determine if gender-based interventions are warranted.

Mental health was critical to the relationship with health-compromising behaviors and risky driving. Our results echo the findings by Scott-Parker and colleagues, where psychological distress (depression and anxiety) (20) and depression specifically (19) predicted risky driving in 17–25 year olds. Our findings with conduct behavior problems are also consistent

with previous literature suggesting relationships among risky driving behaviors (21, 36), and drinking and driving.(37) The co-morbidity of conduct behavior problems and depression in the late adolescents has the potential to contribute not only to risky driving but may extend to other risk behaviors such as sexual risk taking and drug use.

Though poor sleep patterns have been associated with risky driving and MVCs (38), sleep was not directly related to risky driving in our late adolescents or adults. However, the relationship between sleep and problem drinking in the late adolescent group supports the complex nature of sleep and alcohol use.(39, 40) Given the association of problem drinking with risky driving in the analysis, in this high-risk sample of risky drivers and problem drinkers, sleep may contribute most saliently to risky driving through the pathway of problem drinking. Further examination of sleep patterns in relationship to risky driving in late adolescents is warranted.

The role of mental health in late adolescent risk engagement reinforces current thinking that adolescence has a profound impact on long-term health.(41) Biological changes and mental health during adolescence affect behavior that may become particularly salient during driver training and when young people make on-road decisions. At the time of driver training and licensure, strategies might include health screening and integration of health care providers into the licensure process and additional components of driver training programs that address mental health risks. Health care providers counseling adolescents on driving can address the multidimensional nature of risks.(42) The influence of conduct behavior problems also suggests that identification and intervention in the early teen years may be important for addressing risky driving during late adolescence. Adolescent crash and near-crash risk decreases with experience, though some young drivers remain at risk even with miles driven.(43) Mental health may be a key area to address and could potentially ameliorate crash risk. This study was cross-sectional and additional prospective research is needed to determine the how the relationship between multiple health compromising behaviors, mental health, and risky driving changes over time, from adolescence to adulthood.

Limitations

The sample included participants enrolled in an RCT of screening, brief intervention, and referral to treatment from a single Emergency Department. Not only is there an association between problem drinking and utilization of the Emergency Department,(44) but due to the nature of the larger RCT, our sample screened positive for risky driving and problem drinking. The generalizability of these findings is thus limited to high-risk individuals. In order to increase the generalizability, future research should examine the relationship of heath compromising behaviors, mental health problems and risky driving in a community sample. The low composite reliability of the latent variable for sleep may limit the findings surrounding this variable. This secondary analysis used baseline data that were cross sectional; therefore, there is no indication of the causality between the relationships in the data, except potentially in the context of the items regarding conduct disorder before age 15.

Conclusion

An improved understanding of how health compromising behaviors, mental health, and risky driving clusters in different age groups is particularly important given the prevalence and consequences of MVCs in the adolescent and adult populations. Our findings suggest that risk-taking is a more complex phenomenon during late adolescence than adulthood, and likely is more pronounced in males than females. Health policy initiatives related to licensure and behavioral interventions for teens and adults that target driving risks related to mental health and health compromising behaviors may have the potential to reduce MVCs.

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What is already known on this subject

Risky driving is associated with motor vehicle crashes.

Adolescents and adults engage in multiple health compromising behaviors.

Factors such as mental health, alcohol consumption, and poor sleep are related to risky driving behaviors in adolescents and adults.

What this study adds

Clustering of mental health problems and health compromising behaviors in relationship to risky driving is different for late adolescents than adults.

Late adolescents have complex relationships between conduct behavior problems, depression and risky driving.

To promote safe driving in teens, driver training and licensure could be an important time to address mental health needs.

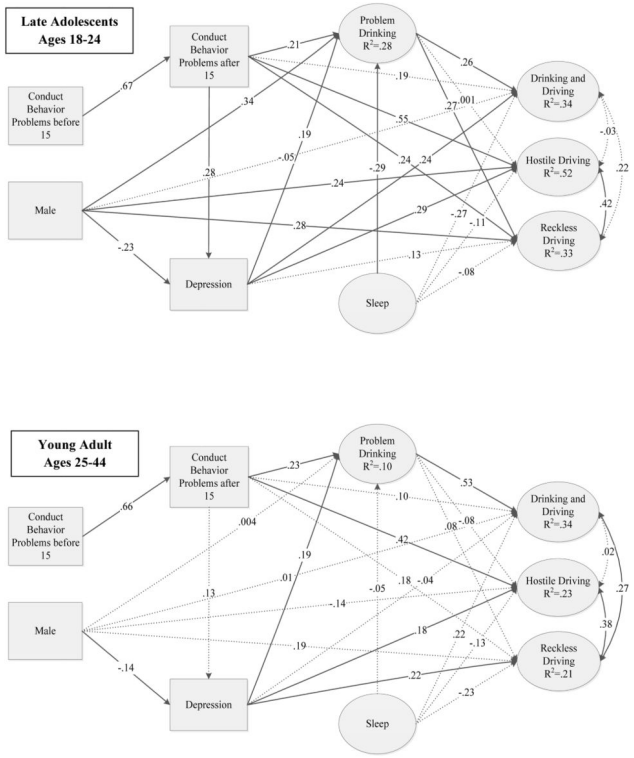

Figure 1.

Initial Model for the Two Groups

Note: Solid lines indicate significant paths ($p<.05$); dotted paths indicate paths that are not significant

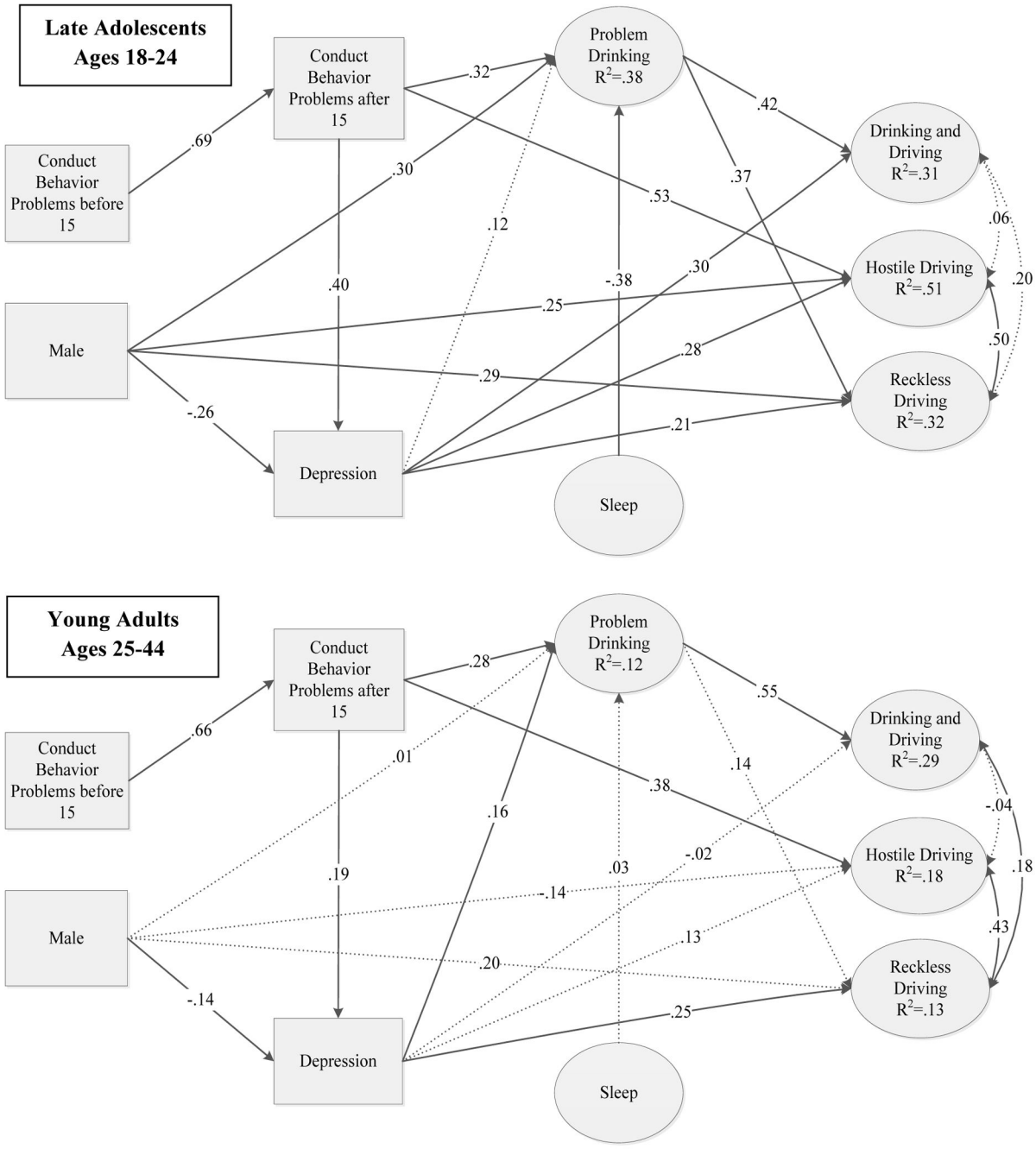

Figure 2.

Final Model for the Two Groups

Note: Solid lines indicate significant paths (p<.05); dotted paths indicate paths that are not significant

Table 1

Cronbach Alpha and Composite Reliabilities

	Late Adolescents (n=110)	Adults (n=202)	Both Groups (n=312)
Conduct Behavior Problems before 15*	0.76	0.74	0.75
Conduct Behavior Problems after 15*	0.65	0.74	0.71
Depressive Symptoms*	0.81	0.81	0.81
Sleep**	0.59	0.47	0.54
Problem Drinking**	0.82	0.79	0.81
Drinking and Driving**	0.85	0.88	0.87
Hostile Driving**	0.78	0.76	0.78
Reckless Driving**	0.95	0.91	0.94

Note:

* Cronbach Alpha,

** Composite Reliabilities

Table 2

Descriptive Statistics

	Total Sample (n=312) %(n)	Late Adolescents (n=110) %(n)	Adults (n=202) %(n)	p
Gender[2]				**0.01**
Male	68% (213)	59% (65)	73% (148)	
Female	32% (99)	41% (45)	27% (54)	
Race/Ethnicity[2]				**0.03**
White Non-Hispanic	62% (192)	71% (78)	56% (114)	
White Hispanic	1% (3)	0% (0)	1.5% (3)	
Black Non-Hispanic	34% (106)	26% (28)	39% (78)	
Asian	0.3% (1)	1% (1)	0% (0)	
Native American	0.3% (1)	1% (1)	0% (0)	
>1 Race Reported	3.0% (9)	2% (2)	3.5% (7)	

	m(sd) [median]	m(sd) [median]	m(sd) [median]	
Age[1]	28.85 (7.17) [27]	21.76 (1.84) [22]	32.71 (5.93) [32]	**<.001**
Conduct Behavior Problems before 15[1]	2.44 (2.26) [2]	2.29 (2.28) [2]	2.52 (2.25) [2]	0.41
Conduct Behavior Problems after 15[1]	2.39 (1.96) [2]	2.49 (1.89) [2]	2.34 (2.00) [2]	0.52
Depressive Symptoms[1]	10.19 (6.39) [9]	9.31 (6.22) [8]	10.67 (6.44) [10]	0.07
Sleep				
In the past 12 months, on the average, how many hours of sleep have you gotten each night?[1]	6.34 (1.38) [6]	6.51 (1.35) [6]	6.25 (1.39) [6]	0.11
In the past 12 months, how often have you had difficulty getting to sleep?[3]	2.32 (1.10) [2]	2.54 (1.06) [2]	2.21 (1.11) [2]	**0.007**
Problem Drinking				
AUDIT Score[1]	9.43 (5.86) [8]	9.82 (5.82) [8]	9.21 (5.88) [7]	0.39
How many drinks do you have during a typical week?[1]	9.87 (13.45) [6]	9.69 (9.49) [6]	9.97 (15.21) [6]	0.86
In a typical week, how many times do you have 4 (or 5 if male) or more drinks during a 6 hour time period?[1]	1.19 (1.55) [1]	1.24 (1.25) [1]	1.16 (1.69) [1]	0.69
Drinking and Driving				
Drive within an hour after drinking 1 or 2 beers of other alcoholic beverages?[1]	5.14 (11.68) [1]	6.04 (12.13) [1]	4.64 (11.42) [1]	0.32
Drive when you knew your drinking may already have affected your coordination?[1]	2.03 (8.64) [0]	1.59 (6.64) [0]	2.27 (9.57) [0]	0.51
Drive when you felt high or light-headed from drinking?[1]	2.56 (9.44) [0]	2.02 (7.26) [0]	2.87 (10.46) [0]	0.45
Hostile Driving				
Make rude gestures at drivers who do things that annoy you?[3]	1.92 (1.03) [2]	2.02 (1.09) [2]	1.87 (.99) [2]	0.34
Yell at other drivers when they do something stupid?[3]	2.37 (1.07) [2]	2.44 (1.15) [2]	2.33 (1.02)/2	0.53
Reckless Driving				
Out-maneuver other drivers for the thrill of it?[3]	1.31 (.74) [1]	1.46 (.90) [1]	1.23 (.62) [1]	**0.005**
Drive dangerously because you enjoy it?[3]	1.15 (.51) [1]	1.25 (.65) [1]	1.10 (.40) [1]	**0.02**

	m(sd) [median]	m(sd) [median]	m(sd) [median]	
Take some risks because it feels good?[3]	1.28 (.63) [1]	1.37 (.68) [1]	1.23 (.60) [1]	**0.01**
It's a thrill to out-maneuver other drivers.[3]	1.45 (.81) [1]	1.64 (.97) [1]	1.34 (.70) [1]	**0.003**
It's fun to weave through slower traffic.[3]	1.38 (.75) [1]	1.65 (.93) [1]	1.23 (.58) [1]	**<.001**

Note:

[1] Independent t-test;

[2] Pearson Chi-square

[3] Mann-Whitney U test

Table 3

Factor loadings and variance explained in the CFA

	Late Adolescents (n=110)		Young Adults (n=202)	
Factor	**Standardized Estimate**	**R^2**	**Standardized Estimate**	**R^2**
Sleep				
In the past 12 months, on the average, how many hours of sleep have you gotten each night?	0.63	0.40	0.54	0.29
In the past 12 months, how often have you had difficulty getting to sleep?	0.67	0.45	0.57	0.32
Problem Drinking				
AUDIT Score	0.63	0.39	0.78	0.62
How many drinks do you have during a typical week?	0.88	0.78	0.70	0.49
In a typical week, how many times do you have 4 (or 5 if male) or more drinks during a 6 hour time period?	0.82	0.67	0.77	0.60
Drinking and Driving				
Drive within an hour after drinking 1 or 2 beers of other alcoholic beverages?	0.73	0.53	0.89	0.79
Drive when you knew your drinking may already have affected your coordination?	0.84	0.71	0.82	0.68
Drive when you felt high or light-headed from drinking?	0.84	0.70	0.82	0.68
Hostile Driving				
Make rude gestures at drivers who do things that annoy you?	0.92	0.85	0.90	0.80
Yell at other drivers when they do something stupid?	0.66	0.44	0.66	0.44
Reckless Driving				
Out-maneuver other drivers for the thrill of it?	0.93	0.87	0.88	0.77
Drive dangerously because you enjoy it?	0.95	0.90	0.90	0.80
Take some risks because it feels good?	0.90	0.81	0.80	0.63
It’s a thrill to out-maneuver other drivers.	0.90	0.81	0.75	0.57
It’s fun to weave through slower traffic.	0.77	0.60	0.79	0.63

Table 4

Common and different pathways in the final model

Both groups
Conduct Disorder before 15 → Conduct Disorder after 15 → Problem Drinking → Drinking & Driving
Conduct Disorder before 15 → Conduct Disorder after 15 → Depressive Symptoms → Reckless Driving
Conduct Disorder before 15 → Conduct Disorder after 15 → Hostile Driving
Gender → Depressive Symptoms → Reckless Driving
Late Adolescent Group Only
Conduct Disorder before 15 → Conduct Disorder after 15 → Depressive Symptoms → Drinking & Driving
Conduct Disorder before 15 → Conduct Disorder after 15 → Depressive Symptoms → Hostile Driving
Conduct Disorder before 15 → Conduct Disorder after 15 → Problem Drinking → Reckless Driving
Gender → Depressive Symptoms → Drinking & Driving
Gender → Depressive Symptoms → Hostile Driving
Gender → Problem Drinking → Drinking & Driving
Gender → Problem Drinking → Reckless Driving
Gender → Hostile Driving
Gender → Reckless Driving
Sleep → Problem Drinking → Drinking & Driving
Sleep → Problem Drinking → Reckless Driving
Adult Group Only
Conduct Disorder before 15 → Conduct Disorder after 15 → Depressive Symptoms → Problem Drinking → Drinking & Driving
Gender → Depressive Symptoms → Problem Drinking → Drinking & Driving