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An Evaluation of the *Road Ready Teens* Video Game:

Final Report

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16. Abstract

This study evaluated the effectiveness of the Road Ready Teens video game "Streetwise," in (1) raising teen awareness of key driving risks, (2) strengthening positive attitudes toward driving safety guidelines, and (3) emphasizing that the experience they get through practice-driving helps them become safe drivers. Twenty-four teens who were either within three months of beginning, or were currently taking but had not completed driver education, were evaluated before and after 50 minutes of playing Streetwise, and then participated in a focus group lasting one hour. Pre- and post-game comparisons indicated that playing Streetwise significantly increased perceptions of personal driving risk; however, intentions to avoid risky driving behaviors, attitudes toward driving guidelines, and acceptance of driving guidelines did not change significantly from pre- to post-test. Girls were more likely than boys to report increased awareness of driving risks, greater acceptance of driving guidelines, and clearer perceptions of personal driving risk. Prior driving experience, video game playing experience, risk-taking propensity, driving risk-taking, and living locale (i.e., rural vs. in-town) also related to game outcomes. Teens in the focus groups said the video game gave too little opportunity to make driving decisions and not enough vehicle control to practice safe driving. They recommended leaving more decisions up to the driver, such as choosing to use safety belts and turn signals; checking blind spots; choosing their own routes or following directions instead of following turn arrows; and controlling vehicle speed to follow posted speed limits. They also suggested adding life-like driving situations, such as realistic obstacles; oncoming traffic; opposing traffic at intersections; and executing left turns at intersections and navigating four-way stops with on-coming traffic. The teens also wanted realistic feedback about the consequences of their mistakes and choices, such as degree of injury, repair cost, damage from hitting obstacles, and consequences of their decisions about safety belt and turn signal use. They felt this type of information would help them learn safe driving skills and the benefits of safe driving habits. Overall, the teens enjoyed playing the video game and felt it was a good teaching tool for people their age.

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Executive Summary

Topline Results

- Twenty-four teens participated in the evaluation; however, one individual did not provide any pre- or post-test data. Nineteen took part in the focus groups.

- Participants were 74% male (n = 17), 30% Asian American (n = 7), 70% White (n = 16), 13% freshmen (n = 3), 57% sophomores (n = 13), and 30% juniors (n = 7). They ranged in age from 15 to 17 years.

- All participants reported that their typical marks in school were C's or higher, and 52% (n = 12) reported A's as their typical mark.

- The majority (91%, n = 21) of the participants were in Level 1 (learner's stage) of the Michigan Graduated Driver License program.

- Most participants lived in a town (83%, n = 19) as opposed to a rural area.

- Sixteen participants (70%) reported having driven prior to taking driver education. The vehicle most commonly driven was a passenger car.

- Most participants said they enjoyed the game some (39%, n = 9) or quite a bit (35%, n = 8).

- Sixty-one percent of the participants played video games several times or more a week.

- Mission 4 was the highest mission reached by most participants (48% n =11). Four reached Mission 5, and four reached Mission 6. Everyone made it at least to the second Mission.

- Participants reported liking the challenging scenarios most about the game, and maneuverability of the car was what they liked least.

- Thirty-six percent said they were likely to recommend the game to a friend, and 15% said they were unlikely or very unlikely to recommend the game to a friend.

- The mission most liked by the participants was Mission 3 (44%, n = 10), and 22% said they did not like any of the missions (n = 5).

- Thirty percent were neither likely nor unlikely to play the game more (n = 7), 40% reported being unlikely to play the game again (n = 9), and another 30% (n = 7) said they would be likely to play the game more.

- All participants reported that the game helped them at least "a little" to understand the driving risks that they face as new drivers, and 65% (n = 15) reported that it helped them quite a bit or a lot.

- When asked how much more aware of the risks they were after playing the game, 91% (n = 22) reported being at least "a little more" aware, and 22% (n = 5) reported being quite a bit more aware.

- Sixty-one percent (n = 14) said they were more likely to take steps to protect themselves from driving risks as a result of playing the game.

- Positive attitudes toward driving guidelines increased slightly from pre- to post-test.

- The likelihood of being involved in risky driving behaviors decreased slightly from pre- to post-test.

- The participants were quite risk averse, both in terms of general risk-taking and driving-specific risk-taking.

Specific Results

- *Streetwise* was generally positively received by the teen participants, as evidenced by both the quantitative and qualitative results. All participants said they enjoyed the video game at least "a little," and 43% indicated they enjoyed the game either "quite a bit" or "a lot."

- Perceptions of personal driving risk increased significantly from pre- to post-test. Intentions to avoid risky driving behaviors, attitudes toward driving guidelines, and acceptance of driving guidelines did not change significantly from pre- to post-test.

- Girls were more likely than boys to say that their awareness of driving risks had been increased by playing the video game.

- Girls in the sample were more likely to increase their acceptance of driving guidelines from pre- to post-test.

- Boys were more likely than girls to report an increase in their perception of personal driving risk from pre- to post-test.

- Asian-American teens had better perceptions of personal driving risk, greater acceptance of driving guidelines, more positive attitudes toward driving guidelines, and greater intentions to avoid risky driving behaviors than White teens at both pre- and post-test.

- White teens were more likely than Asian-American teens to increase their perceptions of personal driving risk, acceptance of driving guidelines, positive attitudes toward driving guidelines, and intentions to avoid risky driving behaviors from pre- to post-test.

- Teens living in town were more likely than teens living in rural areas to report that they were more likely to protect themselves from driving risks as a result of playing *Streetwise*, increase their perception of personal driving risk, and increase their positive attitudes toward driving guidelines from pre- to post-test.

- Teens living in rural areas were more likely than teens living in town to say their awareness of driving risks increased as a result of playing the video game.

- Participants who had driven before driver education were more likely to report an increase in their intentions to avoid risky driving behaviors and acceptance of driving guidelines from

pre- to post-test, and were more likely to report being more aware of driving risks as a result of playing the video game.

- Compared to the inexperienced video game players, experienced players were less likely to protect themselves from driving risks as a result of playing the video game and less likely to report that they enjoyed the game. However, they were more likely than inexperienced players to increase their intentions to avoid risky driving behaviors, increase their perception of personal driving risks, increase their acceptance of driving guidelines, and increase their positive attitudes toward driving guidelines from pre- to post-test.

- Teens in the high risk-taking propensity group were more likely than the low risk-taking propensity teens to intend to protect themselves from driving risks as a result of playing the video game, and less likely to improve their perception of personal driving risks from pre- to post-test.

- Compared to low-driving-risk-takers, teens with high-driving-risk-taking scores were less likely to increase their intentions to avoid risky driving behaviors; less likely to increase their acceptance of safe driving guidelines; and less likely to adopt more positive attitudes toward driving guidelines from pre- to post-test.

- Teens in the focus groups felt the increased driving risk associated with having teen passengers and eating or drinking while driving was made clear by the video game, but that other guidelines are not clearly addressed and should receive more attention.

- The message for safety belt use was clearly present in the game, but several teens in the focus groups felt the message was not very specific.

- The teens in the focus groups had hoped that the game would teach them more about driving safely but said there was too little opportunity to make driving decisions, and that too many things were under control of the game for them to practice driving safely. They thought this would include leaving more things up to driver discretion, such as using a safety belt or not; checking blind spots; choosing their own routes or following directions through town instead of having turn arrows; turning signals on and off; more control of vehicle speed with posted limits to follow; and having more realistic obstacles. They felt that life-like driving situations should be added, such as oncoming traffic; opposing traffic at intersections; driver choosing the right time to make a left turn at an intersection with on-coming traffic; and navigating four-way stops with traffic coming from the other directions.

- Teens in the focus groups also wanted more realistic feedback on the consequences of their mistakes, such as degree of injury, cost of repair, a flat tire after hitting a pothole, and information about what would have happened, based on the decisions made, such as differences in injury outcome because of not wearing a safety belt. They felt this type of information would help them learn more about being responsible drivers; and about potential consequences of their behavior.

Introduction

Data on the driving behavior of teens leaves little doubt that young drivers are at high risk of injury or death from motor vehicle crashes. Risk of death in a motor vehicle crash peaks at age 16, and remains elevated relative to other drivers through age 35. With the exception of the elderly, drivers in this age range are the most likely to be involved in, to be drivers in, and to lose their lives in a motor vehicle crash (National Center for Injury Prevention and Control [NCIPC], 2000). In 1999, teen drivers represented only 6.8% of all drivers, but accounted for 15% of all drivers involved in fatal crashes, and 18% of all drivers involved in police-reported crashes. Alcohol involvement was also related to crash severity in this age group. Among 15-20-year-old drivers in 2000, alcohol was a factor in 3% of crashes resulting only in property damage, 5% of crashes resulting in an injury, and in 22% of fatal crashes (National Highway Traffic Safety Administration (NHTSA), 2002).

High-risk driving behaviors and serious driving outcomes are associated with various driver characteristics, including inexperience, distraction, emotional states such as anger or depression (Donovan, Marlatt, Salzberg, 1983), high-risk driving practices and attitudes (Evans & Wasielewski, 1983; Jonah, 1990; Jonah & Dawson, 1987; Peck, 1985; Wasielewski, 1984; Yu & Williford, 1993), thrill seeking, various personality factors, and substance use. High-risk driving behaviors such as drinking and driving, tailgating, driving 20 miles per hour or more over the speed limit, traffic signal violations, and passing violations are common among young drivers and also contribute to crash-related injury and death (Centers for Disease Control (CDC), 1994; Insurance Institute for Highway Safety [IIHS], 1993).

These data document the danger faced by young drivers and the hazards they present to passengers and other drivers on the road. They also bring to the fore the importance of developing, evaluating, and refining programs that reduce the risk of motor vehicle injury or death for young drivers. Several such programs have been initiated; perhaps most recognized are the recently developed, administered, and evaluated graduated driver licensing (GDL) programs. While the general GDL approach has been shown to be an effective method of decreasing risk while improving the driving skills of young drivers, further enhancements are needed.

The Road Ready Teens video game, Streetwise, complements GDL and driver education in many ways, by adding other teaching tools, such as manuals, audiovisual presentations, structured instruction and guidance for parents of new drivers, and a video game designed to (1)

enhance the risk awareness of young drivers, and (2) help them adopt positive attitudes toward driving safety guidelines.

The purpose of this study was to evaluate the effectiveness of Streetwise in (1) raising teen awareness of key driving risks, (2) strengthening positive attitudes toward driving guidelines designed to keep them safe from driving risks, and (3) emphasizing that the experience they gain through practice-driving will help them become safe drivers.

The video game was a web-based computer game, controlled by the four arrow keys on the keyboard and the mouse. The game consisted of six missions that increased in difficulty from the first to the last, with each mission locked until the preceding mission had been successfully navigated. The missions represented six different driving scenarios. Obstacles in the road were presented in all six missions, and the game player must successfully navigate them. As the difficulty increased, so did the responsibilities for signaling turns and slowing down for stop signs. The first mission was called "Mom's Gauntlet" and involved running errands with Mom while she gave directions. The second mission specifically focused on passenger distractions and was called "Driving with Friends." The third mission was called "King of the Neighborhood" and involved driving around town with friends. The fourth mission was called "Night Driver" and simulated driving at night. The fifth mission was called "Bad Weather" and added the challenge of driving in the rain. Finally, the sixth mission was called "Drink Drivers" and involved the safe negotiation of hazards presented by drink driving.

Methods

Sample

<u>Recruitment</u>

Michigan uses a three-level graduated driver licensing program. The process begins with Segment 1 of driver education, which consists of 24 hours of class instruction, and six hours of on-road driving. Once Segment 1 is successfully completed, a Level 1 supervised learner's license can be issued, which allows the holder to drive only with a licensed parent/guardian or designated adult age 21 or over in the front seat. Following completion of at least 30 hours of supervised driving, the holder of a Level 1 license can attend Segment 2 driver education which consists of six classroom hours where the students discuss and examine their driving experiences and share what they learned as supervised drivers. After successfully completing Segment 2 and a total 50 hours of supervised driving, including at least 10 hours of driving at night, Level 1 license holders can apply for a Level 2 license, which requires passing a road test.

To qualify for this study, participants had to be teenagers within three months of beginning their driver education classes, attending Segment 1 classes, driving with a Level 1 supervised license, or attending Segment 2 classes. To recruit eligible participants, project staff coordinated efforts with driving schools in the Ann Arbor Area, including the Sears Driving Schools, All Star Driver Education, Ann Arbor Driving School, and A-1 DiGregorio Adult and Teen School of Driving. Each driving school was contacted by a project staff person who made an appointment to recruit study participants from the school.

At the recruitment appointment, the staff member introduced themselves to the class, gave some background about the video game, and told the potential participants that their help was needed to evaluate the game. They were informed that they would receive a $15 Border's gift certificate for playing the video game and completing two short surveys, and another $15 gift certificate for remaining an additional hour after the video game session to attend a discussion group to about their impressions of the game, what they liked and disliked, and how it could be improved. They were also told that the video game was not being developed for commercial purposes, but instead would be available to the public on the World Wide Web and that, by helping us with the evaluation, they would be performing a public service. Then informed consent forms and information about the evaluation were handed out and explained. The students were given time to complete their forms, and they gave them to the recruiter along with

contact information, so they could be scheduled for an evaluation time and reached with a reminder a day or two before the evaluation.

Because minors were being recruited, signed informed consent was needed from both the teen and his/her parent (i.e., teen assent and parental consent) in order for the teens to participate. Most of the driving schools offer a parent class so, to facilitate obtaining signed informed consent, recruitment was done at parent classes whenever possible.

All potential participants were given an information sheet describing the evaluation, giving directions to the evaluation site, and providing the e-mail address and phone number of the project's Principal Investigator. They were invited to call or e-mail with any questions. Participants who were recruited from a regular (not parent) class, as well as any who chose not to hand in a teen assent form at recruitment, were encouraged to come on the day of the evaluation with the necessary forms completed. In addition, eligible participants were asked to invite friends to join them, and told to have their friends contact the Principal Investigator using the phone number or e-mail address on the information sheet, to obtain the consent and assent forms and to be scheduled for the evaluation.

Participants were also recruited by sending the project flyer out to UMTRI staff, as well as staff at the Department of Veterans Affairs, Health Services Research and Development in Ann Arbor, Michigan, asking employees at these locations to pass the information along to their children, neighbors, and friends with the invitation to contact the Principal Investigator for more information and to be scheduled for the evaluation.

Participants

Twenty-four teens participated in the evaluation; however, one individual played the video game, but did not complete either the pre- or post-test surveys. The participants were 74% male (n = 17), 30% Asian American (n = 7), 70% White (n = 16), 13% freshmen (n = 3), 57% sophomores (n = 13), and 30% juniors (n = 7). They ranged in age from 15 to 17 years. All participants reported that their typical marks in school were mostly C's or higher, and 52% (n = 12) reported A's as their typical marks. Only one person reported getting mostly C's.

The majority (91%, n = 21) of the participants were in Level 1 of the Michigan Graduated Driver License program and lived in a town (83%, n = 19), as opposed to a rural area.

Details regarding participants in each of the four focus groups follow. Group One included seven teens, two female. Group Two included two male teens. Group Three included four male teens, and Group Four included six teens, two female. Discussion time for each

group ranged from about 40 to 60 minutes. In general, the teens seemed serious about learning to drive and eager for good information to help them learn. They showed respect and understanding of their parents' driving experience and knowledge, and of Michigan's GDL program. Several teens seemed unimpressed with their Segment 1 driver education classes (24 classroom hours, 6 behind-the-wheel sessions), which almost all had attended. They acknowledged that they needed the information and road advice, but did not enjoy some of the educational methods and materials used.

Evaluation

The evaluation was conducted at the University of Michigan Media Union on August 30, 2003, with the surveys and video game in a computer lab, and focus groups in a conference room. The information sheets given to potential participants during recruitment included a map showing the location, giving the Media Union street address and instructions for locating the evaluation room. On the day of the evaluation, a large sign announcing the evaluation was placed at curbside, and signs were posted inside the building to guide participants to the computer lab.

The evaluation was conducted in four consecutive sessions, beginning at 8:30am, 10:30am, 12:30pm, and 2:30pm. The video game component of the evaluation occurred first. This began with a welcome by C. Raymond Bingham, PhD, brief instruction and administration of a computerized pre-test survey (Appendix) that allowed immediate storage of the data in a database located on the computer lab server. The pre-test was followed by 50 minutes of game play, then the administration of the post-test survey (Appendix), which was also computerized. Project staff were available throughout the video game component of the evaluation to answer questions, and to monitor participants to ensure that they played the video game as instructed.

When all participants completed the post-test survey, they were escorted to the conference room for the focus group discussions (see Appendix, Focus Group Moderator's Guide). Not all the teens who took part in the video game portion of the evaluation were able to remain for the focus group. Five teens elected to not take part in the focus groups. One Borders gift certificate worth $15 was given to each of these individuals following the post-test survey.

A total of 19 teens (15 male and 4 female) participated in the four focus groups. The focus groups were held in a windowed conference room with a large table and chairs around it. Juice and cookies were served. The discussions were led by Jean T. Shope, MSPH, PhD,

using the Moderator's Discussion Guide included in the Appendix. Notes were taken by Helen Spradlin, research assistant. In some groups, the discussion rolled along, and the actual questions from the moderator's guide did not need to be specifically asked. The discussions were audio-taped as back-up, and duplicate tapes were sent to the game developers at WildTangent. Most of the focus groups were observed by one to four staff members of GMMB and DaimlerChrysler. They sat on chairs in one corner of the room, and asked a few questions after the moderated focus group was finished. At the conclusion of each session, participants were thanked and each given two $15 Border's gift certificates; one for playing the video game; and one for participating in the focus group.

Quantitative Measures

The pre- and post-test surveys containing the measures used in this study are provided in the Appendix.

Demographics

The demographic measures included sex (1 = male, 2 = female), race (1 = African American, 2 = Asian American, 3 = Caribbean Islander, 4 = Latino/Hispanic, 5 = Native American Indian, 6 = Pacific Islander, and 7 = White), date of birth, location of residence (1 = rural [in the country], 2 = in town [in a neighborhood]), grade in school (1 = Freshman – 9th grade, 2 = Sophomore – 10th grade, 3 = Junior – 11th grade, 4 = Senior – 12th grade), and marks in school (1 = Mostly A's, 2 = Mostly A's & B's, 3 = Mostly B's, 4 = Mostly B's & C's, 5 = Mostly C's, 6 = Mostly C's & D's, 7 = Mostly D's, 8 = Mostly D's & F's [E's], 9 = Mostly F's [E's]).

Mission/Game Specific Questions

At the post-test, the teens were asked several questions about their experience with the *Streetwise* video game. Examples of these items are: How much did you enjoy playing the video game?; What was the highest mission you reached in the video game?; and Which of the following did you like best about the video game? (see Appendix, Post-Test Survey for all post-test items and response categories).

Outcome Measures

Perception of Personal Driving Risks. This content area was one of the four primary areas that the video game was designed to influence, and it was assessed by two measures. The first was a 9-item measure of Perception of Personal Driving Risk (both pre- and post-test),

that asked the teens to rate how much each of nine risky driving behaviors increases THEIR OWN risk of being in a car crash. Each item was rated on a five-point scale with 1 = not at all, 2 = a little, 3 = somewhat, 4 = very, and 5 = extremely (see Appendix, Pre-Test Survey, item 12, and Post-Test Survey, item 5). The scores on these items were averaged to provide a single overall score of participants' perceptions of their personal driving risk. Internal consistency reliability (α) for this scale ranged from 0.91 to 0.93 and test-retest stability, tested using the Pearson Product Moment Correlation (r), was 0.80.

The effect of the video game on Risk Awareness was measured by a single item at the post-test measuring how much more aware of driving risks the teen felt s/he was as a result of playing the video game (see Appendix, Post-Test Survey, item 15). Responses to this item were 1 = no more aware, 2 = a little more aware, 3 = somewhat more aware, 4 = quite a bit more aware, and 5 = a lot more aware. The Pearson Product Moment Correlation between the Perception of Personal Driving Risk scale score and this item was 0.46.

Increased understanding of driving risks that resulted from playing the video game was measured by a single post-test item that asked the teen how much the video game helped him/her better understand the risks that new drivers face (see Appendix, Post-Test Survey, item 10). Responses were 1 = Not at all, 2 = A little, 3 = Some, 4 = Quite a bit, and 5 = A lot. Correlations between this item with Risk Awareness, and Perception of Personal Driving Risk were 0.51 and 0.70, respectively.

Intention to Avoid High-Risk Driving Behaviors. The effect of the video game on avoidance of high-risk driving behaviors was assessed by two measures. The first was the Intention to Avoid High-Risk Driving scale (see Appendix, Pre-Test, item 4 and Post-Test Survey, item 9). This 9-item scale in the pre-test and post-test asked the teen to rate how likely s/he was to do each of nine behaviors related either to risk avoidance or taking driving risks. The items were rated on a 5-piont scale, with 1 = not at all, 2 = a little, 3 = somewhat, 4 = very, and 5 = extremely. The scale was scored so that a higher score indicated greater risk avoidance. Test-retest stability was r = 0.52 and α ranged from 0.55 to 0.64.

The second measure of driving risk avoidance was a single item in the post-test that asked the teen if s/he was more likely to protect her/himself from driving risks as a result of playing the video game (see Appendix, Post-Test Survey, item 15). Responses to this Self Protection measure were 1 = yes, 2 = no. The Spearman Correlation Coefficient relating this item to the Intention to Avoid High-Risk Driving scale was 0.40.

Attitudes toward Guidelines. The teens' attitudes toward driving guidelines were measured by the Positive Attitudes Toward Driving Guidelines scale (see Appendix, Pre-Test, item 2 and Post-Test Survey, item 11). This 11-item scale asked teens (pre-test and post-test) how much they agreed or disagreed with 11 statements reflecting either a positive or a negative attitude toward a driving guideline. Agreement was rated on a five point scale, with 1 = strongly disagree, 2 = disagree, 3 = neither agree nor disagree, 4 = agree, and 5 = strongly agree. Scale scores were calculated so a higher score reflected a more positive attitude toward driving guidelines. Test-retest stability was 0.49 but internal consistency reliability was low ($\alpha \sim 0.30$).

Acceptance of Driving Guidelines. The teen's willingness to follow driving guidelines was measured using the Acceptance of Driving Guidelines Scale (see Appendix, Pre-Test, item 6 and Post-Test Survey, item 12). This 10-item scale (pre-test and post-test) asked the teen to rate how willing s/he would be to accept each of 10 driving guidelines. Willingness was measured on a 5-point scale: 1 = not at all, 2 = a little, 3 = somewhat, 4 = very, and 5 = extremely. Test-retest stability was 0.84, and α ranged from 0.88 to 0.89.

Potential Confounding Variables

Risk-Taking Propensity. Attitudes toward general risk-taking were measured at pre-test by the 19-item Sensation Seeking Scale (Zuckerman, Kolin, Price, & Zoob, 1964; Zuckerman & Link, 1968) (Appendix, Pre-Test Survey, item 8). Each of the 19 items in this scale is a statement about a risky or high sensation behavior, and the teen responded with 1 = true (i.e., the statement is true of the teen), or 0 = false (the statement is not true of the teen). The scale was scored so that a higher score indicated greater risk-taking propensity. The Kuder-Richardson-20 estimate of internal consistency was 0.84.

Driving-Risk-Taking. A 12-item scale measuring Driving Risk Taking asked the teens at pre-test to rate how strongly they expected to have each of 12 risky driving experiences (see Appendix, Pre-Test Survey, item 13). They rated each item on a 5-point scale with 1 = not at all, 2 = a little, 3 = somewhat, 4 = very, and 5 = extremely. This scale had an internal consistency of $\alpha = 0.92$ and correlation with the Risk-Taking Propensity of r = 0.49.

Driving Experience Prior to Driver Training. Driving experience prior to taking driver education was measured was measured at pre-test, and assessed the diversity in pre-licensure driving experience (see Appendix, Pre-Test Survey, item 11). Prior driving experience was measured by 10 items asking the teen to respond 1 = yes or 0 = no to indicate *if* they had ever driven prior to starting driver education classes, and if yes, had they driven a car/minivan/bus,

pick-up truck, full-size van, farm truck (larger than a pick-up), motorcycle, tractor, three- or four-wheeled ATV, a riding mower, or another vehicle (verbatim response). The teens were also asked at pre-test *how often* they had driven before beginning driver education (see Appendix, Pre-Test Survey, item 3). The responses to this single item measure were 0 = never, 1 = a few times – one to six times, 2 = several times – seven to 12 times, 3 = occasionally – once or twice a month, 4 = often – weekly, 5 = regularly – a few times a week, 6 = frequently – almost every day, and 7 = daily.

     Extent of Driver Training Experience. Participants were asked at pre-test to report how much time they had spent practice-driving since they began driver education (see Appendix, Pre-Test Survey, item 1). Responses to this single item were 0 = I haven't started driver education classes, 1 = 1 to 30 minutes, 2 = 31 minutes to 1 hour, 3 = 1 to 2 hours, 4 = 3 to 6 hours, 5 = 7 to 10 hours, 6 = 11 to 20 hours, 7 = 21 to 30 hours, 8 = 31 to 40 hours, 9 = 41 to 50 hours, and 10 = more than 50 hours. A second item asked the participant how far s/he had advanced in the GDL program. Responses were 1 = I haven't begun driver education, 2 = currently taking Segment 1 driver education classes, 3 = Level 1 – supervised learner's license, 4 = currently taking or have taken Segment 2 driver education classes, 5 = Level 2 – license that limits nighttime driving, and 6 = Level 3 – license with full privileges.

Quantitative Results

The analyses were conducted in three sets, and the results of these analyses are presented in three sections called Results I, Results II, and Results III. Results I describes the overall reaction of the participants to the video game. Results II presents the results of tests of the central hypotheses of this evaluation by examining changes in perceptions of personal driving risk, intentions to avoid risky driving behaviors, positive attitudes toward driving guidelines, and acceptance of driving guidelines from pre- to post-test. Results III identifies the characteristics of the participants that were associated with an increase, or lack of an increase, in perceptions, intentions, attitudes, or acceptance. Each set is presented separately, and is directly preceded by a description of the statistical tools and decision criteria used to examine the data and interpret the statistical results from that set.

Results I: Teens' Reactions and Game Performance

Analysis I

The comparisons in this section were made by cross-tabulating the variables in pairs. Differences in responses across groups were then identified by a visual inspection of the tables. No statistical tests were used, because these statistics were intended only to describe the teens' reactions to the game and their performance playing the game.

Results I

The reactions of the participants to the game were generally positive. All of the participants indicated that they enjoyed the video game at least "a little," and 43% indicated that they enjoyed the game either "quite a bit" or "a lot." Boys gave the game an overall higher rating than girls, with 47% of boys and 33% of girls saying they enjoyed the game at least "quite a bit."

The mission that the participants liked the most was Mission 3, "King of the Neighborhood," with 48% (n = 10) rating this as their favorite. It still appeared to be the most liked when mission completion was taken into account. One person only progressed to Mission 2; however, of those who made it to Mission 3 or further, 10 indicated Mission 3 was their favorite. Overall, Mission 1 was voted the best by one person, Mission 2 by two, Mission 3 by 10, Mission 4 by two, and Mission 5 by three. Five participants (22%) said they didn't like any of the missions.

The boys and girls who played the game agreed on aspects of the game they liked the most and the least. The most liked aspect was the challenge the game offered (n = 11, 48%), while the least liked was the degree of maneuverability of the car (n = 7, 33%).

Finally, when asked about further engagement with the game, 70% of the teens were either indifferent or stated that they were not likely to play the game more if given the chance. Thirty percent (n = 7) of the teens said that if they were given the chance, they were neither likely nor unlikely to spend more time playing the game, and equal numbers said they were unlikely (n = 5, 22%) and likely (n = 5, 22%) to spend more time playing the game. Similarly, when asked how likely they were to recommend this game to a friend, 41% (n = 9) said they were neither likely nor unlikely to recommend it to a friend. However, the likelihood of recommending the game to a friend was slightly different for boys and girls. Thirty-eight percent of boys (n = 8) and 33% of the girls (n = 2) said they were likely to recommend the game to a friend.

Results II: Changes from Pre- to Post-Test
Analysis II

Change in perceptions of personal driving risks (perceptions), intentions to avoid risky driving behaviors (intentions), positive attitudes toward driving guidelines (attitudes), and acceptance of driving guidelines (acceptance), measured both before and after the teens played the video game, were tested using the signed ranks test and difference t-tests. The difference t-test was chosen because it is widely used to examine repeated measures and paired data. The signed ranks test was also selected because it is suitable for use with these data, and is slightly more liberal than the difference t-test, making it better suited for examining effects in small samples. Finally, measures of effect size (δ) were also calculated, so that the actual magnitude of the video game effect, rather than just statistical tests of significance, could be used to evaluate the effect of the video game on teen's intentions, perceptions, attitudes and acceptance. Effect sizes are considered small if they are in the range of 0.2, medium in the range of 0.5 and large if they are about 0.8 (Cohen, 1992).

Result II

Intentions, perceptions, attitudes, and acceptance were each measured at pre- and post-test. To test the hypothesis that intentions, perceptions and acceptance would increase, and

attitudes would improve, statistical comparisons were made between pre- and post-test using both the difference t-test and the signed ranks test.

Perceptions of personal driving risk increased 11.2% from pre- to post-test. This increase was significant, both for the difference t-test (t = 3.16, p > .0045) and the signed ranks test (S = 84.5, p ≥ .0002). The difference constituted a small to medium effect, with δ = 0.30.

Intentions to avoid risky driving behaviors increased 2.4% from the pre- to post-test. This increase was not significant as tested by the difference t-test (t = 1.45, p > 0.1614), or the signed ranks test (S = 46.5, p ≥ 0.1318). The effect size associated with the difference t-test was very small at δ = 0.10.

Attitudes toward driving guidelines increased 2.2% (became more favorable) from pre-test to post-test. However, this did not constitute a significant change (difference t = 1.45, p > 0.1614; S = 46.5, p ≥ .1318). The effect size was very small at δ = 0.08.

Acceptance of driving guidelines remained nearly stable from pre- to post-test, demonstrating a minimal increase of 1.1%. This increase was not significant, with a difference t-test = 0.58 (p > 0.5705), and a signed ranks test = 21.5 (p ≥ 0.4349). The effect size was very small at δ = 0.03.

Results III: Characteristics Related to Increases

Analysis III

Bivariate comparisons between different variables were conducted using cross tabulation tables. Due to the small sample, measures of effect size, rather than significance tests, were used to interpret the statistics and to identify potentially interpretable results. To facilitate this method of comparison, the measures of perceptions, intentions, attitudes, and acceptance that were made at the beginning and the end of the video game session were used to create four new categorical variables, one each for perceptions, intentions, attitudes, and acceptance. These variables had two categories, one included teens who responded to the video game as hypothesized (i.e., increased intentions to follow driving guidelines), and the other represented those who did not (i.e., showed no change, or changed opposite the direction hypothesized). These categorical variables were then contrasted with other measures (e.g., game enjoyment, understanding driving risks), to identify the characteristics of teens who did/did not exhibit change in the hypothesized direction.

Odds ratios were used to identify effects in cross-tabulations of two categorical variables that have only two categories each (2 X 2 table). To extend the usefulness of the odds ratios,

many of the variables that had more than two categories were recoded (categories collapsed) so that they formed two groups, (i.e., not at all likely versus any degree of likelihood). However, some measures could not be reduced to two meaningful categories (i.e., marks in school). The associations of these measures with the categorical outcomes were made using larger tables (2 X j, where j > 2), which were interpreted either visually, or by breaking them down into sets of 2 X 2 comparisons if clear patterns could not be determined through visual inspection. Due to the complexity of these latter sets of analyses and to avoid confusion, odds ratios are not reported for tables larger than 2 X 2, but the direction and nature of the effects is described verbally.

Odds ratios represent the likelihood that cases will be in a particular cell in the table; hence they allow precise statements to be made about how much more likely one group is than the other to have particular characteristics (e.g., male teens were 4.2 times more likely to do *x*). Odds ratios range from 0 to infinity but, because odds ratios greater than one are more intuitive, all effects in this report are interpreted in the direction of odds greater than one. In the preparation of this report, odds ratios less than 1.5 were treated as no effect. Odds ratios from 1.5 to 1.9 were considered small effects. Odds ratios from 2.0 to 2.9 were medium effects and those 3.0 and larger were considered large effects. Cohen recommends that when his method of calculating effect size is used, effects from 0.20 to 0.49 be considered small effects, 0.5 to 0.79 as medium effects, and 0.06 and larger as large effects (Cohen, 1992). In this report, Cohen's effect sizes less than 0.20 were interpreted to be null effects.

Result III

The video game' desired outcomes were: increased awareness of driving risks, greater acceptance of driving guidelines, positive attitudes toward driving guidelines, and intentions to avoid driving risks. The results are reported in separate sections for each predictor variable.

Demographic Factors. The demographic factors examined include sex, grade in school, marks in school, and area of residence (i.e., rural versus in town). Seventeen boys and six girls took part in the evaluation. Female teens were more likely than male teens to say that they were more aware of driving risks as a result of playing the video game (odds ratio [o.r.] = 3.1), and they were also more likely to increase their acceptance of driving guidelines as a result of playing the video game (o.r. = 5.6). However, boys were 4.7 times more likely than girls to report an increase in their perception of personal driving risk as a result of playing the video game. Boys and girls did not differ from each other in their intentions to protect themselves against driving risks, intention to avoid risky driving behaviors, or in positive attitudes toward driving guidelines.

Asian-American and White teens differed on several game outcomes. White teens were much more likely (o.r. > 12) to increase their perceptions of personal driving risk, 1.7 times more likely to increase their acceptance of driving guidelines, 11 times more likely to report an increase in positive attitudes toward driving guidelines, and 7.7 times more likely to report an increase in their intentions to avoid risky driving behaviors from pre- to post-test.

For this sample, grade in school can be used as a proxy for age, as well as a marker of advancement through school, because the two variables were nearly perfectly correlated. Three freshmen, 13 sophomores, and seven juniors played the video game. The sophomores and juniors were less likely than the freshmen to enjoy the game. Juniors were less likely than the other grades to enjoy playing the game, to feel that the game helped them understand driving risks, or to feel that playing the game had made them more aware of driving risks. Sophomores were less likely than the other teens to increase their perceptions of personal driving risk and more likely to increase their intention to avoid risky driving behavior from pre- to post-test. But they were less likely to report that they would take action to protect themselves from driving risks. Participants from the three grades did not differ in their enjoyment of the game, their acceptance of driving guidelines, or their attitudes toward driving guidelines.

"Marks in school" was not a strong predictor of game outcomes. People with higher marks were more likely to show an increase in positive attitudes toward driving guidelines from pre- to post-test, and to report being more aware of driving risks as a result of playing the game. Marks were not associated with any other outcomes.

The sample included 14 in-town residents, and eight rural residents. Location of residence (i.e., rural versus in-town) was associated with several of the outcome measures. Teens living in rural areas were 4.1 times more likely than teens living in town to say they were more aware of driving risks as a result of playing the video game. Place of residence was not associated with increased acceptance of driving guidelines, or increased intentions to avoid risky driving behaviors.

Driving Experience. Teens in the sample varied in terms of their driving experience. Seven teens reported that they had never driven before taking driver education. This lack of driving experience included never having driven a car/minivan/SUV, pick-up truck, full-size van, farm truck larger than a pick-up, motorcycle, three- or four-wheeled ATV, or a riding mower. Participants who had driven any of these vehicles before driver education were 3.2 times more likely to report an increase in their intentions to avoid risky driving behaviors. Teens who had never driven before taking driver education were 2.2 times more likely to increase in their acceptance of driving guidelines from pre- to post-test, and 2.4 times more likely to report being

more aware of driving risks as a result of playing the video game. There were no differences in increase in perceptions of personal driving risk or attitudes toward driving guidelines.

The sample also reported a wide range of time spent practice-driving as part of their learning to drive, ranging from two reporting that they had not started driver education to two who reported having driven more than 50 hours. The most common amount of practice driving was from 11 to 20 hours. For these analyses, practice driving was collapsed into three categories, which encompassed 0 to six hours, seven to 20 hours, and more than 20 hours of driving. Teens with six hours of practice driving or less were more likely than the other two groups to improve their attitudes toward guidelines from pre- to post-test. Teens with 7 to 20 hours of practice driving increased their acceptance of driving guidelines from pre- to post-test. Finally, teens with more than 20 hours of practice driving were more likely to increase their intentions to follow the guidelines from pre- to post-test. No other outcomes were associated with practice driving.

Video Game Experience. The amount of previous video game experience varied widely across members of the sample. For the purposes of these analyses, participants were classified into two groups, experienced and inexperienced video game players. Experienced players included participants who reported playing video games weekly or more often (n = 15) and inexperienced players played video games less than weekly (n = 8).

All of the experienced players were boys. Compared to inexperienced players, the experienced players were 1.5 times less likely to report that they enjoyed the game. Experienced players were also 1.9 times more likely to increase their intentions to avoid risky driving behaviors, 6.5 times more likely to report increased perception of personal driving risks, 3.4 times more likely to increase in acceptance of driving guidelines, and 1.7 time more likely to increase in positive attitudes toward driving guidelines from pre- to post-test. The experienced and inexperienced players did not differ in their likelihoods of driving before they started driver education, or in awareness of driving risks.

Compared to the inexperienced players, the experienced players were more likely to reach higher missions. Seven of the experienced players (four to Mission 5 and three to Mission 6) and only one of the inexperienced players (Mission 6) got beyond Mission 4. Regardless of video-game-playing experience, there were no differences in the aspects of the game participants liked best (the challenge for both groups); however, experienced players were more likely to indicate that the maneuverability of the cars was what they liked least about the game (35% [n = 5] for the high group, and 29% [n = 2] for the low group), or to indicate that they did not enjoy any of the Missions (27%, n = 4; inexperienced: 13%, n = 1). Finally,

compared to the inexperienced players, the experienced players were more likely to report being either "unlikely" or "very unlikely" to spend more time playing the game if given the chance.

Risk-Taking Propensity. High (n = 11) and low risk-taking propensity (n = 10; two cases with missing scores) groups were formed by dividing the sample at the median score of the risk-taking propensity scale. Surprisingly, girls (n = 4, 66%) in this sample were three times more likely to be in the high propensity group than boys (n = 6, 40%), and this may be a result of the very small numbers of participants in these groups. Participants in the high propensity group were 1.5 times less likely than the low propensity teens to experience an increase in their perception of personal driving risks from pre- to post-test. High and low propensity groups did not differ from each other on change in the intentions to avoid risky driving behaviors, awareness of driving risks, change in their levels of acceptance of driving guidelines, or change in their attitudes toward driving guidelines.

Driving-Risk-Taking. High and low driving risk groups were formed by dividing the sample at the median score of the Driving-risk-taking scale. Compared to the low group, participants with high driving-risk-taking scores were 1.7 times less likely to increase their intentions to avoid risky driving behaviors, two times less likely to increase their acceptance of safe driving guidelines, and 1.9 times less likely to adopt more positive attitudes toward driving guidelines.

Qualitative Results

Overall Reactions to Streetwise

While experience with video games and time spent playing video games varied widely, the majority of teens seemed to enjoy playing *Streetwise* and enjoyed talking about it, and providing their impressions and feedback. While most thought the game somewhat fun and at least not boring, a few claimed it was boring. This was not as clearly true of the last focus group. The last group was more negative about the game than the other groups had been, but this was plainly caused by a few outspoken, contrary members. Nevertheless, some teens did not feel that the game was much fun or very exciting. A few teens felt the game was childish and said they would have to be really bored to choose to play it.

Most of the teens said the video game was a helpful addition to the process of learning to drive. They were also mindful that the game was not for profit and primarily educational/ informational in purpose and, therefore, could not be expected to match the quality of commercial entertainment games currently on the market.

Achievement of the Game's Goals

Increase Awareness of Driving Risks

A majority of teens (but not all) understood the driving risks caused by the distractions portrayed in the game, especially the potential distractions caused by passengers. For some, the game was harder with passengers. They do believe passengers are a risk, but they mentioned having heard that warning over and over. A few stated that limiting passengers is unrealistic, even impossible. They want their license so they can do things with their high school friends. That is why they want to drive. "Why else would you want it?" They felt that the other risks were less well portrayed.

Several teens agreed that trying to deal with the distraction tasks (i.e., drinking the soda) made it tough to concentrate on anything else. Overall, they felt the game did a "pretty good job of showing you the risks." One teen stated that the primary messages conveyed by the game were, "You must constantly pay attention to driving. Don't talk on the cell phone while driving or load up your friends, and night driving is harder."

The teens also said the game taught them about hazards that were new to them and that they "should pay more attention and be careful." One teen said the game brought out "watching the numbers of passengers and speed risk." Another noted "the eat and/or drink

distraction issue." Animals (i.e., deer, cows) in the road were another hazard the game highlighted for the teens.

A minority claimed to have learned nothing new about driving risks, but the game refreshed their memory. They said that they are bombarded with the same messages delivered by the game. Others said the game made them more aware of what could happen. The game "reminds you of other unpredictable objects, i.e. UPS trucks backing out. But dancing clowns are a bit far fetched. And UFO's don't really fit. It would help if you saw trucks actually swerving."

Several said the message for safety belt use was peppered throughout the game, but the messages were not very specific.

Some teens found it a lot harder and were slower to react in the night mission of the video game, while others said it was "still like just pushing buttons." When asked about alcohol messages in the game, respondents mentioned that you have to avoid other alcohol users, "there are more drunk drivers on the road at night." Some participants did not realize there was anything about alcohol in the game, probably because they had not reached that mission.

Many teens commented that the game helped their reaction time, but they were less clear about how well that would translate to real driving situations. An observer could have gotten the impression that some teens thought the game was enhancing their skill in dealing with the risks, rather than in learning about and understanding the risk. One even said the game "helps with multi-tasking" as though that had been the goal.

Increase Acceptability of Guidelines During Early Driving

The participants did not feel that the driving guidelines were portrayed well enough in the game. Some mentioned, however, that the game helped them to understand the rationale behind some of the state laws and their parents' guidelines for protecting new teen drivers from risk (i.e., passenger restrictions). One said it backed up how his mother always says "Do not distract the driver."

Increase Understanding that Driving Experience Must be Gained

The value of practice was also not conveyed well by the video game, according to many of the participants. They felt that emphasis on the value of practice driving and gradually gaining experience before licensure could be highlighted more. They noted that practicing with parents was emphasized in the game, but not for night driving.   However, some teens said that

the graduated skill levels across the missions put a clear emphasis on the importance of practice and experience in becoming a safe driver.

Grades for Streetwise Goals

At the end of the first focus group, one of the sponsors' staff shared the four goals of the game as: (1) entertainment, (2) education about driving risk, (3) guidelines to protect against risks and (4) the need for gaining driving experience. Each focus group participant was asked to give the video game a grade for how well each goal was achieved. The results of this rough grading (influenced, of course, by the group setting) follow:

Entertainment: Over half the participants gave the video game a B.

Education regarding risks: Nearly three quarters of the participants gave the video game a B or better.

Education regarding guidelines: Nearly a third gave the video game a B or better.

Education regarding driving experience: Nearly one half gave the video game a B or better.

Overall Educational Suggestions

Many teens had hoped the game could teach even more than it did about driving safely. Suggestions were made, such as having the game allow the players to buckle their seatbelts, adjust their mirrors, check their blind spots, etc., on their own rather than just in response to instructions. Many teens wanted more realism in the game, in the vehicles, the obstacles, the road hazards, and the need to perform certain actions, such as checking their blind spots while driving. In addition, many were surprised that they weren't allowed/required to control more of the car's movements.

Some teens commented that they didn't really need to think or make decisions in the game; all they needed to do was respond to the red arrows. They would have liked more decision control (i.e. the ability to turn the wrong way on a one-way street; the ability to choose and not be forced to wear belts). Consequences in the game could then be moderated by the decisions made by the player (i.e., they die in a crash, rather than just being injured).

An additional driving risk for teens that was suggested regarded regular brakes versus ABS brakes. Teens said they need practice with both types, but the game did not focus much on correct braking. In fact, the only braking allowed was hard braking that made the tires screech. Controlled braking was not included in the game.

They also wanted more realistic feedback (even injury) on the consequences of their driving errors (i.e., if they hit a pothole, they might have to change a tire, be delayed, or pay for the repair), as well as their score and reaction times. They suggested "adding a text message saying what happened to you (specifically) if you did not wear the safety belt, or if you hit the animal, etc. (specific injuries, details, and cost)." Many of the teens wanted more feedback on their driving ability, and felt it would be helpful if they were ranked relative to other players on their driving ability/performance in the game. However, one teen said feedback was not important; you learn by "picking it up" and you shouldn't drive fast if you keep hitting trees. Finally, the scoring procedure for the game was not clear to the teens. Some said they didn't even know how they earned their points in the game.

Many teens did not take the time to read the informational text boxes that appeared on the game's screen. They said the messages were "just factoids" (i.e. # of Minnesota deaths), and skipped them quickly to continue with the game, especially when they realized some of them were repeated. Other teens saw them, but were tempted to skip over them. One teen read them, but "already knew all of that stuff." It refreshed his memory, however. "The car stops so you will read message," but they still didn't read it. When the moderator asked, "What would help you to read the message?" the teens responded, "If you had to do something to progress [like answer questions] so that you were forced to read them."

Specific Educational Suggestions

"It would be more realistic if obstacles were oncoming, not behind you."

"Top, middle screen is an area without much going on. You could add a mirror, so you can see behind you."

"For night-time driving, it would have been nice to have low and high-beam headlights."

"Add skill levels, street lights, headlights, mirrors, and receiving verbal driving directions."

"Map reading could be another skill level."

"Game could allow experience with what it is like to be driving drunk, with blurred vision, slow reaction times, etc. in order to get the message across."

"Various types of weather during driving scenarios would be educational."

"Four way stops are needed, with more traffic. Red lights, signs, and turn signals should all be added, as 'those mistakes can kill you.' Variation in the roadway type would be helpful, too."

"Tickets (police citations) should be issued, which you are penalized for by skill level."

"Add more traffic zones, such as construction zones where you can control the speed. Traffic zone it has slowed your car down. "

"Making things more realistic would help; have opposite traffic leg of a 4-way stop."

"Include a mission for learning to drive. Allow user to be able to drive the car more."

 "Model the mission like a city vs. rural, try various environments. Add blind corners with houses limiting your vision."

"You should be able to choose your risk level, and make bad vs. good decisions (i.e. pick up one guy, he says to go pick up his friend, you do it, or not)."

Several teens commented on the unlikely road hazards. They felt there were too many unlikely road hazards (toilet, piano from sky, clowns). Several said the crazy objects made the game less realistic, and they didn't like that. But they also said the game would not teach any better even if they were realistic, and the crazy obstacles offered minor entertainment value. The teens said the game is easier because you don't have to drive, and that the pop-ups kept them busy.

Technical Suggestions

There seemed to be some game features that only some teens figured out (i.e., how to increase speed). Only three out of eight in the first focus group realized the "up" arrow made you go faster. Some of the teens who were experienced and knowledgeable about video games were more interested in talking about the technical aspects of the game and ways to enhance it. Feedback on the game included some technical suggestions, for example, the desire for more control of the car (speed, handling). In general, they also wanted more realism in the vehicles and the obstacles/road hazards. Several specific suggestions follow:

"The patterns on each mission are always exactly the same; same obstacles come up at the same time each time. You need around five different versions of each mission which load randomly. "

"Offer a 'quit mission' option."

"Interface could be set up so that there would be arrows to move you in a direction. Or you could use the number pad to do certain functions (i.e. "Squirrel Combat" is an entirely keyboard based game)."

Tones for maneuvers: "If they varied by each of the four arrows, it would have helped get the hand to block the sound."

"After you were out of the first level, you didn't need to use the turn signal any longer; it was only necessary while with Mom in the car. You should have to use it all of the time."

"Need more first-level car options." They want to drive different cars in both handling and color (a black car and pickup truck were suggested).

Teens wanted more car control. For example, the game always picked up the same people, and did not allow the player any choice.

"Interface and game did not get more complicated with time or obstacles."

"There was a speedometer on the screen, but you could hardly control it. Having control of speed would make it better and more challenging."

"Adding sound information to the game would make it harder, causing you to go through an obstacle."

Teens suggested making the handling of the vehicles more realistic, and felt that would make the game more fun. They also noticed no change between vehicle types in handling or control.   "Include a pickup truck. Have the Neon skidding." "Game needs to have different types of cars to choose, which work and drive different by model."

"Game needs lead time for deer jumping out, driveway pull-outs, and UFO."

"Including a van, which you could fill with passengers, would make the game harder."

"Label the streets. Include more traffic interaction, like another car going through the light against their turn."

"It would be better if you could do more than one function at one time, like using two keys for stopping and turning."

"Would like not to have to pick up the little sister!" That left one teen hanging, wondering what was going on.

Feedback on driving, points adding up quick, or winning fake money would be good.

"Have an indicator so that if you hit a deer, you have only so much more 'car health' left, or if you popped your tire into a pot hole, it would reduce it."

"If arrows and cell phone you have to click on were in a more unpredictable place, it would make it more difficult."

"Friends need to be more annoying, trying to take wheel away. They are noisy in game, but are easy enough to tune out."

Some teens thought it would help if they saw trucks actually swerving, or swaying.

"It would be better if you could speed up," but for those who figured out that you could, you could then only slow down to a certain point. One teen said he heard a cop's siren on the screen after speeding up.

Maneuvering "around" puddle (or other objects) was not very accurately controlled.

The game should include traffic lights, other traffic, and people walking or construction workers in more appropriate places.

Some said they read the pop-up bubbles, but some did not, in part because sometimes the bubbles said the same thing. One teen said it was hard to read the conversation bubbles at the bottom of the screen and they seemed irrelevant to the game, so he ignored them. A few teens said if bubble statements were verbal, it would be better, and the verbal statements could serve as another distraction.

Technical Problems

The teens did not like that they could not correct mistakes in level selection. Once they had selected a wrong level (i.e., the same one they just completed, because the game does not automatically advance you when you succeed at a level), they could not go back to select the next level without playing the same level again.

One left-hand player had a tough time with the interface.   He said he switched mouse with keyboard, but he had problems with that arrangement that led him to repeat the third level twice.

One teen thought the mouse was "kind of hard" to use, and wished you could use the "enter" key.

One teen picked a car, went on to the next one and somehow skipped a screen. As a result Mission 1 had to be repeated three times.

Graphics were overlapping (briefly at end of session).

Keys didn't work as they should. For example, tapping the key didn't work.

Future Use of the Game/Recommendations

Participants thought that the video game would be helpful to teens who were in the process of learning to drive, having just started driver's education, or doing their practice driving. This was because "It improves reaction time," and, "The facts stop you, and the quizzes in the beginning give you useful theory." Others recommended that teens play the game before Segment 1 driver's education *and* before Segment 2 *and* while holding a Level 2 license. "By 16 you are living the game." Younger is better, and it was suggested that perhaps the Segment 1 driver's education class instructor could recommend the game to the students. One boy said

any time before or after Level 2 licensed driving (independent) is good. He felt the game would be particularly helpful to those who have only driven a little. The focus group that was most negative about the game thought it was for young children or those in middle school, but they agreed that it is uncertain if kids who played the game so long before taking driver education would remember the material later when they were learning to drive.

Many of the teens said they would enjoy competing with other people via the internet. They thought that would make the game more fun. But some were not interested in challenging others, and some felt the game was not challenging enough to really promote or sustain competition.

Communication with Teens

In general the participants said they thought that a video game was a good, if not the best, way to communicate with them. They said that video games are more interesting and engaging than other modes of communication.   They said they felt video games were a good way of getting their attention, although a few said that they would have preferred written material. But while the teens generally expressed that a video game was a good teaching method, they said they did not think it was the ideal method for conveying information. The most negative participants said they don't want to learn when they play video games. They said they play video games for fun, not education, and that they already "hear about it all too much." Finally, another teen commented, "The video game is not the right tool to eliminate risks, but it did inform."

Evaluators' Comments on the Results

Change in Perceptions, Intentions, Attitudes, and Acceptance

The video game appears to increase perceptions of personal driving risk. The change in this variable from pre- to post-test was relatively robust, in spite of having a small sized effect. However, there was not evidence that the game influenced overall intentions to avoid risky driving behaviors, attitudes toward driving guidelines, or acceptance of driving guidelines. This lack of effect may have been partly due top the impression highlighted in the focus group sessions where some of the teens pointed out that information about driving guidelines and their importance was not directly conveyed through playing the game. Instead, much of that information, with the notable exception of limiting teen passengers, was provided indirectly through the use of pop-up text boxes. The information in these boxes was largely disregarded by the teens, who felt they were mere "factoids." Integrating the guidelines more fully into game play may help address this issue, as might implementing the suggestion that the game offer more choices and report consequences based on those choices as well as on driving behavior.

Tying the guidelines more directly to game play activities would only address the lack of effect on attitudes and acceptance, and would not address the lack of an effect on intentions to avoid risky driving behaviors. While increasing teens' perceptions of driving risks is important, unless it is coupled with appropriate intentions, it will not help reduce the risk of motor vehicle crashes. Drawing from the focus group feedback, it would help the teens develop an appreciation of the real-life consequences of events depicted in the game if the following changes were made: 1. More information was given on the realistic consequences of the crashes that occur in the game (e.g., cost of car repair, points for a ticket and increase in insurance costs, likelihood that the person would have been slightly injured, injured and taken to the hospital for ambulatory care, injured seriously with a stay in the hospital, injured permanently, or killed); 2. Feedback was given on the effect that the driver's choices had on the results of the crash (e.g., speeding made it worse, not wearing a seatbelt cost a driver his/her life); and, 3. More player control over certain aspects of the game (e.g. choice to wear a seatbelt, choice to follow posted speed limits). This feedback might help teen drivers to understand the importance of taking action to reduce their driving risk and to actively avoid unnecessary risks.

Game Enjoyment and Engagement

The teens enjoyed the game, overall. Most of the participants reported a mission that they liked best, a small minority said they did not like any of the missions. Some teens said they would be likely to recommend the game to a friend, but this response was more common for boys than for girls. This difference may be due to the greater popularity of video games among boys than girls and may not relate to their enjoyment of the game, per se. This finding raises questions about the effectiveness of the game to engage teenage girls to the extent needed for the intended effects. Also, the majority of the teens stated that they were either indifferent or were unlikely to spend more time playing the game if given the chance, and the experienced video game players indicated that they were unlikely to recommend the game to a friend. This finding also raises concerns over engagement and having sufficient interaction with the game to benefit from playing it.

Players who advanced further in the game were more likely to show positive changes. Therefore, it seems that the players must be sufficiently engaged so that they play the game long enough and progress far enough to benefit from the information conveyed by the game. This is evidenced in part by the greater positive effects seen among the experienced game players who, even though they were less likely to report enjoying the game, were more likely than inexperienced players to increase in perceptions, intentions, attitudes, and acceptance from pre- to post-test. This may identify a potential barrier that will limit the benefit of the game to less experienced players, including girls. In order to have a generalized positive effect, the game will need to appeal highly enough to inexperienced and female players to ensure that they play long enough and progress far enough to benefit from the game.

Demographics and Potential Confounds

White teens showed improvement in perceptions, intentions, attitudes, and acceptance, while the Asian-American teens were less likely to report any effects of playing the game. Further analyses were conducted to determine if this was due to pre-existing differences between these groups. The Asian-American and White teens were compared on their pre-test perceptions, intentions, attitudes, and acceptance. These comparisons showed that at the pre-test the Asian-American teens had higher scores on perceptions, intentions, attitudes and acceptance, with Cohen's effect sizes ranging from 0.43 for acceptance of driving guidelines, to 1.3 for perception of personal driving risk. While the White teens increased on these measures

from pre- to post-test, the Asian-American teens maintained their already high levels on these variables.

Younger teens were more likely than older teens to benefit from playing the game. While this finding supports the focus group recommendations that the game would be more appropriate for people who are in the early stages of learning to drive, it is not supported by other quantitative results indicating that more practice driving was associated with greater game effects. Overall, these somewhat contradictory quantitative results, along with the focus group recommendations may suggest that the game has something to offer for both younger, less experienced drivers, and those who have had more practice driving.

Marks in school were not associated with the game outcomes. This is probably good news, as it suggests that the game may be equally beneficial to teens that vary in their academic performance, rather than being limited in its effectiveness. However, it is worth remembering that the lowest achieving participants reported getting mostly C's in school, and that the poorest performing students were not represented in this sample.

Rural teens were less likely than those living in town to increase in positive attitudes toward driving guidelines and perception of personal driving risks. Further analyses indicated that rural teens also had less positive attitudes than teens living in town before they played the video game (Cohen's effect size = 0.41). This was not the case for perception of personal driving risk. Teens living in rural areas and in town did not differ in their perceptions on the pre-test survey, but the teens living in town were more likely to increase their perceptions from pre- to post-test. Further analyses also indicated that this difference was not due to the rural teens having greater driving experience than teens living in town prior to playing the game. One potential explanation of this difference in effects may be that the rural teens were all inexperienced video game players. This, again, raises questions about the issue of engagement.

Driving experience prior to beginning driver education was not associated with any of the outcomes. This finding is good, suggesting that prior driving experience does not lessen the game effect and that teens, regardless of prior experience, are equally likely to benefit from playing the game.

Risk-Taking

Several differences were found between high and low risk-taking propensity groups on the game outcomes, but some of these differences are counter intuitive. Compared to low risk-

taking propensity teens, the teens in the high propensity group were simultaneously more likely to report that they will avoid driving risks, and less likely to report increases in their intentions to avoid risky driving behaviors from pre- to post-test. One explanation of these apparently opposing effects may be the marginal size of these effects, which barely reach the 1.5 minimum value for accepting an effect in this study.

High driving-risk-taking teens were uniformly less likely to increase their perceptions, intentions, attitudes, and acceptance from pre- to post-test. This pattern is not uncommon among brief interventions. Generally, regardless of the target behavior or the method of the intervention, brief interventions are not sufficient to change the behavior of individuals who have the highest levels of risk. Therefore, it may be unreasonable to expect a video game intervention to alter the perceptions, intentions, attitudes, and acceptance of teens for whom taking driving risks is appealing.

Limitations

Several limitations to this study should be kept in mind when interpreting the results. First, the sampling method relied entirely on convenience. It was not random – participants were not recruited in a manner to ensure that the sample was representative of all teens learning to drive. This was due to an extremely short study time-frame. This sampling method is completely open to, and may even promote, certain sources of selection bias. For example, those who participated may have been systematically more likely than other teens in the population to enjoy and be interested in video games, be more altruistic or more socially aware and willing to help out or contribute, understand the importance of the topic of the evaluation, etc. The characteristics of this sample suggest that some selection bias was at work, as the teens in this study had good grades and, overall, were very risk-averse. These characteristics suggest that the results of this evaluation may not apply to teens that do poorly in school, and/or are more risk-inclined.

Another major limitation of this study was the small sample size. In addition to being a convenience sample, this study only included 23 participants. This small sample in combination with the method to recruit participants, further limits the chance that the sample could be used to represent the population of teen drivers taking driver education. It is also decreases the ability of statistical tests to identify game effects that were real but too small to identify in a small sample. The effect of the small sample size was especially apparent in the general lack of statistical significance in cases where effect size estimates suggested a large game effect, and in the large number of small or empty cells in the cross-tabulations.

Finally, the evaluation design was weakened by several characteristics. First, the post-test was given within an hour of the pretest. The proximity of the two surveys increases the chance that observed response patterns were due to social desirability, learning, and/or practice. The teen participants, who were not blind to the study purpose, may have remembered how they responded on the pre-test, and consciously or unconsciously given the desired responses on the post-test. Hence, the observed effects may not have been entirely due to the game.

Second, a single post-test was given immediately following the video game play session. This makes it impossible to guess about the longevity, or lack thereof, of the video game effect on the evaluation outcomes. In addition, it is not possible to make inferences about any effect the game might have had on subsequent teen driving behavior.

Third, there was no control group condition against which the effects of the video game could be contrasted and judged. As a result, observed game effects cannot be compared to the effects of a control condition on changing perceptions, intentions, attitudes, and acceptance.

Evaluators' Recommendation

The results of this evaluation were positive and encouraging. They suggest that video games might be an effective means of reaching teens with important messages about public health issues, such as traffic-related morbidity and mortality among young drivers. These results also raise a variety of intriguing questions about *Streetwise* and how it might be employed to help keep teen drivers safe. Based on these positive results, the evaluators recommend that the results of this study be treated as preliminary evidence of the video game's effectiveness, and used to guide the design of other studies that strategically sample, track, and measure participant outcomes to determine the effect of the full *Road Ready Teens* program on driving-related outcomes, parent-teen interactions around teen driving and learning to drive, and the effects of this program on the actual driving outcomes of teens during their driver training and beyond. The Social and Behavioral Analysis Division of the University of Michigan Transportation Research Institute would be pleased to offer assistance with the development and execution of further investigations into the *Road Ready Teens* program.

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Appendix

Pre- and Post-Test Surveys

The University of Michigan
Transportation Research Institute
Road Ready Teens Video Game Pre-Test Survey

i. ID Number _____

ii. What time is it now? _____

1. Since you began driver education classes, how much time have you spent practice driving?

     0   I haven't started driver education classes
     1   1 to 30 minutes
     2   31 minutes to 1 hour
     3   1 to 2 hours
     4   3 to 6 hours
     5   7 to 10 hours
     6   11 to 20 hours
     7   21 to 30 hours
     8   31 to 40 hours
     9   41 to 50 hours
     10 More than 50 hours

2. Please, indicate how much you agree or disagree with each statement.

		Strongly Agree	Agree	Neither Agree nor Disagree	Disagree	Strongly Disagree
1	Guidelines that limit my driving do not reduce my chances of being in a car crash.	5	4	3	2	1
2	My driving gets better as I get more driving experience.	5	4	3	2	1
3	Making a written agreement with my parents about my early driving is a bad idea.	1	2	3	4	5
4	Driving for 50 hours with an adult will <u>not</u> help me learn to drive better.	1	2	3	4	5
5	Limiting how much I drive at night decreases my chances of being in a car crash.	5	4	3	2	1
6	Driver education classes are a waste of my time.	1	2	3	4	5
7	Limiting the number of teens riding in my car when I am driving reduces my risk of being in a car crash.	5	4	3	2	1
8	I am willing to accept and follow driving guidelines that are designed to keep me safe as I gain driving experience.	5	4	3	2	1
9	It is not important to wear my safety belt if I am only driving a short distance.	5	4	3	2	1
10	I am at greater risk of being in a car crash if I drive after drinking even a little alcohol.	1	2	3	4	5
11	Limiting distractions won't reduce my risk of being in a car crash.	1	2	3	4	5

3. About how often did you drive before taking any driver education classes?

   0   Never
   1   A few times – One to six times
   2   Several times – Seven to 12 times
   3   Occasionally – Once or twice a month
   4   Often – Weekly
   5   Regularly – A few times a week
   6   Frequently– Almost daily
   7   Daily

4. While you are gaining driving experience, how likely are you to:

		Not at all	A Little	Somewhat	Very	Extremely
1	Avoid talking on a cell phone while driving	5	4	3	2	1
2	Drive fast through a construction zone	1	2	3	4	5
3	Limit driving after dark	5	4	3	2	1
4	Drive after drinking alcohol	1	2	3	4	5
5	Always wear a safety belt	5	4	3	2	1
6	Have one or more teenage passengers in the car with you when you are driving	1	2	3	4	5
7	Avoid eating while driving	5	4	3	2	1
8	Drive late at night	1	2	3	4	5
9	Ignore guidelines that limit your driving	1	2	3	4	5

5. How far have you advanced in the graduated driver licensing (GDL) program?

   1   I haven't begun driver education
   2   Currently taking Segment 1 driver education classes
   3   Level 1 – supervised learner's license
   4   Currently taking or have taken Segment 2 driver education classes
   5   Level 2 – license that limits nighttime driving
   6   Level 3 – license with full driving privileges

6. How willing are you to accept each of the following driving guidelines as you gain driving experience?

		Not at all	A Little	Somewhat	Very	Extremely
1	Never drive after drinking alcohol	1	2	3	4	5
2	Always wear a safety belt	1	2	3	4	5
3	Always limit the number of teen passengers in the car when driving	1	2	3	4	5
4	Maintain a clean driving record (no tickets)	1	2	3	4	5
5	Always drive the speed limit	1	2	3	4	5
6	Keep music at a level that allows me to hear traffic, horns, and sirens when I am driving.	1	2	3	4	5
7	Limit driving after dark	1	2	3	4	5
8	Never eat while driving	1	2	3	4	5
9	Obey all traffic laws	1	2	3	4	5
10	Never talk on a cell phone while driving	1	2	3	4	5

7. What is your race?

    1   African American
    2   Asian American
    3   Caribbean Islander
    4   Latino/Hispanic
    5   Native American Indian
    6   Pacific Islander
    7   White

8. Please answer true (the statement is true of you) or false (the statement is not true of you) to each of the following statements.

		True	False
1	Before I begin a complicated task, I make careful plans.	1	0
2	I would like to take off on a trip with no preplanned or definite routes or timetables.	1	0
3	I like to have new and exciting experiences and sensations even if they are a little frightening.	1	0
4	I usually think about what I am going to do before doing it.	1	0
5	I would like the kind of life where one is on the move and traveling a lot, with lots of change and excitement.	1	0
6	I sometimes like to do things that are a little frightening.	1	0
7	I very seldom spend much time on the details of planning ahead.	1	0
8	I enjoy getting into new situations where you can't predict how things will turn out.	1	0
9	I sometimes do "crazy" things just for fun.	1	0
10	I like "wild" uninhibited parties.	1	0
11	I like to explore a strange city or section of town by myself, even if it means getting lost.	1	0
12	I often get so carried away by new and exciting things and ideas that I never think of possible complications.	1	0
13	I like doing things just for the thrill of it.	1	0
14	I am an impulsive person.	1	0
15	I'll try anything once.	1	0
16	I tend to begin a new task without much advance planning on how I will do it.	1	0
17	I often do things on impulse.	1	0
18	I prefer friends who are excitingly unpredictable.	1	0
19	I tend to change interests frequently.	1	0

9. When were you born?

    __ __/__ __/__ __
    month   day   year

10. In what area do you live?

    1   Rural (in the country)
    2   In town (in a neighborhood)

11. BEFORE taking driver education classes, what kind(s) of vehicle(s) had you driven?

(mark all that apply)

0   I never drove before starting driver education classes
1   Car/Minivan/SUV
2   Pick-up truck
3   Full-size van
4   Farm truck (larger than a pick up)
5   Motorcycle
6   Tractor
7   Three- or four-wheeled ATV
8   Riding mower or garden tractor
9   Other: _____

12. While you are gaining driving experience, how much does each of the following increase <u>YOUR</u> risk of being in a car crash?

	Not at all	A Little	Somewhat	Very	Extremely
1 Eating while driving	1	2	3	4	5
2 Driving after dark	1	2	3	4	5
3 Driving 20 mph over the limit	1	2	3	4	5
4 Driving after midnight	1	2	3	4	5
5 Talking on a cell phone while driving	1	2	3	4	5
6 Driving without wearing a safety belt	1	2	3	4	5
7 Driving 10 mph over the limit	1	2	3	4	5
8 Driving after drinking alcohol	1	2	3	4	5
9 Having one or more teen passengers with me in the car when I am driving	1	2	3	4	5

13. How much do you expect to do each of the following?

	Not at all	A Little	Somewhat	Very	Extremely
1 Taking risks just for the fun of it while driving	1	2	3	4	5
2 Driving fast down country roads at night	1	2	3	4	5
3 Driving 20 mph or more over the speed limit	1	2	3	4	5
4 Weaving quickly through traffic on the freeway	1	2	3	4	5
5 Testing your driving skills in ways others might find risky	1	2	3	4	5
6 Making the car fishtail on gravel or icy roads	1	2	3	4	5
7 Seeing how fast you can drive out of curiosity	1	2	3	4	5
8 Driving dangerously because you enjoy it	1	2	3	4	5
9 Taking some driving risks because it feels good	1	2	3	4	5
10 Racing or playing cat and mouse with people who are driving other cars	1	2	3	4	5
11 Trying to beat other drivers leaving a stoplight	1	2	3	4	5
12 Out-maneuvering other drivers for the thrill of it	1	2	3	4	5

14. What is your sex?

1   Male
2   Female

15. What grade will you be in this fall?

1   Freshman – 9th grade
2   Sophomore – 10th grade
3   Junior – 11th grade
4   Senior – 12th grade

iii. What time is it now? _____

vi. ID Number _____

vii. What time is it now? _____

1. How much did you enjoy playing the video game?

    4   A lot
    3   Quite a bit
    2   Some
    1   A little
    0   Not at all

2. What was the highest mission you reached in the video game?

    1   Mission 1: "Mom's Gauntlet" Driving Mom and little sister around town
    2   Mission 2: "Driving with Friends" Dealing with passenger distractions
    3   Mission 3: "King of the Neighborhood" Neighborhood hazards and rural driving
    4   Mission 4: "Night Driver" Driving at night
    5   Mission 5: "Bad Weather" Driving in stormy weather
    6   Mission 6: "Drink Drivers" Being a designated driver and avoiding drunk drivers

3. Which of the following did you like best about the video game?

    1   Character options
    2   Graphics
    3   Sound
    4   Challenging scenarios
    5   Car options
    6   How maneuverable the vehicles are
    7   Other: _____

4. How likely would you be to recommend this video game to your friends or classmates at school?

    5   Very likely
    4   Likely
    3   Neither likely or unlikely
    2   Unlikely
    1   Very unlikely

5. While you are gaining driving experience, how much does each of the following increase <u>YOUR</u> risk of being in a car crash?

		Not at all	A Little	Somewhat	Very	Extremely
1	Driving after drinking alcohol	1	2	3	4	5
2	Driving after dark	1	2	3	4	5
3	Driving without wearing a safety belt	1	2	3	4	5
4	Having one or more teen passengers with me in the car when I am driving	1	2	3	4	5
5	Eating while driving	1	2	3	4	5
6	Driving after midnight	1	2	3	4	5
7	Talking on a cell phone while driving	1	2	3	4	5
8	Driving 10 mph over the limit	1	2	3	4	5
9	Driving 20 mph over the limit	1	2	3	4	5

6. Of the missions you completed, which did you like the most?

    1   Mission 1: "Mom's Gauntlet" Driving Mom and little sister around town
    2   Mission 2: "Driving with Friends" Dealing with passenger distractions
    3   Mission 3: "King of the Neighborhood" Neighborhood hazards and rural driving
    4   Mission 4: "Night Driver" Driving at night
    5   Mission 5: "Bad Weather" Driving in stormy weather
    6   Mission 6: "Drink Drivers" Being a designated driver and avoiding drunk drivers
    7   I didn't like any of them

7. Which of the following did you like least about the video game?

    1   Character options
    2   Graphics
    3   Sound
    4   Challenging scenarios
    5   Car options
    6   How maneuverable the vehicles are
    7   Other: _____

8. How likely would you be to spend more time playing the video game?

    1   Very unlikely
    2   Unlikely
    3   Neither likely or unlikely
    4   Likely
    5   Very likely

9. While you are gaining driving experience, how likely are you to:

		Not at all	A Little	Somewhat	Very	Extremely
1	Avoid talking on a cell phone while driving	5	4	3	2	1
2	Drive after drinking alcohol	1	2	3	4	5
3	Drive late at night	1	2	3	4	5
4	Limit driving after dark	5	4	3	2	1
5	Avoid eating while driving	5	4	3	2	1
6	Drive fast through a construction zone	1	2	3	4	5
7	Ignore guidelines that limit your driving	1	2	3	4	5
8	Always wear a safety belt	5	4	3	2	1
9	Have one or more teenage passengers in the car with you when you are driving	1	2	3	4	5

10. How much did the video game help you better understand the risks that new drivers face?

1 Not at all
2 A little
3 Some
4 Quite a bit
5 A lot

11. Please, indicate how much you agree or disagree with each statement.

		Strongly Agree	Agree	Neither Agree nor Disagree	Disagree	Strongly Disagree
1	Limiting the number of teens riding in my car when I am driving reduces my risk of being in a car crash.	5	4	3	2	1
2	My driving gets better as I get more driving experience.	5	4	3	2	1
3	Driver education classes are a waste of my time.	1	2	3	4	5
4	I am willing to accept and follow driving guidelines that are designed to keep me safe as I gain driving experience.	5	4	3	2	1
5	It is not important to wear my safety belt if I am only driving a short distance.	5	4	3	2	1
6	Limiting distractions won't reduce my risk of being in a car crash.	1	2	3	4	5
7	Driving for 50 hours with an adult will not help me learn to drive better.	1	2	3	4	5
8	I am at greater risk of being in a car crash if I drive after drinking even a little alcohol.	1	2	3	4	5
9	Limiting how much I drive at night decreases my chances of being in a car crash.	5	4	3	2	1
10	Making a written agreement with my parents about my early driving is a bad idea.	1	2	3	4	5
11	Guidelines that limit my driving do not reduce my chances of being in a car crash.	5	4	3	2	1

12. How willing are you to accept each of the following driving guidelines as you gain driving experience?

		Not at all	A Little	Somewhat	Very	Extremely
1	Always drive the speed limit	1	2	3	4	5
2	Never talk on a cell phone while driving	1	2	3	4	5
3	Limit driving after dark	1	2	3	4	5
4	Maintain a clean driving record (no tickets)	1	2	3	4	5
5	Never eat while driving	1	2	3	4	5
6	Always wear a safety belt	1	2	3	4	5
7	Never drive after drinking alcohol	1	2	3	4	5
8	Keep music at a level that allows me to hear traffic, horns, and sirens when I am driving.	1	2	3	4	5
9	Always limit the number of teen passengers in the car when driving	1	2	3	4	5
10	Obey all traffic laws	1	2	3	4	5

13. After playing the video game, how much more aware were you of the risks you face as a new driver than you had been before playing the game?

1   No more aware
2   A little more aware
3   Somewhat more aware
4   Quite a bit more aware
5   A lot more aware

14. What are your typical marks in school?

1   Mostly A's
2   Mostly A's & B's
3   Mostly B's
4   Mostly B's & C's
5   Mostly C's
6   Mostly C's & D's
7   Mostly D's
8   Mostly D's & F's (E's)
9   Mostly F's (E's)

15. Are you more likely to protect yourself from driving risks as a result of playing the video game?

1   Yes
2   No

16. How much time do you spend playing video games?

0   None
1   About once or twice a year
2   A few times a year
3   About once a month
4   A few times a month
5   About one day a week
6   A few days a week
7   Once every day
8   Several time a day

viii. What time is it now? _____

Focus Group Moderator's Guide

Focus Group

Road Ready Teens Video Game

Moderator's Discussion Guide

1- What did you think of the video game? How much fun was it?

2- Would you want to play the game again, or play more of it? What about the game makes you want to or not?

3- How much fun would it be to compete with other players on the Web? Reasons?

4- What did you get out of the game about teen driving?

5- How much have you thought about the driving risks you'll be facing and your own safety? How much more aware of the risks are you after playing the video game?

6- How did the game help (or not help) you understand the driving risks that teens face? What did you find new or interesting?

How could the video game be changed to be more clear about specific driving risks?

7- How did the game help (or not help) you understand guidelines for protecting teens from driving risks? *(gradual exposure, practice, night, passengers, alcohol, safety belt, distractions)* What information did you find new or interesting?

How could the video game be changed to be more clear about guidelines to protect teens from driving risks?

8- Are there other driving risks or guidelines for teens that should be included?

9- How do you think playing the game would help other young drivers understand the driving risks they face? And the steps they could take to reduce the risks?

10- Who do you think should play the video game? *(pre-driver ed, in driver ed, post driver ed)*

11- Would you recommend this game to friends or classmates? Why or why not?

12- What could be changed that would make the game the more fun to play? More helpful regarding teens' driving risks and guidelines to reduce those risks?

13- Is there anything else you'd like to share about your experience today with the video game?

14- Is the video game a good way to communicate with you? How would it compare to a video? Pamphlet? Book?

15- Should organizations consider video games as they endeavor to communicate with you?

Thank you so much for helping us test the video game!