Web-Based Assessment and Brief Motivational Intervention
to Increase Safety-Belt on a University Campus

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Abstract

While safety-belt use markedly reduces morbidity and mortality, many young adults in the U.S. do not buckle-up 100% of the time. Following a series of community-level interventions on a university campus, this dissertation project focused on promoting individual-level safety-belt use. More specifically, a targeted web-based assessment and brief motivational intervention for individuals with lower rates of safety-belt use was developed and tested. A Pilot Study conducted prior to the Main Study developed self-reported assessment measures for safety-belt use and motivation. Recruitment, baseline assessment, intervention, and follow-up assessment were conducted via the Internet. Student drivers who buckled-up less than 70% of the time and who met other eligibility requirements were enrolled in a within subjects, randomized, attention-controlled design.

At baseline, each participant completed an assessment of: (1) demographics; (2) driving behaviors; and (3) social cognitive and motivational variables including knowledge, perceived importance, confidence (self-efficacy), and readiness to buckle-up. Participants were then randomly assigned to one of two groups: (1) an attention-control group receiving emailed general nutrition information or (2) a motivational interviewing-consistent feedback group receiving emailed personalized feedback. Dependent variables were re-assessed approximately ten days after feedback/general nutrition information were emailed via follow-up assessment.

Outcomes analyses using non-parametric statistics were conducted twice. First, an analysis of “completers” was conducted using data from those who completed follow-up. Second, a more conservative intent-to-treat analysis was conducted after carrying the last observation forward for those who did not complete follow-up, assuming no change among those who did not complete follow-up. Overall, results suggest this web-based assessment and brief motivational intervention was feasible and acceptable to participants. Overall, results from both analyses found statistically significant increases in median driver and passenger belt use between baseline and follow-up among participants in both groups. Further, effect sizes suggest the magnitude of change was greater among those in the intervention group versus those in the attention-control group. Participants were then categorized according to whether or not they increased driver belt use by at least one instance between baseline and follow-up. Those who received the intervention were not significantly more likely than those who received general nutrition information (i.e., assessment only) to increase driver safety-belt use by at least one instance. No statistical differences were found in either the completer or intent-to-treat analyses. Yet, when participants were categorized according to whether or not they increased passenger belt use by at least one instance between baseline and follow-up, those who received the intervention were 1.75 times more likely than those who received general nutrition information (i.e., assessment only) to increase passenger safety-belt use by at least one instance. This difference was not found in the intent-to-treat analysis.
In general, study participation was associated with increased ratings of motivation (i.e., importance, confidence, and readiness) at follow-up. Results were interpreted with caution given psychometric weaknesses including high intercorrelations found between constructs of motivation in the Pilot Study. However, median change in one construct, readiness, was investigated in post-hoc analyses. Using the intent-to-treat sample, it was found that participants who were categorized as having increased driver safety-belt use by at least one instance also reported statistically significant median changes in readiness to buckle-up as a driver. Those categorized as having increased passenger safety-belt use by at least one instance also reported statistically significant median changes in readiness to buckle-up as a passenger. Further, although there was a trend for participants in the intervention group to be more likely than those in the attention-control group to commit to buckling-up and asking others to do the same at follow-up, there were no significant differences in commitment between groups.

However, regardless of group assignment, change in median readiness was associated with: (1) commitment to buckle-up as a driver; (2) commitment to buckle-up as a passenger; (3) commitment to ask others to buckle-up while acting as a driver; and (4) commitment to ask others to buckle-up while acting as a passenger.

Overall, these studies found the Internet to be an acceptable and promising venue for assessment and brief motivational intervention to promote safety-belt use among university students. Further, safety-belt use and motivational constructs such as importance, confidence, and readiness may be measured via self-report methodology. Results suggest participation in the study was associated with improvement in safety-belt use and some levels of motivation. While there were trends for those in the intervention group to report greater increases, there were no statistically significant differences between the groups in the ITT analyses. In the completer analyses, it was found that those in the intervention group were significantly more likely to report increased passenger safety-belt use. Future research may elucidate more specific psychometric properties of new measures used. In particular, readiness may be a proxy motivational variable that appears to relate to change in safety-belt use among drivers and passengers as well as commitment to buckle-up and ask others to do the same. The simple process of assessment may be sufficient to produce changes in readiness related to behavior change.
Dedication

This dissertation is dedicated to the people who gave me the power to take the time and effort to conduct research and earn my Ph.D.

- To my Grandma Marge who embodies grace, worldly curiosity, art, science, and compassion. Grandma Marge encourages me to reach for my dreams and do the best I can along the way.

- To my parents who taught me the value of hard work, perseverance, and delayed gratification.

- To my friends who offer listening ears and words of encouragement. My friends help me stay on track toward fulfilling one of my life’s dreams, to earn a Ph.D. in clinical psychology. They believe in my ability to do this and also remind me of my passion for health research along the way. When things get difficult, they remind me that taking the time and effort to earn my doctorate will enable me to have the life I have envisioned.

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- To junior research colleagues who worked very hard to make this dissertation research project happen. In pursuit of learning and contribution to science, they assisted in the implementation of this research project.
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With specific regard to my family, I am fortunate to have both a large and close-knit group of people from which to draw support from. My mother, a hard-working and focused
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INTRODUCTION
A Web-Based Assessment and Brief Motivational Intervention to Increase Safety-Belt Use on a University Campus

Safety-belt use reduces motor vehicle crash-related morbidity and mortality, yet an estimated 19% of motorists do not consistently buckle up, (NHTSA, 2006). Millions of dollars are spent each year on diffuse large-scale campaigns and enforcement in an attempt to change the use of vehicle safety belts. Young adults are a particularly vulnerable population. While unintentional injuries are currently ranked as the leading cause of death among young adults in the U.S., safety-belt use percentages were markedly lower among persons aged 16-24 years (69%) than among the general population (79%) in 2003 (NHTSA, 2003a).

College and university campuses are uniquely positioned to reach vulnerable young adult drivers. Virginia Tech (VT) has become a leader in developing and testing innovative safety-belt promotion interventions where E. Scott Geller and colleagues have conducted safety-belt intervention research for over 25 years. Geller and colleagues have achieved significant success. Yet, there remains an opportunity to boost safety-belt use levels beyond current levels in accordance with the Federal initiative “Healthy People 2010” (HP2010). This initiative challenges researchers, practitioners, and community change agents to increase safety-belt use to 92% by the year 2010 (HP2010, 2004).

Following a series of larger-scale interventions on the VT campus, this dissertation project sought to contribute to the health psychology literature in two general areas. First research took the step in safety-belt promotion research at VT by narrowing in on individuals with lower rates of use. The second contribution involves the selected mode of intervention. The development and testing of the brief motivational intervention sought to address gaps in the line
of research on assessment and feedback modeled on the spirit and guiding principles of motivational interviewing (MI), a way of communicating to encourage exploration and resolution of ambivalence regarding a specific behavior change (Miller & Rollnick, 2002).

THE TARGET BEHAVIOR: SAFETY-BELT NON-USE

The use of vehicle safety belts is considered the most effective and convenient means of reducing motor vehicle crash-related morbidity and mortality. Estimates of the protective effects of proper safety-belt use on mortality reduction range from 22-75% (Derrig et al., 2002). Over time, the prevalence of driver safety-belt use in the U.S. has increased dramatically from 11% in 1980 to 81% in 2006, partly due to driver safety-belt use laws, which New York state pioneered in 1984 (Derrig et al., 2002; NHTSA, 2006).

Although safety-belt use continues to increase in a linear fashion, motor vehicle crashes remain the leading cause of death for people age 15 to 20 years of age in the U.S. (NHTSA, 2004). Federal, state, and local initiatives have been launched to reduce the economic and human costs of morbidity and mortality due to such crashes. Many such initiatives focus on increasing the use of safety belts. According to NHTSA, safety belts are 50% effective at preventing death in crashes in which motorists would otherwise suffer fatal injuries (2003a). Indeed, safety-belt use reduces motor vehicle crash-related morbidity and mortality.

There have been many successful approaches to increasing safety-belt use since their introduction in 1959, and a steady increase in safety-belt use has been documented. However, as use increases, it also becomes increasingly difficult to create effective non-punitive safety-belt use promotion programs and to date; researchers and practitioners have not found a successful and sustainable intervention to increase safety-belt use beyond 80% without the use of law-based interventions.
Recent Safety-Belt Use Promotion Interventions Targeting Young Adults on the Virginia Tech Campus

The VT campus has hosted many pivotal safety-belt use promotion intervention studies developed and evaluated by E. Scott Geller and colleagues. In recent years, the research group has conducted several studies which set the stage for this dissertation project.

The A.R.K. Project

To target young adult drivers who do not buckle-up, a large-scale, grassroots, multi-component intervention was conducted. Researchers utilized all of the previously mentioned behavioral interventions and a conducted a large, diffuse public health campaign. Overall, The A.lways R.emember to K.lick it Project (The A.R.K. Project) intervention was not associated with statistically significant changes in student’s belt-use behavior.

The Flash-for-Life Prompt Revisited

However, one component from The A.R.K. Project was associated with significant increases in belt-use—the previously described Flash-for-Life prompt (Geller, Bruff, & Nimmer, 1985). As in earlier applications, the Flash-for-Life interpersonal prompting intervention was associated with increases in belt-use, despite the sharp contrast in baseline use between the 1980’s and the 2000’s. Specifically, out of the 427 unbuckled drivers, 30% complied with the prompt (Farrell, Cox, & Geller, 2007).

The relative success of the Flash-for-Life prompt suggests the feasibility of more targeted personal interventions aimed at those who do not buckle-up as opposed to more diffuse campaigns targeting all students. Also, it is possible the Flash-for-Life prompt is a particularly effective individual-level intervention for those who may simply forget to buckle-up or are in some other way amenable to a direct peer-delivered suggestion to buckle-up. While forgetfulness
may be one person-factor correlated with safety-belt non-use, other variables related to knowledge, perceptions, and motivation may also be important.

What Do We Know About Those Who Don’t Buckle-Up?

Demographic Variables

While some demographic research has been conducted, we do not have an overall profile of the typical young adult non-user, especially at VT. The most authoritative source for demographic data on safety-belt use and non-use are the National Occupant Protection Use Survey (NOPUS) surveys by NHTSA, most recent of which was conducted in 2006. However, to this author’s knowledge, the most recent full NOPUS report was issued in 2004 on data collected during 2003. This research suggests differences in use along the lines of gender, urbanization, vehicle type, and geographic region.

According to demographic trends found in the 2003 NOPUS, described by NHTSA (2004b), an estimated 80% of females between the ages of 16 – 24 use safety belts. This is seven percentage points higher than male use in the same age range (73%). Farrell, Geller, and Cox (2007) found similar differences in belt-use along gender lines in a large sample of VT student drivers.

Level of urbanization has been associated with safety-belt use and non-use. According to trends found in the 2003 NOPUS, NHTSA (2004b) suggests suburban drivers buckle-up more (81%) than urban (79%) and rural motorists (74%). Furthermore, safety-belt use ranges from 72% in rural areas, 75% in suburban areas, to 77% in urban areas among drivers between the ages of 16 and 24.

Vehicle type has also been associated with safety-belt use and non-use. More specifically, NHTSA provides these data by gender and by urbanization in their 2004 report. However, these
data are not available by age and by grouped genders. Overall, male drivers of pick-up trucks are the least likely to buckle-up (66%). Among female drivers of pick-up trucks, 74% were buckled while 84% of female drivers of passenger cars and 89% of females driving vans or sports utility vehicles (SUV) were buckled. Among male drivers of passenger cars and SUVs, 79% were buckled. Urban (60%) and rural (62%) drivers of pick-up trucks were least likely to be buckled-up while SUV drivers in suburban areas were the most likely to be buckled-up (85%). Among drivers in passenger cars, rural drivers were less likely to buckle-up (76%) than suburban (83%) and urban drivers (81%).

The 2003 NOPUS also examined safety-belt use by geographic region. As reported by NHTSA (2004b), drivers between the ages of 16 to 24 in the Northeast to buckle-up more often (87%) than those in the Midwest (79%), West (75%), and South (57%). Drivers in the South (including Texas, Oklahoma, Arkansas, Louisiana, Mississippi, Alabama, Tennessee, Kentucky, West Virginia, Virginia, North Carolina, South Carolina, Georgia, Maryland, Delaware, and Florida) seem particularly vulnerable to safety-belt non-use. A majority of VT students maintain permanent addresses in the south.

Social Cognitive and Motivational Variables

Most of the influential research on safety-belt use to date has been conducted by the U.S. federal government using standard observational methods. Very little exploratory research has been conducted to investigate social cognitive and motivational variables related to use and non-use of vehicle safety belts. However, the most recent NHTSA 2003 Motor Vehicle Occupant Safety Survey (NHTSA, 2004b) reached a randomly selected sample of 6000 people ages 16 years of age and higher via telephone. The survey gathered self-reported data on attitudes toward safety-belts and opinions regarding safety-belt use laws.
**Attitudes Toward Safety Belts**

According to the survey (NHTSA, 2004b) the most common reasons given for non-use among 16 – 20 year olds were forgetting and driving only a short distance; 30% assumed crashes occurring close to home are less serious. The most common reason given for belt use was injury avoidance. Of drivers 16≤ years of age, 88% strongly agreed and 7% somewhat agreed they would want to have their safety belts on if they were in a crash. However, 47% of drivers between 16 to 24 years of age believe safety belts are as likely to help as to harm. Furthermore, perceived social norms seemed important to drivers in the 16 – 24 age category—19% indicated they would feel socially uncomfortable using their safety belt in a vehicle when others were not. Also, 27% of 16 – 24 year olds believed fastening their belts made them worry more about being in a crash.

**Opinions About Safety-Belt Use Laws**

Overall, results of the survey (NHTSA, 2004b) suggest young people (ages 16 – 20) harbor favorable opinions toward safety-belt use laws. Sixty-six percent of those polled favored safety-belt use laws “a lot” and 27% said they favored laws “some.” When asked if police should be allowed to stop a vehicle after observing only a safety-belt use violation (without another offense), 64% said “yes” and 65% favored fines and 42% favored license points for non-users.

Need for a More Personalized Assessment and Intervention

While surveys have categorized demographic trends related to safety-belt non-use and some targeted interventions have found some success, it remains a challenge to influence the belt-use of non-users. For instance, the recent Flash-for-Life prompting intervention described in Farrell et al. (2007) is promising, especially for drivers who may simply forget to buckle-up and subsequently respond to a prompting intervention. Yet, an alarming 70% of un-buckled
prompted drivers did not comply with the simple request. At this point, we do not know reasons why, yet the previously-described correlates of non-use are of interest. However, a more intensive assessment and within-subject design to evaluate an individual-level intervention is warranted.

Support for developing and applying a more intensive assessment and intervention can be found in the Multilevel Intervention Model (MIM) developed by Geller, Berry, Ludwig, Evans, Gilmore, and Clarke (1990). Geller et al. describe a theoretical framework with multiple levels of large-scale intervention strategies in which a given population is progressively segmented and targeted with increasingly intrusive behavior-change techniques. For example, diffuse educational interventions have increased the safety-belt use of many drivers over time. Those drivers not influenced by relatively low-cost educational approaches are subsequently targeted by enforcement-based tactics. Some drivers remain unbuckled despite these attempts. In keeping with the MIM, a progressive segmentation and intensive targeting for behaviors is called for. A next step in promoting safety-belt use on the VT campus is a more intensive, personalized assessment and intervention specifically targeting drivers who do not buckle-up in 100% of driving instances.

BRIEF INTERVENTIONS BASED ON THE FRAMES APPROACH

One type of intervention showing promise to effect change in health behaviors is the brief intervention outlined by Miller and Rollnick (1991). Brief interventions involve a minimal interaction, ranging from a few minutes to several sessions in length with a health or medical professional focusing on health risks. Within the FRAMES approach to brief intervention: Feedback about health status, risks, and normative behavior is given; Responsibility for change is conveyed to the target person; Advice is given about what to change and how to reduce harm;
a Menu of options is provided for the target person to select from; Empathy is conveyed as the intervention agent’s ability to see the target person’s perspective; and Self-efficacy is conveyed and fostered within the target person so they believe in their abilities to make successful changes.

The FRAMES approach, is conceptually influenced by MI. The role of MI is to acknowledge and resolve ambivalence in the direction of change. Conceptually, this is accomplished through the building of response-relevant motivation. To that end, Miller and Rollnick (2002) discuss motivation as comprised of three perceptual components: importance, confidence, and readiness.

Importance

Perceptions of the importance of change relate to discrepancy between current behavior and goal behavior (Miller & Rollnick, 2002). In the context of a therapeutic relationship, it is the provider’s responsibility to elicit the person’s awareness of discrepancy. Although a person may project ambivalence about change during this process, the ambivalence is considered necessary and not pathological. According to self-regulation theory (Brown, 1998; Kanfer, 1986; Miller & Brown, 1991) and cognitive dissonance theory (Festinger, 1957), when discrepancy is high and made explicit in the process of MI, a person may begin to perceive greater importance to change.

Confidence

Miller and Rollnick (2002) suggest a person may develop greater perceived importance for change but may not feel confidence in their ability to change. Yet, the provider can facilitate the building of self-efficacy (Bandura, 1982). By eliciting\(^1\) the discrepancy between perceptions

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\(^1\) The verb “elicit” is defined by Merriam-Webster (2007) as: 1) to draw forth or bring out (something latent or potential) and 2) to call forth or draw out (as information or a response). While it seems Miller and Rollnick (2002) use this term with the above-mentioned definition, there exists some semantic disagreement. Specifically, within the field of psychology, the term elicit is used in connection with the classical conditioning paradigm in which a stimulus is said to elicit (i.e., cause) a response. Given this and, in retrospect, several other words may have been more appropriate to describe the process of eliciting in the MI relationship such as: evoke, solicit, provoke, or prompt (Geller, 2007, personal communication, March 20, 2007).
of importance and confidence while also eliciting statements regarding successful efforts at change in the past, confidence (self-efficacy) builds.

**Readiness**

Finally, Miller and Rollnick (2002) claim perceived readiness is contingent on perceived importance and confidence. Yet, perceived importance and confidence do not produce readiness to change. Instead, readiness is determined by the person’s relative priorities. The person may have high levels of perceived importance and confidence but may simultaneously perceive change to be undesirable at a given time. Instead of naming this pathological resistance, it is important to consider the person’s ambivalence and the existence of relative priorities.

**Volitional Control**

With this understanding of motivation, a person has volitional control. The process of change is contextualized within the person’s own perceptions of the importance of change, readiness to change, and confidence in one’s ability to change. Miller and Rollnick (2002) note people experience ambivalence about change (i.e., they feel at least two ways about change). Providers recognize and reflect the discrepancies between the components of motivation to skillfully direct the person toward resolution of ambivalence in the desired direction. All the while, it is understood the person chooses the status-quo behavior instead of an alternative behavior or vice versa.

Understandably, harmful behaviors, like riding in a vehicle without using safety belts, may persist because some consequences following these behaviors bring "soon, certain, and positive" consequences like: feeling un-restricted by a belt, feeling socially accepted in front of peers who also ride in vehicles without using safety-belts, and feeling uncontrolled by extrinsic consequences. Thus, while some more negative consequences are also possible (like police
citations, injuries, and deaths) a person may continue an unsafe behavior because they are more motivated by "soon, certain, and positive" consequences than less likely negative consequences or intrinsic motivation to choose safer behaviors. This occurs because at least some of the predictable consequences are so rewarding they outweigh any predictable negative consequences. Again, this behavior is not to be perceived as pathologically resistant. Rather, the behavior should be acknowledged and discussed as a product of the person’s ambivalence (Miller & Rollnick, 2002).

At a systems level Miller (1983) suggests a person is bound by competing motivations and behaviors which are determined by the interaction of within-person processes (i.e., cognitions and emotions), between-person processes (e.g., peer pressure, interpersonal interactions), and environmental factors (e.g., discomfort or inconvenience). Therefore, a person’s behavior choices are entwined in a web of competing motivations and components of motivations (i.e., importance, confidence, and readiness). These may be situationally dependent, as reflected in the situational temptation and confidence measure (Miller & Rollnick, 2002).

Ultimately, a person operates with volitional control. For a person to choose behavior change over the status-quo, the person’s motivations for change must outweigh the person’s perceptions of associated risk or harm. It is the person’s own assessment (not the provider’s assessment) of associated costs and benefits that drives motivation for change or maintenance of the status quo. The process of exploring and resolving ambivalence throughout MI and specifically in decisional balance exercises, often leads a person toward increased motivation to change (Miller & Rollnick, 2002).

Please see Figure 1 for a visual display of the conceptual context of MI. While in pure form MI is a counseling style, applications of the constructs and features of MI, which are described as
the MI spirit, philosophy, and principles, have been adapted for briefer health behavior interventions. These are known as adaptations of MI (AMI; Miller & Rollnick, 2002).

Figure 1. Conceptual context of motivational interviewing.

One consistent feature of most AMIs to date has been assessment followed by personalized feedback communicated in a manner that incorporates the MI spirit, philosophy, and principles as described in Miller and Rollnick (2002). Most AMIs using assessment and tailored feedback focus on changing one or two target behaviors. To the extent AMIs incorporate the MI spirit, philosophy, and principles into an assessment and feedback process, the assessment and feedback is referred to as “MI-consistent.” Brief interventions based on the FRAMES approach are considered MI-consistent.

Empirical Support for Brief Interventions

The FRAMES approach has been used successfully to effect beneficial change in: preventive behavior for cancer (Skinner, Strecher, & Hospers, 1994; McPhee, Bird, Rodham, Rodnick, & Osborn, 1991); marital discord (Cordova, Scott, Dorian, Mirgain, Yaeger, & Groot, 2005); eating disorders (Long & Hollin, 1995); and constellations of risky safety-related
behaviors like bicycle helmet use and safety-belt use (Dunn, Droesch, Johnston, & Rivara, 2004).

A search was performed on the Medline and PsychInfo databases with the terms: “brief intervention”, “motivation”, and “measures”. Twenty-two scholarly articles were found. Although brief interventions have been developed and tested to target the above-mentioned behaviors, most brief interventions can be found in treatment literature on substance abuse.

Such interventions have been found to be a promising approach to reduce women’s risk for alcohol exposed pregnancy (AEP). Following a successful five-session MI plus contraception counseling intervention for reducing women’s risk for AEP (Project Choices Research Group, 2003), a less costly, transportable brief intervention was developed and tested that used the effective components of the longer interventions delivered in a condensed format. A single-session intervention, Project Balance, has shown evidence of efficacy with college women. A follow-up study testing a single session intervention (i.e., Project Early) is underway currently with aims to show efficacy with women who are not in college and are living in the community (Ingersoll, Ceperich, Nettleman, Karanda, Brocksen, & Johnson, 2005).

Participants in Project Early complete a baseline assessment to measure: (1) demographics; (2) alcohol consumption and contraceptive behaviors; (3) perceived risk for alcohol-related problems and pregnancy; (4) alcohol dependence and abuse; (5) reasons for not using effective contraception; (6) importance, confidence, and readiness to change drinking and or contraceptive behaviors; (7) stage of change for both drinking and contraceptive behaviors, and (8) situational temptation and confidence regarding drinking and contraceptive behaviors.

Then, participants are randomly assigned to one of three groups: (1) assessment plus a minimal literature control intervention, whereby participants are given three brochures on
women’s health topics; (2) an attention-matched comparison intervention whereby participants view three videos on drinking alcohol, alcohol-exposed pregnancy, and general women’s health, or (3) a one-session MI-consistent feedback condition. Follow-up continues over a six-month period. Project Early and Project Balance are promising brief interventions that could be used with women awaiting services or in addition to existing therapeutic services, possibly impacting a public health by reducing the risk of AEP for women drawn from diverse settings.

The “Drinkers’ Check-Up” (Miller & Sovereign, 1989) was one brief assessment and feedback intervention, originally found to be effective in working with problem drinkers who were not seeking treatment. It has also been successfully adapted to effect change in marijuana users who where not seeking treatment (Stephens, Roffman, Fearer, Williams, & Picciano, 2004). These “Check-Ups” assessed: (1) frequency and severity of use; (2) abuse and dependence; (3) problems related to use; (4) treatment utilization; (5) self-efficacy (situational temptation and confidence), and (6) readiness to change. Both studies delivered feedback in an MI-consistent format during one-session.

Other un-controlled feasibility studies show support for brief motivational interventions. For instance, Martin, Copeland, and Swift (2005) found a brief individual assessment session followed by one session of feedback delivered in an MI-consistent style was associated with decreases in marijuana use among adolescents. These gains were maintained through the six-month follow-up point.

Another study targeting illicit drug use (e.g., alcohol, tobacco, and cannabis) compared the efficacy of one-session of MI against an education-as-usual control group (McCambridge & Strang, 2004). This study found adolescents (aged 16 – 20 years) in the MI group reduced use of
drugs, especially when drug-use frequency and severity at baseline was more severe. Results were maintained through the three-month follow-up point.

Although most brief motivational interventions have been delivered in-vivo, there are few published accounts of rigorously evaluated, web-based, brief motivational interventions using both assessment and feedback. However, there is reason to suggest web-based applications are feasible and promising. A study conducted by Ondersma, Svikis, and Schuster (2007) was the first to suggest a 20-minute web-based assessment and feedback intervention could be feasible and related to change in illicit drug use among a sample of postpartum community women. The assessment included validated, brief measures of: (1) self-reported behaviors including frequency and consequences of substance use; (2) social cognitive and motivational variables including perceptions of importance, confidence, and readiness to change, and (3) intelligence quotients.

While there are great inconsistencies and differences in the design and content of brief motivational interventions, there are some overlapping trends. Most assessments measure self-reported behavior and social cognitive and motivational variables such as: perceptions of pros and cons of performing the target behavior (including reasons why/why not to do it) and importance, confidence, and readiness to change. Although there is some variability in feedback content, MI-consistent feedback tends to include: (1) frequency of target behavior; (2) normative comparison of target behavior; (3) reasons against change or “pros/cons” of change; (4) personal risks, and (4) a menu of options.

While these studies investigating efficacy of brief motivational interventions to change problem behaviors among non-treatment-seeking samples, mostly in the substance use field, show promise, researchers admit the mechanisms of action are still unknown. For instance, it is hypothesized the process of assessment and feedback influences behavior change by way of
increasing cognitive dissonance and perceived discrepancies (Miller & Rollnick, 2002). However, some suggest the process of undergoing assessment focuses attention on problem behaviors leading to change (Epstein, Drapkin, Yusko, Cook, McCrady, & Jensen, 2005). All reviewed studies on brief interventions test the use of assessment and feedback. However, many studies fail to include an Assessment Only condition, preventing researchers from observing and comparing the impact of assessment alone with assessment plus feedback.

Also, while MI is thought to work by resolving ambivalence in the direction of change by selectively reinforcing change talk utterances in therapeutic interactions, it is unknown if this can be successfully recreated through written or web-based delivery, particularly because the therapeutic process of resolving ambivalence is thought to depend on accurate empathy. At least one study suggests participants had significantly better outcomes with in-vivo MI counseling in comparison to feedback provided in paper form only (Monti et al., 2007). Yet, other studies (Murphy et al., 2003; White et al., 2005) found increases in substance use behaviors following assessment with written feedback and following assessment with one session of MI-consistent counseling in which feedback was delivered. These studies suggest there is at least some support to suggest feedback delivered in print or web-based interactions has promise despite a widely held belief that empathy is better communicated through in-person interactions.

Despite these outstanding questions, the recent web-based study aiming to promote changes in illicit drug use among postpartum women, provides a model for the current research in that it incorporated an assessment only condition (control) and used the Internet as a platform to deliver assessment and feedback based on MI (Ondesma, Svikis, & Schuster, 2007). Given the wide availability of the Internet for VT college students and the efficiency of a web-based
intervention, this mode of delivery seemed to be a reasonable place to begin such a personalized, yet inexpensive, efficient, and replicable intervention.

CURRENT RESEARCH

Again, while most randomized controlled studies investigating the efficacy of AMIs include assessment and feedback, some do not. It is not yet clear what roles assessment and feedback play in the MI process. The comparative impact of assessment alone and assessment with feedback have not been elucidated. Is feedback necessary or is assessment sufficient to yield changes in a target behavior? How do assessment and assessment plus feedback relate to perceptions of importance, confidence, and readiness? Furthermore, does web-based assessment and feedback have promise for large-scale safety-belt use behavioral intervention? Prior to completing an intervention study (Main Study) aimed to bring more clarity to these questions a Pilot Study was performed to develop procedures and methodologies.

Pilot Study: Exploring the Use of New Measures

There were two specific aims for the Pilot Study: (1) develop new measures and (2) conduct an a priori power analyses to determine an adequate sample size for the Main Study using data collected on a new 1-item measure of self-reported safety-belt use. To this end, a survey was created, administered, and evaluated.

A survey including new measures on: (1) demographics; (2) opinions and attitudes about safety-belt use; (3) opinions and attitudes about safety-belt use laws and enforcement; (4) motivation to buckle-up in each driving instance; (5) motivation to buckle-up in each passenger instance and; (6) safety-belt use during the past ten driving and passenger instances. Means, standard deviations, and inter-item correlations and estimations of internal consistency were derived for the measures to be used in the Main Study.
Methods

The following methodology addressed the above-mentioned specific aims. The study materials (e.g., survey) can be viewed in Appendix A.

Procedures

Sample

Members of four VT undergraduate psychology classes were given the opportunity to complete the anonymous survey during the spring 2008 semester. Virginia Tech is a large regional public university located in Blacksburg, Virginia (pop. 39,500). There are approximately 26,000 students enrolled at VT. According to the parking services department of VT, 11,590 parking permits were issued to undergraduate students for the 2007-2008 academic year.

Recruitment Procedures

Instructors announced the opportunity to complete the anonymous survey during regularly scheduled classes. Students were offered extra credit for completing the surveys. Completion of surveys was voluntary.

Measures

The following measures were presented as one consolidated survey.

Demographics and Belt Use

Demographic variables that have previously been associated with safety-belt use and non-use were assessed (NHTSA, 2003a). Specific variables of interest were: gender, urbanization, vehicle type, and geographic region. Also, several exploratory questions about safety-belt use were included in this measure.
Opinions and Attitudes about Safety-Belt Use

Items from a large survey previously administered by NHTSA (2004b) were selected to assess favorability of attitudes and opinions toward safety-belt use. A ten-item measure was created using items from the NHTSA survey. Responses to these items occurred on a one-to-eight scale ranging from complete disagreement (1) with a pro-safety-belt use statement to complete agreement (8). Two of these items were asked twice in reverse direction.

Opinions and Attitudes about Safety-Belt Use Laws and Enforcement

Items from a large survey previously administered by NHTSA (2004b) were selected to assess favorability of attitudes and opinions toward safety-belt use laws and enforcement. A seven-item measure was created using items from the NHTSA survey. Responses to these items occurred on a one-to-eight scale ranging from complete disagreement (1) with a pro-safety-belt use statement to complete agreement (8).

Motivation: Importance, Confidence, and Readiness to Buckle-Up Each Time Driving

While these variables have not previously been associated with driver safety-belt use, previous interventions using assessment and tailored feedback for specific behaviors have assessed motivational constructs of perceived importance, confidence, and readiness with the Importance, Confidence, and Readiness Rulers (Miller & Rollnick, 2002). These “rulers” are typically measured on visual analogue scales ranging from 0-100. However, in clinical practice, clinicians often adapt the rulers to fit a target behavior and limit the range to an eleven-point Likert scale. In this study, the rulers were presented on an eleven-point scale depicting the participants’ judgment of the importance of safety-belt use as a driver, their confidence to buckle-up in each driving instance, and their readiness to buckle-up in each driving instance.
Motivation: Importance, Confidence, and Readiness to Buckle-Up Each Time Riding as a Passenger

While these variables have not previously been associated with passenger safety-belt use, previous interventions using assessment and tailored feedback for specific behaviors have assessed motivational constructs of perceived importance, confidence, and readiness with the Importance, Confidence, and Readiness Rulers (Miller & Rollnick, 2002). These “rulers” are typically measured on visual analogue scales ranging from 0-100. However, in clinical practice, clinicians often adapt the rulers to fit a target behavior and limit the range to an eleven-point Likert scale. In this study, the rulers were presented on an eleven-point scale depicting the participants’ judgment of the importance of safety-belt use as a passenger, their confidence to buckle-up in each passenger instance, and their readiness to buckle-up in each passenger instance.

Safety-Belt Use in the Past Ten Instances as a Driver and a Passenger

Safety-belt use was measured by asking respondents to indicate the number of times they buckled-up in the past ten instances they were a vehicle occupant (0 -10 scale). This was measured separately for the past ten instances they were a driver and the past ten instances they were a passenger. The term “instance” was explicitly described. More specifically, participants were asked: “In how many of the past ten driving instances did you use your safety-belt exactly as described here: You buckled your safety-belt before your vehicle began to roll regardless of how fast or slow the vehicle was rolling and regardless of the length of your driving trip. You did not unbuckle your belt until your vehicle came to a complete and total stop at a parking space.”
Data Coding and Analyses Plan

Before data analyses were performed, all data were entered into a Microsoft Excel spreadsheet and imported into an SPSS database. All reverse coded variables on the opinions and attitudes about safety-belt use and opinions and attitudes about safety-belt use laws and enforcement were recoded to reflect higher values indicating greater agreement with statements. Also, two new composite variables were created. Specifically, mean scores for attitude toward safety-belt use were computed for each individual by summing responses for the ten items, including reverse scored items, and dividing by the total number of items (10). Mean scores for opinion and attitudes about safety-belt use measure were computed for each individual by summing responses for the seven items, including reverse-scored items, and dividing by the total number of items (7).

Descriptive statistics were used to characterize the sample according to demographic variables, dependent variables, and independent variables. Analyses of reliability of measures followed. Further exploratory analyses of the relationships between the independent and dependent variables followed. All analyses were performed on the entire dataset (N = 126 participants) and separately for respondents who reported buckling up in seven or less of their past ten driving and or passenger instances (N = 57 participants). The reason for computing statistics on both the entire sample and the subsample was to further examine the qualities of dependent measures among a sample most like the sample to be drawn during the Main Study (eligibility partly depended on self-reported safety-belt use as a driver and or a passenger to be ≤7 at enrollment into the Main Study).

An a priori power analyses to determine an adequate sample size was conducted using data from the measure assessing safety-belt use during past ten driving instances. This item was
selected for the power analyses because it was to be the primary dependent variable of interest in the Main Study.

Results

Frequency and Descriptive Statistics

*Entire dataset.* A total of 126 students completed the survey. The sample of 126 was equally male and female (50.8%) with a mean age of 19.85 \((SD = 1.56)\). Most participants reported living in a house or apartment (66.7%), hailing from a suburban hometown (67.5%), and owning a vehicle registered in the state of Virginia (78.6%). Most indicated their primary vehicle was a passenger car (67.5%). Descriptive statistics regarding safety-belt use, attitudes, and motivation (i.e., means, standard deviations, medians, and range) are presented in Table 1.

*Sub-dataset.* The sample of 57 was equally male and female (49.1%) with a mean age of 19.86 \((SD = 1.99)\). Most participants reported living in a house or apartment (77.2%), hailing from a suburban hometown (64.9%), and owning a vehicle registered in the state of Virginia (70.2%). Most indicated their primary vehicle was a passenger car (56.1%). Descriptive statistics regarding safety-belt use, attitudes, and motivation (i.e., means, standard deviations, medians, and range) are presented in Table 1.
Table 1.

**Descriptive Statistics.**

<table>
<thead>
<tr>
<th>Variable</th>
<th>Entire Dataset (N = 126)</th>
<th>Sub-Dataset (N = 57)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Use Safety-Belt All The Time as a Driver [n (%)]</td>
<td>108.99 (86.5)</td>
<td>41 (71.9)</td>
</tr>
<tr>
<td>Use Safety-Belt All The Time as a Passenger [n (%)]</td>
<td>97.02 (77)</td>
<td>31 (54.4)</td>
</tr>
<tr>
<td><strong>Driver Safety-Belt Use in Past 10 Instances</strong>&lt;br&gt;[instances, M (SD)]</td>
<td>8.14 (2.69)</td>
<td>6.40 (3.16)</td>
</tr>
<tr>
<td>Median</td>
<td>10</td>
<td>7</td>
</tr>
<tr>
<td>Range</td>
<td>10</td>
<td>10</td>
</tr>
<tr>
<td>Kurtosis</td>
<td>1.47</td>
<td>-863</td>
</tr>
<tr>
<td>Skewness</td>
<td>-1.55</td>
<td>-492</td>
</tr>
<tr>
<td><strong>Passenger Safety-Belt Use in Past 10 Instances</strong>&lt;br&gt;[instances, M (SD)]</td>
<td>7.36 (2.65)</td>
<td>5.26 (2.58)</td>
</tr>
<tr>
<td>Median</td>
<td>8</td>
<td>6</td>
</tr>
<tr>
<td>Range</td>
<td>10</td>
<td>10</td>
</tr>
<tr>
<td>Kurtosis</td>
<td>89</td>
<td>-438</td>
</tr>
<tr>
<td>Skewness</td>
<td>-1.24</td>
<td>-618</td>
</tr>
<tr>
<td><strong>Composite Attitude Scores Toward Safety-Belt Use</strong>&lt;br&gt;[score, M (SD)]</td>
<td>6.52 (.64)</td>
<td>6.33 (.68)</td>
</tr>
<tr>
<td>Median</td>
<td>6.6</td>
<td>6.5</td>
</tr>
<tr>
<td>Range</td>
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<td>3.10</td>
</tr>
<tr>
<td>Kurtosis</td>
<td>.63</td>
<td>.85</td>
</tr>
<tr>
<td>Skewness</td>
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<td>-.794</td>
</tr>
<tr>
<td><strong>Composite Attitude Scores Toward Safety-Belt Use Laws</strong>&lt;br&gt;[score, M (SD)]</td>
<td>4.21 (1.58)</td>
<td>3.81 (1.55)</td>
</tr>
<tr>
<td>Median</td>
<td>4.29</td>
<td>4</td>
</tr>
<tr>
<td>Range</td>
<td>7</td>
<td>7</td>
</tr>
<tr>
<td>Kurtosis</td>
<td>-.02</td>
<td>-.125</td>
</tr>
<tr>
<td>Skewness</td>
<td>-.07</td>
<td>-.041</td>
</tr>
<tr>
<td><strong>Importance: Buckle-Up as a Driver</strong>&lt;br&gt;[score, M (SD)]</td>
<td>8.98 (1.78)</td>
<td>8.4 (2.10)</td>
</tr>
<tr>
<td>Median</td>
<td>10</td>
<td>9</td>
</tr>
<tr>
<td>Range</td>
<td>10</td>
<td>10</td>
</tr>
<tr>
<td>Kurtosis</td>
<td>9.31</td>
<td>4.76</td>
</tr>
<tr>
<td>Skewness</td>
<td>-2.79</td>
<td>-2.10</td>
</tr>
<tr>
<td><strong>Confidence: Buckle-Up as a Driver</strong>&lt;br&gt;[score, M (SD)]</td>
<td>9.08 (1.9)</td>
<td>8.29 (2.58)</td>
</tr>
<tr>
<td>Median</td>
<td>10</td>
<td>9</td>
</tr>
<tr>
<td>Range</td>
<td>9</td>
<td>9</td>
</tr>
<tr>
<td>Kurtosis</td>
<td>7.26</td>
<td>1.31</td>
</tr>
<tr>
<td>Skewness</td>
<td>-2.77</td>
<td>-1.58</td>
</tr>
<tr>
<td><strong>Readiness: Buckle-Up as a Driver</strong>&lt;br&gt;[score, M (SD)]</td>
<td>9 (1.8)</td>
<td>8.16 (2.39)</td>
</tr>
<tr>
<td>Median</td>
<td>10</td>
<td>9</td>
</tr>
<tr>
<td>Range</td>
<td>8</td>
<td>8</td>
</tr>
<tr>
<td>Kurtosis</td>
<td>6.51</td>
<td>1.24</td>
</tr>
<tr>
<td>Skewness</td>
<td>-2.56</td>
<td>-1.46</td>
</tr>
<tr>
<td><strong>Importance: Buckle-Up as a Passenger</strong>&lt;br&gt;[score, M (SD)]</td>
<td>8.63 (1.91)</td>
<td>7.61 (2.30)</td>
</tr>
<tr>
<td>Median</td>
<td>9</td>
<td>8</td>
</tr>
<tr>
<td>Range</td>
<td>10</td>
<td>10</td>
</tr>
<tr>
<td>Kurtosis</td>
<td>4.77</td>
<td>1.72</td>
</tr>
<tr>
<td>Skewness</td>
<td>-2.02</td>
<td>-1.32</td>
</tr>
<tr>
<td><strong>Confidence: Buckle-Up as a Passenger</strong>&lt;br&gt;[score, M (SD)]</td>
<td>8.46 (2.10)</td>
<td>7.39 (2.57)</td>
</tr>
<tr>
<td>Median</td>
<td>9</td>
<td>8</td>
</tr>
<tr>
<td>Range</td>
<td>8</td>
<td>8</td>
</tr>
<tr>
<td>Kurtosis</td>
<td>2.5</td>
<td>-27</td>
</tr>
<tr>
<td>Skewness</td>
<td>-1.75</td>
<td>-93</td>
</tr>
<tr>
<td><strong>Readiness: Buckle-Up as a Passenger</strong>&lt;br&gt;[score, M (SD)]</td>
<td>8.59 (1.99)</td>
<td>7.47 (2.4)</td>
</tr>
<tr>
<td>Median</td>
<td>9</td>
<td>8</td>
</tr>
<tr>
<td>Range</td>
<td>9</td>
<td>9</td>
</tr>
<tr>
<td>Kurtosis</td>
<td>3.65</td>
<td>.516</td>
</tr>
<tr>
<td>Skewness</td>
<td>-1.92</td>
<td>-1.09</td>
</tr>
</tbody>
</table>
Four new measures were tested for inter-item reliability. Analyses of internal consistency using Cronbach’s alpha were performed for these four measures: (1) opinions and attitudes about safety-belt use; (2) opinions and attitudes about safety-belt use laws and enforcement; (3) motivation to buckle-up in each driving instance; and (4) motivation to buckle-up in each passenger instance.

Entire dataset. A minimally acceptable alpha level of .60 or greater was achieved for each measure when analyses were performed using the entire sample (N = 126). The ten-item measure to assess favorability of opinions and attitudes about safety-belt use, measured on a 1-8 scale, achieved a Cronbach’s alpha of .63. Notably, data suggest item eight (i.e., “I would not feel self-conscious around my friends if I wore a safety belt and they did not.”) was significantly correlated with every other item except for the reverse-scored item five (i.e., “A crash close to home is usually not as serious.”). Further, item five was not significantly correlated with any other items suggesting item five should be dropped from the survey. A correlation matrix is provided in Table 2.

The 7-item measure to assess favorability of opinions and attitudes about safety-belt use laws, measured on a 1-8 scale achieved a Cronbach’s alpha of .89. A correlation matrix is provided in Table 3 in which, statistically significant intercorrelations between items are shown. Notably, all items were significantly intercorrelated with the surprising exception of item one (i.e., “Safety-belt use laws are good to have.”) and the reverse-scored item seven (i.e., “I do not support fines for drivers who do not use safety belts.”).

The three-item measure of three constructs related to motivation (importance, confidence, and readiness to buckle-up in each driving instance), measured on a 0-10 scale, achieved a
Cronbach’s alpha of .91. As shown in the correlation matrix provided in Table 4, all items are significantly intercorrelated. In particular, the correlation between readiness and confidence is notable, \( r = -.874, p < .01 \).

The three-item measure of three constructs related to motivation (importance, confidence, and readiness to buckle-up in each passenger instance), measured on a 0-10 scale, also achieved a Cronbach’s alpha of .91. As shown in the correlation matrix is provided in Table 5, all items are significantly intercorrelated. In particular, the correlation between readiness and confidence is notable, \( r = -.866, p < .01 \).

Table 2.
Inter correlations Between Items on the Opinions and Attitudes about Safety-Belt Use Measure for the Entire Sample (N = 126).

<table>
<thead>
<tr>
<th>Items</th>
<th>1</th>
<th>2</th>
<th>3</th>
<th>4</th>
<th>5</th>
<th>6</th>
<th>7</th>
<th>8</th>
<th>9</th>
<th>10</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>1</td>
<td>.346 **</td>
<td>0.127</td>
<td>0.113</td>
<td>0.128</td>
<td>0.085</td>
<td>0.108</td>
<td>.207 *</td>
<td>.176 *</td>
<td>0.106</td>
</tr>
<tr>
<td>2</td>
<td></td>
<td>.362 **</td>
<td>0.154</td>
<td>0.105</td>
<td>0.139</td>
<td>0.147</td>
<td>.302 **</td>
<td>0.125</td>
<td>.417 **</td>
<td></td>
</tr>
<tr>
<td>3</td>
<td></td>
<td></td>
<td>.185 *</td>
<td>0.005</td>
<td>0.164</td>
<td>0.153</td>
<td>.185 *</td>
<td>.179 *</td>
<td>.294 **</td>
<td></td>
</tr>
<tr>
<td>4</td>
<td></td>
<td></td>
<td></td>
<td>.293**</td>
<td>.287**</td>
<td>.848 **</td>
<td>0.075</td>
<td>0.06</td>
<td></td>
<td></td>
</tr>
<tr>
<td>5</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td>0.061</td>
<td>0.08</td>
<td>0.138</td>
<td>0.057</td>
<td>.189 *</td>
<td></td>
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<tr>
<td>6</td>
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<td>.345 **</td>
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<td></td>
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<td></td>
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<td>.244 **</td>
<td>0.018</td>
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<td>0.103</td>
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</tr>
</tbody>
</table>

Note. Scale of measurement = 1 – 8 (1 = completely disagree, 8 = completely agree), Items 3, 4, 5, 6, 7, 9, 10, are reverse coded.

Items:
1) I have a habit of buckling-up because my parents insisted I did when I was child.
2) If I were in a crash, I would want to have my safety belt on.
3) Safety belts are just as likely to harm you as help you.
4) I would feel self-conscious around my friends if I wore a safety belt and they did not.
5) A crash close to home is usually not as serious.
6) Putting on a safety belt makes me worry more about being in a crash.
7) Wearing my safety belt makes me physically uncomfortable.
8) I would not feel self-conscious around my friends if I wore a safety belt and they did not.
9) How much do you agree with this statement: “If it is your time to die, you’ll die.”
10) If I were in a crash, I would not want to have my safety belt on.

* \( p < .05 \) level (2-tailed). ** \( p < .01 \) level (2-tailed).
Table 3.
**Intercorrelations Between Items on the Opinions and Attitudes about Safety-Belt Use Laws and Enforcement Measure for the Entire Sample (N = 126).**

<table>
<thead>
<tr>
<th>Items</th>
<th>1</th>
<th>2</th>
<th>3</th>
<th>4</th>
<th>5</th>
<th>6</th>
<th>7</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>1</td>
<td>.604**</td>
<td>.675**</td>
<td>.629**</td>
<td>.563**</td>
<td>.511**</td>
<td>0.124</td>
</tr>
<tr>
<td>2</td>
<td>--</td>
<td>.720**</td>
<td>.747**</td>
<td>.561**</td>
<td>.420**</td>
<td>.259**</td>
<td></td>
</tr>
<tr>
<td>3</td>
<td>--</td>
<td>.879**</td>
<td>.723**</td>
<td>.461**</td>
<td>.352**</td>
<td></td>
<td></td>
</tr>
<tr>
<td>4</td>
<td>--</td>
<td>.719**</td>
<td>.436**</td>
<td>.352**</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>5</td>
<td>--</td>
<td>.367**</td>
<td>.272**</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>6</td>
<td>--</td>
<td>.600**</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>7</td>
<td>--</td>
<td>--</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

Note. Scale of measurement = 1 – 8 (1 = completely disagree, 8 = completely agree), Items 6,7, are reverse coded. Items:
1) Safety-belt use laws are good to have.
2) Police should be allowed to stop a vehicle if they observe a safety belt use violation when no other traffic laws are being broken.
3) I support fines for drivers who do not use safety belts.
4) I support fines for passengers who do not use safety belts.
5) I support drivers getting points against their license for not using safety belts.
6) Safety-belt use laws are not good to have.
7) I do not support fines for drivers who do not use safety belts.
* p <.05 level (2-tailed). ** p <.01 level (2-tailed).

Table 4.
**Intercorrelations Between Importance, Confidence, and Readiness to Buckle-up in Each Driving Instance for the Entire Sample (N = 126).**

<table>
<thead>
<tr>
<th>Items</th>
<th>Importance</th>
<th>Confidence</th>
<th>Readiness</th>
</tr>
</thead>
<tbody>
<tr>
<td>Importance</td>
<td>--</td>
<td>.679**</td>
<td>.736**</td>
</tr>
<tr>
<td>Confidence</td>
<td>--</td>
<td>.874**</td>
<td>--</td>
</tr>
</tbody>
</table>

Note.
Items:
1) Importance: On a scale of 0 to 10, if 0 is not important at all and 10 is very important, **how important** it is for you to buckle-up each time you drive a vehicle?
2) Confidence: On a scale of 1 to 10, if 0 is not confident at all and 10 is very confident, **how confident** are you that you can buckle-up each time you drive a vehicle?
3) Readiness: On a scale of 0 to 10, if 0 is not ready at all and 10 is very ready, **how ready** you to buckle-up each time you drive a vehicle?
* p <.05 level (2-tailed). ** p <.01 level (2-tailed).
Table 5.
Intercorrelations Between Importance, Confidence, and Readiness to Buckle-up in Each Passenger Instance for the Entire Sample (N = 126).

<table>
<thead>
<tr>
<th>Items</th>
<th>Importance</th>
<th>Confidence</th>
<th>Readiness</th>
</tr>
</thead>
<tbody>
<tr>
<td>Importance</td>
<td>--</td>
<td>.694**</td>
<td>.759**</td>
</tr>
<tr>
<td>Confidence</td>
<td>--</td>
<td>--</td>
<td>.866**</td>
</tr>
<tr>
<td>Readiness</td>
<td></td>
<td></td>
<td>--</td>
</tr>
</tbody>
</table>

Note.
Items:
1) Importance: On a scale of 0 to 10, if 0 is not important at all and 10 is very important, how important it is for you to buckle-up each time you are a passenger in a vehicle?
2) Confidence: On a scale of 1 to 10, if 0 is not confident at all and 10 is very confident, how confident are you that you can buckle-up each time you are a passenger in a vehicle?
3) Readiness: On a scale of 0 to 10, if 0 is not ready at all and 10 is very ready, how ready you to buckle-up each time you are a passenger in a vehicle?

* p <.05 level (2-tailed). ** p <.01 level (2-tailed).

Sub-dataset. A minimally acceptable alpha level of .60 or greater was achieved for each measure when analyses were performed using the sub-dataset (N = 57). The ten-item measure to assess favorability of opinions and attitudes about safety-belt use, measured on a 1-8 scale, achieved a Cronbach’s alpha of .64. A correlation matrix is provided in Table 6 in which it can be seen that the reverse-scored item five (i.e., “A crash close to home is usually not as serious.”) is not intercorrelated with any other items.

The seven-item measure to assess favorability of opinions and attitudes about safety-belt use laws, measured on a 1-8 scale achieved a Cronbach’s alpha of .88. As seen in the correlation matrix provided in Table 7, all items are significantly intercorrelated with the exception of the reverse-scored item seven (i.e., “I do not support fines for drivers who do not use safety belts.”) and items one through five.

The three-item measure of three constructs related to motivation (importance, confidence, and readiness to buckle-up in each driving instance), measured on a 0-10 scale, achieved a Cronbach’s alpha of .93. As seen in the correlation matrix provided in Table 8, all items are significantly intercorrelated with the highest correlations appearing between readiness and confidence (r = -.866, p<.01) and readiness and importance (r = -.843, p <.01).
The three-item measure of three constructs related to motivation (importance, confidence, and readiness to buckle-up in each passenger instance), measured on a 0-10 scale, achieved a Cronbach’s alpha of .90. As seen in the correlation matrix provided in Table 9, all items are significantly intercorrelated with the highest correlations appearing between readiness and confidence ($r = -.862, p<.01$) and readiness and importance ($r = -.711, p <.01$).

**Table 6.**
**Intercorrelations Between Items on the Opinions and Attitudes about Safety-Belt Use Measure for the Subgroup Sample ($N = 57$).**

<table>
<thead>
<tr>
<th>Items</th>
<th>1</th>
<th>2</th>
<th>3</th>
<th>4</th>
<th>5</th>
<th>6</th>
<th>7</th>
<th>8</th>
<th>9</th>
<th>10</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>--</td>
<td>.276 *</td>
<td>0.097</td>
<td>0.042</td>
<td>-0.074</td>
<td>0.139</td>
<td>0.098</td>
<td>0.197</td>
<td>0.136</td>
<td>0.057</td>
</tr>
<tr>
<td>2</td>
<td>--</td>
<td>--</td>
<td>.640 **</td>
<td>.323 *</td>
<td>-0.207</td>
<td>.346 **</td>
<td>0.203</td>
<td>.462 **</td>
<td>.304 *</td>
<td>.493 **</td>
</tr>
<tr>
<td>3</td>
<td>--</td>
<td>--</td>
<td>.293 *</td>
<td>--</td>
<td>-0.124</td>
<td>0.187</td>
<td>0.156</td>
<td>.313 *</td>
<td>.324*</td>
<td>.399 **</td>
</tr>
<tr>
<td>4</td>
<td>--</td>
<td>--</td>
<td>0.008</td>
<td>0.139</td>
<td>0.233</td>
<td>.875 **</td>
<td>0.082</td>
<td>0.022</td>
<td>--</td>
<td>--</td>
</tr>
<tr>
<td>5</td>
<td>--</td>
<td>--</td>
<td>0.037</td>
<td>0.006</td>
<td>0.071</td>
<td>0.164</td>
<td>0.164</td>
<td>0.089</td>
<td>--</td>
<td>--</td>
</tr>
<tr>
<td>6</td>
<td>--</td>
<td>--</td>
<td>0.445 **</td>
<td>0.187</td>
<td>--</td>
<td>0.151</td>
<td>0.171</td>
<td>--</td>
<td>--</td>
<td>--</td>
</tr>
<tr>
<td>7</td>
<td>--</td>
<td>--</td>
<td>0.172</td>
<td>--</td>
<td>-0.042</td>
<td>0.12</td>
<td>--</td>
<td>0.017</td>
<td>0.029</td>
<td>--</td>
</tr>
<tr>
<td>8</td>
<td>--</td>
<td>--</td>
<td>0.017</td>
<td>0.029</td>
<td>--</td>
<td>0.029</td>
<td>0.017</td>
<td>--</td>
<td>--</td>
<td>--</td>
</tr>
<tr>
<td>9</td>
<td>--</td>
<td>--</td>
<td>0.319 *</td>
<td>--</td>
<td>--</td>
<td>--</td>
<td>0.319 *</td>
<td>--</td>
<td>--</td>
<td>--</td>
</tr>
<tr>
<td>10</td>
<td>--</td>
<td>--</td>
<td>--</td>
<td>--</td>
<td>--</td>
<td>--</td>
<td>--</td>
<td>--</td>
<td>--</td>
<td>--</td>
</tr>
</tbody>
</table>

Note. Scale of measurement = 1 – 8 (1 = completely disagree, 8 = completely agree), Items 3,4,5,6,7,9, 10, are reverse coded. Items:
1) I have a habit of buckling-up because my parents insisted I did when I was child.
2) If I were in a crash, I would want to have my safety belt on.
3) Safety belts are just as likely to harm you as help you.
4) I would feel self-conscious around my friends if I wore a safety belt and they did not.
5) A crash close to home is usually not as serious.
6) Putting on a safety belt makes me worry more about being in a crash.
7) Wearing my safety belt makes me physically uncomfortable.
8) I would not feel self-conscious around my friends if I wore a safety belt and they did not.
9) How much do you agree with this statement: “If it is your time to die, you’ll die.”
10) If I were in a crash, I would not want to have my safety belt on.

* $p <.05$ level (2-tailed). ** $p <.01$ level (2-tailed)
**Table 7.**  
*Intercorrelations Between Items on the Opinions and Attitudes About Safety-Belt Use Laws and Enforcement Measure for the Subgroup Sample (N = 57).*

<table>
<thead>
<tr>
<th>Items</th>
<th>1</th>
<th>2</th>
<th>3</th>
<th>4</th>
<th>5</th>
<th>6</th>
<th>7</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>--</td>
<td>.668 **</td>
<td>.714 **</td>
<td>.643 **</td>
<td>.627 **</td>
<td>.467 **</td>
<td>0.1</td>
</tr>
<tr>
<td>2</td>
<td>--</td>
<td>.737 **</td>
<td>.698 **</td>
<td>.551 **</td>
<td>.405 **</td>
<td>0.169</td>
<td></td>
</tr>
<tr>
<td>3</td>
<td>--</td>
<td>.832 **</td>
<td>.763 **</td>
<td>.441 **</td>
<td>0.234</td>
<td></td>
<td></td>
</tr>
<tr>
<td>4</td>
<td>--</td>
<td>.681 **</td>
<td>.385 **</td>
<td>0.256</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>5</td>
<td>--</td>
<td>.330 *</td>
<td>0.17</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>6</td>
<td>--</td>
<td>.575 **</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>7</td>
<td>--</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

Note. Scale of measurement = 1 – 8 (1 = completely disagree, 8 = completely agree), Items 6,7, are reverse coded.  
Items:  
1) Safety-belt use laws are good to have.  
2) Police should be allowed to stop a vehicle if they observe a safety belt use violation when no other traffic laws are being broken.  
3) I support fines for drivers who do not use safety belts.  
4) I support fines for passengers who do not use safety belts.  
5) I support drivers getting points against their license for not using safety belts.  
6) Safety-belt use laws are not good to have.  
7) I do not support fines for drivers who do not use safety belts.  
* p < .05 level (2-tailed). ** p < .01 level (2-tailed).

**Table 8.**  
*Intercorrelations Between Importance, Confidence, and Readiness to Buckle-up in Each Driving Instance for the Subgroup Sample (N = 57).*

<table>
<thead>
<tr>
<th>Items</th>
<th>Importance</th>
<th>Confidence</th>
<th>Readiness</th>
</tr>
</thead>
<tbody>
<tr>
<td>Importance</td>
<td>--</td>
<td>.756**</td>
<td>.843**</td>
</tr>
<tr>
<td>Confidence</td>
<td>--</td>
<td>.866**</td>
<td></td>
</tr>
<tr>
<td>Readiness</td>
<td>--</td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

Note.  
Items:  
1) Importance: On a scale of 0 to 10, if 0 is not important at all and 10 is very important, how important it is for you to buckle-up each time you drive a vehicle?  
2) Confidence: On a scale of 1 to 10, if 0 is not confident at all and 10 is very confident, how confident are you that you can buckle-up each time you drive a vehicle?  
3) Readiness: On a scale of 0 to 10, if 0 is not ready at all and 10 is very ready, how ready you to buckle-up each time you drive a vehicle?  
* p < .05 level (2-tailed). ** p < .01 level (2-tailed).
Table 9.  
*Intercorrelations Between Importance, Confidence, and Readiness to Buckle-up in Each Passenger Instance for the Subgroup Sample (N = 57).*

<table>
<thead>
<tr>
<th>Items</th>
<th>Importance</th>
<th>Confidence</th>
<th>Readiness</th>
</tr>
</thead>
<tbody>
<tr>
<td>Importance</td>
<td>--</td>
<td>.655**</td>
<td>.711**</td>
</tr>
<tr>
<td>Confidence</td>
<td>--</td>
<td>--</td>
<td>.862**</td>
</tr>
<tr>
<td>Readiness</td>
<td>--</td>
<td>--</td>
<td>--</td>
</tr>
</tbody>
</table>

Note.
Items:
1) Importance: On a scale of 0 to 10, if 0 is not important at all and 10 is very important, how important it is for you to buckle-up each time you are a passenger in a vehicle?
2) Confidence: On a scale of 1 to 10, if 0 is not confident at all and 10 is very confident, how confident are you that you can buckle-up each time you are a passenger in a vehicle?
3) Readiness: On a scale of 0 to 10, if 0 is not ready at all and 10 is very ready, how ready you to buckle-up each time you are a passenger in a vehicle?

* $p < .05$ level (2-tailed). ** $p < .01$ level (2-tailed).

A priori Power Analysis

An a priori power analysis was conducted to determine an adequate sample size for the Main Study. G*Power 3 was used to conduct the analyses (Faul, Erdfelder, Lang, & Buchner, 2007). The research hypotheses selected for this analysis was:

H0: Mean aggregate driver safety-belt use will not differ by as much as one point between groups at follow-up.

H1: Mean aggregate driver safety-belt use will be at least one point greater in the Intervention group than in the Attention-Control group at follow-up.

The standard deviation used in the analysis was derived from what was found in sub-dataset analyses in the Pilot Study on this item: “Please think of the last ten times you drove a vehicle. In how many of these instances did you use your safety belt as described here…” ($M = 6.40, SD = 3.156$). A non-null hypothesis was selected to allow the researcher to detect a difference of one instance between group means at follow-up ($E.S. = .32$) using a one-way, one-tailed ANOVA. The research hypothesis is that the mean number of instances participants report buckling up in when a driver in the Intervention group will be one instance higher than in the
Attention-Control group. Power was set at .80 (alpha = .05), and the researcher planned to have a 95% chance of observing this difference at follow-up if it existed. Observing these parameters, G*Power 3 (Faul et al., 2007) suggested a sample size of 244 with two groups of 122 would be sufficient. Summary information for the statistical power analysis to compute adequate sample size is provided in Table 10.

**Table 10.**

**Summary Information for the Statistical Power Analysis to Compute Adequate Sample Size.**

<table>
<thead>
<tr>
<th>Test</th>
<th>Sample Size</th>
<th>Test Size</th>
<th>Power</th>
<th>Effect Size</th>
<th>Variation</th>
</tr>
</thead>
<tbody>
<tr>
<td>T-test</td>
<td>244</td>
<td>.05</td>
<td>.80</td>
<td>.32 (=7.4 - 6.4/3.156)</td>
<td>3.156</td>
</tr>
</tbody>
</table>

**Discussion**

The Pilot Study was conducted to prepare for the Main Study. These data from the sub-dataset suggested the feasibility of using the new measures described above for the Main Study given the primary purpose of the intervention study was to test the feasibility and efficacy of a new intervention through the use of a randomized, attention-controlled design.

However, based on results of the Pilot Study, the researcher decided to exclude the opinions and attitudes about safety-belt use measure and the opinions and attitudes about safety-belt use laws and enforcement measure in the Main Study as these measures had relatively lower inter-item reliability when compared to measures of motivation. Also, the measures to be excluded contained constructs not directly relevant to the specific aim of the intervention study: to change self-reported safety-belt use and concordant report of motivation to buckle-up and ask others to do the same, including readiness (a construct suggesting strength of intention and commitment).

Very high levels of internal consistency among new measures of motivation suggested their promise as measures to be used and explored further the Main Study. Further, it was
decided that two additional measures of motivation (i.e., importance, confidence, and readiness) were to be added in the Main Study to measure participants’ motivation to ask others to buckle-up: (1) motivation to ask passengers to buckle-up when participants are drivers and (2) motivation to ask other passengers to buckle-up when participants are also passengers. Underlying assumptions, based on the Theory of Planned Behavior and Cognitive Dissonance Theory are that intentions and commitment are associated with verbal report of safety-belt use behavior (Fishbein & Ajzen, 1975).

The results of the a priori power analyses conducted in this study provided guidance for planning the number of participants needed to find the smallest difference in driver safety-belt use between groups if one exists in the Main Study.

Main Study: Developing and Testing a Web-Based Assessment and Intervention to Promote Safety-Belt Use on a University Campus

The Main Study aimed to increase self-reported safety-belt use and concordant verbal report of motivation and commitment (intention) to buckle-up and ask others to do the same. To this end, the Main Study implemented and evaluated the assessment and intervention materials developed in the Pilot Study with a design attempting to minimize threats to internal validity while focusing on the isolation of distinct effects of MI-consistent assessment alone and MI-consistent assessment plus feedback in combination. Overall, it was thought that self-reported safety-belt use as well as motivation to buckle-up would increase in both groups due to the awareness-raising effects of participating in an MI-consistent assessment process. Further, it was thought that said increases would be significantly higher among those who received personalized feedback regarding assessment findings than those who did not. Additionally, it was thought tha
that the proportion of participants who committed (intention) to buckle-up and ask others to do the same would be higher among those who received feedback than those who did not.

Design

Student drivers who buckled-up ≤70% of the time and who met other eligibility requirements were enrolled in a within-subjects, randomized, attention-controlled design. At baseline, each participant completed a web-based assessment of: (1) demographics; (2) driving behaviors, and (3) social cognitive and motivational variables including knowledge, perceived importance, confidence (self-efficacy), and readiness to buckle-up. Participants were then randomly assigned to one of two groups: (1) an Attention-Control group receiving general nutrition information via email or (2) an Intervention group (e.g., motivational interviewing-consistent feedback group) receiving an emailed attachment with personalized feedback. Dependent variables were re-assessed approximately ten days after materials were emailed in a follow-up assessment. Recruitment, baseline assessment, intervention, and follow-up assessment were conducted via the Internet.

Exploratory Hypotheses

Safety-Belt Use

The main research hypotheses for the Main Study related to the difference in safety-belt use between baseline and follow-up assessments. First, it was hypothesized drivers’ safety-belt use will be higher at follow-up than at baseline for those who received personalized feedback (H1) as well as those who received general nutrition information (H2) due to awareness-raising assessment effects and any effect of intervention and or attention.

It was also hypothesized passengers’ safety-belt use will be higher at follow-up than at baseline for those who received personalized feedback (H3) as well as those who received
general nutrition information (H4) due to awareness-raising assessment effects and any effect of intervention and or attention.

Although was hypothesized that safety-belt use would increase significantly within both groups, due to awareness-raising assessment effects and any effect of intervention and or attention, it was also hypothesized that group assignment will be significantly associated with increases in driver belt use (increase ≥1 instance/s) (H5) and passenger belt use (H6) between baseline and follow-up. More specifically, those who received personalized feedback will be more likely to increase driver and passenger belt use by ≥1 instance/s between baseline and follow-up.

Motivation to Buckle-Up and Ask Others to do the Same

Additional hypotheses relate to within-participant increases in motivation (e.g., importance, confidence, and readiness) from baseline to follow-up points among participants who received personalized feedback and participants who received general nutrition information. Other hypotheses relate to between-participant levels of motivation at follow-up in relation to group assignment.

Participants who received personalized feedback. For participants who received personalized feedback, it was hypothesized that motivation ratings will be significantly higher at follow-up than at baseline due to assessment effects and the effects of personalized feedback. Importance (H7), confidence (H8), and readiness (H9) to buckle-up when driving will be higher at follow-up than at baseline. Importance (H10), confidence (H11), and readiness (H12) to buckle-up when riding as a passenger will be higher at follow-up than at baseline. Importance (H13), confidence (H14), and readiness (H15) to ask others to buckle-up when participants act as drivers will be higher at follow-up than at baseline. Further, importance (H16), confidence
(H17), and readiness (H18) to ask other passengers to buckle-up when participants act as passengers will be higher at follow-up than at baseline.

*Participants who received general nutrition information.* For participants who received general nutrition information, it was hypothesized that motivation ratings will be significantly higher at follow-up than at baseline due to assessment effects and the effects of attention. Importance (H19), confidence (H20), and readiness (H21) to buckle-up when driving will be higher at follow-up than at baseline. Importance (H22), confidence (H23), and readiness (H24) to buckle-up when riding as a passenger will be higher at follow-up than at baseline. Importance (H25), confidence (H26), and readiness (H27) to ask others to buckle-up when participants act as drivers will be higher at follow-up than at baseline. Further, importance (H28), confidence (H29), and readiness (H30) to ask other passengers to buckle-up when participants act as passengers will be higher at follow-up than at baseline.

*Comparison of follow-up levels of motivation between groups.* It was hypothesized that follow-up ratings of motivational dependent variables will be significantly higher among those who received personalized feedback than those who received general nutrition information due to the added effects of personalized feedback above and beyond assessment and attention. Follow-up levels of importance (H31), confidence (H32), and readiness (H33) to buckle-up when driving will be greater among those who received personalized feedback versus general nutrition information. Follow-up levels of importance (H34), confidence (H35), and readiness (H36) to buckle-up when riding as a passenger will be greater among those who received personalized feedback versus general nutrition information. Follow-up levels of importance (H37), confidence (H38), and readiness (H39) to ask passengers to buckle-up when participants act as drivers will be greater among those who received personalized feedback versus general nutrition information.
Further, follow-up levels of importance (H40), confidence (H41), and readiness (H42) to ask other passengers to buckle-up when participants act as passengers will be greater among those who received personalized feedback versus general nutrition information.

**Commitment**

Further hypotheses related to participants’ stated commitment (intention) to buckle-up 100% of the time and ask others to do the same when queried at follow-up. It was hypothesized the proportion of participants who committed to buckling-up 100% of the time when acting as drivers (H43) and as passengers (H44) will be higher among those who received personalized feedback than those who received general nutrition information. Further, it was hypothesized the proportion of participants who committed to ask their passengers to buckle-up when participants act as drivers (H45) will be higher among those who received personalized feedback than those who received general nutrition information. Further, the proportion of participants who committed to ask their passengers to buckle-up when participants act as fellow passengers (H46) will be higher among those who received personalized feedback than those who received general nutrition information.

**Dependent Variables**

**Safety-Belt Use**

The main dependent variables of interest were safety-belt use for drivers and passengers. Reported safety-belt use was measured on a 0-10 scale.

**Motivation**

Additional dependent variables of interest were the motivational variables of: importance, confidence, and readiness to buckle-up as a driver and as a passenger as well as asking others to
buckle-up when participants are drivers and passengers. Motivational variables were measured on a 0-10 scale.

**Commitment**

Additional dependent variables were: commitment to buckle-up 100% of the time as a driver, commitment to buckle-up 100% of the time as a passenger, commitment to ask others to buckle-up 100% of the time when participants are drivers, and commitment to ask others to buckle-up 100% of the time when participants are passengers. Commitment variables were dichotomous (i.e., yes/no).

**Independent Variables**

Independent variables were "groups" as described below (i.e., Intervention group/personalized feedback and Attention-Control group/general nutrition information). Group was measured dichotomously.

**Intervention Group**

Members of the Intervention group received personalized feedback via an emailed PDF document. The researcher adapted the MI-Consistent feedback template used in Project Balance (Ingersoll, Ceperich, Nettleman, Karanda, Brocksen, & Johnson, 2005). The template was designed to blend and present information gathered from each participant's baseline assessment with supplemental education about safety-belt use among similar others (i.e., Virginia Tech students) and actual risk for injury and or death based on population studies.

In an MI-consistent format, the feedback provided information on: (1) frequency of the target behavior (e.g., safety-belt use); (2) motivation to buckle-up and or ask others to do the same in various situations; (3) normative comparison of target behavior; (4) reasons against
change or “pros/cons” of change; (5) personal risks, and (6) a menu of options. A sample personalized feedback is included in Appendix D.

**Attention-Control Group**

Members of the Attention-Control group received general nutrition information via an emailed web link. [http://www.health.gov/dietaryguidelines/dga2005/document/pdf/brochure.pdf](http://www.health.gov/dietaryguidelines/dga2005/document/pdf/brochure.pdf) (U.S.D.H.H.S., 2005). This information was sent in effort to control for possible effects of attention. Therefore, conclusions about differences in dependent variables between groups could be linked to whether participants received assessment plus personalized feedback (Intervention group) or assessment only (Attention-Control group). A sample of the general nutrition information is included in Appendix D.

**Methods**

**Sample**

Undergraduate students enrolled in psychology courses offering extra credit for participation in research studies at VT were eligible to enroll. Virginia Tech is a large regional public university located in Blacksburg, VA (pop. 39,500). There are approximately 26,000 students enrolled at VT. According to the parking services department of VT, 11,590 parking permits were issued to undergraduate students for the 2007-2008 academic year.

**Recruitment Procedures**

During the spring semester of 2008, undergraduate students in psychology courses in which instructors permitted participation in research studies for extra credit points were eligible to request a screening for this study via the Sona Experiment Management System (Sona) (https://vt-psyc.sona-systems.com/). Recruitment was conducted on a rolling basis from April 1, 2008 through April 30, 2008. Following sign-up via Sona, students were directed via instructions
on Sona to the web-based survey system (www.surveymonkey.com) to complete the eligibility questionnaire which can be viewed in Appendix C.

Informed consent. Those who screened eligible for participation were directed to a webpage that provided information about Main Study and an opportunity to provide informed consent. Those who screened ineligible were directed to a "thank you" screen and given one point of extra credit for screening. The informed consent text is provided in Appendix B. Those who provided informed consent via electronic signature were reminded of the participant responsibilities and directed to complete the baseline assessment.

Random Assignment to Groups

As participants enrolled in the study and completed baseline assessment on a rolling basis, the researcher assigned a number to each participant (for purposes of identification) and randomly assigned each individual to one of two experimental groups within one week following completion of the baseline assessment. More specifically, using a free Internet "randomizer" called GraphPad (http://www.graphpad.com/quickcalcs/randomize2.cfm), each participant was randomly assigned to one of two groups: (1) the Intervention group that received personalized feedback or (2) the Attention-Control group that received general nutrition information.

Within one week of randomization, participants who were randomly assigned to the Intervention group were emailed a PDF document containing personalized feedback and those who were randomly assigned to the Attention-Control group were emailed the previously described website link containing general nutrition information. The researcher did not view or employ the use of participants' names and or any other identifying information, beyond the email address provided by the participants at baseline.
Measures and Assessment Procedures

Specific measures are described here. All measures are included in Appendix C.

Eligibility questionnaire. This questionnaire determined eligibility prior to study entry. Eligibility requirements included: (1) current VT student status; (2) driving or riding in a vehicle \( \geq 5 \) instances per week; (3) buckling-up in seven or less instances out of past ten instances of driving or riding in a vehicle, and (4) age \( \geq 18 \).

Demographics. Demographic variables that have previously been associated with safety-belt use and non-use were assessed (NHTSA, 2003). Specific variables of interest were: age, gender, urbanization, vehicle type, and geographic region.

Safety-belt use in the past ten instances as a driver and a passenger. Safety-belt use was measured by asking respondents to indicate the number of times they buckled-up in the past ten instances (0 -10 scale). This was measured separately for the past ten driving instances and the past ten passenger instances. The term “instance” was explicitly described.

Motivation: importance, confidence, and readiness rulers. Previous interventions using assessment and tailored feedback for specific behaviors have assessed motivational constructs of perceived importance, confidence, and readiness with the Importance, Confidence, and Readiness Rulers (Miller & Rollnick, 2002). While these “rulers” are typically measured on visual analogue scales ranging from 0-100, they have been adapted for to fit the target behavior and limited to an 11-point Likert scale to depict the participant’s judgment of: (1) the importance of safety-belt use as a driver, their confidence they can buckle-up in each driving instance, and their readiness to buckle-up in each driving instance; (2) the importance of safety-belt use as a passenger, their confidence they can buckle-up in each passenger instance, and their readiness to buckle-up in each passenger instance; (3) the importance of asking passengers to buckle-up in
situations when they are the driver, their confidence to make that request, and their readiness to make that request; and (4) the importance of asking other passengers to buckle-up in situations when they are also a passenger, their confidence to make that request, and their readiness to make that request.

**Situational temptation and confidence.** Self-efficacy refers to the belief one can carry out and succeed at a given behavior (Bandura, 1982). In accordance with other AMIs, a measure of situational temptation and confidence assessed the confidence the participant has that he/she can buckle-up across difficult situations and their temptation not to buckle-up in those situations as well as temptation and confidence to ask others to buckle-up when a driver and a passenger (Miller & Rollnick, 2002). This measurement tool has been adapted by this researcher for use regarding safety-belt use behavior and was included for the purely clinical reason of preparing the feedback for participants in the personalized feedback group.

**Decisional balance.** An assessment and or intervention activity, known as the decisional balance exercise (Miller & Rollnick, 2002) assessed each participant's view of the pros and cons of using a vehicle safety belt. This clinical tool was adapted for use with safety-belt use to ask the participant the “good things and the not-so-good things” about buckling-up each time he/she drives, as well as the “good things and the not-so good things” about increasing safety-belt use. This measurement tool was included for the purely clinical reason of preparing the feedback for participants in the personalized feedback group.

**Perceived risk.** Participant’s perceived risk of harm from not using safety belts on a regular basis was assessed. This was assessed to prepare the feedback for participants in in personalized feedback group.
Exposure to enhanced enforcement efforts. A measure of the participant’s exposure to other interventions was used. The measure assessed exposure to broad enhanced enforcement campaigns (e.g., CIOT advertising campaigns and roadside interventions), VT safety-belt use promotion interventions, and enforcement incidents (i.e., citation for non-use). This was assessed to prepare the feedback for participants in the personalized feedback group and to gather data for a secondary project.

Commitment and intention to buckle-up. During the follow-up assessment, participants were asked to indicate their commitment and intention (yes/no) to: (1) always buckle-up when driving, always buckle-up when riding as a passenger, always ask others to buckle-up when participants are driving vehicles, always ask others to buckle-up when participants are riding as passengers in vehicles.

Measures occurred at three distinct points in time depending on the purpose of the measurement. Table 11 displays when measures were used. Some measures assessed dependent variables and were used for outcome analyses to assess changes in self-reported safety-belt use behavior and motivation (importance, confidence, and readiness). Other measures administered at baseline only were used only for the purposes of gathering information to create personalized feedback for participants randomly assigned to the personalized feedback group.
Table 11. 
Assessment Schedule.

<table>
<thead>
<tr>
<th>Measure</th>
<th>Eligibility Questionnaire</th>
<th>Baseline</th>
<th>Follow-up</th>
<th>Scale of Measurement</th>
</tr>
</thead>
<tbody>
<tr>
<td>Eligibility Questionnaire</td>
<td>✓</td>
<td></td>
<td></td>
<td>*</td>
</tr>
<tr>
<td>Demographics</td>
<td>✓</td>
<td>✓</td>
<td></td>
<td>*</td>
</tr>
<tr>
<td>Safety-Belt Use in the Past 10 Instances</td>
<td>✓</td>
<td>✓</td>
<td></td>
<td>0 - 10</td>
</tr>
<tr>
<td>as a Driver and as a Passenger</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Importance, Confidence, &amp; Readiness Rulers</td>
<td>✓</td>
<td>✓</td>
<td></td>
<td>0 - 10</td>
</tr>
<tr>
<td>Situational Temptation &amp; Confidence</td>
<td>✓</td>
<td></td>
<td></td>
<td>**</td>
</tr>
<tr>
<td>Decisional Balance</td>
<td>✓</td>
<td></td>
<td></td>
<td>**</td>
</tr>
<tr>
<td>Perceived Risk</td>
<td>✓</td>
<td></td>
<td></td>
<td>**</td>
</tr>
<tr>
<td>Exposure to Enhanced Enforcement Efforts</td>
<td>✓</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Commitment/Intention to Buckle-Up</td>
<td>✓</td>
<td>✓</td>
<td></td>
<td>Yes/No</td>
</tr>
</tbody>
</table>

* This measure used multiple measurement scales and data were not compared between baseline and follow-up. Scale of measurement is not relevant.

** This measure was used for clinical purposes of preparing feedback only therefore data were not compared between baseline and follow-up. Scale of measurement is not relevant.

**Baseline assessment procedures.** Immediately following provision of a web-based signature during the informed consent process, participants were directed to the baseline assessment on www.surveymonkey.com where baseline measures were delivered in one survey. The baseline assessment took approximately 10 to 20 minutes to complete. Participants were granted one point of extra credit for completing the baseline assessment.

**Follow-up assessment procedures.** Approximately ten days after the emailed attachment was sent, the researcher emailed each participant, prompting them to log back onto www.surveymonkey.com to complete the post-test assessment (referred to as the follow-up assessment), which included all dependent variables. Two to three days later, the researcher sent an additional email two to three days later if the participant had not yet complied with the prompt. This assessment took approximately ten minutes for participants to complete. Participants were granted one point of extra credit for completing the follow-up assessment.
Security and data management procedures. Given the web-based nature of this study, steps were taken to protect each participant's privacy. Identifying information was kept in a password-protected file, separate from participants' responses to the assessments. The password-protected file containing their identifying information will be destroyed three years after participation in this study as per VT Institutional Review Board policy. Participants were assigned a unique identifying number associated with responses.

Participants were encouraged to utilize free, anonymous email providers such as Yahoo (http://mail.yahoo.com) or Hotmail (http://www.hotmail.com). They were instructed to properly exit or close their Internet browser when finished with the assessments to protect against outside parties viewing responses. A professional and encrypted subscription to the survey application (surveymonkey.com) was purchased for this study. Survey Monkey uses Secure Sockets Layer (SSL) to encrypt all surveys. SSL is used for transmitting information privately over the Internet. Many corporations and academic institutions require SSL when collecting data. SSL is supported in all modern browsers. For the purposes of analyses, data were downloaded from Survey Monkey into Excel spreadsheets retaining no identifying information. In these spreadsheets, participants were identifiable only by a unique identifying number. Subsequently, these de-identified data were imported into SPSS 17.0 for analyses.

Analyses

Overall, analyses sought to evaluate, using a two-arm randomized controlled trial, the effects of the independent variables (personalized feedback versus general nutrition information) on participants’ safety-belt use including: (1) safety-belt use when a driver and (2) safety-belt use when a passenger. Additional aims focused on evaluating the effects of the independent variables (personalized feedback versus general nutrition information) on participants’ motivation
including: (3) motivation to buckle-up when a driver; (4) motivation to buckle-up when a passenger; (5) motivation to ask passengers to buckle-up when a driver; (6) motivation to ask passengers to buckle-up when a passenger.

Further aims focused on evaluating the effects of the independent variables (personalized feedback versus general nutrition information) on participants’ commitment including: (7) commitment to buckle-up 100% of the time a driver; (8) commitment to buckle-up 100% of the time when a passenger; (9) commitment to ask their passengers to buckle-up 100% of the time when participants a driver themselves, and (10) commitment to ask fellow passengers to buckle-up 100% of the time when a passenger themselves. Specific hypotheses were described above.

Data were imported from a web survey site (www.surveymonkey.com) into Microsoft Excel. Then, data were imported into a database built with SPSS 17.0 statistical analyses software system for Mac computers in which data were analyzed. First, continuously arrayed data (i.e., safety-belt use and motivational variables) were explored to determine appropriate statistical tests.

Specifically, the data were explored to determine the appropriateness of using parametric statistics, such as ANOVA—as was planned during the power analyses to determine appropriate sample size in the Pilot Study. Assumptions of parametric tests include: (1) normally distributed data; (2) homogeneity of variance; (3) interval distributions, and (4) independence. To determine if these assumptions were met, data were first examined via histograms and because the first assumption of normality was violated, a decision was made to use non-parametric statistics to analyze continuously arrayed data. Descriptive statistics, including skewness and kurtosis statistics are provided in Table 13.
Due to the negatively-skewed distribution of these data, median values will be given when reporting results of non-parametric tests. Medians values are widely considered to be more appropriate values of central tendency (as opposed to mean values) when data are not normally distributed (Field, 2005).

Baseline characteristics of all participants, participants in the Attention-Control group, participants in the Intervention group, participants who completed the follow-up session (e.g., completers), and participants who did not complete the follow-up session (e.g., non-completers), were summarized and described in Table 12 and 13. Summary and descriptive statistics included: means, standard deviations and medians for continuous variables and frequency distributions for categorical variables.

To examine potential sources of bias, baseline characteristics of participants in the Attention Control and the Intervention group were compared as were baseline characteristics of those who completed follow-up assessment versus those who did not. Second, baseline data were analyzed to assess any significant differences between intervention and control groups. Chi Square tests were used for categorical data. Non-parametric tests (Mann-Whitney and Wilcoxon rank-sum tests) were used for continuous data. Mann-Whitney and Wilcoxon rank sum tests are used to compare two groups in which different people participated; these tests are the equivalent of the independent t-test for non-parametric data.

Outcome analyses investigated the above-mentioned hypotheses. Non-parametric tests were used including the: Mann-Whitney test, Wilcoxon rank sum test, and Wilcoxon signed-rank test. The Wilcoxon signed-rank test is a non-parametric equivalent to the dependent t-test for non-parametric data to allow comparison of baseline and follow-up values within subjects for repeated measures data. Categorically arrayed data were evaluated with Chi-Square tests.
More specifically, Hypotheses 1-4 were evaluated using the Wilcoxon signed-rank test. Hypotheses five and six were evaluated using Chi-Square tests. Wilcoxon signed-rank tests were used to evaluate Hypotheses 7 - 30. Mann-Whitney tests were used to evaluate Hypotheses 31 - 42 and Chi-square tests were used to evaluate Hypotheses 43 - 46.

Chi-square analyses were conducted to determine whether rates of attrition differed by experimental group. Further, in instances where analyses compared values from baseline and follow-up points, analyses were performed twice. First, analyses were performed using data from completers (see section titled “Outcomes: Completers”). Also, analyses were performed using data from the entire sample, including non-completers, with an intent-to-treat (ITT) approach (see section titled “Outcomes: Intent-to-Treat”).

ITT protects against threats to validity from attrition where all “drop-outs” are considered to have negative or neutral outcomes (Eysenbach, 2005). This approach is thought to protect against overestimation of the intervention’s effectiveness. The ITT approach includes data from all participants who were randomly assigned to groups, regardless of whether or not they actually complete the intervention and or follow-up assessment. Thus, participants’ baseline data were used as their follow-up assessment data in cases where there were repeated measures in a “last observation carried forward” process. Intent-to-Treat analyses has been widely used in similarly designed RCTs comparing Internet intervention effects among two or more groups using a repeated measure design (e.g., Cobb, Graham, Bock, Papandonatos, & Abrams, 2005; Etter, 2005; Ondersma et al., 2007; Tate, Jackvony, & Wing, 2006; Tate, Jackvony, & Wing, 2003; Tate, Wing, & Winett, 2001).
Results

Participation Flow

A total of 1059 students completed the online eligibility questionnaire. Of those, 173 were randomly assigned to the Intervention group and 174 were randomly assigned to the Attention-Control group. 276 participants completed the follow-up assessment and included in the analyses of completer data. All 347 were included in the ITT analyses. The flow of participants is displayed graphically in Figure 2.

![Figure 2. Participation flow.](image)

Participant Demographics

A description of demographic characteristics gathered at baseline for all randomized participants, completers, and non-completers is provided in Table 12. There were no significant demographic differences between completers and non-completers. A description of demographic characteristics of both treatment groups is provided in Table 13. There were no significant demographic differences between treatment groups at baseline.
Table 12.
**Demographic Characteristics Between All Randomized, Completers, and Non-Completers.**

<table>
<thead>
<tr>
<th>Variable</th>
<th>All Randomized (N = 347)</th>
<th>Completers (N = 276)</th>
<th>Non-Completers (N = 71)</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Age [years, M (SD)]</strong></td>
<td>19.4 (1.268)</td>
<td>19.4 (1.302)</td>
<td>19.5 (1.130)</td>
</tr>
<tr>
<td><strong>Gender [n (%)]</strong></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Men</td>
<td>156 (45)</td>
<td>122 (44.2)</td>
<td>34 (47.9)</td>
</tr>
<tr>
<td>Women</td>
<td>191 (55)</td>
<td>154 (55.8)</td>
<td>37 (52.1)</td>
</tr>
<tr>
<td><strong>Home Type [n (%)]</strong></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Dormitory</td>
<td>195 (56.2)</td>
<td>154 (55.8)</td>
<td>41 (57.7)</td>
</tr>
<tr>
<td>House or Apartment</td>
<td>152 (43.8)</td>
<td>122 (44.2)</td>
<td>30 (42.3)</td>
</tr>
<tr>
<td><strong>Vehicle Registration [n (%)]</strong></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Virginia</td>
<td>258 (74.4)</td>
<td>208 (75.4)</td>
<td>50 (70.4)</td>
</tr>
<tr>
<td>Not Virginia</td>
<td>89 (25.6)</td>
<td>68 (24.6)</td>
<td>21 (29.4)</td>
</tr>
<tr>
<td><strong>Rurality [n (%)]</strong></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Rural Hometown</td>
<td>74 (21.3)</td>
<td>60 (21.7)</td>
<td>14 (19.7)</td>
</tr>
<tr>
<td>Suburban Hometown</td>
<td>222 (64)</td>
<td>175 (63.4)</td>
<td>47 (66.2)</td>
</tr>
<tr>
<td>Urban Hometown</td>
<td>51 (14.7)</td>
<td>41 (14.9)</td>
<td>10 (14.1)</td>
</tr>
<tr>
<td><strong>Type of Vehicle [n (%)]</strong></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Passenger Car</td>
<td>238 (68.6)</td>
<td>189 (68.5)</td>
<td>49 (69)</td>
</tr>
<tr>
<td>Sports Utility Vehicle</td>
<td>90 (25.9)</td>
<td>70 (25.4)</td>
<td>20 (28.2)</td>
</tr>
<tr>
<td>Pick-up Truck</td>
<td>19 (5.5)</td>
<td>17 (6.2)</td>
<td>2 (2.8)</td>
</tr>
</tbody>
</table>

Table 13.
**Demographic Characteristics of Both Groups.**

<table>
<thead>
<tr>
<th>Variable</th>
<th>General nutrition information (N = 174)</th>
<th>Personalized Feedback (N = 173)</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Age [years, M (SD)]</strong></td>
<td>19.35 (1.239)</td>
<td>19.34 (1.3)</td>
</tr>
<tr>
<td><strong>Gender [n (%)]</strong></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Men</td>
<td>75 (43.1)</td>
<td>81 (46.8)</td>
</tr>
<tr>
<td>Women</td>
<td>99 (56.9)</td>
<td>92 (53.2)</td>
</tr>
<tr>
<td><strong>Home Type [n (%)]</strong></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Dormitory</td>
<td>94 (54)</td>
<td>101 (58.4)</td>
</tr>
<tr>
<td>House or Apartment</td>
<td>80 (46)</td>
<td>72 (41.6)</td>
</tr>
<tr>
<td><strong>Vehicle Registration [n (%)]</strong></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Virginia</td>
<td>132 (75.9)</td>
<td>126 (72.8)</td>
</tr>
<tr>
<td>Not Virginia</td>
<td>42 (24.1)</td>
<td>47 (27.2)</td>
</tr>
<tr>
<td><strong>Rurality [n (%)]</strong></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Rural Hometown</td>
<td>29 (16.7)</td>
<td>45 (26)</td>
</tr>
<tr>
<td>Suburban Hometown</td>
<td>122 (70.1)</td>
<td>100 (57.8)</td>
</tr>
<tr>
<td>Urban Hometown</td>
<td>23 (13.2)</td>
<td>28 (16.2)</td>
</tr>
<tr>
<td><strong>Type of Vehicle [n (%)]</strong></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Passenger Car</td>
<td>120 (69)</td>
<td>118 (68.2)</td>
</tr>
<tr>
<td>Sports Utility Vehicle</td>
<td>44 (25.3)</td>
<td>46 (26.6)</td>
</tr>
<tr>
<td>Pick-up Truck</td>
<td>10 (5.7)</td>
<td>9 (5.2)</td>
</tr>
</tbody>
</table>

**Sources of Bias Between Groups**

No statistically significant differences were found between baseline characteristics of participants in the Attention-Control and the Intervention group with one exception. Among all participants who were randomized and included in the ITT analyses, participants in the Attention-Control group had significantly higher median ratings of importance to ask others to
buckle-up as a driver ($Mdn = 7$) than those in the Intervention group ($Mdn = 6$), $z = -2.585, p < .05$. No statistically significant differences were found between baseline characteristics of those who completed follow-up assessment versus those who did not.

**Summary of Hypotheses Testing Results**

A summary of hypotheses testing results are presented in Table 14. More specifically, hypotheses numbers and results (supported or not) are provided for each analyses. Narrative descriptions of hypotheses are presented on pages 41 – 44. Narrative descriptions of results follow in outcomes sections for completers and the ITT sample.

**Table 14.**

**Summary of Hypotheses Testing Results: Both Analyses**

<table>
<thead>
<tr>
<th>Hypotheses</th>
<th>Completer Analysis ($N = 347$)</th>
<th>ITT Analysis ($N = 276$)</th>
</tr>
</thead>
<tbody>
<tr>
<td>H1</td>
<td>+</td>
<td>+</td>
</tr>
<tr>
<td>H2</td>
<td>+</td>
<td>+</td>
</tr>
<tr>
<td>H3</td>
<td>+</td>
<td>+</td>
</tr>
<tr>
<td>H4</td>
<td>+</td>
<td>+</td>
</tr>
<tr>
<td>H5</td>
<td>-</td>
<td>-</td>
</tr>
<tr>
<td>H6</td>
<td>+</td>
<td>-</td>
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<tr>
<td>H7</td>
<td>+</td>
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</tr>
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<td>H8</td>
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<tr>
<td>H16</td>
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<td>+</td>
</tr>
<tr>
<td>H17</td>
<td>+</td>
<td>+</td>
</tr>
<tr>
<td>H18</td>
<td>+</td>
<td>+</td>
</tr>
<tr>
<td>H19</td>
<td>-</td>
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<td>-</td>
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</tr>
<tr>
<td>H22</td>
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</tr>
<tr>
<td>H23</td>
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<td>-</td>
</tr>
<tr>
<td>H24</td>
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</tr>
<tr>
<td>H30</td>
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</tr>
<tr>
<td>H31</td>
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</tr>
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<td>H32</td>
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<td>H34</td>
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</table>
Table 14., cont.

Summary of Hypotheses Testing Results: Both Analyses

<table>
<thead>
<tr>
<th>Hypotheses</th>
<th>Completer Analysis (N = 347)</th>
<th>ITT Analysis (N = 276)</th>
</tr>
</thead>
<tbody>
<tr>
<td>H35</td>
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<tr>
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<td>H45</td>
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</tr>
<tr>
<td>H46</td>
<td>-</td>
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</tr>
</tbody>
</table>

+ supported hypotheses
- failed to support hypothesis

Outcomes: Completers

Descriptive statistics (i.e., means, standard deviations, medians, range, skewness, and kurtosis) with regard to the dependent variables: (1) driver safety-belt use; (2) passenger safety-belt use; (3) motivation to buckle-up as a driver; (4) motivation to buckle-up as a passenger; (5) motivation to ask others to buckle-up when acting as a driver; (6) motivation to ask others to buckle-up when acting as a passenger are presented in Table 15.

Table 15.

Descriptive Statistics of Dependent Variables Among Completers: Baseline and Follow-up

<table>
<thead>
<tr>
<th>Variable</th>
<th>General nutrition information (N = 145)</th>
<th>Personalized feedback (N = 131)</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>Baseline</td>
<td>Follow-up</td>
</tr>
<tr>
<td>Driver Safety-Belt Use in Past 10 Instances [instances, M (SD)]</td>
<td>6.18 (3.03)</td>
<td>6.8 (2.83)</td>
</tr>
<tr>
<td>Median</td>
<td>7</td>
<td>8</td>
</tr>
<tr>
<td>Range</td>
<td>10</td>
<td>10</td>
</tr>
<tr>
<td>Kurtosis</td>
<td>-8.23</td>
<td>-.46</td>
</tr>
<tr>
<td>Skewness</td>
<td>-.44</td>
<td>-.74</td>
</tr>
<tr>
<td>Passenger Safety-Belt Use in Past 10 Instances [instances, M (SD)]</td>
<td>4.87 (2.33)</td>
<td>6.07 (2.79)</td>
</tr>
<tr>
<td>Median</td>
<td>5</td>
<td>7</td>
</tr>
<tr>
<td>Range</td>
<td>10</td>
<td>10</td>
</tr>
<tr>
<td>Kurtosis</td>
<td>-5.4</td>
<td>-.71</td>
</tr>
<tr>
<td>Skewness</td>
<td>-.22</td>
<td>-.45</td>
</tr>
<tr>
<td>Importance: Buckle-Up as a Driver [score, M (SD)]</td>
<td>8.1 (2.2)</td>
<td>8.39 (2.13)</td>
</tr>
<tr>
<td>Median</td>
<td>9</td>
<td>9</td>
</tr>
<tr>
<td>Range</td>
<td>9</td>
<td>8</td>
</tr>
<tr>
<td>Kurtosis</td>
<td>1.05</td>
<td>.87</td>
</tr>
<tr>
<td>Skewness</td>
<td>-1.20</td>
<td>-1.33</td>
</tr>
</tbody>
</table>
Table 15, cont.

*Descriptive Statistics of Dependent Variables Among Completers: Baseline and Follow-up*

<table>
<thead>
<tr>
<th>Variable</th>
<th>General nutrition information ((N = 145))</th>
<th>Personalized feedback ((N = 131))</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>Baseline Follow-up</td>
<td>Baseline Follow-up</td>
</tr>
<tr>
<td>Confidence: Buckle-Up as a Driver ([score, M (SD)])</td>
<td>8.35 (2.29) 8.26 (2.24)</td>
<td>8.5 (1.98) 8.68 (1.93)</td>
</tr>
<tr>
<td>Median</td>
<td>10 9</td>
<td>9 10</td>
</tr>
<tr>
<td>Range</td>
<td>10 10</td>
<td>9 9</td>
</tr>
<tr>
<td>Kurtosis</td>
<td>1.67 1.46</td>
<td>2.05 1.90</td>
</tr>
<tr>
<td>Skewness</td>
<td>-1.5 -1.36</td>
<td>-1.53 -1.56</td>
</tr>
<tr>
<td>Readiness: Buckle-Up as a Driver ([score, M (SD)])</td>
<td>8.03 (2.07) 8.1 (2.09)</td>
<td>7.95 (2.09) 8.37 (2.19)</td>
</tr>
<tr>
<td>Median</td>
<td>9 9</td>
<td>8 9</td>
</tr>
<tr>
<td>Range</td>
<td>10 8</td>
<td>10 10</td>
</tr>
<tr>
<td>Kurtosis</td>
<td>1.11 -1.15</td>
<td>1.09 2.91</td>
</tr>
<tr>
<td>Skewness</td>
<td>-1.12 -0.96</td>
<td>-1.11 -1.69</td>
</tr>
<tr>
<td>Importance: Buckle-Up as a Passenger ([score, M (SD)])</td>
<td>7.34 (2.31) 7.88 (2.20)</td>
<td>7.44 (2.13) 8.25 (2.02)</td>
</tr>
<tr>
<td>Median</td>
<td>8 9</td>
<td>7 9</td>
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<tr>
<td>Range</td>
<td>10 9</td>
<td>10 10</td>
</tr>
<tr>
<td>Kurtosis</td>
<td>0.88 0.18</td>
<td>0.546 2.20</td>
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<tr>
<td>Skewness</td>
<td>-0.97 -0.94</td>
<td>-0.70 -1.4</td>
</tr>
<tr>
<td>Confidence: Buckle-Up as a Passenger ([score, M (SD)])</td>
<td>7.58 (2.10) 7.72 (2.15)</td>
<td>7.56 (1.96) 8.2 (2.03)</td>
</tr>
<tr>
<td>Median</td>
<td>8 8</td>
<td>8 9</td>
</tr>
<tr>
<td>Range</td>
<td>10 8</td>
<td>10 10</td>
</tr>
<tr>
<td>Kurtosis</td>
<td>-2.98 -0.51</td>
<td>-0.47 2.32</td>
</tr>
<tr>
<td>Skewness</td>
<td>-0.63 -0.92</td>
<td>-0.50 -1.47</td>
</tr>
<tr>
<td>Readiness: Buckle-Up as a Passenger ([score, M (SD)])</td>
<td>7.27 (1.97) 7.73 (2.15)</td>
<td>7.18 (2.19) 8.1 (2.11)</td>
</tr>
<tr>
<td>Median</td>
<td>7 8</td>
<td>7 9</td>
</tr>
<tr>
<td>Range</td>
<td>8 7</td>
<td>10 10</td>
</tr>
<tr>
<td>Kurtosis</td>
<td>-0.60 -0.59</td>
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</tr>
<tr>
<td>Skewness</td>
<td>-0.37 -0.64</td>
<td>-0.57 -1.5</td>
</tr>
<tr>
<td>Importance: Ask others to Buckle-Up as Driver ([score, M (SD)])</td>
<td>6.78 (2.96) 7.20 (2.6)</td>
<td>6.09 (3.09) 7.29 (2.35)</td>
</tr>
<tr>
<td>Median</td>
<td>7 8</td>
<td>7 8</td>
</tr>
<tr>
<td>Range</td>
<td>10 10</td>
<td>10 10</td>
</tr>
<tr>
<td>Kurtosis</td>
<td>-0.52 -0.23</td>
<td>-0.84 -3.3</td>
</tr>
<tr>
<td>Skewness</td>
<td>-0.37 -0.85</td>
<td>-0.57 -6.1</td>
</tr>
<tr>
<td>Confidence: Ask others to Buckle-Up as Driver ([score, M (SD)])</td>
<td>6.5 (2.94) 6.94 (2.78)</td>
<td>5.92 (2.91) 7.31 (2.47)</td>
</tr>
<tr>
<td>Median</td>
<td>7 7</td>
<td>6 8</td>
</tr>
<tr>
<td>Range</td>
<td>10 10</td>
<td>10 9</td>
</tr>
<tr>
<td>Kurtosis</td>
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<tr>
<td>Skewness</td>
<td>-0.58 -0.70</td>
<td>-0.27 -6.8</td>
</tr>
<tr>
<td>Readiness: Ask others to Buckle-Up as Driver ([score, M (SD)])</td>
<td>6.34 (2.87) 6.71 (2.76)</td>
<td>5.91 (2.94) 7.03 (2.66)</td>
</tr>
<tr>
<td>Median</td>
<td>7 7</td>
<td>6 8</td>
</tr>
<tr>
<td>Range</td>
<td>10 10</td>
<td>10 10</td>
</tr>
<tr>
<td>Kurtosis</td>
<td>-0.73 -0.61</td>
<td>-0.85 -1.4</td>
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<tr>
<td>Skewness</td>
<td>-0.48 -0.46</td>
<td>-0.30 -0.79</td>
</tr>
</tbody>
</table>
Table 15., cont.

**Descriptive Statistics of Dependent Variables Among Completers: Baseline and Follow-up**

<table>
<thead>
<tr>
<th>Variable</th>
<th>General nutrition information (N = 145)</th>
<th>Personalized feedback (N = 131)</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>Baseline</td>
<td>Follow-up</td>
</tr>
<tr>
<td>Importance: Ask others to Buckle-Up as Passenger [score, M (SD)]</td>
<td>4.23 (2.81)</td>
<td>5.47 (2.83)</td>
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<tr>
<td>Median</td>
<td>4</td>
<td>6</td>
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<tr>
<td>Range</td>
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<tr>
<td>Kurtosis</td>
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<td>-.78</td>
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<tr>
<td>Skewness</td>
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<td>-.18</td>
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<tr>
<td>Confidence: Ask others to Buckle-Up as Passenger [score, M (SD)]</td>
<td>4.34 (2.94)</td>
<td>5.17 (2.98)</td>
</tr>
<tr>
<td>Median</td>
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<td>5</td>
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<td>Range</td>
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<tr>
<td>Kurtosis</td>
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<td>-.98</td>
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<tr>
<td>Skewness</td>
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<td>-.04</td>
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<tr>
<td>Readiness: Ask others to Buckle-Up as Passenger [score, M (SD)]</td>
<td>4.16 (2.75)</td>
<td>5.03 (2.90)</td>
</tr>
<tr>
<td>Median</td>
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<td>5</td>
</tr>
<tr>
<td>Range</td>
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</tr>
<tr>
<td>Kurtosis</td>
<td>-6.14</td>
<td>-93</td>
</tr>
<tr>
<td>Skewness</td>
<td>.243</td>
<td>-.01</td>
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</table>

**Safety-belt Use**

The Wilcoxon signed-rank test was used to test the main hypotheses: H1, H2, H3, and H4.

**Safety-belt use while driving within participants by group.** For participants who received personalized feedback (n = 131), the number of instances participants used safety belts when a driver was significantly higher at follow-up (Mdn = 8) than at baseline (Mdn = 6), z = -4.91, p < .001, r = -.21 as displayed in Table 16. This represents a small increase in drivers' safety-belt use. 75 participants buckled up in at least 1 additional instance at follow-up when compared to baseline. Belt use did not vary for 32 participants, and 24 reported decreased use.

For participants who received general nutrition information (n = 145), the number of instances participants used safety-belts when a driver was significantly higher at follow-up (Mdn = 8) than at baseline (Mdn = 7), z = -2.895, p < .05, r = -.12 as displayed in Table 16. This represents a small increase in drivers' safety-belt use. 75 participants buckled up in at least 1
additional instance at follow-up when compared to baseline. Belt use did not vary for 34 participants and 36 reported decreased use.

Safety-belt use while riding as passengers within participants by group. For participants who received personalized feedback \((n = 131)\), the number of instances participants used safety belts when a passenger was significantly higher at follow-up \((Mdn = 7)\) than at baseline \((Mdn = 5)\), \(z = -6.509, p < .001, r = -.28\) as displayed in Table 16. This represents a small increase in passengers’ safety-belt use. 91 participants buckled up in at least 1 additional instance at follow-up when compared to baseline. Belt use did not vary for 20 participants and 20 reported decreased use.

Table 16.
Significant Increases in Median Safety-Belt Use among Completers

<table>
<thead>
<tr>
<th></th>
<th>Personalized Feedback ((n = 131))</th>
<th>General nutrition information ((n = 145))</th>
</tr>
</thead>
<tbody>
<tr>
<td>Driver Safety -Belt Use ((Mdn\ Change))</td>
<td>2**</td>
<td>1*</td>
</tr>
<tr>
<td>Passenger Safety -Belt Use ((Mdn\ Change))</td>
<td>2**</td>
<td>2**</td>
</tr>
</tbody>
</table>

* \(p < .05\)
** \(p < .001\)

For participants who received general nutrition information \((n = 145)\), the number of instances participants used safety belts when a passenger was significantly higher at follow-up \((Mdn = 7)\) than at baseline \((Mdn = 5)\), \(z = -4.334, p < .001, r = -.18\) as displayed in Table 16. This represents a small increase in passengers’ safety-belt use. 82 participants buckled up in at least 1
additional instance at follow-up when compared to baseline. Belt use did not vary for 21 participants and 42 reported decreased use.

*Increases in belt use from baseline to follow-up between-participants by group assignment.* Chi-square tests were used to evaluate H5 and H6. There was not a significant association between group assignment (i.e., personalized feedback versus general nutrition information) and whether or not participants reported increases in driver safety-belt use between baseline and follow-up (increase in belt-use by at least 1 instance) \( (N = 276) \). The percent of participants reporting increases of at least 1 instance by group is displayed in Figure 3.

There was a significant association between group assignment (i.e., personalized feedback versus general nutrition information) and whether or not participants reported increases in passenger safety-belt use between baseline and follow-up (increase in belt-use by at least 1 instance) \( X^2(1) = 4.907, p = .034 \) \( (N = 276) \). This seems to represent the fact that based on the odds ratio, participants were 1.75 times more likely to report increases if they were assigned to receive personalized feedback than if assigned to received general nutrition information. The percent of participants reporting increases of at least 1 instance by group is displayed in Figure 3.

*Motivation*

*Within-participant change in motivation by group assignment: Participants who received personalized feedback.* Results of analyses that investigated differences in motivation (H7
through H18) between baseline and follow-up via Wilcoxon signed-rank tests are provided below. For participants who received personalized feedback (n =131), ratings of perceived importance of using safety belts when a driver was significantly higher at follow-up (Mdn = 10) than at baseline (Mdn = 9), z = -2.183, p <.001, r = -.13. This represents a small increase in drivers’ perceptions regarding the importance of using safety belts when driving. 91 participants’ importance ratings increased by one or more points between baseline and follow-up. Importance ratings did not vary for 132 participants and 53 reported lower ratings at follow-up. For participants who received personalized feedback (n =131), ratings of perceived confidence to use safety belts when a driver did not vary significantly between baseline and follow-up. For participants who received personalized feedback (n =131), ratings of readiness to use safety belts when a driver was significantly higher at follow-up (Mdn = 9) than at baseline (Mdn = 8), z = -10.062, p <.001, r = -.62. This represents a large increase in drivers’ readiness to use safety belts when driving. 187 participants’ ratings increased by one or more points between baseline and follow-up. Readiness ratings did not vary for 49 participants and 40 reported lower ratings at follow-up.

For participants who received personalized feedback (n =131), ratings of perceived importance of using safety belts when a passenger was significantly higher at follow-up (Mdn = 9) than at baseline (Mdn = 8), z = -5.606, p <.001, r = -.35. This represents a medium-sized increase in perceptions regarding the importance of using safety belts when a passenger. 129 participants’ importance ratings increased by one or more points between baseline and follow-up. Importance ratings did not vary for 84 participants and 63 reported lower ratings at follow-up. For participants who received personalized feedback (n =131), ratings of perceived confidence to use safety belts when a passenger did not vary significantly between baseline and
follow-up. For participants who received personalized feedback ($n=131$), ratings of readiness to use safety belts when a passenger was significantly higher at follow-up ($Mdn = 8$) than at baseline ($Mdn = 7$), $z = -5.625$, $p < .001$, $r = -.35$. This represents a medium-sized increase in drivers’ readiness to use safety belts when riding as a passenger. 141 participants’ ratings increased by one or more points between baseline and follow-up. Readiness ratings did not vary for 79 participants and 56 reported lower ratings at follow-up.

For participants who received personalized feedback ($n=131$), ratings of perceived importance of asking others to use safety belts while acting as a driver were significantly higher at follow-up ($Mdn = 8$) than at baseline ($Mdn = 7$), $z = -5.258$, $p < .001$, $r = -.32$. This represents a medium-sized increase in perceptions regarding the importance of asking others to buckle-up when a driver. 123 participants’ importance ratings increased by one or more points between baseline and follow-up. Importance ratings did not vary for 87 participants and 66 reported lower ratings at follow-up. For participants who received personalized feedback ($n=131$), ratings of perceived confidence to ask others to use safety belts while acting as a driver were significantly higher at follow-up ($Mdn = 8$) than at baseline ($Mdn = 6.5$), $z = -5.397$, $p < .001$, $r = -.33$. This represents a medium-sized increase in confidence to ask others to buckle-up when a driver. 133 participants’ confidence ratings increased by one or more points between baseline and follow-up. Confidence ratings did not vary for 77 participants and 66 reported lower ratings at follow-up.

For participants who received personalized feedback ($n=131$), ratings of readiness to ask others to use safety belts while acting as a driver were significantly higher at follow-up ($Mdn = 7$) than at baseline ($Mdn = 6$), $z = -4.628$, $p < .001$, $r = -.29$. This represents a small change in drivers’ readiness to ask others to buckle-up when a driver. 131 participants’ ratings increased by one or
more points between baseline and follow-up. Readiness ratings did not vary for 79 participants and 66 reported lower ratings at follow-up.

For participants who received personalized feedback \((n = 131)\), ratings of perceived importance of asking others to use safety belts while acting as a passenger were significantly higher at follow-up \((Mdn = 6)\) than at baseline \((Mdn = 4)\), \(z = -7.110, p < .001, r = -.44\). This represents a medium-sized increase in perceptions regarding the importance of asking others to buckle-up when a passenger. 158 participants’ importance ratings increased by one or more points between baseline and follow-up. Importance ratings did not vary for 56 participants and 62 reported lower ratings at follow-up. For participants who received personalized feedback \((n = 131)\), ratings of perceived confidence to ask others to use safety belts while acting as a passenger were significantly higher at follow-up \((Mdn = 5)\) than at baseline \((Mdn = 4)\), \(z = -6.371, p < .001, r = -.39\). This represents a medium-sized increase in confidence to ask others to buckle-up when a passenger. 165 participants’ confidence ratings increased by one or more points between baseline and follow-up. Confidence ratings did not vary for 53 participants and 58 reported lower ratings at follow-up.

For participants who received personalized feedback \((n = 131)\), ratings of readiness to ask others to use safety belts while acting as a passenger were significantly higher at follow-up \((Mdn = 5)\) than at baseline \((Mdn = 4)\), \(z = -6.904, p < .001, r = -.43\). This represents a medium-sized increase in drivers’ readiness to ask others to buckle-up when a passenger. 155 participants’ ratings increased by one or more points between baseline and follow-up. Readiness ratings did not vary for 60 participants and 61 reported lower ratings at follow-up.

*Within-participant change in motivation by group assignment: Participants who received general nutrition information.* Results of analyses that investigated differences in motivation
(H19 through H30) between baseline and follow-up via Wilcoxon signed-rank tests are provided below. For participants who received general nutrition information ($n = 145$), ratings of importance regarding the use safety belts when a driver did not vary significantly between baseline and follow-up. For participants who received general nutrition information ($n = 145$), ratings of confidence to use safety belts when a driver did not vary significantly between baseline and follow-up. For participants who received general nutrition information ($n = 145$), ratings of readiness to use safety belts when a driver did not vary significantly between baseline and follow-up. For participants who received general nutrition information ($n = 145$), ratings of perceived importance of using safety belts when a passenger was significantly higher at follow-up ($Mdn = 9$) than at baseline ($Mdn = 8$), $z = -3.118$, $p < .05$, $r = -.18$. This represents a small increase in perceptions regarding the importance of using safety belts when a passenger. 64 participants’ importance ratings increased by one or more points between baseline and follow-up. Importance ratings did not vary for 43 participants and 38 reported lower ratings at follow-up. For participants who received general nutrition information ($n = 145$), ratings of confidence to use safety belts when a passenger did not vary significantly between baseline and follow-up. For participants who received general nutrition information ($n = 145$), ratings of readiness to use safety belts when a passenger was significantly higher at follow-up ($Mdn = 8$) than at baseline ($Mdn = 7$), $z = -2.882$, $p < .05$, $r = -.17$. This represents a small increase in drivers’ readiness to use safety belts when riding as a passenger. 50 participants’ ratings increased by one or more points between baseline and follow-up. Readiness ratings did not vary for 52 participants and 43 reported lower ratings at follow-up.
For participants who received general nutrition information ($n = 145$), ratings of perceived importance of asking others to use safety belts while acting as a driver were significantly higher at follow-up ($Mdn = 8$) than at baseline ($Mdn = 7$), $z = -2.110, p < .05, r = -.12$. This represents a small increase in perceptions regarding the importance of asking others to buckle-up when a driver. 63 participants’ importance ratings increased by one or more points between baseline and follow-up. Importance ratings did not vary for 51 participants and 31 reported lower ratings at follow-up. For participants who received general nutrition information ($n = 145$), ratings of perceived confidence to ask others to use safety belts while acting as a driver were significantly higher at follow-up ($Mdn = 7$) than at baseline ($Mdn = 7$), $z = -2.196, p < .05, r = -.13$. This represents a small increase in confidence to ask others to buckle-up when a driver. 54 participants’ confidence ratings increased by one or more points between baseline and follow-up. Confidence ratings did not vary for 50 participants and 41 reported lower ratings at follow-up. For participants who received general nutrition information ($n = 145$), ratings of readiness to ask others to use safety belts while acting as a driver were did not differ significantly between baseline and follow-up.

For participants who received general nutrition information ($n = 145$), ratings of perceived importance of asking others to use safety belts while acting as a passenger were significantly higher at follow-up ($Mdn = 6$) than at baseline ($Mdn = 4$), $z = -5.013, p < .001, r = -.29$. This represents a small increase in perceptions regarding the importance of asking others to buckle-up when a passenger. 84 participants’ importance ratings increased by one or more points between baseline and follow-up. Importance ratings did not vary for 26 participants and 35 reported lower ratings at follow-up. For participants who received general nutrition information ($n = 145$), ratings of perceived confidence to ask others to use safety belts while acting as a
passenger were significantly higher at follow-up ($Mdn = 5$) than at baseline ($Mdn = 4$), $z = -3.846$, $p < .001$, $r = -.23$. This represents a small increase in confidence to ask others to buckle-up when a passenger. 83 participants’ confidence ratings increased by one or more points between baseline and follow-up. Confidence ratings did not vary for 30 participants and 32 reported lower ratings at follow-up. For participants who received general nutrition information ($n = 145$), ratings of readiness to ask others to use safety belts while acting as a passenger were significantly higher at follow-up ($Mdn = 5$) than at baseline ($Mdn = 4$), $z = -4.114$, $p < .001$, $r = -.24$. This represents a small increase in readiness. 78 participants’ ratings increased by one or more points. Readiness ratings did not vary for 32 participants and 35 reported lower ratings at follow-up.

**Differences in motivation between participants by group assignment at follow-up.** Mann-Whitney tests were used to investigate the differences in motivation at follow-up in relation to group assignment (H31 – H42). There were no statistically significant differences in motivation between participants by group assignment at follow-up.

**Commitment**

Chi-square tests were used to explore associations between group assignment (i.e., personalized feedback versus general nutrition information) and commitment at follow-up (i.e., H43, H44, H45, H46). There were no statistically significant associations between group assignment and commitment to buckle-up when a driver and or a passenger. Further there were no statistically significant associations between group assignment and commitment to ask others to buckle-up when a driver and or a passenger.
Outcomes: Intent-to-Treat

Descriptive statistics (i.e., means, standard deviations, medians, range, skewness, and kurtosis) with regard to the dependent variables: (1) driver safety-belt use; (2) passenger safety-belt use; (3) motivation to buckle-up as a driver; (4) motivation to buckle-up as a passenger; (5) motivation to ask others to buckle-up when acting as a driver; (6) motivation to ask others to buckle-up when acting as a passenger are presented in Table 17.

Table 17.
Descriptive Statistics of Dependent Variables Among ITT: Baseline and Follow-up

<table>
<thead>
<tr>
<th>Variable</th>
<th>General nutrition information (N = 174)</th>
<th>Personalized feedback (N = 173)</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>Baseline</td>
<td>Follow-up</td>
</tr>
<tr>
<td>Driver Safety-Belt Use in Past 10 Instances</td>
<td>6.16 (2.98)</td>
<td>6.69 (2.8)</td>
</tr>
<tr>
<td>[instances, M (SD)]</td>
<td>Median</td>
<td>7</td>
</tr>
<tr>
<td>Range</td>
<td>10</td>
<td>10</td>
</tr>
<tr>
<td>Kurtosis</td>
<td>-0.87</td>
<td>-0.63</td>
</tr>
<tr>
<td>Skewness</td>
<td>-0.40</td>
<td>-0.65</td>
</tr>
<tr>
<td>Passenger Safety-Belt Use in Past 10 Instances</td>
<td>4.82 (2.35)</td>
<td>5.86 (2.8)</td>
</tr>
<tr>
<td>[instances, M (SD)]</td>
<td>Median</td>
<td>5</td>
</tr>
<tr>
<td>Range</td>
<td>10</td>
<td>10</td>
</tr>
<tr>
<td>Kurtosis</td>
<td>-0.61</td>
<td>-0.85</td>
</tr>
<tr>
<td>Skewness</td>
<td>-0.13</td>
<td>-0.32</td>
</tr>
<tr>
<td>Importance: Buckle-Up as a Driver</td>
<td>8.25 (2.16)</td>
<td>8.49 (2.08)</td>
</tr>
<tr>
<td>[score, M (SD)]</td>
<td>Median</td>
<td>9</td>
</tr>
<tr>
<td>Range</td>
<td>9</td>
<td>8</td>
</tr>
<tr>
<td>Kurtosis</td>
<td>1.23</td>
<td>1.12</td>
</tr>
<tr>
<td>Skewness</td>
<td>-1.29</td>
<td>-1.41</td>
</tr>
<tr>
<td>Confidence: Buckle-Up as a Driver</td>
<td>8.4 (2.23)</td>
<td>8.32 (2.19)</td>
</tr>
<tr>
<td>[score, M (SD)]</td>
<td>Median</td>
<td>9</td>
</tr>
<tr>
<td>Range</td>
<td>10</td>
<td>10</td>
</tr>
<tr>
<td>Kurtosis</td>
<td>1.79</td>
<td>1.55</td>
</tr>
<tr>
<td>Skewness</td>
<td>-1.53</td>
<td>-1.4</td>
</tr>
<tr>
<td>Readiness: Buckle-Up as a Driver</td>
<td>8.13 (2.03)</td>
<td>8.21 (2.05)</td>
</tr>
<tr>
<td>[score, M (SD)]</td>
<td>Median</td>
<td>9</td>
</tr>
<tr>
<td>Range</td>
<td>10</td>
<td>8</td>
</tr>
<tr>
<td>Kurtosis</td>
<td>1.17</td>
<td>.08</td>
</tr>
<tr>
<td>Skewness</td>
<td>-1.17</td>
<td>-1.04</td>
</tr>
<tr>
<td>Importance: Buckle-Up as a Passenger</td>
<td>7.34 (2.33)</td>
<td>7.8 (2.24)</td>
</tr>
<tr>
<td>[score, M (SD)]</td>
<td>Median</td>
<td>8</td>
</tr>
<tr>
<td>Range</td>
<td>10</td>
<td>9</td>
</tr>
<tr>
<td>Kurtosis</td>
<td>.48</td>
<td>-.09</td>
</tr>
<tr>
<td>Skewness</td>
<td>-.87</td>
<td>-.87</td>
</tr>
</tbody>
</table>
Table 17., cont.

**Descriptive Statistics of Dependent Variables Among ITT: Baseline and Follow-up**

<table>
<thead>
<tr>
<th>Variable</th>
<th>General nutrition information ((N = 174))</th>
<th>Personalized feedback ((N = 173))</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>Baseline</td>
<td>Follow-up</td>
</tr>
<tr>
<td>Confidence: Buckle-Up as a Passenger ([\text{score}, M (SD)])</td>
<td>7.43 (2.17)</td>
<td>7.55 (2.23)</td>
</tr>
<tr>
<td>Median</td>
<td>8.00</td>
<td>8.00</td>
</tr>
<tr>
<td>Range</td>
<td>9.00</td>
<td>10.00</td>
</tr>
<tr>
<td>Kurtosis</td>
<td>-.302</td>
<td>.23</td>
</tr>
<tr>
<td>Skewness</td>
<td>-.65</td>
<td>-.85</td>
</tr>
<tr>
<td>Readiness: Buckle-Up as a Passenger ([\text{score}, M (SD)])</td>
<td>7.16 (2.11)</td>
<td>7.57 (2.12)</td>
</tr>
<tr>
<td>Median</td>
<td>7.00</td>
<td>8.00</td>
</tr>
<tr>
<td>Range</td>
<td>8.00</td>
<td>8.00</td>
</tr>
<tr>
<td>Kurtosis</td>
<td>-.73</td>
<td>-.64</td>
</tr>
<tr>
<td>Skewness</td>
<td>-.37</td>
<td>-.62</td>
</tr>
<tr>
<td>Importance: Ask others to Buckle-Up as Driver ([\text{score}, M (SD)])</td>
<td>6.89 (2.88)</td>
<td>7.25 (2.54)</td>
</tr>
<tr>
<td>Median</td>
<td>7.00</td>
<td>8.00</td>
</tr>
<tr>
<td>Range</td>
<td>10.00</td>
<td>10.00</td>
</tr>
<tr>
<td>Kurtosis</td>
<td>-.37</td>
<td>.32</td>
</tr>
<tr>
<td>Skewness</td>
<td>-.73</td>
<td>-.88</td>
</tr>
<tr>
<td>Confidence: Ask others to Buckle-Up as Driver ([\text{score}, M (SD)])</td>
<td>6.57 (2.89)</td>
<td>6.94 (2.76)</td>
</tr>
<tr>
<td>Median</td>
<td>7.00</td>
<td>8.00</td>
</tr>
<tr>
<td>Range</td>
<td>10.00</td>
<td>10.00</td>
</tr>
<tr>
<td>Kurtosis</td>
<td>-.548</td>
<td>-.35</td>
</tr>
<tr>
<td>Skewness</td>
<td>-.61</td>
<td>-.70</td>
</tr>
<tr>
<td>Readiness: Ask others to Buckle-Up as Passenger ([\text{score}, M (SD)])</td>
<td>6.44 (2.87)</td>
<td>6.75 (2.78)</td>
</tr>
<tr>
<td>Median</td>
<td>7.00</td>
<td>7.50</td>
</tr>
<tr>
<td>Range</td>
<td>10.00</td>
<td>10.00</td>
</tr>
<tr>
<td>Kurtosis</td>
<td>-.68</td>
<td>-.43</td>
</tr>
<tr>
<td>Skewness</td>
<td>-.55</td>
<td>-.68</td>
</tr>
<tr>
<td>Importance: Ask others to Buckle-Up as Passenger ([\text{score}, M (SD)])</td>
<td>4.48 (2.87)</td>
<td>5.53 (2.83)</td>
</tr>
<tr>
<td>Median</td>
<td>4.00</td>
<td>6.00</td>
</tr>
<tr>
<td>Range</td>
<td>10.00</td>
<td>10.00</td>
</tr>
<tr>
<td>Kurtosis</td>
<td>-.79</td>
<td>-.81</td>
</tr>
<tr>
<td>Skewness</td>
<td>.17</td>
<td>-.17</td>
</tr>
<tr>
<td>Confidence: Ask others to Buckle-Up as Passenger ([\text{score}, M (SD)])</td>
<td>4.43 (2.9)</td>
<td>5.14 (2.93)</td>
</tr>
<tr>
<td>Median</td>
<td>4.00</td>
<td>5.00</td>
</tr>
<tr>
<td>Range</td>
<td>10.00</td>
<td>10.00</td>
</tr>
<tr>
<td>Kurtosis</td>
<td>-.76</td>
<td>-.95</td>
</tr>
<tr>
<td>Skewness</td>
<td>.20</td>
<td>-.05</td>
</tr>
<tr>
<td>Readiness: Ask others to Buckle-Up as Passenger ([\text{score}, M (SD)])</td>
<td>4.28 (2.78)</td>
<td>5.02 (2.9)</td>
</tr>
<tr>
<td>Median</td>
<td>4.00</td>
<td>5.00</td>
</tr>
<tr>
<td>Range</td>
<td>10.00</td>
<td>10.00</td>
</tr>
<tr>
<td>Kurtosis</td>
<td>-.59</td>
<td>-.90</td>
</tr>
<tr>
<td>Skewness</td>
<td>.235</td>
<td>.001</td>
</tr>
</tbody>
</table>
Safety-belt Use

Frequency distributions of baseline safety-belt use as a driver and a passenger are provided in Figure 4. Further, the proportion of participants who reported an increase of one or more instance of buckling-up as a driver and or as a passenger is provided in Figure 5, according to reported baseline safety-belt use. These figures display relative change in safety-belt use as a driver and as a passenger.

Safety-belt use when a driver within participants by group. The Wilcoxon signed-rank test was used to test the main Hypotheses: H1, H2, H3, and H4. For participants who received personalized feedback (N = 173), the number of instances participants used safety belts when a driver was significantly higher at follow-up (Mdn = 8) than at baseline (Mdn = 6), z = -4.247, p < .001, r = -.16, as displayed in Table 18. This represents a small increase in drivers’ safety-belt use. 77 participants buckled up in one or more additional instance at follow-up when compared to baseline while 28 reported decreased use. There were 68 participants for whom driver safety-belt use did not differ by as much as one point between baseline and follow-up including the 42 participants for whom baseline data were carried forward to complete the IIT analyses.

For participants who received general nutrition information (N = 174), the number of instances participants used safety belts when a driver was significantly higher at follow-up (Mdn = 7) than at baseline (Mdn = 7), z = -2.93, p < .05, r = -.11, as displayed in Table 18. This represents a small increase in drivers’ safety-belt use. 77 participants buckled up in one or more additional instance at follow-up when compared to baseline while 37 reported decreased use. There were 60 participants for whom driver safety-belt use did not differ by as much as one point between baseline and follow-up including the 29 participants for whom baseline data were carried forward to complete the IIT analyses.
**Safety-belt use while riding as passengers within participants by group.** For participants who received personalized feedback \((N = 173)\), the number of instances participants used safety belts when a passenger was significantly higher at follow-up \((Mdn = 7)\) than at baseline \((Mdn = 5)\), \(z = -5.90, p < .001, r = -.22\), as displayed in Table 18. This represents a small increase. 93 participants buckled up in one or more additional instance at follow-up when compared to baseline while 25 reported decreased use. There were 55 participants for whom driver safety-belt use did not differ by as much as one point between baseline and follow-up including the 42 participants for whom baseline data were carried forward to complete the IIT analyses.

For participants who received general nutrition information \((N = 174)\), the number of instances participants used safety belts when a passenger was significantly higher at follow-up \((Mdn = 6)\) than at baseline \((Mdn = 5)\), \(z = -4.503, p < .001, r = -.17\), as displayed in Table 18. This represents a small increase. 86 participants buckled up in one or more additional instance at follow-up when compared to baseline while 42 reported decreased use. There were 46 participants for whom driver safety-belt use did not differ by as much as one point between baseline and follow-up including the 29 participants for whom baseline data were carried forward to complete the IIT analyses.

**Table 18.**

**Significant Increases in Median Safety-Belt Use Among ITT: Baseline to Follow-up.**

<table>
<thead>
<tr>
<th></th>
<th>Personalized Feedback ((n = 173))</th>
<th>General nutrition information ((n = 174))</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Driver Safety -Belt Use</strong> ((Mdn Change))</td>
<td>2**</td>
<td>0 *</td>
</tr>
<tr>
<td><strong>Passenger Safety -Belt Use</strong> ((Mdn Change))</td>
<td>2 **</td>
<td>1 **</td>
</tr>
</tbody>
</table>

* * \(p < .05\);
** ** \(p < .001\)
Increases in belt use from baseline to follow-up between-participants by group assignment. Chi-square tests were used to evaluate H5 and H6. There were no statistically significant associations between group assignment (i.e., personalized feedback versus general nutrition information) and whether or not participants reported increases in driver and or passenger safety-belt use between baseline and follow-up (increase in belt-use by one or more instance) \((N = 347)\).

**Motivation**

**Within-participant change in motivation by group assignment:** Participants who received personalized feedback. Results of analyses that investigated differences in motivation (H7 through H18) between baseline and follow-up via Wilcoxon signed-rank tests are provided below. For participants who received personalized feedback \((n = 173)\), ratings of perceived importance of using safety belts when a driver did not differ significantly between baseline and follow-up. For participants who received personalized feedback \((n = 173)\), ratings of perceived confidence to use safety belts when a driver did not vary significantly between baseline and follow-up. For participants who received personalized feedback \((n = 173)\), ratings of readiness to use safety belts when a driver was significantly higher at follow-up \((Mdn = 9)\) than at baseline \((Mdn = 8)\), \(z = -2.721, p < .05, r = -.15\). This represents a small increase in drivers’ readiness to use safety belts when driving. 53 participants’ ratings increased by one or more points between baseline and follow-up and 27 reported lower ratings at follow-up. Readiness ratings did not vary by as much as one point for 93 participants including the 42 participants for whom baseline data were carried forward to complete the IIT analyses.

For participants who received personalized feedback \((n = 173)\), ratings of perceived importance of using safety belts when a passenger was significantly higher at follow-up \((Mdn = \)
9) than at baseline ($Mdn = 7$), $z = -4.773$, $p < .001$, $r = -.26$. This represents a small change in perceptions regarding the importance of using safety belts when a passenger. 66 participants’ importance ratings increased by one or more points between baseline and follow-up while 26 reported lower ratings at follow-up. Importance ratings did not vary by as much as one point for 81 participants including the 42 participants for whom baseline data were carried forward to complete the IIT analyses. For participants who received personalized feedback ($n = 173$), ratings of perceived confidence to use safety belts when a passenger were significantly higher at follow-up ($Mdn = 9$) than at baseline ($Mdn = 8$), $z = -3.314$, $p < .05$, $r = -.18$. This represents a small increase in drivers’ readiness to use safety belts when riding as a passenger. 63 participants’ ratings increased by one or more points between baseline and follow-up while 31 reported lower ratings at follow-up. Importance ratings did not vary by as much as one point for 79 participants including the 42 participants for whom baseline data were carried forward to complete the IIT analyses. For participants who received personalized feedback ($n = 173$), ratings of readiness to use safety belts when a passenger was significantly higher at follow-up ($Mdn = 8$) than at baseline ($Mdn = 7$), $z = -4.754$, $p < .001$, $r = -.26$. This represents a small increase in drivers’ readiness to use safety belts when riding as a passenger. 78 participants’ ratings increased by one or more points between baseline and follow-up while 27 reported lower ratings at follow-up. Importance ratings did not vary by as much as one point for 68 participants including the 42 participants for whom baseline data were carried forward to complete the IIT analyses.

For participants who received personalized feedback ($n = 173$), ratings of perceived importance of asking others to use safety belts while acting as a driver were significantly higher at follow-up ($Mdn = 7$) than at baseline ($Mdn = 6$), $z = -5.353$, $p < .001$, $r = -.29$. This represents a small increase in perceptions regarding the importance of asking others to buckle-up when a
driver. 71 participants’ importance ratings increased by one or more points between baseline and follow-up while 26 reported decreased ratings. Importance ratings did not vary by as much as one point for 76 participants including the 42 participants for whom baseline data were carried forward to complete the IIT analyses. For participants who received personalized feedback (n =173), ratings of perceived confidence to ask others to use safety belts while acting as a driver were significantly higher at follow-up (Mdn = 8) than at baseline (Mdn = 6), z = -5.451, p <.001, r = -.29. This represents a medium-sized increase in confidence to ask others to buckle-up when a driver. 74 participants’ confidence ratings increased by one or more points between baseline and follow-up while 29 reported lower ratings at follow-up. Confidence ratings did not vary for 70 participants including the 42 participants for whom baseline data were carried forward to complete the IIT analyses. For participants who received personalized feedback (n =173), ratings of readiness to ask others to use safety belts while acting as a driver were significantly higher at follow-up (Mdn = 7) than at baseline (Mdn = 6), z = -5.029, p <.001, r = -.27. This represents a medium-sized increase in drivers’ readiness to ask others to buckle-up when a driver. 69 participants’ ratings increased by one or more points between baseline and follow-up while 26 reported lower ratings at follow-up. Importance ratings did not vary for 78 participants including the 42 participants for whom baseline data were carried forward to complete the IIT analyses.

For participants who received personalized feedback (n =173), ratings of perceived importance of asking others to use safety belts while acting as a passenger were significantly higher at follow-up (Mdn = 5) than at baseline (Mdn = 4), z = -4.967, p <.001, r = -.27. This represents a small increase in perceptions regarding the importance of asking others to buckle-up when a passenger. 77 participants’ importance ratings increased by one or more points between baseline and follow-up while 29 reported decreased ratings. Importance ratings did not vary for
67 participants including the 42 participants for whom baseline data were carried forward to complete the IIT analyses. For participants who received personalized feedback ($n = 173$), ratings of perceived confidence to ask others to use safety belts while acting as a passenger were significantly higher at follow-up ($Mdn = 5$) than at baseline ($Mdn = 4$), $z = -4.915$, $p < .001$, $r = -.26$. This represents a small increase in confidence to ask others to buckle-up when a passenger. 83 participants’ confidence ratings increased by one or more points between baseline and follow-up while 28 reported lower ratings. Confidence ratings did not vary for 62 participants including the 42 participants for whom baseline data were carried forward to complete the IIT analyses. For participants who received personalized feedback ($n = 173$), ratings of readiness to ask others to use safety belts while acting as a passenger were significantly higher at follow-up ($Mdn = 5$) than at baseline ($Mdn = 4$), $z = -5.323$, $p < .001$, $r = -.29$. This represents a small increase in drivers’ readiness to ask others to buckle-up when a passenger. 78 participants’ ratings increased by one or more points between baseline and follow-up while 29 reported lower ratings at follow-up. Readiness ratings did not vary by as much as one point for 60 participants including the 42 participants for whom baseline data were carried forward to complete the IIT analyses.

Within-participant change in motivation by group assignment: Participants who received general nutrition information. Results of analyses that investigated differences in motivation (H19 through H30) between baseline and follow-up via Wilcoxon signed-rank tests are provided below. For participants who received general nutrition information ($n = 174$), ratings of importance regarding the use safety belts when a driver did not vary significantly between baseline and follow-up, as displayed in Table 20. For participants who received general nutrition information ($n = 174$), ratings of confidence to use safety belts when a driver did not vary significantly between baseline and follow-up. For participants who received general nutrition
information \((n = 174)\), ratings of readiness to use safety belts when a driver did not vary significantly between baseline and follow-up.

For participants who received general nutrition information \((n = 174)\), ratings of perceived importance of using safety belts when a passenger was significantly higher at follow-up \((Mdn = 8)\) than at baseline \((Mdn = 8)\), \(z = -3.194\), \(p < .05\), \(r = -.17\), as displayed in Table 20. This represents a small increase in importance. 66 participants’ importance ratings increased by one or more points between baseline and follow-up while 38 reported lower ratings at follow-up. Importance ratings did not vary by as much as one point for 70 participants including the 29 participants for whom baseline data were carried forward to complete the IIT analyses. For participants who received general nutrition information \((n = 174)\), ratings of confidence to use safety belts when a passenger did not vary significantly between baseline and follow-up. For participants who received general nutrition information \((n = 174)\), ratings of readiness to use safety belts when a passenger was significantly higher at follow-up \((Mdn = 8)\) than at baseline \((Mdn = 7)\), \(z = -2.971\), \(p < .05\), \(r = -.16\). This represents a small increase in readiness. 65 participants’ ratings increased by one or more points between baseline and follow-up while 32 reported lower ratings at follow-up. Importance ratings did not vary by as much as one point for 77 participants including the 29 participants for whom baseline data were carried forward to complete the IIT analyses.

For participants who received general nutrition information \((n = 174)\), ratings of perceived importance of asking others to use safety belts while acting as a driver were significantly higher at follow-up \((Mdn = 8)\) than at baseline \((Mdn = 7)\), \(z = -2.247\), \(p < .05\), \(r = -.12\). This represents a small increase in importance. 56 participants’ importance ratings increased by one or more points between baseline and follow-up while 41 reported lower ratings at follow-
up. Importance ratings did not vary for 77 participants including the 29 participants for whom baseline data were carried forward to complete the IIT analyses. For participants who received general nutrition information (\(n = 174\)), ratings of perceived confidence to ask others to use safety belts while acting as a driver were significantly higher at follow-up (\(Mdn = 8\)) than at baseline (\(Mdn = 7\)), \(z = -2.167, p < .05, r = -.12\). This represents a small increase in confidence.

63 participants’ confidence ratings increased by one or more points between baseline and follow-up while 40 reported lower ratings. Confidence ratings did not vary by as much as one point for 71 participants including the 29 participants for whom baseline data were carried forward to complete the IIT analyses. For participants who received general nutrition information (\(n = 174\)), ratings of readiness did not differ significantly between baseline and follow-up.

For participants who received general nutrition information (\(n = 174\)), ratings of perceived importance of asking others to use safety belts while acting as a passenger were significantly higher at follow-up (\(Mdn = 6\)) than at baseline (\(Mdn = 4\)), \(z = -5.110, p < .001, r = -.27\). This represents a small increase in importance. 86 participants’ importance ratings increased by one or more points between baseline and follow-up while 35 reported lower ratings.

Importance ratings did not vary by as much as one point for 57 participants including the 29 participants for whom baseline data were carried forward to complete the IIT analyses.

For participants who received general nutrition information (\(n = 174\)), ratings of perceived confidence to ask others to use safety belts while acting as a passenger were significantly higher at follow-up (\(Mdn = 5\)) than at baseline (\(Mdn = 4\)), \(z = -3.995, p < .001, r = -.22\). This represents a small increase in confidence. 85 participants’ confidence ratings increased by one or more points between baseline and follow-up while 32 reported lower ratings at follow-up. Confidence ratings did not vary by as much as one point for 57 participants including the 29 participants for whom baseline data were carried forward to complete the IIT analyses.
participants for whom baseline data were carried forward to complete the IIT analyses. For participants who received general nutrition information ($n = 174$), ratings of readiness to ask others to use safety belts while acting as a passenger were significantly higher at follow-up ($Mdn = 5$) than at baseline ($Mdn = 4$), $z = -4.185$, $p < .001$, $r = -.22$. This represents small increase in readiness. 79 participants’ ratings increased by one or more points between baseline and follow-up while 36 reported lower ratings. Readiness ratings did not vary by as much as one point for 59 participants including the 29 participants for whom baseline data were carried forward to complete the IIT analyses.

* Differences in motivation between participants by group assignment at follow-up. *Mann-Whitney* tests were used to investigate the differences in motivation at follow-up in relation to group assignment (H31 – H42). There were no statistically significant differences in motivation between participants by group assignment at follow-up, with on exception. Follow-up levels of confidence to buckle-up when riding as a passenger did differ significantly between those who received personalized feedback versus general nutrition information. Levels of confidence to buckle-up when riding as a passenger were significantly greater at follow-up than they were at baseline, $U = 13113.50$, $p = .035$.

*Discussion*

Safety-belt non-use is a significant public health concern with numerous associated health and psychological complications. Young adults are at greater risk for non-use of safety belts. There is a particularly salient need for interventions aimed at promoting safety-belt use among this vulnerable population (NHTSA, 2003c). Given the tendency for young adults to have wide access and familiarity with the Internet, the current study used the Internet as a venue to assess and intervene on college students’ safety-belt use. Specifically, this study aimed to assess
and promote driver and passenger safety-belt use as well as commitment to buckle-up as drivers and passengers and commitment to ask others to do the same. This study evaluated the effects of a web-based MI-consistent assessment alone process as compared with an as assessment plus brief motivational intervention with personalized feedback. As described in the introduction, many AMIs incorporate both assessment and feedback, yet it is not yet clear what distinct roles assessment and feedback play in the MI process and what their relative impacts may be on measurable behavior change. Indeed, the comparative impact of assessment alone and assessment with feedback have not been elucidated in previous studies due to wide heterogeneity of what constitutes assessment and feedback.

Overall, results suggest this web-based assessment and brief motivational intervention was feasible and acceptable to participants. Notably, the assessment and intervention were associated with increases in reported belt use, especially passenger belt use. Overall, results from both analyses found statistically significant increases in median driver and passenger reported belt use between baseline and follow-up among participants in both groups. Further, effect sizes suggest the magnitude of change was greater among those in the intervention group versus those in the attention-control group.

When participants were categorized according to whether or not they increased their safety-belt use when driving by at least one instance between baseline and follow-up, those who received the intervention were not significantly more likely than those who received general nutrition information (i.e., assessment only) to increase driver safety-belt use by at least one instance. No statistical differences were found in either the completer or ITT analyses. Yet, when participants were categorized according to whether or not they increased passenger belt use by at least one instance between baseline and follow-up, those who received the intervention were
1.75 times more likely than those who received general nutrition information (i.e., assessment only) to increase passenger safety-seat belt use by at least one instance. This difference was not found in the ITT analysis.

In general, study participation was associated with increased ratings of motivation (i.e., importance, confidence, and readiness) at follow-up. Results were interpreted with caution given psychometric weaknesses including high intercorrelations found between constructs of motivation in the Pilot Study. However, median change in one construct, readiness, was investigated in post-hoc analyses. Using the ITT sample, it was found that participants who were categorized as having increased driver safety-seat belt use by at least one instance also reported statistically significant median changes in readiness to buckle-up as a driver. Further, participants who were categorized as having increased passenger safety-seat belt use by at least one instance also reported statistically significant median changes in readiness to buckle-up as a passenger.

Although there was a trend for participants in the intervention group to be more likely than those in the attention-control group to commit to buckle-up and asking others to do the same at follow-up, there were no significant differences in commitment between groups. However, regardless of group assignment, change in readiness was associated with commitment: (1) participants who committed to buckle-up as a driver also reported statistically significant median changes in readiness to buckle-up as a driver; (2) participants who committed to buckle-up as a passenger also reported statistically significant median changes in readiness to buckle-up as a passenger; (3) participants who committed to asking others to buckle-up as a driver also reported statistically significant median changes in readiness to ask others to buckle-up as a driver; and (4) participants who committed to asking others to buckle-up as a passenger also
reported statistically significant median changes in readiness to ask others to buckle-up as a passenger.

Overall, these three studies found the Internet to be an acceptable and promising venue for assessment and brief motivational intervention to promote safety-belt use among university students. In particular, readiness may be a proxy motivational variable that appears to relate to change in safety-belt use among drivers and passengers as well as commitment to buckle-up and ask others to do the same. The simple process of assessment may be sufficient to produce changes in readiness related to behavior change.

**Safety-Belt Use**

Consistent with previous findings suggesting extended assessment may produce results similar to that of brief intervention (Epstein et al., 2005), all participants, including those who received personalized feedback, as well as those who received general nutrition information, reported significantly higher median driver and passenger safety-belt use at follow-up than at baseline. Significant increases were found in both analyses (i.e., completer and ITT). Findings suggest participation in the study alone was associated with small yet statistically significant increases in reported belt use. In context of the MI framework, these findings suggest the simple act of focusing on the target behaviors in a non-confrontational way during the assessment process may itself have been associated with resolution of ambivalence and subsequent improvement in reported safety-belt use among all participants, regardless of group assignment. The group that received personalized feedback evidenced slightly higher effect sizes regarding increases in reported safety-belt use when driving than those who received general nutrition information. However, when the two groups were compared in terms of proportion of participants reporting an increase of one or more instance/s of belt use when driving, it was
found that participants who received personalized feedback were just as likely to report increases of at least one instance in driver safety-belt use as participants who received general nutrition information. Therefore, the hypothesis that a significantly higher proportion of participants receiving personalized feedback will report increased driver belt use from baseline to follow-up of one or more instance/s was not supported. However, within the completer analyses only, participants who received personalized feedback were significantly more likely (i.e., 1.75 times more likely) to report these increases in safety-belt use when a passenger than those who received general nutrition information. This result is similar to one found in association with delivery of a brief motivational risk-reduction counseling intervention for adolescents receiving treatment in an emergency department whereby adolescents’ reported safety-belt use increased by 1.42 times when measured three months after intervention and 1.49 times when measured six months after intervention (Johnston, Rivara, Droesch, Dunn, & Copass, 2002).

This study’s findings suggest that although the combination of participant assessment and personalized feedback was not associated with a greater proportion of drivers increasing belt use by at least one instance when compared to assessment alone, the combination of participant assessment and personalized feedback was associated with a greater proportion of passengers increasing belt use by at least one instance when compared to assessment alone, at least among those who completed the follow-up assessment. Interestingly, this study included a manipulation check and asked participants, at follow-up, to report which condition they had been randomized to. This manipulation check assumed some participants completed the baseline and follow-up assessments without reading the emailed feedback or general nutrition information. Only 79% of completers randomized to the experimental condition correctly reported they were randomly assigned to receive personalized feedback, meaning almost 20% of those who were emailed
personalized feedback did not read it. Therefore, the reported improvements in reported passenger associated with this large-scale provision of assessment and personalized feedback are remarkable. It may be a feasible and effective way to increase passenger safety-belt use even when adherence to the intervention is relatively low.

It is important to note the lack of statistically significant difference in the proportion of drivers who increased reported safety-belt use by at least one instance following receipt of either assessment or assessment plus personalized feedback may have been due to ceiling effects. While results suggest reported belt use did not increase significantly, median driver belt use did increase significantly in both analyses despite the lack of between group differences.

Further, in post-hoc analyses, the baseline frequency distribution of safety-belt use among the ITT sample was considered. Analyses investigated possible differential responses to assessment and feedback on the basis of participants' reported baseline level of safety-belt (0 – 10). Within each level of use, the proportion of participants who increased their belt-use as drivers did not differ significantly from the proportion who did not report change. However, the proportion of participants who increased their belt-use as passengers did differ significantly from the proportion who did not report change among those who reported buckling-up in 2 instances ($X^2 (1) = 3.903, p = .048$); 4 instances ($X^2 (1) = 4.59, p = .032$); and 5 instances ($X^2 (1) = 7.41, p = .006$) at baseline. These results are presented graphically in Figure 5 and suggest no differential response for driver safety-belt use and some differential response for passenger safety-belt use on the basis of reported use at baseline.

Motivation

As previously described, the role of MI is to acknowledge and resolve ambivalence in the direction of change. Conceptually, this is accomplished through the building of response-relevant
motivation. To that end, Miller and Rollnick (2002) discuss motivation as comprised of three perceptual components: importance, confidence, and readiness. To this researchers’ knowledge no published studies have examined the application of MI to promotion of safety-belt use. Further, no published studies have fully integrated the constructs of importance, confidence, and readiness into a web-based assessment and subsequent feedback intervention. However, the current study was modeled after a non-web-based assessment and feedback study Project Early (Ingersoll et al., 2005) and a web-based study that delivered an MI intervention via the web (Ondersma, Svikis, & Schuster, 2007).

Overall, results suggest participation in this study was associated with increases in motivation (i.e., importance, confidence, and readiness) to perform target behaviors. Relative to those who received general nutrition information, those who received personalized feedback generally reported greater increases in motivation, yet increases did not appear to be in any significant pattern. These results should be interpreted with caution.

Given the high intercorrelation found in the Pilot Study between importance, confidence, and readiness, it is possible one motivation variable serves as a proxy for all three. Readiness was most strongly correlated with both confidence and importance in the Pilot Study. Further, in the Main Study, statistically significant increases in readiness to: (1) buckle-up as a driver; (2) buckle-up as a passenger; (3) ask others to buckle-up as a driver; and (4) ask others to buckle-up as a passenger were found in both analyses among those who received personalized feedback. Readiness was therefore selected as a proxy motivational variable and included in post hoc analyses in the Main Study as reported below. More specifically, the relation of readiness to change and whether or not reported driver and or passenger belt use increased by at least one instance was investigated in post hoc analyses.
Notably, post hoc analyses performed using data from all participants (more conservative ITT analyses), regardless of group assignment, found participants who reported increasing belt use by one or more instance/s when a driver reported significantly greater median ratings of readiness to buckle-up 100% of the time when a driver at follow-up ($Mdn = 9$) than at baseline ($Mdn = 8$), $z = -4.404$, $p < .001$. No statistically significant median differences, between baseline and follow-up readiness ratings, were found among those who did not increase driver belt use by at least one instance.

Additionally, post hoc analyses performed using data from all participants (more conservative ITT analyses), regardless of group assignment, found participants who reported an increase of one or more instance/s of belt use when a passenger reported significantly greater median ratings of readiness to buckle-up 100% of the time when a passenger at follow-up ($Mdn = 9$) than at baseline ($Mdn = 8$), $z = -5.823$, $p < .001$. No statistically significant median differences, between baseline and follow-up readiness ratings, were found among those who did not increase passenger belt use by at least one instance.

In sum, although overall median motivation ratings appeared to increase as a function of study participation, psychometric weaknesses inherent in these new measures prompted the researcher to be cautious in interpretation. Interestingly, when readiness was selected as a proxy variable and when group assignment was not considered, those who were characterized by having increased driver and passenger safety-belt use by at least one instance between baseline and follow-up showed consistent and significantly greater improvements in median readiness ratings between baseline and follow-up. These findings suggest MI-consistent assessment may be sufficient to promote improvements in readiness that are then associated with increases in safety-belt use behavior.
Commitment

Commitment to buckle-up and ask others to do the same was assessed at follow-up. Previous research has found committing to act is associated with consistent behavior (e.g., commitment and consistency principle; Cialdini, 2001) and intention to act is associated with action (e.g., theory of reasoned action, Azjen & Fishbein, 1975). Notably, the hypotheses that group assignment will be associated with whether or not participants chose to commit to: (1) buckling-up 100% of the time when a driver; (2) buckling-up 100% of the time when a passenger; (3) requesting that passengers buckle-up 100% of the time when a driver; and (4) requesting that passengers buckle-up 100% of the time when a passenger were not supported. However, post hoc analyses found likelihood to commit to buckling-up and asking others to do the same was significantly related to increases in median reported levels of readiness to do the behavior.

More specifically, a similar percentage of participants in the group that received personalized feedback (86.3%) and percentage of the group that received general nutrition information (86.2%) committed to buckling-up 100% of the time when driving. Post hoc analyses were performed using data from all completers, regardless of group assignment. Participants who committed to buckling-up 100% of the time when a driver evidenced significantly greater median ratings of readiness to buckle-up 100% of the time when a driver at follow-up ($Mdn = 9$) than at baseline ($Mdn = 9$), $z = -2.963, p < .05$. No statistically significant median differences, between baseline and follow-up readiness ratings, were found among those who did not commit.

Further, 80.2% of participants who received personalized feedback and 73.8% of those who received general nutrition information committed to buckle-up 100% of the time when
riding as a passenger. Post hoc analyses were performed using data from all completers, regardless of group assignment. Participants who committed to buckling-up 100% of the time when a passenger evidenced significantly greater median ratings of readiness to buckle-up 100% of the time when a passenger at follow-up ($Mdn = 9$) than at baseline ($Mdn = 8$), $z = -5.467$, $p < .001$. No statistically significant median differences, between baseline and follow-up readiness ratings, were found among those who did not commit.

Also, 64.9% of participants who received personalized feedback and 64.8% of those who received general nutrition information committed to asking others to buckle-up 100% of the time when a driver. Post hoc analyses performed using data from all completers, regardless of group assignment. Participants who committed to asking others to buckle-up 100% of the time when a driver evidenced significantly greater median ratings of readiness to ask others to buckle-up 100% of the time when a driver at follow-up ($Mdn = 6$) than at baseline ($Mdn = 4$), $z = -5.113$, $p < .001$. No statistically significant median differences, between baseline and follow-up readiness ratings, were found among those who did not commit.

Additionally, 38.2% of participants who received personalized feedback and 33.8% of those who received general nutrition information committed to asking others to buckle-up 100% of the time when a passenger. Post hoc analyses performed using data from all completers, regardless of group assignment. Participants who committed to asking others to buckle-up 100% of the time when a passenger evidenced significantly greater median ratings of readiness to ask others to buckle-up 100% of the time when a passenger at follow-up ($Mdn = 9$) than at baseline ($Mdn = 8$), $z = -7.088$, $p < .001$. No statistically significant median differences, between baseline and follow-up readiness ratings, were found among those who did not commit.
Thus, while it appears commitment to buckling-up and asking others to do the same at follow-up was not significantly associated with group assignment, as originally hypothesized, the percentage of those who committed was slightly higher among those who received personalized feedback than those who received general nutrition information. More interestingly when group assignment was not considered and the entire completer sample was analyzed, those who committed to buckling-up and asking others to do the same showed consistent and significantly greater improvements in median readiness ratings between baseline and follow-up. These findings suggest MI-consistent assessment may be sufficient to promote improvements in readiness that are then associated with increased commitment to buckling-up and asking others to do the same. According to the commitment and consistency principle, those who commit to buckling-up and asking others to do the same should be likely to behave consistently (Cialdini, 2001).

The Role of Readiness

The role of MI is to acknowledge and resolve ambivalence in the direction of change. Conceptually, this is accomplished through the building of response-relevant motivation. To that end, Miller and Rollnick (2002) discuss motivation as comprised of three perceptual components: importance, confidence, and readiness. Miller and Rollnick claim perceived readiness is contingent on perceived importance and confidence. Yet, perceived importance and confidence do not produce readiness to change. Instead, readiness is determined by the person’s relative priorities. The person may have high levels of perceived importance and confidence but may simultaneously perceive change to be undesirable at a given time. Instead of naming this pathological resistance, it is important to consider the person’s ambivalence and the existence of relative priorities. To this end, MI has been adopted and used by health care providers to assist
individuals in moving through stages of change toward action and maintenance of behavior change.

Motivational Interviewing in brief intervention form including feedback (e.g., adaptations of the FRAMES approach) has been associated with changes in: risk behaviors for alcohol exposed pregnancy (e.g., Ingersoll et al., 2005; Project CHOICES Intervention Research Group, 2003); risky drinking (e.g., Miller & Sovereign, 1989); marijuana use (e.g., Martin, Copeland, & Swift, 2005; Stephens et al., 2004); preventive behavior for cancer (e.g., Skinner, Strecher, & Hospers, 1994); marital discord (e.g, Cordova et al., 2005); eating disorders (e.g, Long & Hollin, 1995); and constellations of risky safety-related behaviors like bicycle helmet use and safety-belt use (e.g, Dunn et al., 2004). While most studies using MI to promote change in health behavior to date have incorporated the construct of readiness into the intervention, only a few have considered and measured change in readiness between pre and post intervention in conjunction with behavioral outcomes. For instance, in an uncontrolled feasibility study testing the use of a brief MI intervention to promote healthier eating behaviors, Berg et al. (1999) found readiness to change increased in conjunction with behavioral outcomes (i.e., consumption of less dietary fat and cholesterol).

To this researcher’s knowledge, no published studies have investigated the relation of readiness to buckle-up and safety-belt use. Therefore, specific research questions are: (1) Do high levels of reported readiness to buckle-up co-occur with high levels of reported safety-belt use at baseline and or follow-up?; (2) Do high levels of reported readiness to buckle-up provide a necessary and or sufficient antecedent condition for improvement in safety-belt use following assessment and or intervention?; and or (3) Do changes in reported readiness to buckle-up co-occurs with changes in reported safety-belt use? While future research may address the relation
between reported readiness to buckle-up and safety-belt use with regard to the unanswered questions above, some exploratory analyses were conducted using data from the Pilot Study and the Main Study.

With regard to the first question (i.e., Do high levels of reported readiness to buckle-up co-occur with high levels of reported safety-belt use at baseline and or follow-up?), post hoc analyses explored the relation between readiness to buckle-up as a driver and driver safety belt use using data from the Pilot Study. Not surprisingly, there was a significant difference in mean readiness levels to buckle-up as a driver among participants who reported buckling up as a driver in 8 or more of past 10 (M= 9.57, SD= .69) and those who reported buckling-up less in less than 8 of the past 10 instances (M= 6.81, SD= 2.87) conditions; $t(124)=-8.79, p < .001$. Also, there was a significant difference in mean readiness levels to buckle-up as a passenger among participants who reported buckling up as a passenger in 8 or more of past 10 (M= 9.33, SD= .91) and those who reported buckling-up less in less than 8 of the past 10 instances (M= 6.48, SD= 2.6) conditions; $t(124)=-9.116, p < .001$. These results support the notion that high levels of reported safety-belt use co-occur with high levels of reported readiness to buckle-up.

With regard to the second question (i.e., Do high levels of reported readiness to buckle-up provide a necessary and or sufficient antecedent condition for improvement in safety-belt use following assessment and or intervention?), post hoc analyses using data from the Main Study explored the relation between baseline readiness to buckle-up and whether or not participants reported increases (1+ instance) in safety-belt use. Results from chi square analyses found participants with varying levels of reported levels of baseline readiness to buckle-up as a driver and a passenger were no more or less likely to be categorized as having increased reported safety-belt use by one or more instance as a driver and or a passenger. Results of these
exploratory tests suggest high levels of baseline readiness to buckle-up may not provide a necessary or sufficient antecedent condition for change in safety-belt use.

With regard to the third question (i.e., Do changes in reported readiness to buckle-up co-occurs with changes in reported safety-belt use?), as described above, post hoc analyses using data from the Main Study found those who reported changes in driver and passenger safety-belt use, also reported significant changes in readiness to buckle-up. Further, commitment (or intention) to buckle-up and ask others to do the same was associated with statistically significant changes in readiness.
Limitations

Limitations of this study should be noted. Specifically, randomization error occurred for a substantial number of potential participants (63) who were enrolled in the study due to researcher error. Randomization errors were an artifact of conducting this study online in which two researchers completed randomization and encountered some difficulty with email communications surrounding notification of enrollment of new participants to be randomized. This error could easily be minimized or eliminated in future studies by developing centralized systems for logging contacts and randomization.

Also, all measures were newly developed for this study and had never been used before. The use of self-report measures of safety-belt use is less ideal than direct observation as it is well-documented that self-reported belt use is higher than observed use (e.g., Beg & Langley, 2000). However, if self-reported safety-belt use is conceptualized in terms of intention, there is research to support the notion that those who report intentions to buckle-up have corresponding behavior (e.g., commitment and consistency principle; Cialdini, 2001). In addition to measurement issues regarding correspondence between actual behavior and reported behavior, the self-report measure of safety-belt use may not have been sensitive enough to detect meaningful changes in reported belt use. Further, as previously described, measures of motivation (i.e., importance, confidence, and readiness) were newly adapted and used for this study. Although measures of importance, confidence, and readiness have previously been adapted with regard to motivation to do other behaviors like: adhere to medication and reduce risky drinking (e.g., Ingersoll et al., 2005), there is a need to further explore the psychometric properties of these adapted measures.
While it is possible the intensity of the personalized feedback intervention might not have been sufficient to elicit changes in safety-belt use, perhaps one of the most important limitations is that there was no way to insure participants’ receipt and reading of the personalized feedback and or general nutrition information. Specifically, of the completers who were randomly assigned to receive personalized feedback, only 79% reported they received and read the feedback and only 62% of those who were randomly assigned to receive general nutrition information received and read it. Future studies could incorporate methods to promote adherence. For instance, in this study, participants’ adherence would have likely been higher had their extra credit been contingent on reading emailed feedback/information and responding to an embedded prompt within the feedback/information alerting the researcher regarding completion. Then, subgroup analyses could have been completed to examine outcomes associated with varying levels of adherence.

Finally, the results of this investigation may not generalize to individuals who are not enrolled in college. College populations may have different access to and use of the Internet, affecting generalizability to non-college populations. One other special consideration is that VT students are known to have a high degree of “school spirit.” Therefore, the intervention was designed to compare participants’ behaviors with similar others from their VT peer group. The feedback intervention incorporated comparison of participants’ safety-belt use behavior with that of like others based on Cialdini’s notion of “social proof”-- idea that people change their behavior to conform with like others’ behavior (2001). Therefore, conceptually, generalizability of this intervention would be dependent on identifying and incorporating social norms of a salient peer group.
**Strengths**

Nevertheless, this study had several strengths including the use of a large sample that reflected the demographic characteristics of the VT population, random assignment, comparison of a treatment condition to an Attention-Control group, and the use of rigorous ITT analyses. Also, the current study implemented and evaluated components of a theory-based intervention. Further, use of the Internet allowed individuals to participate in the assessment and intervention at their convenience, and provided anonymity in the assessment and feedback process. In addition, the rate of attrition was almost exactly that typically found in web-based intervention trials (21%; Wantland, Portillo, Holzemer, Slaughter, McGhee, 2004). Additionally, given the popularity of the Internet, delivery of this intervention might be feasible with other young adults outside of college. Thus, this study was both unique and cost-effective.

**Social Validity**

This assessment and intervention appears to be relatively socially valid. Social validity was first described by Baer, Wolf, and Risley (1968). Gresham and Lopez (1996) suggest three critical dimensions of social validity: (1) social importance of the study aims/goals; (2) acceptability of procedures to participants; and (3) social importance of study outcomes.

With regard to the social importance of this study's aims and goals, it is well-known that improvements in safety-belt use will lead to improvements in the public health. The use of vehicle safety belts is considered the most effective and convenient means of reducing motor vehicle crash-related morbidity and mortality. Estimates of the protective effects of proper safety-belt use on mortality reduction range from 22-75% (Derrig et al., 2002). Over time, the prevalence of driver safety-belt use in the U.S. has increased dramatically from 11% in 1980 to 81% in 2006, partly due to driver safety-belt use laws, which New York state pioneered in 1984.
(Derrig et al., 2002; NHTSA, 2006). However, while unintentional injuries are currently ranked as the leading cause of death among young adults in the U.S., safety-belt use percentages are markedly lower among persons aged 16-24 years (69%) than among the general population (79%) in 2003 (NHTSA, 2003). As such, the federal government put forth an objective for safety-belt use levels to reach 92% by 2010 (HP 2010).

With regard to acceptability, the rate of attrition of this study mirrored rates found in other studies, suggesting procedures were no more or less acceptable than others' (Wantland et al., 2004). Further, it can be assumed that Internet delivery was acceptable and desirable by the young adult population.

With regard to the social importance of the study's outcomes, driver and passenger belt use increased significantly between baseline and follow-up, regardless of group assignment. These changes in reported safety-belt use among the VT student population may have a significant public health impact. According to NHTSA, each percentage point increase in safety-belt use at the national level results an additional 2.8 people buckling-up per year resulting in 270 lives saved per year (2004c). This is roughly equivalent to preventing one plane crash in which all passengers die each year. Further, safety-belt use prevents morbidity.

**Future Research**

The informative theory-relevant results found in this study suggest the utility of further research on web-based assessment and brief motivational interventions to promote safety-belt use. Similar interventions should be developed and delivered via the Internet to the general population to assess their effectiveness beyond the university setting. Perhaps more targeted interventions focusing on drivers least likely to buckle-up-- males who drive pick-up trucks in the rural southern U.S. (NHTSA, 2004) will produce a meaningful impact. However, that target
population will also be less likely to have access to and use the Internet. Internet-facilitated assessment and intervention is amendable to a variety of settings, including doctors’ offices and hospitals. One potential setting to test the external validity of this web-based assessment and intervention would be the emergency department, as emergency department patients are known to report particularly low levels of safety-belt use (e.g., Fernandez, Mehta, Coles, Feldman, Mitchell, & Olshaker, 2006).

With regard to Internet delivery, the Internet is emerging as a niche area for behavioral researchers. A recent meta-analysis suggests Internet-based psychotherapeutic interventions may be as effective as traditional face-to-face interventions (Barak, Hen, Boniel-Nissim, & Shapira, in press). This review and analyses of 92 empirical articles published up to March of 2006 calculated a medium-sized mean weighted effect size (.53) that was similar to mean weighted effect sizes calculated via meta-analyses on traditional face-to-face interventions. A previous meta-analysis of heterogeneous web-based interventions found the effect sizes associated with the use of Internet-based interventions to be comparable or greater than non-Internet-based interventions for a variety of behavioral and knowledge-based outcomes (e.g., increased knowledge of nutritional status, increased exercise time, increased knowledge of asthma treatment, slower health decline, increased participation in healthcare, improved body shape perception, and weight loss; Wantland et al., 2004). These meta-analyses included studies with diverse targets, methodologies, and measures, and suggest Internet-based interventions have promise.

While many Internet-delivered interventions combine face-to-face components with Internet and or emailed components, it is not known whether face-to-face interaction is critical and or adds substantial added value. At least one study in the substance abuse field suggests
added benefit of in-person MI counseling in comparison to feedback provided in paper form only (Monti et al., 2007). While it is intuitively plausible to believe empathy can be better communicated through in-person interactions, the results of this study provide additional support to suggest feedback delivered in print or web-based interactions has promise. Further, other studies (Murphy et al., 2003; White et al., 2005) found improvements in substance use behaviors following assessment with written feedback and following assessment with one session of MI-consistent counseling in which feedback was delivered.

Because the mechanisms of action of MI are still unknown and the Internet provides a platform through which to examine technologically delivered interventions, this researcher suggests continued investigation into the role of assessment and feedback, as opposed to more expensive interpersonal counseling interventions that are difficult to quantify. For instance, a future study could delineate the relative efficacy of web-based MI-consistent assessment alone versus assessment plus: (1) salient information (e.g., information about safety risk); (2) feedback with salient information; and (3) feedback without salient information. Later studies could compare the relative efficacy of Internet-delivered MI-consistent interventions versus in-person MI-consistent interventions. Further, with regard to technological delivery of interventions (e.g., feedback), greater attention to measuring and enhancing adherence to the intervention is crucial given the results suggesting only 79% of completers who received personalized feedback were aware and or read the feedback in this study. For instance, more interactive Internet technology has the capability to measure time and frequency of log-ins and use.

There are opportunities to incorporate more interactivity into future assessment and feedback interventions, although this study relied on a rather static emailed-feedback due to budgetary constraints. Studies reviewed in the meta-analysis by Barak et al. (in press)
incorporated a wide range of synchronous and asynchronous interactive components designed to capture audience attention. More interactive and technologically advanced applications have capability to generate feedback personalized according to readiness. Personalization, conveyed through more interactive methodology, could possible improve therapeutic alliance and adherence.

In addition, future research should differentiate, as this study did, between driver and passenger use. Result from this study support previous research findings regarding differences between driver and passenger safety-belt use. Specifically, drivers are more likely than passengers to buckle-up. And, passengers have been found to buckle-up more often when in the presence of buckled drivers, and less often in the presence of unbuckled drivers (Nambisan & Vasudevan, 2007). Given the principle of conformity (Cialdini, 2001), the safety-belt use of relevant others in the vehicular environment may be salient and deserves further research attention.

Finally, the mechanisms involved in changing belt use, and the willingness to ask others to do the same, as well as changing motivation to buckle-up and ask others to do the same are unclear. Thus, future research is needed to explore mechanisms of change and identify the most effective method to promote safety-belt use among young adults who are not necessarily seeking a change in this behavior. As discussed above, the role of readiness is of most interest to this researcher.

Summary

In sum, this study demonstrated the feasibility and acceptability of an inexpensive web-based intervention in promoting safety-belt use among students at VT. As hypothesized, all participants, including those who received personalized feedback as well as those who received
general nutrition information, reported significantly higher median driver and passenger safety-belt use at follow-up than they did at baseline. Further, among those participants who completed follow-up, those who received personalized feedback following assessment were significantly more likely than those who received general nutrition information following assessment to report significant increases in passenger safety-belt use. Interestingly, change in reported driver belt use was not significantly associated with group assignment. Additionally, regardless of group assignment, most participants showed increases in the highly intercorrelated constructs of importance, confidence, and readiness to buckle-up and ask others to do the same. Further, post hoc analyses suggest the importance of readiness as reported increases in median readiness was significantly associated with reported increases in safety-belt use as a driver and passenger as well as commitment to buckle-up and ask others to do the same. Future research should investigate the mediating role of readiness to buckle-up and ask others to do the same in conjunction with assessment and feedback.
References


*Traffic safety facts: Young drivers (15-20) involved in fatal crashes.* (DOT HS 809 820).

Washington, D.C., National Center for Statistics and Analysis.


*Overview of the buckle-up America campaign.* (DOT HS 809 884). Retrieved on February 12, 2009 from:


Figure 4. Frequency Distribution of Baseline Safety-Belt Use (N = 347)
**Figure 5.** Proportion of Participants Reporting Increase in Safety-Belt Use According to Baseline Safety-Belt Use (N = 347)
Appendix A

Pilot Study Survey
Demographics & Safety-Belt Use

(1) What is your gender?
- Male
- Female
- Transgender

(2) What is your date of birth?
- Date: ___
- Month: ___
- Year: ___

(3) What is your current age? ___

(4) Which best describes the place you live most of the time?
- House/apartment
- Dorm

(5) In which state is your car registered?

(6) I use my safety belt when I am driving a vehicle all of the time. Y/N

(7) I use my safety belt when I am a passenger in a vehicle all of the time. Y/N

(8) How would you best classify your “hometown”:
- Urban
- Suburban
- Rural

(9) What type best describes your vehicle:
- Passenger car
- Sports utility vehicle or van
- Pick-up truck

(10) What is your weight range compared to other people?
- Underweight
- Normal weight
- Overweight
- Obese

IF OVERWEIGHT OR OBESE:

11) Is wearing a safety belt uncomfortable for you because of your weight? Y/N

12) Do you own a safety-belt length extender? Y/N
Opinions & Attitudes About Safety-Belt Use

Please answer the following questions about your opinions and attitudes about safety-belt use.

Please circle the answer that fits best for you:

1) I have a habit of buckling-up because my parents insisted I did when I was child.

1__________2___________3___________4___________5__________6__________7_______8

I completely disagree  I completely agree

2) If I were in a crash, I would want to have my safety belt on.

1__________2___________3___________4___________5__________6__________7_______8

I completely disagree  I completely agree

3) Safety belts are just as likely to harm you as help you.

1__________2___________3___________4___________5__________6__________7_______8

I completely disagree  I completely agree

4) I would feel self-conscious around my friends if I wore a safety belt and they did not.

1__________2___________3___________4___________5__________6__________7_______8

I completely disagree  I completely agree

5) A crash close to home is usually not as serious

1__________2___________3___________4___________5__________6__________7_______8

I completely disagree  I completely agree
Pilot Study Survey, cont.

6) Putting on a safety belt makes me worry more about being in a crash.

1 2 3 4 5 6 7 8

I completely disagree I completely agree

7) Wearing my safety belt makes me physically uncomfortable.

1 2 3 4 5 6 7 8

I completely disagree I completely agree

8) I would not feel self-conscious around my friends if I wore a safety belt and they did not.

1 2 3 4 5 6 7 8

I completely disagree I completely agree

9) How much do you agree with this statement: “If it is your time to die, you’ll die.”:

1 2 3 4 5 6 7 8

I completely disagree I completely agree

10) If I were in a crash, I would not want to have my safety belt on.

1 2 3 4 5 6 7 8

I completely disagree I completely agree

Overall, my main reason for using my safety belt is:

Overall, my main reason for not using my safety belt is:

Items 3, 4, 5, 6, 7, 9, 10, are reverse coded

Adapted from NHTSA survey (2003d)
Pilot Study Survey, cont.

Opinions & Attitudes About Safety-Belt Use Laws & Enforcement

Please answer the following questions about your opinions and attitudes about safety-belt use laws.

Please circle the answer that fits best for you:

1) Safety-belt use laws are good to have.

1__________2___________3___________4___________5__________6__________7_______8

* I completely disagree

* I completely agree

2) Police should be allowed to stop a vehicle if they observe a safety belt use violation when no other traffic laws are being broken.

1__________2___________3___________4___________5__________6__________7_______8

* I completely disagree

* I completely agree

3) I support fines for drivers who do not use safety belts.

1__________2___________3___________4___________5__________6__________7_______8

* I completely disagree

* I completely agree

4) I support fines for passengers who do not use safety belts.

1__________2___________3___________4___________5__________6__________7_______8

* I completely disagree

* I completely agree

5) I support drivers getting points against their license for not using safety belts.

1__________2___________3___________4___________5__________6__________7_______8

* I completely disagree

* I completely agree
6) Safety-belt use laws are not good to have.

1 __________ 2 __________ 3 __________ 4 __________ 5 __________ 6 __________ 7 _______ 8

I completely disagree  I completely agree

7) I do not support fines for drivers who do not use safety belts.

1 __________ 2 __________ 3 __________ 4 __________ 5 __________ 6 __________ 7 _______ 8

I completely disagree  I completely agree

Items 6,7, are reverse coded

Adapted from NHTSA survey (2003d)
Pilot Study Survey, cont.

**Motivation: Importance, Confidence, & Readiness to Buckle-Up Each Time Driving**

Please take a minute to indicate the following by circling the answer that fits best for you:

On a scale of 0 to 10, if 0 is not important at all and 10 is very important, **how important** it is for you to buckle-up each time you **drive** a vehicle?

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</table>

*Not Important at all* | *Very Important*

On a scale of 1 to 10, if 0 is not confident at all and 10 is very confident, **how confident** are you that you can buckle-up each time you **drive** a vehicle?

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</table>

*Not Confident at all* | *Very Confident*

On a scale of 0 to 10, if 0 is not ready at all and 10 is very ready, **how ready** you to buckle-up each time you **drive** a vehicle?

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</table>

*Not ready at all* | *Very Ready*
Pilot Study Survey, cont.

**Motivation: Importance, Confidence, & Readiness to Buckle-Up Each Time a Passenger**

Please take a minute to indicate the following by circling the answer that fits best for you:

On a scale of 0 to 10, if 0 is not important at all and 10 is very important, **how important** it is for you to buckle-up each time you are a passenger in a vehicle?

0 1 2 3 4 5 6 7 8 9 10

*Not Important at all*  *Very Important*

On a scale of 1 to 10, if 0 is not confident at all and 10 is very confident, **how confident** are you that you can buckle-up each time you are a passenger in a vehicle?

0 1 2 3 4 5 6 7 8 9 10

*Not Confident at all*  *Very Confident*

On a scale of 0 to 10, if 0 is not ready at all and 10 is very ready, **how ready** you to buckle-up each time you are a passenger in a vehicle?

0 1 2 3 4 5 6 7 8 9 10

*Not ready at all*  *Very Ready*
Pilot Study Survey, cont.

Safety-Belt Use in Past 10 Instances: Driver & Passenger

Please think of the last ten times you drove a vehicle. In how many of these instances did you use your safety-belt exactly as described here: You buckled your safety-belt before the vehicle began to roll regardless of how fast or slow the vehicle was rolling and regardless of the length of your driving trip. You did not unbuckle your belt until the vehicle came to a complete and total stop at a parking space. Please circle your answer.

0 1 2 3 4 5 6 7 8 9 10

Please think of the last ten times you were a passenger in a vehicle. In how many of these instances did you use your safety-belt exactly as described here: You buckled your safety-belt before the vehicle began to roll regardless of how fast or slow the vehicle was rolling and regardless of the length of your driving trip. You did not unbuckle your belt until the vehicle came to a complete and total stop at a parking space. Please circle your answer.

0 1 2 3 4 5 6 7 8 9 10

THANK YOU FOR YOUR ANSWERS
Appendix B

Main Study Web-based Informed Consent
Main Study Web-based Informed Consent

By reading this over, you will be able to make a decision about whether or not you would like to participate in the study:

VIRGINIA POLYTECHNIC INSTITUTE AND STATE UNIVERSITY

Informed Consent for Participants in Research Projects
Involving Human Subjects

STUDY TITLE: Developing & Testing a Web-Based Brief Motivational Intervention to Promote Safety-Belt Use

My name is Leah Farrell. I am a doctoral student in clinical psychology at Virginia Tech. I am a co-investigator on a study about driving behaviors. The principle investigator of this study is Dr. E. Scott Geller, professor of psychology. This study is being run through the Center for Applied Behavior Systems in the Department of Psychology at Virginia Tech.

The purpose of this two-part study is to develop and test a new web-based assessment and brief intervention about safety-belt use. The study will enroll up to 300 participants. All participants will be undergraduate students at Virginia Tech who drive or ride in vehicles.

You have been asked to participate in the study because of how you use your safety-belt.

Before choosing to participate, it is important that you read and understand the following statements:

Study Procedures: If you choose to participate in part one, you will be asked to complete a web-based survey. This survey is called the baseline assessment and it is about your demographic characteristics, your safety-belt use, your attitudes and opinions about safety belts, your motivations regarding using safety belts, your exposure to enhanced enforcement efforts, and your perceptions about your risk of harm or injury when a driver or riding in a vehicle. The baseline assessment will take approximately 10 - 20 minutes to complete.

Then, you will be randomly assigned to receive an email within one week containing either: 1) personalized feedback about the baseline assessment or 2) general nutrition information. It will take you approximately 10 minutes to review these materials and you will be able to save and or print them for your records and further review.

Two weeks later, you will receive a reminder email from the investigator (Leah Farrell, lvf2101@vt.edu) prompting you to log onto SONA to complete part two.

Part two of this two part study entails you logging onto a website and completing a briefer version of the first survey you completed at baseline (part one). This is called the follow up assessment. It will take you approximately 10 minutes to complete the follow up assessment.
The combined time required for your completion of this two-part study is estimated to be less than 40 minutes over the course of three to four weeks. You will receive 1 extra credit point for participation in part one and 1 extra credit point for participation in part two. You will receive up to 2 extra credit points by participating in both parts.

Although there are no direct benefits to you as a result of your participation, the information you provide will help society learn more about how people use safety-belts and about safety belt use fits into peoples’ lives. No promise or guarantee of benefits have been made to encourage you to participate.

There are no more than minimal risks involved with this study.

You will be asked to provide identifying information such as: your name and email address. This identifying information will be used to assign you extra credit for your participation and to contact you via email to provide you with personalized feedback or general nutrition information. Also, the researcher may send you an email to prompt you to log on to complete your follow up survey.

To re-iterate, email will also be used for assigning extra credit as well as notification of the intervention and part two of the study (follow up survey).

Your identifying information will be kept in a password-protected file, separate from your responses to the survey. Your name and or email address will not appear on any of the surveys, data, final report, or any publications or presentations based on this research. The password-protected file containing your identifying information will be destroyed three years after your participation in this study.

Steps will be taken to protect your confidentiality. You will be assigned a unique identifying number that will be associated with your survey responses. This ensures your responses will not be associated with your name and or email address. The information that you provide will be analyzed in aggregate form only. Please note, however, that absolute confidentiality cannot be wholly guaranteed due to the limited protections of Internet use.

For the purpose of further insulating confidentiality, participants are encouraged to utilize free, anonymous email providers such as Yahoo (http://mail.yahoo.com) or Hotmail (http://www.hotmail.com). If you do not properly exit or close your Internet browser when you are finished with your surveys it is possible that an outside party could view your responses. Be sure to close your browser after you have submitted your responses or if you choose to discontinue participation. At no time will the researchers release the results of the study to anyone other than individuals working on the project without your written consent. A professional and encrypted subscription to the survey application ( surveymonkey.com) has been purchased for this study. Survey Monkey will use Secure Sockets Layer (SSL) to encrypt all surveys. SSL is used for transmitting information privately over the Internet. Many corporations and academic institutions require SSL when collecting data. SSL is supported in all modern browsers. Only the investigators and people who are directly working as research assistants will have access to your data. It is possible that the Institutional Review Board (IRB) may view this study’s collected data for auditing purposes. The IRB is responsible for the oversight of the protection of human subjects involved in research.
Main Study Web-based Informed Consent, cont.

You will be compensated with extra credit points for completion of each survey. You will receive one extra credit point for completion of the part one (the baseline survey) and one extra credit point for completion of part two (the follow up survey). This means you will be able to receive two extra credit points for your full participation in the entire study. Your choice to participate in compensation is voluntary.

Taking part in this research is voluntary. You are free to withdraw from the study at any time without penalty. Please note the surveys are designed so that none of your responses are submitted until the surveys are complete and you choose to send your responses. You are free not to answer any questions without penalty. You may withdraw from the research project without penalty at any time prior to completing the survey by closing your Internet browser. In these cases, you will not receive the extra credit points for your full participation.

You may direct study-related inquiries to the Principal Investigator by emailing E. Scott Geller at esgeller@vt.edu or to the Co-Investigator, Leah Farrell at lvf2101@vt.edu. Alternatively, you may mail your questions to:
E. Scott Geller or Leah Farrell
Center for Applied Behavior Systems
202 Williams Hall
Blacksburg, Virginia, 24061

Please read and indicate your preference to be in the study or not:

This project has been reviewed by the Human Subjects Protection Review Committee, which ensures that research projects involving human subjects follow federal regulations. If I should have any questions about the protection of human research participants regarding this study, I may contact Dr. David Moore, Chair Virginia Tech Institutional Review Board for the Protection of Human Subjects, telephone: (540) 231-4991; email: moored@vt.edu; address: of Research Compliance, 2000 Kraft Drive, Suite 2000 (0497), Blacksburg, VA 24060.

Please print a copy of this informed consent form for your records.

If I voluntarily agree to participate in this study, I will have the following responsibilities:

1) I will complete the web-based baseline assessment (part 1). This survey will take approximately 10 - 15 minutes to complete.

2) Within one week of completing the baseline assessment, I will receive an email containing either: 1) personalized feedback about the baseline assessment or 2) general nutrition information. It will take approximately 10 minutes to review these materials and I will be able to save and or print them for my records and further review.

3) Two weeks after receiving this email, I will re-visit SONA to find part two and log onto a website and complete a briefer version of the survey I completed at baseline. This is called the follow up survey (part two). This will take approximately 10 minutes. I may receive an email prompt from the co-investigator to remind me to do this.
Main Study Web-based Informed Consent, cont.

The combined time required for my completion of this entire study is estimated to be less than 40 minutes over the course of three to four weeks.

By clicking the "I Agree" button below I am indicating I have read the Consent Form and conditions of this project. I have had all my questions answered. I hereby acknowledge the above and give my voluntary consent. I have printed a copy of the Consent Form statement for my files. I am also accepting my email address, name and today’s date are being stored by the researcher for the purposes of documenting my consent and contacting me for study-related purposes.

By clicking the "I Agree" button below I am indicating:

I have read the Consent Form and conditions of this project. I have had all my questions answered. I hereby acknowledge the above and give my voluntary consent. I have printed a copy of the Consent Form statement for my files. I am also accepting my email address, name, telephone number, and today’s date are being stored by the researcher for the purposes of documenting my consent and contacting me for study-related purposes.

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- I Agree
- I Disagree
Appendix C

Main Study Measures

Eligibility Questionnaire

Demographics

Safety-Belt Use in the Past 10 Instances as a Driver and as a Passenger

Importance, Confidence, & Readiness Rulers

Situational Temptation & Confidence

Decisional Balance

Perceived Risk

Exposure to Enhanced Enforcement Efforts

Commitment/Intention to Buckle-Up
Eligibility Questionnaire

**Would you like to screen?**
Thank you for your interest in this driving study!

To find out if you are eligible to participate, please answer a few quick questions...

**I am interested in screening for this study.**

Yes
No

**VT PID**

_What is your Virginia Tech PID?_

![Input field for VT PID]

**Drive or ride at least 5 times?**

_On average do you drive or ride in a vehicle in at least 5 instances per week? An instance is equal to 1 trip, so a round-trip would have 2 instances in it._

![Input field for drive or ride at least 5 times]

**Buckling Up**

_Please think of the last 10 instance you either drove a vehicle OR rode as a passenger in a vehicle._

_In how many of these instances did you use your safety-belt exactly as described here: You buckled your safety-belt before the vehicle began to roll regardless of how fast or slow the vehicle was rolling and regardless of the length of your trip. You did not unbuckle your belt until the vehicle came to a complete and total stop at a parking space._

![Input field for buckling up]

**18+?**

_Are you at least 18 years of age?_

![Input field for 18+?]

**IF INELIGIBLE ➔**

_Ineligible: thank you_

It appears you are not eligible for this study at this time. Thank you for your interest in this study.

**IF ELIGIBLE ➔**
Eligibility Questionnaire, cont.

Eligible: would you like to know more?
You are eligible for this study.

Would you like to find out more and decide if you would like to participate?

IF YES: Warning
Since you are eligible and you would like to know more, you will be guided through an Informed Consent process.

The Informed Consent process will take a few minutes, depending on how much thought and time you put into it.

If you decide to become a participant in the study by “accepting” the terms of the Informed Consent process, you will be directed through a brief process to get you started on the study. This will take approximately 2 minutes.

PLEASE NOTE: IF YOU ACCEPT THE INFORMED CONSENT AND DO NOT CONTINUE ON TO GET STARTED (this takes about 2 minutes), YOU WILL BE REQUIRED TO RE-SCREEN AND GO THROUGH THE INFORMED CONSENT PROCESS AGAIN.

Would you like to continue?

Yes
No
Demographics

**What is your gender?**

- Male
- Female
- Transgender

**What is your date of birth?**

MM/ DD/ YYYY

**What is your current age?**

age in years:

**What best describes the place where you live most of the time?**

- House/Apartment
- Dorm
- In what state is your primary vehicle registered in?

- Virginia
- NOT Virginia

**I always use my safety belt when I am DRIVING a vehicle.**

- True
- False

**I always use my safety belt when I am RIDING AS A PASSENGER IN A VEHICLE.**

- True
- False

**How would you classify your hometown?**

- Urban
- Suburban
- Rural

**What type best describes your vehicle?**

- Passenger car
- Sports utility vehicle (SUV)
- Pick-up truck
Safety-Belt Use in the Past 10 Instances as a Driver and as a Passenger

<table>
<thead>
<tr>
<th>Safety-Belt Use in Past 10 Instances: Driver &amp; Passenger</th>
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<tbody>
<tr>
<td>Please think of the last 10 times you DROVE a vehicle. In how many of these instances did you use your safety-belt exactly as described here: You buckled your safety-belt before the vehicle began to roll regardless of how fast or slow the vehicle was rolling and regardless of the length of your driving trip. You did not unbuckle your belt until the vehicle came to a complete and total stop at a parking space.</td>
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| Please think of the last ten times you were a PASSENGER in a vehicle. In how many of these instances did you use your safety-belt exactly as described here: You buckled your safety-belt before the vehicle began to roll regardless of how fast or slow the vehicle was rolling and regardless of the length of your driving trip. You did not unbuckle your belt until the vehicle came to a complete and total stop at a parking space. |
| 0 | 1 | 2 | 3 | 4 | 5 | 6 | 7 | 8 | 9 | 10 |
## Motivation: Importance, Confidence, & Readiness to Buckle-Up Each Time Driving

Please indicate the following by selecting the answers that fit best for you.

**On a scale of 0 to 10, if 0 is not important at all and 10 is very important, how important it is for you to buckle-up each time you ARE A DRIVER of a vehicle?**

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**On a scale of 0 to 10, if 0 is not confident at all and 10 is very confident, how confident are you that you can buckle-up each time you ARE A DRIVER of a vehicle?**

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**On a scale of 0 to 10, if 0 is not ready at all and 10 is very ready, how ready you to buckle-up each time you ARE A DRIVER of a vehicle?**

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<tbody>
<tr>
<td>0 NOT READY AT ALL</td>
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## Motivation: Importance, Confidence, & Readiness to Buckle-Up Each Time as a Passenger

Please indicate the following by selecting the answers that fit best for you.

**On a scale of 0 to 10, if 0 is not important at all and 10 is very important, how important it is for you to buckle-up each time you are a PASSENGER in a vehicle?**

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<th></th>
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<tbody>
<tr>
<td>0 NOT IMPORTANT AT ALL</td>
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<tr>
<td>VERY IMPORTANT</td>
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</table>

**On a scale of 0 to 10, if 0 is not confident at all and 10 is very confident, how confident are you that you can buckle-up each time you are a PASSENGER in a vehicle?**

<table>
<thead>
<tr>
<th></th>
<th>0</th>
<th>1</th>
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<tbody>
<tr>
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</tbody>
</table>

**On a scale of 0 to 10, if 0 is not ready at all and 10 is very ready, how ready you to buckle-up each time you are a PASSENGER in a vehicle?**

<table>
<thead>
<tr>
<th></th>
<th>0</th>
<th>1</th>
<th>2</th>
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</tr>
</thead>
<tbody>
<tr>
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<td>VERY READY</td>
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</tr>
</tbody>
</table>
### Motivation: Importance, Confidence, & Readiness to Ask Others to Buckle-Up When You are Driving

**Please indicate the following by selecting the answers that fit best for you.**

**On a scale of 0 to 10, if 0 is not important at all and 10 is very important, IN SITUATIONS WHEN YOU ARE THE DRIVER, how important is it to you to ask all passengers in the vehicle to buckle-up?**

<table>
<thead>
<tr>
<th>0 NOT IMPORTANT AT ALL</th>
<th>1</th>
<th>2</th>
<th>3</th>
<th>4</th>
<th>5</th>
<th>6</th>
<th>7</th>
<th>8</th>
<th>9</th>
<th>10 VERY IMPORTANT</th>
</tr>
</thead>
</table>

**On a scale of 0 to 10, if 0 is not confident at all and 10 is very confident, how confident are you that you can ask all passengers in the vehicle to buckle-up in situations WHEN YOU YOU ARE THE DRIVER?**

<table>
<thead>
<tr>
<th>0 NOT CONFIDENT AT ALL</th>
<th>1</th>
<th>2</th>
<th>3</th>
<th>4</th>
<th>5</th>
<th>6</th>
<th>7</th>
<th>8</th>
<th>9</th>
<th>10 VERY CONFIDENT</th>
</tr>
</thead>
</table>

**On a scale of 0 to 10, if 0 is not ready at all and 10 is very ready, how ready are you to ask all passengers in the vehicle to buckle-up in situations WHEN YOU YOU ARE THE DRIVER?**

<table>
<thead>
<tr>
<th>0 NOT READY AT ALL</th>
<th>1</th>
<th>2</th>
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<th>4</th>
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<th>6</th>
<th>7</th>
<th>8</th>
<th>9</th>
<th>10 VERY READY</th>
</tr>
</thead>
</table>

### Motivation: Importance, Confidence, & Readiness to Ask Others to Buckle-Up When You are Driving

**Please indicate the following by selecting the answers that fit best for you.**

**On a scale of 0 to 10, if 0 is not important at all and 10 is very important, IN SITUATIONS WHEN YOU ARE A PASSENGER, how important is it to you to ask all others in the vehicle to buckle-up?**

<table>
<thead>
<tr>
<th>0 NOT IMPORTANT AT ALL</th>
<th>1</th>
<th>2</th>
<th>3</th>
<th>4</th>
<th>5</th>
<th>6</th>
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<th>8</th>
<th>9</th>
<th>10 VERY IMPORTANT</th>
</tr>
</thead>
</table>

**On a scale of 0 to 10, if 0 is not confident at all and 10 is very confident, how confident are you that you can ask all others in the vehicle to buckle-up in situations WHEN YOU YOU ARE A PASSENGER?**

<table>
<thead>
<tr>
<th>0 NOT CONFIDENT AT ALL</th>
<th>1</th>
<th>2</th>
<th>3</th>
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<th>8</th>
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<th>10 VERY CONFIDENT</th>
</tr>
</thead>
</table>

**On a scale of 0 to 10, if 0 is not ready at all and 10 is very ready, how ready are you to ask all others in the vehicle to buckle-up in situations WHEN YOU YOU ARE A PASSENGER?**

<table>
<thead>
<tr>
<th>0 NOT READY AT ALL</th>
<th>1</th>
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<th>6</th>
<th>7</th>
<th>8</th>
<th>9</th>
<th>10 VERY READY</th>
</tr>
</thead>
</table>
Situational Temptation & Confidence

**Temptation Not to Buckle-Up**

Situations lead people to feel more or less tempted NOT to buckle-up. Please select the number that best matches your temptation not to buckle up in each of the situations below.

**When I am driving a vehicle alone**

<table>
<thead>
<tr>
<th>0</th>
<th>1</th>
<th>2</th>
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<th>4</th>
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</tr>
</thead>
<tbody>
<tr>
<td>NOT AT ALL TEMPTED NOT TO BUCKLE-UP</td>
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<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td>VERY TEMPTED NOT TO BUCKLE-UP</td>
</tr>
</tbody>
</table>

**When I am driving a vehicle and my family is with me**

<table>
<thead>
<tr>
<th>0</th>
<th>1</th>
<th>2</th>
<th>3</th>
<th>4</th>
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</table>

**When I am driving a vehicle and my friends are with me**

<table>
<thead>
<tr>
<th>0</th>
<th>1</th>
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<td>NOT AT ALL TEMPTED NOT TO BUCKLE-UP</td>
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<td></td>
<td>VERY TEMPTED NOT TO BUCKLE-UP</td>
</tr>
</tbody>
</table>

**When I am a passenger in a vehicle with my family**

<table>
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<tr>
<th>0</th>
<th>1</th>
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<td></td>
<td>VERY TEMPTED NOT TO BUCKLE-UP</td>
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</table>

**When I am a passenger in a vehicle with my friends**

<table>
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<tr>
<th>0</th>
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<td></td>
<td></td>
<td></td>
<td>VERY TEMPTED NOT TO BUCKLE-UP</td>
</tr>
</tbody>
</table>
Situational Temptation & Confidence, cont.

**Temptation Not to Buckle-Up**

Situations lead people to feel more or less tempted NOT to buckle-up.
Please select the number that best matches your temptation not to buckle up in each of the situations below.

**When I am traveling a short distance**

<table>
<thead>
<tr>
<th></th>
<th>0</th>
<th>1</th>
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<td></td>
<td>VERY TEMPTED NOT TO BUCKLE-UP</td>
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</table>

**When the weather is "good"**

<table>
<thead>
<tr>
<th></th>
<th>0</th>
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<tr>
<td>NOT AT ALL TEMPTED NOT TO BUCKLE-UP</td>
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<td></td>
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</table>

**When the weather is "bad"**

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<tr>
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<td>VERY TEMPTED NOT TO BUCKLE-UP</td>
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</tbody>
</table>

**When others in the vehicle are not buckled up**

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<td></td>
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<td></td>
<td>VERY TEMPTED NOT TO BUCKLE-UP</td>
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</tbody>
</table>

**When others in the vehicle are buckled up**

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<thead>
<tr>
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</table>

**When I see a police car or think about the possibility of getting a ticket for not using my belt**

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<tr>
<th></th>
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<td></td>
<td></td>
<td></td>
<td></td>
<td>VERY TEMPTED NOT TO BUCKLE-UP</td>
</tr>
</tbody>
</table>
Situational Temptation & Confidence, cont.

**Confidence to Buckle-Up**

Situations lead people to feel more or less confident they would buckle-up. Please select the number that best matches your confidence that you **WOULD** buckle-up in the following situations:

**When I am driving a vehicle alone**

<table>
<thead>
<tr>
<th>0 NOT AT ALL CONFIDENT I WOULD BUCKLE-UP</th>
<th>1</th>
<th>2</th>
<th>3</th>
<th>4</th>
<th>5</th>
<th>6</th>
<th>7</th>
<th>8</th>
<th>9</th>
<th>10 VERY CONFIDENT I WOULD BUCKLE-UP</th>
</tr>
</thead>
</table>

**When I am driving a vehicle and my family is with me**

<table>
<thead>
<tr>
<th>0 NOT AT ALL CONFIDENT I WOULD BUCKLE-UP</th>
<th>1</th>
<th>2</th>
<th>3</th>
<th>4</th>
<th>5</th>
<th>6</th>
<th>7</th>
<th>8</th>
<th>9</th>
<th>10 VERY CONFIDENT I WOULD BUCKLE-UP</th>
</tr>
</thead>
</table>

**When I am driving a vehicle and my friends are with me**

<table>
<thead>
<tr>
<th>0 NOT AT ALL CONFIDENT I WOULD BUCKLE-UP</th>
<th>1</th>
<th>2</th>
<th>3</th>
<th>4</th>
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<th>6</th>
<th>7</th>
<th>8</th>
<th>9</th>
<th>10 VERY CONFIDENT I WOULD BUCKLE-UP</th>
</tr>
</thead>
</table>

**When I am a passenger in a vehicle with my family**

<table>
<thead>
<tr>
<th>0 NOT AT ALL CONFIDENT I WOULD BUCKLE-UP</th>
<th>1</th>
<th>2</th>
<th>3</th>
<th>4</th>
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</tr>
</thead>
</table>

**When I am a passenger in a vehicle with my friends**

<table>
<thead>
<tr>
<th>0 NOT AT ALL CONFIDENT I WOULD BUCKLE-UP</th>
<th>1</th>
<th>2</th>
<th>3</th>
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</tr>
</thead>
</table>

**When I am traveling a short distance**

<table>
<thead>
<tr>
<th>0 NOT AT ALL CONFIDENT I WOULD BUCKLE-UP</th>
<th>1</th>
<th>2</th>
<th>3</th>
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<th>8</th>
<th>9</th>
<th>10 VERY CONFIDENT I WOULD BUCKLE-UP</th>
</tr>
</thead>
</table>

**When the weather is “bad”**

<table>
<thead>
<tr>
<th>0 NOT AT ALL CONFIDENT I WOULD BUCKLE-UP</th>
<th>1</th>
<th>2</th>
<th>3</th>
<th>4</th>
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<th>10 VERY CONFIDENT I WOULD BUCKLE-UP</th>
</tr>
</thead>
</table>
**Confidence to Buckle-Up**

Situations lead people to feel more or less confident they would buckle-up. Please select the number that best matches your confidence that you WOULD buckle-up in the following situations:

### When the weather is "good"

<table>
<thead>
<tr>
<th>0 NOT AT ALL CONFIDENT I WOULD BUCKLE-UP</th>
<th>1</th>
<th>2</th>
<th>3</th>
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<th>8</th>
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<th>10 VERY CONFIDENT I WOULD BUCKLE-UP</th>
</tr>
</thead>
</table>

### When others in the vehicle are not buckled up

<table>
<thead>
<tr>
<th>0 NOT AT ALL CONFIDENT I WOULD BUCKLE-UP</th>
<th>1</th>
<th>2</th>
<th>3</th>
<th>4</th>
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<th>8</th>
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</tr>
</thead>
</table>

### When others in the vehicle are buckled up

<table>
<thead>
<tr>
<th>0 NOT AT ALL CONFIDENT I WOULD BUCKLE-UP</th>
<th>1</th>
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<th>3</th>
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### When I see a police car or think about the possibility of getting a ticket for not using my belt

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</tr>
</thead>
</table>
Decisional Balance

It is common for people to have conflicting feelings about specific behaviors.

For instance, you may be able to list some GOOD things about not buckling-up AND at the same time, you may be able to list some NOT-SO GOOD things about not buckling-up.

Given how complicated we humans are, it’s not surprising we have a hard time looking at why we do what we do and whether or not we want to change.

Please take a moment to answer these questions about how safety-belt use fits into your life:

**Some GOOD THINGS about not buckling-up are:**

**Some NOT SO GOOD THINGS about not buckling-up are:**

**Some GOOD THINGS about changing so I buckle-up more are:**

**Some NOT SO GOOD THINGS about changing so I buckle-up more are:**
## Perceived Risk

Please provide your BEST GUESS to the answers of these questions.

**If you had to guess, what are the chances you will ever be involved in a crash in your lifetime?**

percent chance =

**If you had to guess, what are the chances you will ever suffer from injuries sustained in a vehicle crash in your lifetime?**

percent chance =

**If you had to guess, what are the chances you will die in a motor vehicle crash?**

percent chance =

The leading cause of death for people between the ages of 18 and 24 who live in the United States is:

- gun violence
- cancer
- HIV/AIDS
- motor vehicle crashes
Exposure to Enhanced Enforcement Efforts

<table>
<thead>
<tr>
<th>Exposure to Enhanced Enforcement Efforts</th>
<th>In my lifetime, I have been cited, by an officer, for non-use of a safety-belt.</th>
</tr>
</thead>
<tbody>
<tr>
<td>True</td>
<td>False</td>
</tr>
</tbody>
</table>

In my lifetime, I have seen or heard “Click it or Ticket” advertisements in the following places (please select all that apply):

- the Virginia Tech campus
- television advertisements
- Internet advertisements
- Radio advertisement

I have been cited by an officer for non-use of my safety-belt within the past 2 weeks.

<table>
<thead>
<tr>
<th>True</th>
<th>False</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>My vehicle insurance premiums are higher because I don’t use my safety-belt.</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>True</th>
<th>False</th>
</tr>
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<th>True</th>
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<th>True</th>
<th>False</th>
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</thead>
</table>

Commitment/Intention to Buckle-Up

**Commitment to always buckle-up when I’m a driver**

*Please select the response that fits best for you right now:*

- I commit to always buckling-up when I am a driver from now on.
- I DO NOT commit to always buckling-up when I am a driver from now on.

**Commitment to always buckle-up when I’m a passenger**

*Please select the response that fits best for you right now:*

- I commit to always buckling-up when I am a passenger from now on.
- I DO NOT commit to always buckling-up when I am a passenger from now on.

**Commitment to always ask passengers/others to buckle-up when I am a driver**

*Please select the response that fits best for you right now:*

- I commit to always asking passengers in vehicles I drive to buckle-up from now on.
- I DO NOT commit to always asking passengers in vehicles I drive to buckle-up from now on.

**Commitment to always ask passengers/others to buckle-up when I am a passenger**

*Please select the response that fits best for you right now:*

- I commit to always asking other passengers to buckle-up when I am also a passenger from now on.
- I DO NOT commit to always asking other passengers to buckle-up when I am also a passenger from now on.
Appendix D

Main Study Materials

Personalized feedback example

General nutrition information
Dear Fellow Hokie,

Thank you for completing the survey in part 1 of this two-part study. What thoughts came to mind as you answered the questions?

As you may already know, this study is interested in how your safety-belt use and your commitment to asking others to buckle-up fit together. However, my aim is not to make you change. Rather, I am simply providing an opportunity for you to explore how safety-belt use and your commitment to buckling-up and asking others to buckle-up fit into your own life. How does that sound?

I prepared feedback for you based on how you answered the questions about:

- how often you buckle-up,
- situations where you feel tempted not to use your safety belt as well as situations where you feel more confident to buckle-up,
- your thinking about how important safety-belt use is and how confident and ready you are to buckle-up and ask others to do the same and,
- personal risks linked with non-use of safety-belts.

This feedback packet wraps up with a few questions you may or may not choose to ponder.

Safe Wishes,

Leah Farrell, M.A., M.S.
Psychology Ph.D. Candidate

Please remember to take Part 2 on or around 4/29/08. THANK YOU!
Personalized feedback example

**Personalized Feedback for YOU**

You told me you drove without buckling your safety belt in 4 of the last 10 times you drove your vehicle.

&

You told me you rode, as a passenger, without buckling your safety belt in 6 of the last 10 times you rode as a passenger.

You indicated you are most tempted NOT to buckle-up in these situations:

- When you are driving a vehicle and your friends are with you
- When you are a passenger in a vehicle with your friends
- When you are traveling a short distance
- When the weather is “bad”

On the other hand, you indicated you are MOST CONFIDENT you would buckle-up in these situations:

- When you are driving a vehicle and your family is with you
- When you are a passenger in a vehicle with your family
- When the weather is “bad”
- When you see a police car or think about the possibility of getting a ticket for not using your belt

What do you make of this so far?

How well does it fit for you?
How does your safety-belt use compare?

Most Virginia Tech students buckle-up 100% of the time when they are driving and 100% of the time when they are a passenger.

Overall, you buckle-up about 60% of the time when you are driving.

Overall, you buckle-up about 40% of the time when you are riding as a passenger.

What has safety-belt use research found?:

- If you observe 100 vehicle drivers at any time, about 80 of the drivers are buckled-up.
- If you observe 100 drivers on the Virginia Tech campus at any time, about 82 of the drivers are buckled-up.

How does that fit with what you observe?

How surprising is this to you, if at all?

If most students buckle-up 100% of the time,

How does your belt-use compare to that of other students?
Personalized feedback example

Based on your responses to the surveys in Part 1 of this study...

- You indicated it is *somewhat important* for you to buckle-up each time you drive a vehicle.
- And, you indicated you are *confident* you can buckle-up each time you drive a vehicle.
- Also, you indicated you are *ready* to buckle-up each time you drive a vehicle.

How have things changed for you since you completed the survey, if at all?

Based on your responses to the surveys in Part 1 of this study...

- You indicated it is *very important* for you to buckle-up each time you are vehicle passenger.
- And, you indicated you are *very confident* you can buckle-up each time you are a vehicle passenger.
- Also, you indicated you are *very ready* to buckle-up each time you are a vehicle passenger.

How have things changed for you since you completed the survey, if at all?

Based on your responses to the surveys in Part 1 of this study...

- In situations when you are the driver, you indicated it is *not quite important*.
- And, you indicated you are *not quite confident* you would ask passengers to buckle-up when you are the driver of a vehicle.
- Also, you indicated you are *not quite ready* to ask passengers to buckle-up when you are the driver of a vehicle.

How have things changed for you since you completed the survey, if at all?

Based on your responses to the surveys in Part 1 of this study...

- In situations when you are a passenger, you indicated it is *not important* for you to ask all others in the vehicle to buckle-up.
- And, you indicated you are *not confident* you would ask others in the vehicle to buckle-up when you are riding as a passenger.
- Also, you indicated you are *not ready* to ask others in the vehicle to buckle-up when you are a passenger.

How have things changed for you since you completed the survey, if at all?

What do you make of this? What stands out to you? How accurate is this?
Personalized feedback example

Your thinking about safety-belt use

You see some good things about not buckling-up
(you wrote: “Comfort”) and, on the other hand, you can
see some not-so good things about not buckling-up
(you wrote: “Safety”).

ALSO...

You see some good things about changing your
safety-belt use (you wrote: “Safety, car insurance, not getting a ticket”).
On other hand, you can see some not-so good
things about changing your safety-belt use (you
wrote: “Comfort”).
Your Personal Risks

Your current safety-belt use puts you at increased risk for suffering from crash-related injuries and it also increases the chances you will have legal problems because you don’t buckle-up 100% of the time.

In Virginia, you could be fined $25 for not using your safety belt. Also, your insurance premiums could greatly increase!

Also, when others suffer injuries that been with proper use of safety belts,

insurance premiums increase. What else could you do with that money? More grimly,

you are also at risk for injury or death. One in five drivers to crash your

gets into at least one crash each year! If you were

without using your safety-belt,

serious odds of suffering a injury increase dramatically. The leading causes

of death sustained for people in your age group are injuries

in motor vehicle crashes. However, you have a 50% better chance of surviving a crash if buckled-up.

Some things to consider...

- How does all this information fit with what you already know? In what ways is it different than what you have heard before, if any?
- Whether or not to buckle-up really is your decision. No one can “make you.”
Now that you've reviewed your feedback...

- What do you make of all this?
- What changes, if any are you considering?
- What questions come to mind?
- What health-related behavior changes have you made successfully in the past?
- How did you do it?
- What gets in your way of making health-related behavior changes you want to make?
- How can people in your life support you in making changes you want to make?

Thank you for reviewing your personalized feedback

*Please don’t forget to log onto SONA to complete Part 2 of this 2-part study 2 on or around 4/29/08.*
Hello,

THANK YOU for participating in part 1 of this 2 part study.


PLEASE REMEMBER TO PARTICIPATE IN PART 2 OF THIS STUDY on or around 4/15 (Developing & Testing a Web-Based Brief Motivational Intervention to Promote Safety–Belt Use (PART 2). In part 2, you will complete a survey online as you did today but the length of the survey will be shorter. You may receive a reminder email from me.

You will receive 1 point for your participation in each part of this 2 part study. You will earn a total of 2 extra credit points for your full participation in part 1 and 2.

THANK YOU AGAIN!
Leah
Appendix E

Institutional Review Board Approval Letters
Institutional Review Board Approval Letters

DATE: March 11, 2008

MEMORANDUM

TO: E. S. Geller
Leah Varney Farrell
Amy Wharton

FROM: David M. Moore

SUBJECT: IRB Amendment 1 Approval: "Developing and Testing a Web-Based Brief Motivational Intervention to Promote Safety-Belt Use", IRB # 07-624

This memo is regarding the above referenced protocol which was previously granted approval by the IRB on December 18, 2007. You subsequently requested permission to amend your IRB application. Since the requested amendment is nonsubstantive in nature, I, as Chair of the Virginia Tech Institutional Review Board, have granted approval for requested protocol amendment, effective as of March 11, 2008. The anniversary date will remain the same as the original approval date.

As an investigator of human subjects, your responsibilities include the following:

1. Report promptly proposed changes in previously approved human subject research activities to the IRB, including changes to your study forms, procedures and investigators, regardless of how minor. The proposed changes must not be initiated without IRB review and approval, except where necessary to eliminate apparent immediate hazards to the subjects.
2. Report promptly to the IRB any injuries or other unanticipated or adverse events involving risks or harms to human research subjects or others.
3. Report promptly to the IRB of the study’s closing (i.e., data collecting and data analysis complete at Virginia Tech). If the study is to continue past the expiration date (listed above), investigators must submit a request for continuing review prior to the continuing review due date (listed above). It is the researcher’s responsibility to obtain re-approval from the IRB before the study’s expiration date.
4. If re-approval is not obtained (unless the study has been reported to the IRB as closed) prior to the expiration date, all activities involving human subjects and data analysis must cease immediately, except where necessary to eliminate apparent immediate hazards to the subjects.

cc: File
Institutional Review Board Approval Letter

DATE: December 18, 2007

MEMORANDUM

TO: E. S. Geller
Leah Varney Farrell

FROM: David M. Moore

SUBJECT: IRB Expedited Approval: “Developing and Testing a Web-Based Brief Motivational Intervention to Promote Safety-Belt Use”, IRB # 07-624

This memo is regarding the above-mentioned protocol. The proposed research is eligible for expedited review according to the specifications authorized by 45 CFR 46.110 and 21 CFR 56.110. As Chair of the Virginia Tech Institutional Review Board, I have granted approval to the study for a period of 12 months, effective December 18, 2007.

As an investigator of human subjects, your responsibilities include the following:

1. Report promptly proposed changes in previously approved human subject research activities to the IRB, including changes to your study forms, procedures and investigators, regardless of how minor. The proposed changes must not be initiated without IRB review and approval, except where necessary to eliminate apparent immediate hazards to the subjects.
2. Report promptly to the IRB any injuries or other anticipated or adverse events involving risks or harms to human research subjects or others.
3. Report promptly to the IRB of the study’s closing (i.e., data collecting and data analysis complete at Virginia Tech). If the study is to continue past the expiration date (listed above), investigators must submit a request for continuing review prior to the continuing review due date (listed above). It is the researcher’s responsibility to obtain re-approval from the IRB before the study’s expiration date.
4. If re-approval is not obtained (unless the study has been reported to the IRB as closed) prior to the expiration date, all activities involving human subjects and data analysis must cease immediately, except where necessary to eliminate apparent immediate hazards to the subjects.

Important: If you are conducting federally funded non-exempt research, this approval letter must state that the IRB has compared the OSP grant application and IRB application and found the documents to be consistent. Otherwise, this approval letter is invalid for OSP to release funds. Visit our website at http://www.irb.vt.edu/pages/newstudy.html#OSP for further information.

cc: File