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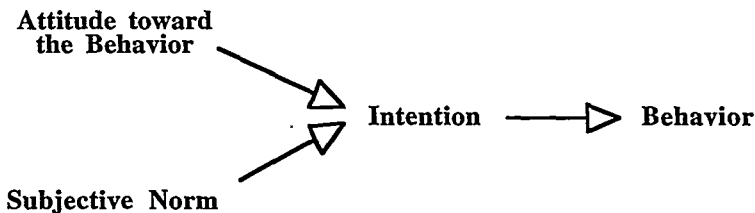
Individual Control of Risk: Seat Belt Use, Subjective Norms and the Theory of Reasoned Action

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Introduction

When faced with a risk for which an inexpensive solution is available, individuals often choose the risk rather than the solution. Protection from certain kinds of risks, e.g., using seat belts or condoms or insulating against radon, is largely under personal control, but individuals often choose not to comply with behaviors which would reduce the risk. The Theory of Reasoned Action (TRA)¹ has been used to predict when individuals will comply.

Figure 1²
The Theory of Reasoned Action



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¹ ICEK AJZEN, ATTITUDES, PERSONALITY, AND BEHAVIOR (1988); ICEK AJZEN & MARTIN FISHBEIN, UNDERSTANDING ATTITUDES AND PREDICTING SOCIAL BEHAVIOR (1980); Martin Fishbein, *Attitude and the Prediction of Behavior*, in READINGS IN ATTITUDE THEORY AND MEASUREMENT, 477 (Martin Fishbein ed. 1967).

² "Generally speaking, people tend to perform a behavior when they evaluate it positively and when they believe that important others think they should perform it." Ajzen, *supra*, at 117.

The literature describing seat belt use and the TRA was surveyed earlier.³ Briefly, it establishes that failure to wear seat belts is risky and that the varied programs attempting to persuade people to wear seat belts have failed. It is known that traffic accidents are the leading cause of death for people aged 5–34⁴ and that most people killed in traffic accidents were not wearing safety equipment.⁵ It has been estimated that 50% of traffic deaths and serious injuries could be avoided by the use of seat belts.⁶ The National Highway Traffic Safety Administration⁷ supported a program designed to increase national seat belt use to 70%. If this program had been successful, many people would still not be protected. Numerous interventions have been attempted to increase seat belt use; e.g., Geller and associates⁸ have applied behavior analysis techniques with varying degrees of success. Modeling,⁹ education,¹⁰ and goal setting have also been tried.¹¹ Still, many accept the risk rather than wear seat belts.

³ Kenneth D. Boehm et al., *Individual Response to Risk as a Function of Normative Social Pressure: A Pilot Study of Seat Belt Use*, 3 RISK 199 (1992).

⁴ D. A. Sleet, *A Preventive Health Orientation in Safety Belt and Child Safety Seat Use*, No. 840325 Soc. Auto. Eng. technical paper series (1984).

⁵ NEW HAMPSHIRE DEPT. TRANSPORTATION, STATE OF NEW HAMPSHIRE FATAL TRAFFIC ACCIDENTS 1990 (1991).

⁶ NATIONAL HIGHWAY TRAFFIC SAFETY ADMIN., THE ECONOMIC COST TO SOCIETY OF MOTOR VEHICLE ACCIDENTS (1983).

⁷ NATIONAL HIGHWAY TRAFFIC SAFETY ADMIN., 70% BY 1992: SAFETY BELT PROGRAM SAMPLER (1992).

⁸ E. Scott Geller, *A Behavioral Science Approach to Transportation Safety*, 64 BULL. N.Y. ACAD. MED. 632 (1988); E. S. Geller, *Preventing Injuries and Deaths from Vehicle Crashes; Encouraging Belts and Discouraging Booze*, in SOCIAL INFLUENCE PROCESSES AND PREVENTION, 249 (John Edwards et al. eds. 1990); E. S. Geller et al., *Promoting Safety Belt Use on a University Campus: An Integration of Commitment and Incentive Strategies*, 19 J. APPL. SOC. PSYCH. 3 (1989); Bruce A. Thyer & E. Scott Geller, *Behavior Analysis in the Promoting of Safety Belt Use: A Review*, in PROGRESS IN BEHAVIOR MODIFICATION, 150 (Michel Herson, Richard M. Eisler & Peter M. Miller eds. 1990); E. Scott Geller & Galen R. Lehman, *The Buckle-Up Promise Card: A Versatile Intervention for Large Scale Behavior Change*, 24 J. APPL. BEHAV. ANAL. 91 (1991).

⁹ Geller (1990) *supra*.

¹⁰ *Id.*; Gunilla Fhaner & Monica Hane, *Seat Belts: Factors Influencing Their Use*, 5 ACCID. ANAL. & PREV. 27 (1973); Gunilla Fhaner & Monica Hane, *Seat Belts: Changing Usage by Changing Beliefs*, 60 J. APPL. PSYCH. 589 (1975).

¹¹ Geller and Lehman, *supra* note 8.

The TRA has been applied to this risk problem, as well as to others. As may be seen in Figure 1, the theory argues that the antecedent of behavior is intention and that intention, in turn, is determined by attitudes and the subjective norm. Ajzen defines subjective norm as the individual's perception of social pressure to engage (or not) in the target behavior.¹² For example, Jonah and Dawson used a single Likert statement ("My family and friends believe that I should wear a seat belt when I am driving.")¹³ and Wittenbraker et al. used questions about whether important others thought subjects should engage in given behaviors in order to measure the subjective norm component of the theory.¹⁴ In terms of seat belt use, the theory would predict that individuals will form an intention to wear seat belts when they evaluate that behavior positively (attitude) and they believe that important others think they should wear seat belts (subjective norm). Many of the studies summarized by Ajzen have examined the attitude component; fewer have considered the subjective norm.¹⁵ Such studies as Jonah and Dawson¹⁶ and Wittenbraker et al.¹⁷ provide empirical support of the importance of the subjective norm, but they have not isolated the effects of this particular variable, and the subjective norm has not been explored as extensively as the other components, intention and attitudes. The purpose of the two studies reported herein was to use normative social pressure to induce subjective norms related to wearing seat belts, thus increasing the individual's intention to behave in this manner.

Study 1: The Pilot Study

As mentioned previously, the pilot study appeared in an earlier issue of *RISK*,¹⁸ but a brief review here seems appropriate in order to refresh

¹² Ajzen, *supra* note 1.

¹³ Brian A. Jonah & Nancy E. Dawson, *Predicting Reported Seat Belt Use from Attitudinal and Normative Factors*, 14 *ACCID. ANAL. & PREV.* 305 (1982).

¹⁴ John Wittenbraker, Brenda L. Gibles & Lynn R. Kahle, *Seat Belt Attitudes, Habits and Behaviors: An Adaptive Amendment to the Fishbein Model*, 13 *J. A PPL. PSYCH.* 406 (1983).

¹⁵ Ajzen, *supra* note 1.

¹⁶ Jonah and Dawson, *supra* note 13.

¹⁷ Wittenbraker et al., *supra* note 14.

the reader's memory. Basically, the pilot study was designed as a preliminary exploration of the relationship between the subjective norm as the independent variable and intention to wear seat belts as the dependent variable.

Subjects

Subjects were 206 students at Plymouth State College in Plymouth, New Hampshire, 70 male and 136 female, aged 18–23 years. 198 were single, six had children, and most had at least five years of driving experience. Other demographic measures were not collected for two reasons: First, it is typical to use college students for this type of research without specifying demographic characteristics,¹⁹ and, second, reports quantifying the risk of not wearing seat belts do not analyze victims in terms of such demographic variables as race, income and education. Thus, to the extent that college students represent the driving population, and we see no reason to think they do not, our results may be generalized.

Materials and Procedures

Questionnaires were administered to subjects in four conditions or groups. Subjects in Condition 1 were asked whether they used seat belts (base line use), the demographic questions, and the measure of the dependent variable, whether they intended to use seat belts in the future. Condition 2 received the same questionnaire with the addition of eleven questions developed from previous research literature which measured the subjective norm. These questions were presented before the presentation of the dependent variable which was, in all cases, the final question. Condition 3 added to the questionnaire three fictitious scenarios or stories designed to induce the subjective norm; the stories described fairly typical driving situations and included statements from important others to the effect that seat belts should be used. Using stories to produce motivational states is a technique generally referred to

¹⁸ Boehm et al., *supra* note 3.

¹⁹ E.g., Mark Stasson & Martin Fishbein, *The Relation between Perceived Risk and Preventive Action: A Within-Subject Analysis of Perceived Driving Risk and Intentions to Wear Seat Belts*, 20 J. APPL. SOC. PSYCH. 1541 (1990); and Wittenbraker et al., *supra* note 14.

as “induction.”²⁰ Each story was followed by seven questions assessing reaction, and the entire presentation concluded with the measurement of the dependent variable. In Condition 4, subjects were presented with the same materials as in Condition 3 with the addition that each story contained a low-key single sentence reminder of the possible negative effects of not using seat belts. Responses to all questions except the base line and demographic questions were recorded on Likert-style seven point scales.

Results:

Tables and discussion of the complete results of the pilot study are available in the previous report; for purposes of this paper, a brief summary should suffice. With regard to risk, the salient measure is whether subjects change behavior in the desired, less risky direction. Intention to wear seat belts did change in the desired direction, and the most change occurred in Conditions 3 and 4, which involved presentation of the scenarios. In addition, the results showed that women were more influenced by the materials than were men.

Subsequent to the publication of the pilot study, a factor analysis was calculated using data from the pilot study. The purpose of this analysis was to determine whether this analytical technique would identify the major components of the TRA (intention, attitude, subjective norm) from among subjects’ responses to questions which purported to measure those components. In addition, it was expected that factor analysis would shed some light upon the relationships among the components if it did, indeed, identify them. Responses to 33 questions by 117 subjects were analyzed using a principal components analysis and a VARIMAX rotation. Seven factors were identified as reported in Table 1.

Factor 1, accounting for considerably more variance than any of the others, is Intention; questions with high loadings on this factor contain the words “plan,” “should” or “would.” The second factor relates to Friends and may be interpreted as the subjective norm of perceived

²⁰ LARRY C. JENSEN & MERRILL KINGSTON, PARENTING (1986); Martin L. Hoffman, *Moral development*, in CARMICHAEL’S MANUAL OF CHILD DEVELOPMENT, 261 (Paul H. Mussen ed., 3d ed. 1970).

normative social pressure from friends. The third factor is Family, i.e., perceived normative social pressure from family members. Factor 4 is Compliance; this factor is referred to in some studies as “Mc” or “motivation to comply.”²¹ Factor 5 is another Family factor; it is unknown why family appeared as two separate factors. Factors 6 and 7 relate to specific situations presented in the scenarios.

Table 1
Results of Factor Analysis

<i>Factor</i>	<i>Eigenvalue</i>	<i>% of Variance</i>	<i>Cumulative %</i>	<i>Description</i>
1	13.80960	41.8	41.8	Intention
2	2.94059	8.9	50.8	Friends
3	2.63879	8.0	58.8	Family
4	1.75215	5.3	64.1	Compliance
5	1.49722	4.5	68.6	Family
6	1.31989	4.0	72.6	Scenario
7	1.00235	3.0	75.6	Scenario

From these results several conclusions may be drawn. First, the magnitude of the intention factor supports the argument of the TRA that intention to perform a behavior is of primary importance. Second, the analysis did identify factors relating to normative social pressure from friends and family. Previous supporting research has used multiple linear regression procedures to estimate the relative contributions of attitudes and subjective norms to predicting intention.²² The identification of orthogonal factors is a statistical validation of the fact that there is a relationship between attitudes and subjective norms and intention. However, since subjective norms appear as separate factors rather than as part of the Intention factor, they may not be related to intention in the manner suggested by the theory; rather than being antecedents of intention, each may make an independent contribution to behavior. It is difficult to see how two relatively weak independent factors might combine with attitude to produce the strong intention factor; this problem will require additional attention.

²¹ E.g., Brian A. Jonah, *Legislation and the Prediction of Reported Seat Belt Use*, 69 J. APPL. PSYCH. 401 (1984).

²² Ajzen, *supra* note 1.

Identification of the compliance factor should also lend some support to research which has included this as a component of the theory.²³ Finally, we concluded that the specific scenarios or stories might have differential effects since they were represented by different factors. The strength of the first factor and the relative weakness of the other factors suggests that further research efforts should probably be centered upon explication of intention. Furthermore, if we assume that the difference in strength between Intention and the Friends and Family factors is due to the contribution of attitude (not measured in this study), we would appear to provide fairly strong support for the notion that attitude contributes more to intention than does the subjective norm.

Study 2: The Experiment

The results of the pilot study encouraged us to examine the possible role of the subjective norm in the use of seat belts more rigorously. If the contribution of the subjective norm to intention could be enhanced experimentally and, consequently, intention increased, an intervention involving our scenario technique might be developed and could be successful in increasing seat belt use. The pilot study suggested that the scenario approach of using normative social pressure to induce the subjective norm did influence stated intention to wear seat belts; those results also indicated a gender difference in response, with women appearing to be more likely to be influenced by the induction procedure. Thus, we decided to examine both sex and subjective norm as independent variables. It was expected, because of the change in insurance rates at age 25, that age might also be a factor worth consideration; we predicted that older subjects would be more likely to be influenced by normative social pressure. The results of the factor analysis were used to refine and shorten the questionnaire since redundant questions which measured the same factor could be eliminated. We were also interested in attempting to determine whether expression of intention to wear seat belts would actually be followed by the use of seat belts. An experiment was designed and conducted to test whether subjective norms, age, and sex affect seat belt use.

²³ Jonah, *supra* note 21.

Method

• *Subjects*

Ninety-seven subjects (40 male and 57 female) participated. Most of the subjects were undergraduate students at Plymouth State College. To include subjects older than age 25, some were recruited from Franklin Pierce Law Center, a Plymouth State College club for non-traditional students, and employees at a local restaurant. Prior to or during classes or meetings, subjects were asked to respond to a questionnaire. Again, as in the pilot study, it is assumed that these subjects represent the driving public.

• *Procedure and materials*

As shown in Figure 2, the experimental design was a 2x2x2 design with treatment, age, and sex as the three independent variables. The levels of the treatment variable were “experimental” and “control;” for age, the levels were “younger than 25” and “25 and older;” for sex, the levels were “male” and “female.”

Figure 2
Experimental Design

<i>Condition</i>	<i>Experimental</i>				<i>Control</i>			
Age	Under 25		25 and Over		Under 25		25 and Over	
Sex	M	F	M	F	M	F	M	F

Subjects were asked to respond to a questionnaire which was distributed so that experimental and control forms were randomly assigned. Each questionnaire included a measure of seat belt use, three fictitious scenarios followed by Likert-type questions, and the measure of the dependent variable, a Likert expression of intention to wear seat belts. The “experimental” form of the questionnaire provided scenarios about automobile rides and the use of seat belts and was designed to induce subjective norms; questions following the scenarios were designed to increase the salience of subjective norms. The scenarios were those used in Condition 3 of the pilot study; basically, the scenarios described common driving situations (such as driving a

younger brother to baseball practice) and included suggestions by important others (such as a mother and a coach) that seat belts should be used. Each story was followed by three questions, also chosen from those used in the pilot study, which were designed to increase the salience of subjective norms by requiring the subject to think and respond (e.g., "My friends would want me to wear my seat belt in this situation."). The "control" form of the questionnaire included scenarios similar to the experimental form but with no mention of seat belts and no induction of subjective norms; the questions which followed the "control" scenarios were irrelevant to the experimental treatment (e.g., "Jim's little brother is very forgetful."). The question measuring intention was identical for all subjects. Responses to questions were recorded on seven-point scales as in the pilot study.

For 30 of the subjects, it was possible to return seven to ten days after initial testing and measure reported seat belt use during the interim. This was done by asking subjects to respond to the question, "Of the last ten times that I drove, I wore a seat belt ___ times."

Results

• Correlation

In order to test the assumption of the TRA that intention is related to behavior, we calculated the correlation between expressed intention to wear seat belts and reported use of seat belts. This analysis required data collection at two points in time: one when subjects were asked their intention and the second after some period of time to measure reported use since the expression of intention. Intention and reported use were measured with a delay interval of seven to ten days. This was possible with fourteen subjects in the control group and sixteen in the experimental group. The correlation between intention and reported use in the control group was $r = .94$ ($p < 0.01$), and in the experimental group, $r = .99$ ($p < 0.01$). For the combined groups ($N = 30$), $r = .97$ ($p < 0.01$). Thus, regardless of treatment, intention was significantly correlated with reported use, as predicted by the TRA. This does not mean that all subjects reported using seat belts; it means that those who said they would (intention) also said at the later testing that they had, in

fact, done so (reported use), and those who intended not to wear seat belts also reported behavior agreeing with their intention.

• *Analysis of variance*

The effects of the experimental treatment, age, and sex were tested using Analysis of Variance (ANOVA). Table 2 contains these results. We expected the group exposed to the experimental treatment of inducing subjective norms to be more likely to express intention to wear seat belts than the control group exposed to a similar questionnaire omitting the treatment. The dependent variable for this analysis was the expressed intention to wear seat belts. The result for the main effect of experimental vs. control condition was $F = 0.016$ (not significant).

Table 2
ANOVA of Treatment, Age and Sex

<i>Source of Variance</i>	<i>F</i>	<i>p</i>
Experimental Treatment	0.016	n.s.
Sex	6.472	0.012*
Treatment X Sex	0.357	n.s.
Age	5.226	0.023*
Treatment X Age	1.080	0.301
Sex X Age	5.027	0.025*
Treatment X Sex X Age	1.415	0.235

* *statistically significant*

With regard to the effect of age as an independent variable upon intention as the dependent variable, the result for the main effect of age was $F = 5.226$ ($p < 0.023$). Using sex as the independent variable, the result was $F = 6.472$ ($p < 0.012$). There was also an interaction between the effects of age and sex; the result was $F = 5.027$ ($p < 0.025$). All of these effects were statistically significant. Examination of the means for the groups indicated that the effects of age and sex are as follows: older subjects expressed more intention to wear seat belts than did younger subjects; women expressed more intention to wear seat belts than did men; young men were the group expressing strongest disagreement with intention to wear seat belts. The means for the groups of young men in both experimental and control groups indicate that this is the group toward which persuasive attempts should be aimed.

With regard to the effects of the specific situations described in the scenarios, the ANOVA for this variable was calculated for the experimental group only (N=51) since the responses in the control group were not relevant. The dependent variable for this analysis was the mean response to each situation described in the questionnaire.

Table 3
ANOVA of Situation, Age and Sex

<i>Source of Variance</i>	<i>F</i>	<i>p</i>
Situation	1.494	0.226
Sex	13.729	0.001*
Age	28.734	0.001*
Situation X Sex	0.214	n.s.
Situation X Age	0.233	n.s.
Sex X Age	9.271	0.003*
Situation X Sex X Age	0.249	n.s.

* *statistically significant*

Table 3 contains the results. Only the main effects of sex ($F = 13.729$, $p < 0.001$) and age ($F = 28.734$, $p < 0.001$) and the interaction of age and sex ($F = 9.271$, $p < 0.003$) were significant. Thus, the significant age and sex effects were replicated for all dependent variables. Examination of the group means also replicates the results from the previous ANOVA; older subjects and women responded more positively than did younger subjects and men. Again, young men was the group with the lowest mean. This analysis was conducted because of the situational factors which were identified in the factor analysis of the pilot study data; the appearance of these factors suggested that subjective norms might have differential effects in different situations, and this ANOVA was calculated in order to examine that possible effect. The ANOVA did not find differences based upon situations; perhaps these scenarios were sufficiently similar that subjects did not respond to them differentially.

None of the ANOVAs indicated any significant effects of the experimental treatment. Therefore, it seems necessary to conclude that, at least as examined in the current study, either the experimental

treatment did not induce subjective norms or the subjective norm is not a factor in intention to wear seat belts.

Discussion

This research originated in an effort to understand why individuals, when faced with a risk for which a known and inexpensive solution is available, may choose the risk rather than the solution. The TRA appears to be a logical approach to understanding such behavior; the current research attempted to validate certain aspects of the theory by studying the contribution of one element of the theory, the subjective norm, to the formation of intention. We attempted to experimentally manipulate the subjective norm in order to study its effect upon intention. The risk chosen for the study was the failure to use vehicular seat belts. The results of the original pilot study suggested that subjective norms could be induced by the use of scenarios, so this approach was refined for use in the second study. Basically, the results provide support for the TRA but not for the method of inducing the subjective norm.

The results of the factor analysis support the argument of the TRA that intention is a major determinant of behavior. The identification of the large factor of intention supports the theory. The smaller factors of normative social pressure from friends and family provide some support for the argument that the subjective norm is one of the components related to intention. Likewise, the correlational results showing a strong relationship between intention and reported behavior are a replication of results reported by a number of researchers and summarized by Ajzen²⁴ which established the essential link between intention and behavior.

However, the ANOVA results, while providing useful information, did not support the use of the scenarios as an instrument for inducing the subjective norm. It may be that the reason for the apparent failure to induce subjective norms was the preponderance of attention to using seat belts in this society in recent years. Subjects informally expressed boredom with the topic and resultant lack of motivation to respond

²⁴ Ajzen, *supra* note 1.

attentively to the questionnaire. It is also possible that the scenarios were not sufficiently powerful in terms of induction and that various alterations to the method might prove more effective. Nonetheless, the results did provide the useful information that age and sex do make a difference in intention to wear seat belts (and, by extrapolation, in actual use). The current research both validates and replicates previous knowledge on this subject. It identifies males under the age of 25 as most willing to take risk and, thus, the target for efforts to effect change.

Additional research on the contribution of the subjective norm to the formation of intention would seem warranted. There are certainly other possible avenues for using this variable to control risk behavior. One possibility would be to try the induction procedure with a different risk such as geological radon or smoking. Or, alternatively, a different method for manipulating the subjective norm could be devised. It would also be instructive to specify whether people of different ages might be more or less receptive to normative social pressure from various important others; e.g., would younger subjects be more likely to comply with pressure from friends than from family? The TRA argues that subjective norms combine with attitudes to produce intention; the relative contributions have not been specified, but additional research may be enlightening. The problem of persuading people to wear seat belts remains, as does the more general problem of persuading people to comply with known solutions rather than accepting personal risks.



