



Why Drivers Speed: The Speeding Perception Inventory

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This study reports initial results of a project to better understand the factors that predispose, enable, and reinforce drivers' speeding behavior. This information is essential for successful traffic safety programs. A perceptual inventory was developed and administered to a large, college-age sample. High levels of internal consistency were found. Factor analysis suggested five predisposing, enabling, and reinforcing constructs: (a) Ego-gratification; (b) Risk-taking; (c) Time pressures; (d) Disdain of driving; and, (e) Inattention. Males agreed more strongly than females with ego-gratification items; younger subjects agreed more strongly with risk-taking and less strongly with time pressures items than older subjects; and, females agreed more strongly than males with time pressures, disdain of driving, and inattention items. The perceptual inventory approach shows promise over behavioral and attitudinal self-reports, particularly when self-reported referent criteria are difficult to obtain. Results from the inventory can be used to target traffic safety and health education programs, and can be incorporated into discussions of traffic safety policy, legislation, and enforcement. © 1997 National Safety Council and Elsevier Science Ltd

INTRODUCTION

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"Health promotion is the combination of educational and environmental supports for actions and conditions of living conducive to health" (Green & Kreuter, 1991, p. 4). We suggest that through classroom and individual education programs, legislation, and vehicle and highway safety improvements, traffic safety efforts meet the definition of health promotion. Within the PRECEDE-PROCEED health promotion planning model, Green and Kreuter emphasize the importance of identifying the predisposing, enabling, and reinforcing factors that influence the behavior of interest.

Predisposing factors consist of knowledge, beliefs, values, attitudes, and confidence. They mo-

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tivate or provide drivers who speed with a rationale to speed, perhaps being late, or observing that other drivers speed. Enabling factors include availability, accessibility, laws, and driving skills. These factors permit drivers to speed, and might include access to a speed-accommodating vehicle and highway. Reinforcing factors are made up of other people—family, peers, teachers, employers, community leaders, and decision makers. The degree to which people provide drivers who speed with an incentive or reward contributes to continued speeding. Minimal penalties and inadequate enforcement might also constitute reinforcing factors.

Dignan and Carr (1992) label the process of identifying influential factors as “assessing educational readiness” (p. 72). Both Green and Kreuter (1991) and Dignan and Carr (1992) caution that efforts to implement health promotion programming in the absence of understanding the underlying related or causal factors could be less than totally successful.

Background

We describe the application of the PRECEDE portions of the model elsewhere (Gabany, Plummer, & Grigg, 1996). In this report, we concentrate on what we perceive to be the greatest obstacle to the design and implementation of programs aimed at reducing excessive speed—“Phase 4: Educational and Organizational Diagnosis” (Green & Kreuter, 1991). It is at this point in the model, and in that of Dignan and Carr (1992), that health promotion planners must identify the underlying factors that influence the targeted behavior.

Much of the research on speeding behavior concentrates on self-reported speeding behavior and attitudes (e.g., Guppy, 1993; Kanellaidis, Goliass, & Zarifopoulos, 1995; Parker, Manstead, Stradling, & Reason, 1992). This emphasis raises two issues: first, while it is accepted that attitudes influence behavior, most likely as a predisposing factor, enabling and reinforcing factors could be equally influential (Dignan, 1995; Dignan & Carr, 1992; Green & Kreuter, 1991; Windsor, Baranowski, Clark, & Cutter, 1994).

Second is the matter of the validity of attitude measures. Dignan (1995) calls this process, “a formidable challenge” (p. 81), because attitudes represent summary opinions of our feelings toward a specific topic. Determining construct validity requires comparison to a

previously validated instrument or advanced statistical techniques, such as factor or discriminant analysis. Determining criterion-based validity requires observation of the behavior under investigation (Dignan). While this may help explain why few speeding researchers have reported the validity of their instruments, it begs the question of what such instruments measure and how accurately they measure it.

In the absence of criteria against which to validate them, it is difficult to judge the accuracy of self-reported driving behaviors and attitudes toward driving. Without a clear understanding of the factors that influence behavior, the probability of successfully implementing subsequent programs will likely be no better than even (Green & Kreuter, 1991). Groeger (1990) considered the issue of inaccuracy in self-reports of errors. He concluded that without the corroboration of a behavioral index, it may not be possible to answer some questions by self-reports alone. Why drivers speed may be one of those questions. In an effort to develop a delinquency scale, which included unsafe driving, Mak (1993) noted that “researchers willingness to employ self-reported delinquency measures has not been matched by the amount of effort expended on the development of psychometrically sound delinquency scales” (p. 75).

The current research aims to develop a reliable and valid self-reported perceptual inventory to identify predisposing, enabling, and reinforcing factors that influence drivers’ speeding behavior. It was necessary to conduct a series of studies to generate and select items for the inventory, conduct item analysis, obtain reliability and validity estimates, and develop subscales. The remainder of the article contains the method and results of each of the studies conducted, leading to a final section on overall discussion of the findings.

By concentrating on respondents’ perceptions of why *other drivers* speed, the present project strives to overcome what we believe is a fundamental limitation to identifying these factors: questionable accuracy of self-reported illegal behaviors and attitudes toward them.

Preliminary Work on Initial Selection of Items

The goal was to identify items that covered a wide range of predisposing, enabling, and rein-

forcing factors that influence a driver's speeding behavior.

Method

In order to construct an initial list of items, 124 students enrolled in a multiple-section, introductory health course at a Midwestern university were asked to list reasons why they believed drivers exceed the speed limit. The list was edited and purged of duplicates and was submitted to 6 driver education teachers and 14 members of a National Safety Council committee for additional input. The resulting draft scale had 72 items. We applied a 4-point Likert-type scale, anchored at the ends by *Strongly Agree* and *Strongly Disagree*.

Studies on Item Analysis

In order to decide which items in the draft scale should be included in the final instrument, two preliminary factor analyses were conducted. Only items with factor-score coefficients of at least .40 were retained for subsequent analysis.

Method

Subjects were 110 students enrolled in a multiple-section, introductory health class. Demographic information was not deemed to be important for this step.

Results

Factor analysis, using varimax rotation, was used to determine factor loadings. Cronbach's *alpha*, used to estimate the inventory's reliability, was found to be .88 (SPSS-X, 1988). A five-factor solution emerged. Fifty-four of the 72 items loaded at .40 or higher and were retained for the next step.

Method

Subjects were 151 students enrolled in a multiple-section, introductory health class. Demographic information was not gathered.

Results

Chronbach's *alpha* was calculated to be .76. A five-factor solution, using varimax rotation,

emerged once again. Forty-eight of the 54 items loaded at .40 or higher and were retained.

Study on Construction of Subscales

Method

Subjects were 817 students at three, Midwestern, 4-year educational institutions—336 at a large, public institution; 96 from a small, private, female-only college; and 383 from a small, private, male-dominated technical institution. Two of the subjects did not indicate institution. Of the total responding, 487, or 61.2%, were male; and, 309, or 38.8%, were female. More than two-thirds (71.1%), were 19 years old or younger, and over three-fourths (80.3%), were freshmen or sophomores.

Results

Chronbach's *alpha* was calculated to be .89 overall, and for males and females separately. Along with previous coefficients, we concluded that the scale displayed satisfactory internal consistency reliability. Factor analysis, using varimax rotation and establishing a factor-score criteria of at least .40, was used to explore the scale's underlying structure. Table 1 lists item loadings of at least .40 for the five-factor solution (see Appendix for the current version of the instrument).

The table shows that each factor consisted principally of items that could be meaningfully classified into one type of explanation. Only three items, 25, 32, and 35 loaded on two factors. Factor 1 (ego-gratification) comprised 17 items that suggest speeding drivers experience and perhaps seek pleasure at a basic psychological level. Factor 2 (risk-taking) was made up of seven items that center around the excitement of taking driving risks. Factor 3 (time pressures) contained 10 items that focus on feelings of too-little available time, or of trying to gain available time by speeding. Factor 4 (disdain of driving) was made up of five items that suggest that drivers who speed perceive driving to be a wasteful activity, perhaps a perception that driving is not a productive activity. Factor 5 (inattention) was concerned with four items that seem to provide excuses for speeding behavior.

Five, normalized, factor scores were created for each subject where $M = 0.0$, and $SD = 1.0$. A two-factor analysis of variance was conducted on each factor with gender and college class-year

TABLE 1
FACTOR LOADINGS FOR SPEEDING PERCEPTION INVENTORY (N = 787)

Items	Factor Loading
Factor 1: Ego-gratification ($\alpha = .90$)	
42 Drivers speed because they like to scare their passengers	.69
30 Speeders get a thrill out of breaking the law	.68
31 Speeders like the thrill of flirting with death and disaster	.68
16 Most speeders want to see how fast they can go before they get a ticket	.65
45 Drivers speed because speeding is an easy way to defy the law	.62
43 Drivers speed because they want to show off and attract attention	.62
18 Drivers speed because they want to impress their passengers	.61
15 Most speeders like to defy authority	.60
44 Drivers speed because they want to impress members of the opposite sex	.59
25 Speeders want to see if they can get away with speeding	.58
33 Speeders are irresponsible, immature, and rebellious	.56
29 Speeders are trying to escape from someone or something	.54
14 Most speeders are usually drunk or high on drugs	.54
17 Drivers speed because their friends drive fast	.50
37 Speeders like to race each other on the road	.47
24 Speeders like to take risks	.44
11 Most speeders have a broken speedometer	.44
Factor 2: Thrill, excitement, risk-taking ($\alpha = .78$)	
20 Drivers speed because it's more fun to drive fast than slow	.72
34 Speeders like the feeling of driving fast	.66
36 Speeders get a rush of excitement from driving fast	.61
27 Speeders like to speed	.60
38 Drivers speed because speeding gives us a sense of power and control	.53
26 Speeders don't like to be passed by other cars	.49
12 Most speeders speed out of habit	.48
Factor 3: Time pressures ($\alpha = .78$)	
2 Most drivers who speed are late	.72
3 Most drivers who speed are angry	.67
4 Most drivers who speed are upset	.63
1 Most drivers who speed are in a hurry	.62
5 Most drivers who speed are feeling rushed	.54
10 Most speeders have an emergency	.53
32 Speeders are trying to get somewhere before it closes	.47
35 Speeders are trying to get home quickly	.48
9 Most speeders schedule more things than they have time to do	.42
6 Most speeders are excited about getting somewhere	.41
Factor 4: Disdain of driving ($\alpha = .62$)	
41 Drivers speed because every minute counts	.72
40 Drivers speed because time is money	.66
48 Speeding drivers are tired and want to get home quickly	.55
46 Drivers speed because driving has become automatic	.44
21 Drivers speed because they want to get where they're going quickly	.40
Factor 5: Inattention ($\alpha = .64$)	
7 Most speeders don't realize how fast they're going	.81
6 Most drivers who speed are not paying attention to their speed	.75
13 Most speeders don't speed on purpose	.64
47 Speeding drivers are distracted	.41

Note. The coefficient alphas tabled are based on final compositions of the subscales, with Items 21, 24, 25, 30, and 39 dropped because their factor score coefficients did not reach .40.

serving as independent variables, and factor score as the dependent variable. Because of relatively small cell sizes, we allowed class year to serve as a proxy for age. Cell size limitations also did not permit including educational institution as an independent variable. Due to data coding, positive factor scores represent *less* agreement with the

perception that the items included in that factor cause or explain speeding behavior. The following statistically-significant differences resulted from these analyses:

1. Ego-gratification: males *agreed* more strongly than females, $F(1, 722) = 9.07$, $p = .003$; $M = -.06$ vs. $.14$.

2. Risk-taking: freshmen *agreed* more strongly than sophomores, juniors, and seniors, $F(3, 722) = 11.07, p < .001; M = -.16$ vs. $.22, .32$, and $.31$, respectively.

3. Time pressures: freshmen *disagreed* more strongly than sophomores, juniors, and seniors, $F(3, 722) = 12.56, p < .001; M = .17$ vs. $-.32, -.41$, and $-.17$, respectively. Females *agreed* more strongly than males, $F(1, 722) = 34.14, p < .001; M = -.34$ vs. $.21$.

4. Disdain of Driving: females *agreed* more strongly than males, $F(1, 722) = 4.54, p = .033; M = -.12$ vs. $.07$.

5. Inattention: females *agreed* more strongly than males, $F(1, 722) = 12.66, p < .001; M = -.14$ vs. $.11$.

The interaction of gender by class year was not statistically significant for any of the factors.

DISCUSSION

An important first step toward conducting health promotion activities in the area of traffic safety is to develop a valid, economical, and relevant measure of the factors that predispose, enable, and reinforce a driver's decision to perform a risky behavior—in this case, to speed. Factor analysis has demonstrated that the new inventory has satisfactory construct validity and high internal consistency reliability. Meaningful subscales are available to measure specific domains of speeding; namely, ego-gratification, risk-taking, time pressures, disdain of driving, and inattention to the driving activity. By concentrating respondents' attention on drivers in general rather than on themselves, the inventory mitigates against many of the limitations and criticisms of self-reports, particularly those of socially-unacceptable or illegal activities.

If confirmed through replication with larger and more-diverse samples, these findings suggest that perceptions of speeding behavior are more complex than previously recognized and less amenable to "blanket" explanations. For instance, younger drivers—freshman in this study—may experience risk as intrinsically rewarding (Fuller, 1991). As suggested by Arnett (1989) and others, risk-taking may be one of the factors that predispose particularly younger drivers to speed. Although the range of ages here was narrow, the data might suggest an inverse relationship between age and the per-

ception of risk-taking as a predisposing factor to speed. If that is the case, however, other factors must become more influential as the age of speeding drivers increases.

Limited life experiences or immaturity may also help explain why freshman do not seem to perceive the pressures of time as a predisposing factor to speed. It seems possible to us that second- and third-year college students, and particularly seniors, begin to feel the responsibilities of life settle around their shoulders more heavily than freshmen. If so, these data may indicate a relationship between age and perceptions of time constraints as early as the college years. We would anticipate that older drivers will agree strongly with items included in Factor 3 (time pressures).

Across class years, males reported stronger agreement with ego-gratification items than did females. Ego-gratification that results from the approval of others would, under the PRECEDE-PROCEED model, be considered a motivating factor. That which stems from internal values or attitudes would be seen as a predisposing factor.

Females agreed more strongly than males with the items underlying time pressures, disdain of driving, and inattention. Since it is generally accepted that females mature at a more rapid pace than males, their perceptions of the influence of time pressures may be more reflective of differences in maturational age than differences between genders. Disdain of driving and inattention, if prompted by the driving task requiring limited driver input, might represent enabling factors. Conversely, if these reflect a general dislike of driving, health promoters should view them as predisposing factors.

Since we have not yet studied the relationship between speeding perceptions and speeding behavior, we do not know how or whether perceptions and differences among subgroups found here relate to speeding. That is to say, we have not yet established criterion-related validity, but recognize the need to do so. We do agree, nonetheless, with those such as Parker et al. (1992), who consider gender and age differences to be important in traffic safety research.

The Speeding Perception Inventory may be useful in a variety of situations. Driving instructors can use it as a tool to better target their efforts on knowledge of and attitudes toward speeding. For example, if through application of the inventory and other methods, perhaps post-test probing, a driving instructor finds that stu-

dents perceive speeding to be a response to time pressures, instruction could include or emphasize methods to cope with stress caused by feelings of too little time, and the costs versus benefits of speeding to save time.

It can be used in defensive-driving settings as well, and for testing risky-driving theories and evaluating intervention programs. It can be administered individually or to large groups at relatively low costs. After criterion-related validity has been determined, it may also be useful for identifying possible discrepancies between self-reported speeding rates and official statistics.

However, care needs to be exercised in employing this speeding measure. The present scale was developed in one particular area of the country—the Midwest—and while considered unlikely, the data obtained here might be different for other locations. Researchers should watch for variations in laws across states and over time. For instance, there seems to be a general trend in the United States toward lowering blood-alcohol-content levels (BAC), and implementing “zero-tolerance” for youths. This could require eliminating questions about driving while intoxicated; but it is anticipated that the majority of the present subscales would be useful for most purposes.

In terms of future research, it is important to collect more psychometric information, such as criterion-related validity, and to increase the size and representativeness of subsequent samples. Defining speeding offenders and determining differences between them and non-offenders, and between those who are victims of a speed-related collision and those at fault need to be examined. Expanding the database and developing norms will improve the scale’s applicability.

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APPENDIX: THE SPEEDING PERCEPTION INVENTORY

Why Drivers Speed

We are trying to understand why automobile drivers drive faster than the posted, maximum speed limit. We **don’t** want to know whether *you* speed. *Please help us by completing this short survey. Please follow the directions carefully.*

Why Drivers Speed—Indicate the degree to which you agree with each statement as a reason why drivers speed. 1 = Strongly Agree; 2 = Agree; 3 = Disagree; 4 = Strongly Disagree

Most drivers who speed are . . .

1. in a hurry
2. late
3. angry
4. upset
5. feeling rushed
6. not paying attention to their speed

Most speeders . . .

7. don’t realize how fast they’re going
8. are excited about getting somewhere
9. schedule more things than they have time to do
10. have an emergency
11. have a broken speedometer
12. speed out of habit

- 13. don't speed on purpose
- 14. are usually drunk or high on drugs
- 15. like to defy authority
- 16. want to see how fast they can go before they get a ticket

Drivers speed because . . .

- 17. their friends drive fast
- 18. they want to impress their passengers
- 19. it's more fun to drive fast than slow
- 20. they want to get where they're going quickly

Speeders . . .

- 21. like to take risks
- 22. want to see if they can get away with speeding
- 23. don't like to be passed by other cars
- 24. like to speed
- 25. are trying to escape from someone or something
- 26. get a thrill out of breaking the law
- 27. like the thrill of flirting with death and disaster

- 28. are trying to get somewhere before it closes
- 29. are irresponsible, immature, and rebellious
- 30. like the feeling of driving fast
- 31. are trying to get home quickly
- 32. get a rush of excitement from driving fast
- 33. like to race each other on the road

Drivers speed because . . .

- 34. speeding gives us a sense of power and control
- 35. time is money
- 36. every minute counts
- 37. they like to scare their passengers
- 38. they want to show off and attract attention
- 39. they want to impress members of the opposite sex
- 40. speeding is an easy way to defy the law
- 41. driving has become automatic

Speeding drivers are . . .

- 42. distracted
- 43. tired and want to get home quickly