Acc Analysis

ANALYSIS OF DATA ON AIR FORCE PERSONNEL COLLECTED AT LACKLAND AIR FORCE BASE

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Final Report

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U.S. DEPARTMENT OF TRANSPORTATION
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NATIONAL HIGHWAY SAFETY BUREAU

ANALYSIS OF DATA ON AIR FORCE PERSONNEL COLLECTED AT LACKLAND AIR FORCE BASE

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Introduction

In July, 1967, a report was published by the Personnel Research Laboratory, Lackland Air Force Base, entitled "An Attempt to Predict Automobile Accidents Among Air Force Personnnel". Approximately twelve thousand basic airmen and eleven hundred officer training candidates were tested during their first week of duty. Sixteen different tests were administered, including a questionnaire containing a number of biographical items and questions pertaining to personal driving experience prior to entrance into the military. Not all tests were given to all of the subjects, resulting in four officer sub-groups and nine basic airmen groups, each of which had been administered a different combination. Correlational matrices were developed for the various groups and it was concluded that other than "number of miles driven" (as estimated by each subject), there were no variables which would add to the practical prediction of accidents among airmen. However, because of limitations of time and funds imposed upon the project, these data were not further analyzed and the work accomplished was published in a brief report (Mullins, 1967).

However, it was concluded by this author (F.L.M.) that this material was very like data being gathered on a civilian population and could provide additional information concerning accident prediction.

Procedure

A number of the questionnaire items placed certain restrictions on the analysis. For example, the subjects were asked to relate their accident frequency during their entire driving history, but asked for mileage estimates

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Appreciation is expressed to Dr. Cecil J. Mullins and the Personnel Research Laboratory of Lackland Air Force Base for making these data available.

only for the last two years. If mileage was to be utilized as a variable to be controlled and/or used as a predictor, a bias might have been introduced. Therefore, those airmen who indicated they had been issued a license two years previously, as noted by age at time of issuance, were extracted from the main group. For example, if an airman was 18 years of age at the time of testing, and indicated he had received a license at age 16, this was taken as evidence of having driven only for the two years covered by his mileage estimate. The use of whole years is obviously a gross estimate, but the assumption was made that such a method would not grossly affect conclusions drawn. The officer candidate group was not included in the analysis.

The final sample of enlisted airmen consisted of 2,961 subjects, which was randomly divided into a validation group of 1,481 subjects and a cross-validation group of 1,480. All subjects were between the ages of 17 and 20. The criterion was the total number of lifetime accidents reported by the subject during his driving career (i.e., the past two years). Accident frequency was categorized on the basis of 0, 1, 2, 3, or 4 or more accidents.

Three basic questions were posed of these data.

1. Which of certain selected biographical and test scores were significantly related to frequency of accidents?
2. From among these significant variables (if any) which could be classified as "true" predictors, that is, established before-the-fact of the two-year accident experience in question, (e.g., age) and those which could be established as "quasi" or after-the-fact predictors (e.g., estimate of miles driven)?
3. What indications are there that accidents may be predicted among airmen by a combination of these variables?

The distinction between "true" and "quasi" predictors was made in order to identify those which are more likely to provide fruitful results in future studies. It is realized, of course, that such items as Value of Parents' Home may not be an accurate appraisal in terms of its value two years previously, or even refer to the same home. However, it is assumed that any such discrepancies do not effect the results.

Results

The variables selected for study, together with coefficients of validity and cross-validity, are listed in Table 1, page 4.

As noted, those "true" predictors which were significant beyond the .05 level of significance were Home Value, Population of Home Town, and Family Income. The multiple R and cross-validation results are listed in Table 2, page 5.

It is thus seen that while these "true" predictors result in an R of .118, cross-validation allows only Value of Parent's Home to remain in the regression formula (R=.100; $p = < .01$). At first it may appear that a correlation of .100 is small, but it could very well have significance in terms of the number of accidents represented. Table 3, page 7 shows the breakdown of the Home Value categories for 1,480 subjects and the number of accidents per 100 drivers in each category.

Table 1

Description of Variables Correlated With Accident Frequency*

Variable***	Validity	Cross-Validity
Age (Categories: 17, 18, 19, 20)	-.009	
Mechanical Aptitude Test	.110	.043
Administrative Aptitude Test	.040	
General Knowledge Test	.045	
Electronics Aptitude Test	.090	.012
Armed Forces Qualification Test	.066	.057*
Driver Education**	-.010	
Estimated Two-year Mileage	.175	.230*
Age at time of licensure	-.009	
Number of moving violations	.239	.321*
Failure to pass the written and/or the driving part of the drivers license test	.022	
Value of parents' home	.106	.100*
Average income of the major wage earner of family for the past five years	.077	.092*
Whether or not subject has lived mostly with father and/or mother, relatives, foster parents, and/or an orphanage	.041	
Whether father and mother were ever separated or divorced	.031	
Whether or not father is living	.003	
Whether or not mother is living	.046	
Population of community where subject lived most of his life	.069	.018
Smoking habits	.124	.104*

* Correlation significant beyond .05 level
** See text for complete description of this variable
*** See appendix for actual questions

Table 2

Correlation of "True" Predictors
With Accident Frequency, Among 2,961 Airmen

	r.	R	Cross-Validation R
Value of Parents'Home	.106	.106	.100
Population of Home Town	.069	.114	
Income of Major Wage Earner	.077	.118	

In terms of actual accidents, it is easy to see a substantial difference between categories, especially if one multiplies each accident frequency by the many thousands of young male drivers in the U. S. These findings are also in keeping with other evidence which indicates that the higher the social economic status from which a person comes, the higher is likely to be his accident frequency as measured by self-report (Asher, 1969; McGuire & Kersh, 1969).

In an effort to study whether or not certain other variables may be used as predictors, those "quasi" or after-the-fact predictors were added to the so-called "true" predictors. This of course does not give direct evidence as to how well accidents may be predicted by such additional material, but it suggests which variables might be given closer attention in a before-the-fact study.

Table 4, page 8 lists the results of combining those "true" and "quasi" predictors significantly correlated with accidents.

These data suggest that the prediction level represented by a correlation of .10 may be significantly increased, although probably not as high as represented by the R of .22 obtained here. This is particularly true because the variable of mileage estimate cannot legitimately be incorporated into a true before-the-fact study since it is by definition always an after-the-fact variable. One alternative would be to have the subjects estimate how far

Table 3

Relationship Between Value of Parents' Home and Accident Frequency

Value of Home	N	No. Acc. Per 100 Drivers
< $4500	187	44
$4500 - 10,000	469	54
$10,000 - 15,000	387	64
$15,000 - 20,000	258	68
> $20,000	171	70
	1472	

$r = .10$, $p = < .01$.

Table 4

Correlation With Accident Frequency When "True" Predictors are Combined with "Quasi"-Predictors

	r.	Cumulative R	Cross-Validation R
Two-year mileage	.175	.175	-
Mechanical Test Score	.110	.202	.210
Home Value	.106	.216	.224
Electronics Test Score	.090	.223	.216
Home Town Population	.069	.228	-
AFQT Score	.066	.229	-
Income of Major Wage Earner	.077	.229	-

they think they will travel during the next two years (or whatever period of time is under study). However, such a procedure would tend to lower the statistical reliability of the mileage factor considerably and thereby lower the maximum correlation obtainable.

Driver Education

Because the issue of driver education is, at this time, controversial, and since the Air Force is currently investing considerable time and money in driver education efforts with its airmen, this item was viewed separately. In the original study, the driver education variable was separated into two categories, 1) the subject had previously received some kind of formal driver training, and 2) he had not. Mullins found no significant correlation between formal driver training and subsequent accident frequency as reported by the subject.

However, it was thought it might be interesting to look at the issue of high school driver education somewhat differently. A driver education variable was contrived which would compare subjects with no formal driver training with those who had a maximum amount, thus allowing any effect of driver education a better opportunity for revealing itself. Table 5, page 10 shows the results of this analysis.

As noted, this effort resulted in the same near-zero relationship reported by Mullins.

It seems apparent that driver education history cannot be utilized as a predictor, at least as defined by these data. However, apart from the issue

Table 5

Relationship Between High School Driver Education and Subsequent Accident Frequency as Reported by 1472 Airmen

	N	Accidents Per 100 Drivers
Had no driver education in high school and/or other formal driver training	574	61
(a) 21 or more hours classroom instruction (b) 1-3 or more hours behind-the-wheel (c) 1-3 or more hours in-car observation (d) 1-3 or more hours instruction on driving simulator	104	60
All other (had high school driver education in lesser amounts than group 2)	794	59
$r_{\cdot} = .01$ (not significant)		

of prediction, this finding is somewhat puzzling, since so many studies in which variables have not been controlled usually show a superior accident record for those subjects who have taken driver education. This lack of difference in accident record may be due to the fact that we are dealing with a very homogeneous group in terms of age, sex, education, military status, and all of the other variables by means of which they were screened for entrance into the Air Force, such as intelligence, aptitude, physical fitness, volunteering, etc. There are data which indicate that when all of these variables are controlled, that a group is likely to have very similar exposure in terms of miles driven, night driving, rural-urban driving habits, accessibility to a car, and so forth (McGuire, unpublished). If this assumption is correct, then we are in essence comparing groups with most or all of the pertinent variables controlled, therefore rendering tenable the possibility that driver education for this group actually has no real relationship to accident frequency.

In an effort to decide whether or not this is a likely possibility, a number of variables for the two extreme groups were tallied. (See Tables 6 through 10, pages 12, 13, 14, 15, 16.)

As hypothesized, there was no significant difference in the mileage estimates of the two groups; differences were also absent in the areas of Vehicle Ownership (Table 7) and whether or not the subject was ever issued a Learner's Permit (Table 8). However, the driver education group proved to come from families of higher income and more expensive homes (Tables 9 & 10).

Table 6

Mileage of Driver Education and
No Driver Education Groups

Two Year Mileage	No Driver Education		Driver Education	
	N	%	N	%
1-500	37	6.4	4	3.8
501-1,000	74	12.8	21	20.2
1,001-5,000	186	32.2	28	26.9
5,001-10,000	132	22.8	27	26.0
10,001-15,000	76	13.1	16	15.4
> 15,000	73	12.6	8	7.7
	578		104	

$X^2 = 7.753$, df = 5; (not significant)

Table 7

Relationship Between Vehicle Ownership
and Whether Subject Received Driver Education

Vehicle Ownership	No Driver Education		Driver Education	
	N	%	N	%
Do not own	407	70.3	64	61.5
Own - do not plan to take to next duty station	88	15.2	22	21.1
Own - plan to take to next duty station	84	14.5	18	17.3
	579		104	

$X^2 = 3.348$, df = 2; (not significant)

Table 8

Possession of Learner's Permit
For Driver Education and No Driver Education Groups

	No Driver Education		Driver Education	
	N	%	N	%
No learner's permit	243	42.0	35	33.7
Learner's permit	336	58.0	69	66.3
	579		104	

$X^2 = 2.503$, df = 1; (not significant)

Table 9

Distribution of Home Value For Driver Education and No Driver Education Groups

Home Value	No Driver Education N	%	Driver Education N	%
< $4,500	98	16.9	12	11.5
$4,500-10,000	203	35.2	30	28.8
$10,000-$15,000	145	25.1	23	22.1
$15,000-$20,000	77	13.3	23	22.1
> $20,000	54	9.4	16	15.4
	577		104	

$X^2 = 10.663$, df = 4; p = < .05

Table 10

Distribution of Family Income for Driver Education and No Driver Education Groups

Annual Family Income	No Driver Education N	%	Driver Education N	%
< $3,000	59	10.2	2	1.9
$3,000-6,000	318	55.0	53	51.0
$6,000-10,000	141	24.4	34	32.7
$10,000-15,000	43	7.4	13	12.5
> $15,000	17	2.9	2	1.9
	578		104	

$X^2 = 12.520$, df= 4; p= <.02

Because drivers from higher socio-economic levels tend to have higher accident rates, it follows that this particular driver education group should have produced a higher accident rate, which it did not. This means that we cannot reject the possibility that the experience of driver education did in fact lower the accident rate of that group, but that the influence of higher socio-economic status raised the accident rate to equal that of the no-driver education group.

It must be stressed that these data reflect only the inability of driver education to act as a predictor of self-reported accident frequency among young airmen, and cause-and-effect relationships in either direction cannot be inferred. Such digressions as noted above serve only to highlight certain problems in methodology.

Smoking

The variable of smoking was studied separately because the questionnaire asked for current smoking habits and there was no way of knowing whether this represented pre-service behavior.

Table 11, page 18 shows that smoking habits are correlated with accident frequency in the order of .124 on the validity sample, and .104 on the cross-validity group. Table 11 lists the actual number of accidents incurred by each smoking group. (Categories which were not significantly different are combined.)

Table 11

Relationship Between Smoking Habits and Accident Frequency

Variables	N	No. of Accidents Per 100 Drivers
Smokes only pipes or cigars and/or a pack or more of cigarettes per day	334	75
Used to smoke but quit or smokes less than a pack of cigarettes per day	708	59
Never smoked	430	48
	1472	

r.= .10 (p= $<$ .01 level)

Even though the questionnaire elicits present smoking habits and is related to past driving history, these results suggest that in any before-the-fact predictive studies the question of smoking habits might contribute to the prediction formula.

Because of its possible connection with a host of diseases and disorders, the question of smoking is of particular interest. However, the implications of a connection between smoking and highway accidents has not been very well explored. In addition to the data contained herein there appeared to be only two other studies which quantify this relationship between driving records and smoking incidence. In one study (Ianni and Boek, 1958) the authors found that of 161 drivers who had just had an accident 76% were smokers, while in a comparable group of 196 drivers who were accident free only 54% smoked, the difference being significant beyond the .0001 level.

Adams and Williams (1965) examined the driving accident and violation record of 1,025 male insurance applicants between the ages of 18 and 25 years. Most of these young men were students. On the basis of these records subjects were divided into three accident-violation groups. A Low Group which had no accidents or violations, a High Group whose driving licenses had been suspended or revoked, and a Median Group which had accidents and/or violations on their records but not enough for suspension of license. When the three groups were compared as to proportions of smokers in each group the following was found:

No accident-violation group (N=133)	17% smoked
Median accident-violation group (N=766)	29% smoked
High accident-violation group (N=126)	47% smoked.

In spite of the fact that the combination of accidents and/or violations into a single criterion is not always a valid procedure, these results are very much in keeping with those found in this study and the one previously mentioned.

If this relationship between smoking and accident production is valid, then it follows that smokers would have many characteristics in common with accident-involved drivers. In reviewing the literature concerning the personal characteristics of smokers and comparing them with similar data concerning accident-involved drivers, this shows to be very much the case, (Guilford, 1966). In fact, at least one author, (Adams, 1965b) has created an explanatory construct which links together the general categories of smoking, alcoholism, and accident involvement.

One final point regarding the prediction of accidents based on "small" but statistically significant correlations. Experience has indicated that correlations in the range of .10 - .30 but not much higher, are to be expected. However, this still allows any group to be divided into about three sub-groups, each incurring a higher (or lower) accident frequency than the other. In some cases this may prove to be useful and practical. Table 12, page 21 illustrates what kind of prediction power may be expected on the basis of correlations of .10, .15, and .27, respectively. They are based on actual data derived from a number of samples gathered by the author.

Work recently completed upon a series of 2,796 civilian license applicants in the state of Mississippi (McGuire, unpublished), indicate that prediction may be made more effective by including Age, Sex, Mother's Education and Father's Occupational Category, themselves producing an R of .28 with an accident criterion derived from males under age 25. Assuming these latter data should prove applicable to young airmen (and there is every indication that they are) it is logical to guess that it would be possible to predict accidents among airmen in the order of .30 or slightly higher.

The focus of this report is on the prediction of accident frequency, and cause-and-effect statements must naturally be made with extreme caution.

Table 12

Illustration of What Various Correlations Mean When Translated Into Actual Frequencies Of Predicted Accidents

Score Range of Predictor (e.g. age, education, etc.)	r=.10	r=.15	r=.27
1	75	64	72
2	59	45	50
3	48	24	22

Actual accidents per 100 subjects in body of table.

All correlations based on N's allowing for p=.05

However, the contractor expressed interest in seeing to what extent the variable of Home Value and Smoking Habits were related to such factors as Mileage. In the case of a positive relationship it might be thus hypothesized that persons who come from a higher socio-economic level (as measured by Value of Parent's Home) and/or heavier smokers, drive more miles per year, thus increasing their potential for accidents. Tables 13, 14, and 15, pages 23, 24, and 25 each indicate that such might be the case.

Table 13 consists of a correlational matrix between the several factors correlated significantly with accident frequency. Home Value correlates with mileage in the order of about .12, and Smoking Habits to the extent of about .10. Tables 14 and 15 illustrate this same relationship in terms of how many subjects in each Home Value and Smoking category tend to distribute themselves among the various mileage groups.

Because of limitations of time and expense, Tables 14 and 15 were based on a 20% random sample of the validation groups of 1,475 cases (N=300), and the frequencies reported in those tables are percentages rather than raw frequencies. In addition to being a sound procedure on theoretical grounds, it is to be noted that the notion of a relationship between mileage and these two predictors is supported by the correlational matrix.

* *

In conclusion, the following observations and recommendations are offered:

A. If the national highway safety program is to be expressed in terms of cost-effectiveness such effectiveness is more likely

Table 13

Correlation Matrix for Nine Selected Variables Among 2947 Airmen; Divided into Validation and Cross-Validation Groups (N=1472 & N=1475)*

	# Violations	Home Value	Family Income	Mech. Test	Elec. Test	AFQT Score	Home Town Pop.	Smoking Habits	Accident Frequency
MILEAGE	23 27	15 08	12 11	06 09	-01 01	-01 03	01 -03	09 10	18 23
VIOLATIONS		10 04	08 06	04 04	02 -02	02 04	10 02	10 09	24 32
HOME VALUE			49 53	05 06	11 12	10 14	25 24	01 11	11 10
FAMILY INCOME				03 06	09 11	04 07	13 15	04 11	08 09
MECH. TEST					30 24	27 27	02 -03	01 03	11 04
ELEC. TEST						40 39	05 -01	01 -01	09 01
AFQT SCORE							03 06	-01 03	07 06
HOME TOWN POP.								01 -02	07 02
SMOKING HABITS									12 10

*Top figure represents validation group; bottom figure represents cross-validation group. Decimal points omitted.

Table 14

Frequency Relationship Between Mileage and Home Value of Airmen*

(In Percent)

Two Year Mileage	Value of Parents' Home				
	Less than $4,500** (N=13%)	$4,500 $10,000 ** (N=29%)	$10,000 $15,000** (N=33%)	$15,000 $20,000** (N=15%)	Over $20,000** (N=10%)
1 - 500	13%	8%	5%	4%	3%
501-1,000	21	10	14	18	10
1,001 - 5,000	32	29	31	27	29
5,001 - 10,000	13	31	25	13	23
10,001 - 15,000	8	9	15	29	13
15,000 +	13	13	10	9	23
	100%	100%	100%	100%	100%

*Based on 20% random sample (N= 300) from cross-validation group (N= 1475). All percentages rounded off.

**Percent of total sample - percentages in body of table based on number of subjects in each column.

Table 15

Frequency Relationship Between Mileage and Smoking Habits of Airmen*

(In Percent)

Two Year Mileage	Smoking Category		
	More Than One Pack Per Day or Only Pipe or Cigars** (N= 27%)	Smoked But Quit or Smokes Less Than 1 Pack Per Day** (N= 40%)	Never Smoked (N=33%)
1 - 500	4	8	7
501 - 1,000	11	13	18
1,001-5,000	29	27	33
5,001 - 10,000	26	23	20
10,001 - 15,000	14	17	12
15,000+	16	12	9
	100%	100%	100%

* Based on 20% random sample (N=300) from cross-validation group (N=1475). All percentages rounded off.

** Percent of total sample - percentages in body of table based on number of subjects in each column.

to emerge if various "risk-groups" may be identified. That is, a safety program is likely to be differentially effective among high, low, and median risk groups. If all risk-groups are combined, the net effect of any program could well be masked and appear ineffective.

B. When combined with data gathered on other young male drivers, it appears reasonable to assume that "risk-groups" may be identified in the order of r=.30.

C. It is not considered necessary to conduct a before-the-fact study in order to complete the work described above. This may be accomplished by studying a group of subjects on the basis of data gathered retroactively over the most recent two years (or whatever period of time is chosen) as follows:

1. Age.
2. Highest grade completed in school two years ago.
3. Mother's education two years ago.
4. Father's occupational category two years ago.
5. Value of parents' home two years ago.
6. Scores of aptitude tests administered at time of enlistment (in the case of airmen).
7. Smoking habits two years ago.
8. Self-report of number of accidents incurred during last two years.

D. With the possible exception of 5 (value of parent's home) and 7 (smoking habits) all of these items should possess near-perfect reliability, and even those should be high enough on a large group so as to establish

the "true" predictive power of the entire list. It is expected that the final correlation between certain of these variables (not all of them are likely to remain in the formula) and accident frequency would be between .25 and .35.

E. Such a study is feasible at a very reasonable cost and capable of being completed in a comparatively short period of time.

F. Prediction is merely the identification of groups of individuals who are well-defined on the basis of their accident potential. This allows for the more intensive study of causal factors within such people which, in turn, may help produce a useful theory of accident-having behavior.

Summary

In July, 1967, approximately 12,000 airmen were tested during their first week of duty by the staff of the Personnel Research Laboratory of Lackland Air Force Base, Texas. Sixteen tests were administered, including a questionnaire containing a number of biographical items and questions pertaining to personal driving experience prior to entrance into the military. Because of its relevance to research being conducted by the author (F.L.M.) these data were borrowed and analyzed in order to determine which variables might allow for the prediction of accident frequency.

Because of certain restrictions the analysis was limited to a sample of 2,961 subjects between the ages of 17 through 20; the criterion was the raw frequency of accidents reported by each subject and covering the two year period just prior to enlistment.

The variables were classified as "true" predictors (that is, capable of being gathered before-the-fact, such as age) and "quasi" predictors (that is

those gathered after-the-fact, such as mileage) and prediction formulas computed separately. History of formal high school driver education and smoking habits were also analyzed separately.

Among the "true" predictors only the"Value of Parent's Home" survived cross-validation, correlating with accident frequency in the order of .10. This figure is statistically significant and, when translated into actual accident frequency, results in placing all subjects into five different accident groups, with 44, 54, 64, 68, and 70 accidents per hundred persons, respectively.

When combined with "quasi" predictors, cross-validation included Mileage, Home Value, and each persons's score on the Mechanical Aptitude Test and the Electronics Aptitude Test, resulting in an R of .22.

Driver education did not correlate with accident frequency, while smoking habits did so to the extent of .10. The implications of these findings are discussed. It is concluded that prediction of accident frequency, or at least the placing of each subject within broad "risk" categories, is feasible among young male drivers. When combined with data gathered on other populations it is felt that such prediction would be based on a correlation of about .30 or higher. It is suggested that such a hypothesis may be easily tested by the retrospective gathering of "true" predictors, such as age, education, etc.

Appendix

Format of Questionnaire Items Extracted From Driver Background Experience Survey. (Item numbers correspond to numbers in Table 1

1. Age_____

2. Mech.Score _____

3. Adm. Score _____

4. Gen. Know. Score _____

5. Elec. Apt. Score _____

6. AFQT Score _____

7. What formal driver training had you received before you enlisted in the Airforce? ("Formal driver training" involves your enrolling in an official class taught by an approved instructor).

   None.....1 ( )

   In a high school.....2 ( )

   From a commercial driving school.....3 ( )

   Other.....4 ( )

   Indicate the extent of your formal driver training education by placing an "X" in the appropriate boxes below:

   A. Classroom instruction

      none.....1 ( )

      1-10 hours.....2 ( )

      11-20 hours.....3 ( )

      21-30 hours.....4 ( )

      31 or more hours.....5 ( )

Behind the wheel as a driver

none.....1 ( )

1-3 hours.....2 ( )

4-6 hours .....3 ( )

7 or more hours.....4 ( )

Behind the wheel as an observer

none.....1 ( )

1-3 hours.....2 ( )

4-6 hours.....3 ( )

7-9 hours.....4 ( )

10 or more hours.....5 ( )

Driving simulator training

none.....1 ( )

1-5 hours.....2 ( )

6-10 hours.....3 ( )

11-15 hours.....4 ( )

16 or more hours.....5 ( )

8. Indicate the average number of miles you drove each year the last two years before you enlisted

none.....1 ( )

1-500.....2 ( )

501-1,000.....3 ( )

1,001-5,000.....4 ( )

5,001-10,000.....5 ( )

10,001-15,000.....6 ( )

over 15,000.....7 ( )

9. At what age were you licensed to drive alone?

I have never been issued a civilian license to drive a vehicle alone.....1 ( )

13 years old or under.....2 ( )

14.....3 ( )

15.....4 ( )

16.....5 ( )

17.....6 ( )

18.....7 ( )

19 or older.....8 ( )

10. Indicate what types of accidents you have been involved in as the driver of a motor vehicle.

I have never been involved in an accident as the driver of a motor vehicle.....1 ( )

One accident involving only property damage.....2 ( )

Two or more accidents involving only property damage....3 ( )

One accident involving only injury to a person.....4 ( )

Two or more accidents involving only injury to persons..5 ( )

One accident involving both damage to property and injury to person(s).....6 ( )

Two or more accidents involving both damage to property and injury to person(s).....7 ( )

11. Indicate in the space provided at the right of each item below the number of times that you have been caught in that type of traffic violation, as the driver of a motor vehicle. Remember write in the number of times that you have been caught in each violation. Place a zero (o) opposite those traffic violations for which you have never been caught.

I have never been involved in a moving traffic violation as the driver of a vehicle.....1 ( )

Reckless driving.....2 ( )

Had been drinking.....3 ( )

11. (cont.)

Speeding.....4 ( )

Leaving the scene of an accident.....5 ( )

Driving without a license .....6 ( )

Operating an unsafe vehicle .....7 ( )

Failure to obey traffic signs .....8 ( )

Other moving violations.....9 ( )

12. Have you ever failed any part of a driver's license test"

No .....1 ( )

Yes .....2 ( )

If your answer is "yes", write the number of times you failed each part of the driver's license test in the space provided at the right of each part. Be sure to write the number of times you failed. If you have never failed a particular part put a "0" in the space.

How many times did you fail the written part of the driver's license test .....3 ( )

How many times did you fail the driving part of the driver's license test .....4 ( )

13. The value of the home in which your parents live is

$4,500 or less .....1 ( )

between $4,500 and $10,000.....2 ( )

between $10,000 and $15,000 .....3 ( )

between $15,000 and $20,000 .....4 ( )

over $20,000.....5 ( )

14. What has been the average income of the major wage earner of your family for the past five years?

less than $3,000 per year.....1 ( )

from $4,000 to $6,000 per year.....2 ( )

from $6,000 to $10,000 per year.....3 ( )

from $10,000 to $15,000 per year. .....4 ( )

over $15,000 per year.....5 ( )

15. Most of my life I have lived with:

my father and mother.....1 ( )

my father but not my mother.....2 ( )

my mother but not my father .....3 ( )

other relatives but not my father or mother.....4 ( )

foster parents.....5 ( )

an orphanage.....6 ( )

16. Have your father and mother ever been separated or divorced?

Yes.....1 ( )

No .....2 ( )

17. Your father

is living.....1 ( )

died before you were thirteen .....2 ( )

died after you were thirteen.....3 ( )

18. Your mother

is living .....1 ( )

died before you were thirteen.....2 ( )

died after you were thirteen .....3 ( )

19. What is the population of the community where you have lived most of your life?

city of 500,000 or more .....1 ( )

city between 100,000 and 500,000.....2 ( )

city or town from 10,000 to 100,000.....3 ( )

city or town from 1,000 to 10,000.....4 ( )

city or town less than 1,000.....5 ( )

farm area (not in a city or town).....6 ( )

20. Which of the following statements applies to you?

I have never smoked.....1 ( )

I used to smoke, but I quit.....2 ( )

I smoke a pack or more of cigarettes per day.....3 ( )

I smoke less than a pack of cigarettes per day .....4 ( )

I smoke only pipes or cigars.....5 ( )

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