

Appendix F:

Question-by-Questions Justification

There are three questionnaires to be administered in this information collection. First is the Screener Questionnaire (see Appendix C). The Screener is required to screen individuals interested in participating in the study. These questions are required to ensure eligibility for the study and to match them to appropriate rider categories per the study design. The second is the Intake Questionnaire (see Appendix D), which is made up of four separate psychological / behavioral questionnaires that have been validated through previous research. The Intake Questionnaire will be administered while participants are waiting for their motorcycles to be instrumented. The questions are designed to provide important information on demographics, riding history and riding behavior, as well as personality measures that will be used to improve our understanding of riders and to develop appropriate countermeasures to improve motorcycle safety. Third is the Debriefing Questionnaire (see Appendix E), which will gather some basic information on risky behaviors engaged in during the study, self-perceptions on riding skill and experiences riding with the instrumented motorcycle. More details on justifications for the questions included in the questionnaires are provided in this appendix, below.

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**Question-by-Question Justification for Intake Questionnaire
(4 questionnaires combined into a 10 page intake questionnaire)**

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Question-by-Question Justification for Screener (Appendix C)

| ITEM | EXPLANATION |
|---|---|
| 1-14 | These items are used to screen participants. Age and gender will be used to place participants into the demographic cells of the design outlined on pages 2-3 of Part B. To be eligible to participate, volunteers must also have a valid motorcycle endorsement, own a motorcycle from a list of specified models that is in at least fair mechanical condition, have liability insurance, report that others will not operate their motorcycle regularly during the study period, be eligible for employment in the US, and be comfortable reading and writing English. |
| Open Ended Riding Experience Description, pages 4-6 | This item is used to screen participants into cells of the design based on their riding experience, as outlined on pages 2-3 of Part B. To simplify the process, volunteers will be asked to explain their motorcycle riding experience in their own words and then will be asked follow-up questions for clarification. |
| 15 | This question is to determine how the participant learned about the study. Responses will help us determine which recruitment methods are most successful. Methods to recruit future participants may be altered based on responses to this question. |

Question-by-Question Justification for Intake Questionnaires

Intake Questionnaire 1: Demographics and Riding History (Appendix D, pages 1-3)

| ITEM | EXPLANATION |
|-------|---|
| 1-2 | Standard demographic questions. Year of birth will be used to determine age, and also to determine years of motorcycle riding experience from future questions. |
| 3-5 | These items ask respondents about their prior motorcycle riding experience. They will be used to confirm that respondents fall into the experience categories they were placed into during screening, and will also be used to report descriptive statistics on the years of riding experience for respondents in the different experience level categories. |
| 6-7 | Responses to these items will indicate if the instrumentation applied to the respondent's motorcycle will likely capture all of the riding the respondent does over the course of the year, or if the respondent may also be riding other motorcycles. |
| 8-11 | These items will capture information on prior motorcycle riding experience for respondents who have returned to motorcycle riding after taking a break. As in questions 3-5, these items will be used to confirm that respondents fall into the experience categories they were placed into during screening, and will also be used to report descriptive statistics on the years of riding experience for respondents who have recently returned to motorcycle riding after a break. |
| 12-22 | These items ask respondents about the frequency with which they rode their motorcycle in the past year, and the purpose of these rides. This self-report information will be compared to objective trip information captured with instrumentation. These comparisons will provide information on the accuracy of motorcycle riders' self-reported riding frequency. The resulting information will aid in the interpretation of self-reported riding frequency data from prior studies, and will inform the design of future studies where riding frequency data are desired. |
| 23-26 | These questions ask respondents about the motorcycle rider training they have received. Responses will give more insight into the respondent's prior motorcycle riding experience. |
| 27-28 | These questions ask respondents about motorcycle helmet use. This self-reported information can be compared to video footage of what the rider wears on the road. |

**Intake Questionnaire 2: Sensation- and Thrill-Seeking Questionnaire
(labeled on questionnaire as “perceptions”) – (Appendix D, pages 4-5)**

| ITEM | EXPLANATION |
|-------------|---|
| 1-8 | These questions constitute the Brief Sensation Seeking Scale (BSSS). The BSSS was adapted from Form V of the Sensation Seeking Scale (SSS-V) developed by Zuckerman, Eysenck, and Eysenck (1978) and was validated in its shorter form as the BSSS by Hoyle, Stephenson, Palmgreen, Lorch, and Donohew (2002). Sensation seeking has been shown to be related to crashes, traffic violations, self-reported risky driving behavior, and risky driving in a simulator (e.g., Jonah, 1997; Schwebel, Severson, Ball, & Rizzo, 2006). In this study, we will examine if it also related to observed on-motorcycle riding behavior. |
| 9-12 | These items were derived from Akers’ Social Learning Theory (Akers, 1977) and assess how social influences affect risk taking in on-motorcycle riding behavior. |
| 13-20 | These questions constitute eight of the nine questions of the thrill-seeking scale of the Driver Stress Inventory, which was developed and validated by Matthews, Desmond, Joyner, Carcary, and Gilliland (1997). These eight questions have been shown to be related to speeding behavior in a driving simulator (Stradling, Meadows, & Beatty, 2004). In this study, we will use answers to these items to examine if thrill seeking is also related to observed on-motorcycle riding behavior. |

Intake Questionnaire 3: NEO Five Factor Inventory (NEO-FFI) – (Appendix D, pages 6-8)

| ITEM | EXPLANATION |
|------|-------------|
|------|-------------|

1-60 These questions constitute the NEO Five Factor Inventory (NEO-FFI). The NEO-FFI is a validated measure of the personality characteristics of neuroticism, extraversion, openness to experience, agreeableness, and conscientiousness developed by Costa and McRae (1992).

The 60 questions included in this abbreviated version of the NEO-FFI Factor Inventory constitute a well-researched, data-driven and validated set of psychological scales designed to measure what is often referred to as the Big Five – the five major human personality traits. Each of the measures for the 5 factors is made up of 12 questions; each question measures positive or negative affinity with one end or the other of the scale for each factor. All 12 questions for each factor are required to get an accurate measure of the factor as validated in previous research.

- Neuroticism (*sensitive/nervous vs. secure/confident*)
Questions: 1, 6, 11, 16, 21, 26, 31, 36, 41, 46, 51, 56
- Extraversion (*outgoing/energetic vs. solitary/reserved*)
Questions: 2, 7, 12, 17, 22, 27, 32, 37, 42, 47, 52, 57
- Openness (*inventive/curious vs. consistent/cautious*)
Questions: 3, 8, 13, 18, 23, 28, 33, 38, 43, 48, 53, 58
- Agreeableness (*friendly/compassionate vs. cold/unkind*)
Questions: 4, 9, 14, 19, 24, 29, 34, 39, 44, 49, 54, 59
- Conscientiousness (*efficient/organized vs. easygoing/careless*)
Questions: 5, 10, 15, 20, 25, 30, 35, 40, 45, 50, 55, 60

This comprehensive model of human personality traits provides key insights into human behavior. They have been shown to be correlated to individuals’ motivations, attitudes, experiences, emotions, and learning styles.

NHTSA will use these personality trait measures to develop a better understanding of the role they may play in on-motorcycle riding behavior as well as attitudes and riding experiences of riders. This knowledge will enable NHTSA to develop better countermeasures to improve rider safety, including better safety messaging, better training, and better education on motorcycle safety. For example, if certain personality traits, as measured with this intake questionnaire, are over-represented in the more dangerous on-motorcycle riding behaviors found in our on-road motorcycle instrumentation measures, NHTSA will have a better understanding of the types of riders exhibiting these unsafe behaviors, the associated attitudes of these individuals, and the types of learning approaches that may be more effective in getting information out to these types of riders to help them ride safer.

The importance of including these measures in our study is reinforced by the fact that they are included as primary psychological measures in other important on-road naturalistic driving studies. This same 60-question measurement instrument is currently being used in the SHRP-2 instrumented vehicle study, the largest national study of instrumented passenger vehicles (cars) ever undertaken, and for similar reasons – to better understand the relationship between these five major personality traits and the way individuals drive – with the intention of improving driving safety on America’s roadways.

This NEO-FFI questionnaire is also being used in the complementary MSF motorcycle study currently underway; and it is the only psychological questionnaire in the MSF study that will also be used in our NHTSA study. Given that this data is being collected in the MSF study, it will be important to collect the same data for our study should we be able to merge the data sets later on and do analyses of the combined data sets. Without it, we would lose important cross-study data and limit the analyses available if we are able to combine the data sets in the future.

Intake Questionnaire 4:. Motorcycle Rider Behavior Questionnaire (MRBQ)

(Appendix D, pages 9-10)

| ITEM | EXPLANATION |
|-----------|---|
| All Items | <p>The Motorcycle Rider Behavior Questionnaire (MRBQ) is a validated self-report measure of motorcycle riding behavior and errors that predict crash risk. The MRBQ was developed by Elliot, Baughan, and Sexton (2007) and was adapted for motorcycle riders from the Driver Behavior Questionnaire, or DBQ (Reason, Manstead, Stradling, Baxter, & Campell, 1990).</p> <p>These questions provide important insights into the self-perceptions riders have of their riding skills and riding behavior. NHTSA will be able to compare actual behavior from the on-road riding data to these self-reports and self-perceptions to look for areas where they correspond and areas where they do not. This will help NHTSA determine key riding situations to be addressed in future countermeasures and how to address them, i.e. reinforce accurate rider perceptions or try to correct false perceptions of riding issues that riders may encounter.</p> |

Question-by-Question Justification for Debriefing Questionnaire (Appendix E)

| ITEM | EXPLANATION |
|-----------|--|
| 1 | This question asks respondents about the frequency with which they may have been under the influence of drugs or alcohol while riding during this study. This will allow respondents to self-report a risky behavior that will not be captured by the data acquisition system. |
| 2 | This question asks respondents about their seat belt use when driving a car. The risky behavior of driving a car unbelted can be compared to riding behaviors observed on-road. |
| 3 | This item asks respondents how much stress they felt during the time they participated in the study. This self-reported information about the respondent's stress level can be compared to riding behaviors observed on-road. |
| 4-5, 8-11 | These items ask respondents about their subjective experiences riding with the instrumentation, including if they feel the instrumentation affected their behavior. |
| 6-7 | These questions ask riders to rate their safety and skill compared to other riders. The self-reported safety and skill levels of respondents can be compared to riding behaviors observed on-road. |