Older Novice Driver Naturalistic Driving Study

ACTIVE

Contract Opportunity

Notice ID

693JJ924R000021

Related Notice

693JJ923RQ000179

Department/Ind. Agency

TRANSPORTATION, DEPARTMENT OF

Sub-tier

NATIONAL HIGHWAY TRAFFIC SAFETY ADMINISTRATION

Office

693JJ9 NHTSA OFFICE OF ACQUISTION

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General Information View Changes

- **Contract Opportunity Type:** Presolicitation (Updated)
- **All Dates/Times are:** (UTC-05:00) EASTERN STANDARD TIME, NEW YORK, USA
- **Updated Published Date:** Feb 07, 2024 09:27 am EST
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- **Updated Inactive Date:** Mar 07, 2024
- **Original Inactive Date:** Mar 07, 2024
- **Initiative:**
  - None

Classification

- **Original Set Aside:**
-
- **Product Service Code:** R410 - SUPPORT- PROFESSIONAL: PROGRAM EVALUATION/REVIEW/DEVELOPMENT
- **NAICS Code:**
  - 541720 - Research and Development in the Social Sciences and Humanities
- **Place of Performance:**

  Washington , DC 20590

USA

Description

The National Highway Traffic Safety Administration (NHTSA) is an agency of the U.S. Department of Transportation (DOT). NHTSA's mission is to save lives, prevent injuries, and reduce economic costs due to road traffic crashes, through education, research, safety standards, and enforcement activity.

In 2021, drivers ages 15 to 20—many of whom were novices—represented 8.4% of drivers involved in fatal crashes but only 5% of all licensed drivers. While young novice drivers' crash rates have declined since States began implementing Graduated Driver Licensing (GDL) programs in the 1990s, motor vehicle crashes remain a leading cause of death among young people. As a group, novice drivers' crash rates are highest during the initial months of licensure and decline over time. However, individual novices may not follow this pattern of incrementally declining risk. For example, when novices were grouped by longitudinal profiles ("trajectories") of risky driving over the first 20 weeks of independent driving, some novices drove safely throughout this period while others remained at consistently high risk.

One factor that may influence heterogeneity of risk among novice drivers is the age at which they receive licensure and begin driving independently. Crash rates are generally highest for novice drivers at first licensure and decline with experience. However, the declines among older novices appear to be slower than for those licensed at younger ages, and some evidence suggests that drivers first licensed at age 18 may have higher crash rates during their first several months of driving than drivers first licensed at ages 16 or 17.

Furthermore, while an increasing proportion of young people are delaying licensure until age 18 or older, few States currently apply the full GDL program to novices ages 18 to 20. Licensure delays are more likely among Latino, Black, and lower socioeconomic status (SES) young people, raising the possibility of inequities in which novices receive the benefits of GDL. However, because little is known about the safety and driving habits of newly-licensed drivers 18 and older, questions remain about whether and how to develop GDL provisions for older novices that reduce exposure to risk while still ensuring mobility.

The heterogeneity of risk among novice drivers has also led to a call to "move beyond" population-level interventions towards interventions tailored for novices with higher levels of risk or who have already exhibited unsafe driving behaviors. Therefore, it is critical to understand which novice drivers are likely to begin, and to remain, at greatest risk during the first months of independent driving. Conversely, understanding which novices are likely to have persistently low risk—and whether their early independent driving experiences differ in

ways that promote learning but preserve safety—can be useful for those developing recommendations and education for newly-licensed drivers. Yet, few demographic or psychological factors have emerged as significant and consistent predictors of whether novices follow high- or low-risk trajectories of unsafe driving after the transition to independent driving. Similarly, it is unknown whether the amount, type, or patterns of driving in the first months of independent driving differ, or evolve differently over time, for high- and low-risk novice drivers.

To address these questions, a prior NHTSA project (https://rosap.ntl.bts.gov/view/dot/67045) involved designing, and determining the potential challenges for conducting, a hypothetical naturalistic driving study (NDS) with younger (age 15.5 – 16.5) and older (age 18 – 20) novice drivers in the first period of independent driving. Under this project, a research team developed materials related to the design and execution of the hypothetical study, including:

- A literature review of existing research relevant to the research questions and potential methodological approaches for the hypothetical study;
- A study design and data analysis plan;
- Questionnaires to be administered at various timepoints during the hypothetical study;
- Materials required for submission to an Institutional Review Board (IRB);
- A data management plan (DMP);
- Participant consent forms;
- Information Collection Request (ICR) materials describing the study for submission to the Office of Management and Budget (OMB) to comply with the Paperwork Reduction Act (PRA);
- A draft Introduction and Methods sections for a Final Report describing the hypothetical study; and
- An assessment of potential challenges to conducting the hypothetical study, along with solutions.

The research team did not develop materials related to assessing how personally identifiable information would be collected, used, shared, and maintained (e.g., a Privacy Threshold Analysis [PTA]).

The research team for this prior project found that most existing NDS of novice drivers have not included novices 18 and older. Additionally, although older novices are more likely to be Black, Latino, and lower SES, most prior NDS have used convenience samples that overrepresented White and higher SES novice drivers. When designing the study, the research team determined that an alternative approach was necessary to obtain more representative samples of novice drivers. Specifically, the research team devised a recruitment approach in

which, along with a partnership with a State driver licensing agency, researchers could increase the likelihood of reaching a diverse group of potential participants. Additionally, the research team suggested a 'hybrid' approach to data collection, in which most participants would have NDS data collected via an app on their personal smartphones, while a smaller subgroup would additionally be outfitted with the kinds of in-vehicle data acquisition systems (DAS) traditionally used in NDS. This approach removes barriers to participation associated with the installation of in-vehicle equipment, permits the recruitment of a larger number of participants, and allows researchers to examine the correspondence between NDS data obtained with smartphones versus in-vehicle equipment.

NHTSA seeks a Contractor to conduct an NDS with younger (age 15.5 – 16.5) and older (age 18 – 20) novice drivers in their first 12 months of independent driving to answer relevant research questions. The Contractor shall develop a Final Report that describes the results of the NDS and discusses how the results address the research questions in Section C.2. The Contractor shall also transfer datasets resulting from the study to NHTSA, including raw and analysis datasets.

The study design and analyses shall be based on materials developed for this study under a prior project. Some of these materials are available in the published Final Report (https://rosap.ntl.bts.gov/view/dot/67045); any additional materials will be shared with the Contractor at award.

The study developed under the prior project has the following characteristics:

- Naturalistic driving data will be collected for a period of twelve (12) months from 500 novices ages 15.5 – 16.5 (depending on the minimum licensing age of the State in which the study is conducted) and 500 novices ages 18 – 20.
- All participants will have naturalistic driving data collected using a smartphone-based DAS (smartphone app) capable of collecting data necessary to answer the research questions. A subset of 84 younger and 84 older novices (168 total) will also have naturalistic driving data collected using vehicle-based DAS (e.g., with camera, accelerometer, gyroscope, GPS, etc.).
- Naturalistic driving data collection will begin when participants receive the first license that allows them to drive unsupervised.
- Potential participants will be quota sampled to ensure that the study sample aligns with what is known about the sociodemographic characteristics of novice drivers in the U.S. . Currently, the sampling plan includes considering sex, race and ethnicity, and socioeconomic characteristics (e.g., family affluence) when recruiting novice drivers.
- The study will be conducted in a State that does not currently apply GDL provisions to novices 18 and older; the State should also have a minimum age for unsupervised driving between 15.5 and 16.5 (i.e., the minimum age in the majority of States).

- To recruit participants for the study, the research team will need to partner with a State licensing agency. The State licensing agency should have sufficient numbers of younger and older novices applying for licensure to reach recruitment targets.
- Potential participants will be identified using information available in the State licensing agency records (e.g., age, sex, race and ethnicity, licensure status). Potential participants will additionally be administered screening questions to further determine eligibility (e.g., ownership of an Android or iOS smartphone, information about vehicle access necessary to determine eligibility for the in-vehicle DAS subgroup) at the time they schedule their on-road/behind-the-wheel licensing exams.
- Based in part on the experience of Thomas et al., 2016,[1] the current study plan estimates that a high-volume State licensing agency could yield 3 to 18 participants (including 1 to 6 older novices) per day. Assuming this rate, if three individual licensing agency offices participated in the study, it would take a maximum of 167 office days (approximately 8 mos.) to complete recruitment. With 6 offices participating, it would take a maximum of 84 office days (approximately 4 mos.) to complete recruitment.
- The current study plan estimates compensation for novices in the “smartphone only” data collection group to be $475 by the end of the study. The plan estimates the “smartphone plus in-vehicle DAS” data collection group will be compensated $675 by the end of the study.
- Participants will complete three web-based, self-administered questionnaires at the beginning, middle, and end of the study that do not take more than 30 minutes to complete. The baseline questionnaire will contain questions about sociodemographic information and other information that prior studies suggest will predict driving performance and/or exposure, including but not limited to: measures of personality, sensation-seeking, attitudes about traffic safety, self-reported driving behavior, parental involvement, experience with driving and driver education, and vehicle access. Follow-up questionnaires will be shorter and only include measures that may change over time and/or with driving experience, e.g., attitudes about traffic safety, vehicle access.
- Naturalistic driving and questionnaire responses will be used to derive variables necessary to answer relevant research questions, including outcome variables like crashes or near-crashes and kinematic risky driving (i.e., elevated g-force) events. Other variables will include information about the amount and type of exposure (e.g., road type, trip duration, trip time of day, weather, posted speed limit, route familiarity, complexity of driving environment), information about risky behaviors (e.g., speeding, cell phone use), and information from the questionnaires.
- The current plan includes a variety of statistical techniques for data analysis, including approaches that discover groups of participants with similar trajectories of risky driving over the study period (e.g., group-based trajectory models, latent class growth analysis using growth mixture modeling), as well as approaches that allow group-based comparisons between younger and older novices, or higher- and lower-risk novices (e.g., mixed-effects generalized linear models.

- Potential challenges for conducting the study include: finding a State licensing agency willing to participate and maintain its commitment during the approval process, recruiting a sample representative of the younger (15.5 – 16.5) and older (18 – 20) novice driver populations; recruiting the desired number of participants within the specified amount of time; and obtaining accurate measures of performance and exposure from the smartphone app (e.g., distinguishing travel modes; distinguishing passenger from driver).

[1] Thomas, F. D., Rilea, S. L., Blomberg, R. D., Peck. R. C., & Korbelak, K. T. (2016, January). *Evaluation of the safety benefits of the risk awareness and perception training program for novice teen drivers* (Report No. DOT HS 812 235). National Highway Traffic Safety Administration.

Attachments/Links

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Attachments

Document	File Size	Access	Updated Date
Presolicitation 693JJ924R000021_Req 24RQ000003_Older Novice Driver_02.06.2024.pdf (opens in new window)	218 KB	Public	Feb 06, 2024

Contact Information View Changes

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