Effect of speed on flow and enjoyment for driving (#54677)

1) Have any data been collected for this study already?
No, no data have been collected for this study yet.

2) What’s the main question being asked or hypothesis being tested in this study?
Hypotheses
1. At moderate speed (road driving up to 35 mph) the faster the speed the more flow will be experienced.
2. At rapid speed (rollercoaster) the faster the speed the less flow will be experienced.
3. At moderate speed (road driving up to 35 mph) the faster the speed the more enjoyment will be experienced.
4. At rapid speed (rollercoaster) the faster the speed the more enjoyment will be experienced.
5. Sensation seeking will not moderate the experience of flow at moderate speeds (road driving up to 35 mph).
6. Sensation seeking will not moderate the experience of enjoyment at moderate speeds (road driving up to 35 mph).
7. Sensation seeking will moderate the experience of flow at rapid speed (rollercoaster).
8. Sensation seeking will moderate the experience of enjoyment at rapid speed (rollercoaster).
9. Driving skill will moderate the experience of flow at moderate speeds (road driving up to 35 mph).
10. Driving skill will moderate the experience of enjoyment at moderate speeds (road driving up to 35 mph).
11. Ratings of frequency of being hassled will moderate the experience of flow at moderate speeds (road driving up to 35 mph).
12. Ratings of frequency of being hassled will moderate enjoyment at moderate speeds (road driving up to 35 mph).

3) Describe the key dependent variable(s) specifying how they will be measured.
Flow measures: Flow will be assessed using the 10-item Engeser Short Flow Scale (Engeser & Baumann, 2016), and also the 3-item flow index used by Ulrich et al (2014). This latter scale sums responses to three items: “I would love to repeat it again”; “I was thrilled”; “Task demands were well matched to my ability”.

Enjoyment VAS scale: Participants will rate each video on for enjoyment (“I enjoyed watching the video”). Ratings will be made on a Visual Analogue Scale (VAS), consisting of a horizontal line anchored at its left side with “Not at all” and at its right side “Very much”. Participants will move a graphic slider yielding a score from 0-100.

Sensation seeking: This will be assessed using the 8-item Brief Sensation Seeking Scale (Hoyle et al, 2002).

Driving skill VAS: Drivers will be asked “Please rate your skill as a driver” on a VAS anchored at its left side with “Very poor” and at its right side “Excellent”. Participants will move a graphic slider yielding a score from 0-100.

Hassle VAS: Participants will be asked to rate “When you are driving how often do you feel compelled to speed up due to the behaviour of other drivers?” on a VAS anchored at its left side with “Never” and at its right side “Always”. Participants will move a graphic slider yielding a “score from 0-100.

Immersion VAS: After each watching each set of videos (five for driving; three for the rollercoaster), participants will be asked to rate how immersed they felt in the scenes depicted on a VAS anchored at its left side with “Not at all” and at its right side “Fully”. Participants will move a graphic slider yielding a score from 0-100.

4) How many and which conditions will participants be assigned to?

Available at https://aspredicted.org/mp8sr.pdf
The moderate speed road driving task will have five conditions, determined by the speed of the car in the video. The speeds will be: congested traffic (<10 mph), 20 mph, 25 mph, 30 mph, 35 mph. Participants will experience all conditions in a block, with condition order being randomised.

The rapid speed rollercoaster task will have three conditions, determined by the speed of the rollercoaster carriage in the video. The speeds will be: slow (half normal speed), realistic (normal speed) and fast (one-and-a-half times faster than normal speed). Participants will experience all conditions in a block, with condition order being randomised.

The order of presentation of road and rollercoaster videos will be block randomised such that some participants will experience the five driving videos followed by the three rollercoaster videos, and some vice versa. There will be two versions of each set of videos, with version being randomised such that one participant is likely to experience clips from both versions as they complete the study.

5) Specify exactly which analyses you will conduct to examine the main question/hypothesis.
Hypotheses 1-4
One-way repeated measures ANOVAs with the independent variable Speed (congested traffic v. 20 mph v. 25 mph v. 30 mph v. 35 mph). The dependent variables will be as appropriate to each hypothesis.

Hypotheses 5-8
General linear model with the predictors variable Speed (congested traffic v. 20 mph v. 25 mph v. 30 mph v. 35 mph; categorical variable) and sensation seeking scale score (continuous variable). The dependent variables will be as appropriate to each hypothesis.

Hypotheses 9-10
General linear model with the predictors variable Speed (congested traffic v. 20 mph v. 25 mph v. 30 mph v. 35 mph; categorical variable) and driving skill rating (continuous variable). The dependent variables will be as appropriate to each hypothesis.

Hypotheses 11-12
General linear model with the predictors variable Speed (congested traffic v. 20 mph v. 25 mph v. 30 mph v. 35 mph; categorical variable) and hassle rating (continuous variable). The dependent variables will be as appropriate to each hypothesis.

6) Describe exactly how outliers will be defined and handled, and your precise rule(s) for excluding observations.
First, any participants that fail the attention check question “Have you ever suffered a fatal heart attack?” by answering “yes” rather than “no” will be excluded.

Next, outliers will be identified, defined at the upper end as scores more than 3 times the interquartile range above the 75th percentile value, and at the lower end as scores more than 3 times the interquartile range below the 25th percentile value. These will be identified using JASP boxplots.

Outliers will be removed and JASP boxplots will be replotted and rechecked, iteratively. If outliers can be removed without replacement by new outliers with wastage of ten or fewer participants, across all variables, then next skew and kurtosis coefficients will be checked. The data will be declared normal provided these fall within the range -2.0 to 2.0. Should the above not succeed in producing a normal distribution for a DV then outliers identified in JASP boxplots will be winsorised.

7) How many observations will be collected or what will determine sample size? No need to justify decision, but be precise about exactly how the number will be determined.
N=100. A power calculation indicated that N = 83 participants would be required in order to detect small to medium sized differences (f > 0.15) across the three speed conditions of the rapid speed task in one-way repeated measures ANOVAs, with alpha set to 0.05, power set to 0.80 and assuming a correlation across conditions of r=0.5. To allow for loss of data due to elimination of outliers and participant attrition, data from a sample size of N=100 will be collected.

8) Anything else you would like to pre-register? (e.g., secondary analyses, variables collected for exploratory purposes, unusual analyses planned?)
Nothing else.