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Initial Validation of a United States Video Speed Test to Measure Speed Propensity

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Preregistration, preprint, video files, and data: https://osf.io/kmygr/files/osfstorage

Public Qualtrics demo of USVST:
https://lafayettec.az1.qualtrics.com/jfe/form/SV_9O09L1YSbYoZIye

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Abstract

The University of Queensland Video Speed Test (UQVST) has shown validity for measuring speed propensity–a tendency to prefer faster or slower driving speeds. Since the test used driving clips filmed in Australia from the left side of the roadway, the validity of the test for use in samples in the United States is not known. A new United States Video Speed Test (USVST) was developed. The new test used ten video clips, each 8 seconds in duration, which participants viewed before indicating how much slower or faster they would drive in the same scenario. In a preregistered online survey study (*N* = 393 participants), the USVST showed high internal and test-retest reliability. Like the UQVST, the USVST correlated positively with scores on the speed subscale of the Driving Style Questionnaire and negatively with age. Further, the USVST showed a negative correlation with the cautious driving subscale of the Multidimensional Driving Style Inventory and a positive correlation with the sum of self-reported accidents, violations, and police pullovers. Males also scored significantly higher on the USVST than females. Collectively, this evidence suggested that the USVST may be a useful tool for measuring speeding propensity.

Keywords: driving safety; speeding; driving styles; video simulation

1. Introduction

Speeding–driving faster than posted speed limits–is a prevalent and risky driving behavior. A recent study using naturalistic driving data, for example, indicated that drivers spent 35% of their driving time exceeding posted speed limits and 20% of their time spent exceeding limits by more than 5 miles per hour (Perez et al., 2021). Another recent study found that about half of a sample of nearly 3000 drivers reported being occasional or frequent speeders (Kim et al., 2022). Speeding has been estimated to be a factor in up to 61% of vehicle crashes (Doecke et al., 2019) and 28% of fatal crashes, which totaled 12,151 in the United States in 2022 (National Center for Statistics and Analysis, 2024). One analysis indicated that a speed-related death occurs every 49 seconds worldwide (Fondzenyuy et al., 2024).

Given the magnitude of the risks imposed by speeding, research to understand and mitigate speeding is critical for improving road safety. Horswill, Hill, and Santomauro (2022) reviewed the methods available to researchers who study speeding. These methods range from naturalistic observational studies to simulations to surveys (e.g., Wallén Warner et al., 2009), and even implicit association tests (Hatfield et al., 2008). They noted that validated video-based simulations of driving scenarios have some desirable properties, especially for experimental research. Video simulations require less time and fewer resources to implement than naturalistic driving observations or higher fidelity driving simulations. Video simulations present drivers with specific real-world driving scenarios rather than the general, situation-devoid approach of survey questions. As such, including video simulations may increase the external validity of instruments. Video simulations allow for precise control of stimulus presentation that is not possible with observational naturalistic research (see Horswill & McKenna, 1999; Steinbakk et al., 2016). Video simulations also may mitigate common methods biases that can occur when multiple constructs are measured at the same time using monotonous survey questions with ratings scales (see Kock et al., 2021; Podsakoff et al., 2003).

In driving research, video simulations have been used successfully to study drivers' preferred following distances (Horswill et al., 2020), speed preferences in the presence of road construction (Steinbakk et al., 2017), memory for alerts during automated driving (Nees et al., 2016), and ability to identify hazards (Scialfa et al., 2011). In fact, a video-based hazard perception test has been used as a component of the licensing process in Queensland, Australia, because the test was a valid predictor of higher future crash risk (Horswill et al., 2015)

Video simulations also have been used to assess *speed propensity*, which is a trait that denotes drivers' tendency to prefer to drive slower or faster. Horswill and McKenna (1999) developed and validated a video speed test aimed at measuring speed propensity. In their test, participants viewed 15 brief videos of driving scenarios filmed from a driver's perspective. Their task was to indicate how much slower or faster they would normally drive in the scenario depicted in each video. Scores on the video speed test predicted previous involvement in an accident for which speed was a contributing factor. Scores also showed a significant negative correlation with age. This relationship would be expected of a valid measure of speed propensity, since evidence shows that older adults tend to speed less (Kim et al., 2022; Perez et al., 2021; Teo & Gan, 2016; Williams et al., 2006). The video speed test was later used in a number of experiments, including examinations of relationships between speed preferences and auditory feedback (Horswill & McKenna, 1999, Study 2), desire for control (Hammond & Horswill, 2001), and risk-taking (McKenna et al., 2006; McKenna & Horswill, 2006). The video speed test also has been used to evaluate anti-speeding advertisements (Carey & Sarma, 2016; Rossiter & Thornton, 2004).

The original video speed test (Horswill & McKenna, 1999) used driving footage filmed in England. Given its utility as a research tool, researchers later developed Irish (Carey & Sarma, 2016) and Australian (Thornton & Rossiter, 2003) versions of the test. Horswill et al (2022) recently updated and validated the video clips in the video speed test, as the original video speed test footage was from the early 1990s. In the updated version, clips were also embedded into a contemporary online data collection website (Qualtrics) for ease of use and access by other researchers. They called their updated instrument the University of Queensland (UQ) Video Speed Test (UQVST).

The UQVST (Horswill et al., 2022) consists of 16 8-second video clips of driving shown from a first person perspective. After viewing each clip, participants indicate on a slider the extent to which they would choose to drive faster or slower than the speed shown in the clip. The UQVST showed validity for predicting actual speeding while driving. Scores correlated with on-road speeding measures from instrumented vehicles with *r*s ranging from 0.23 to 0.27. UQVST scores also correlated ($r = 0.31$) with a brief, questionnaire-based measure of speeding propensity–the Speed Scale of the Driving Style Questionnaire (DSQ; French et al., 1993), and video speed test scores again correlated negatively with age ($r = -0.33$).

Since the UQVST was developed using Australian driving clips with vehicles driving on the left side of the roadway, its validity for assessing the speeding proclivities of U.S.-based drivers is not known. The current study attempted to provide evidence supporting the validity of a new video speed test (the U.S. Video Speed Test; USVST) with video clips recorded on U.S. roadways. Participant completed two administrations of the 10-item USVST along with the DSQ speed subscale (French et al., 1993), a Self-reported Accidents and Violations scale (SRAV; Nees et al., 2021), and the cautious driving style subscale of the Multidimensional Driving Style Inventory (MDSI; Taubman-Ben-Ari et al., 2004). A series of preregistered hypotheses were tested to evaluate the reliability and concurrent validity of the USVST. The hypotheses are shown in Table 1.

Table 1

List of Preregistered Hypotheses

Hypothesis number	Hypothesis and rationale
1	Internal consistency reliability of scores on the USVST will be > 0.70 at both times of administration. Horswill et al. (2022) observed internal consistency α = 0.90 on their 16-item video speed test, and the Spearman Brown prophecy formula predicts that an equivalent 10-item test would achieve α = 0.85.
2	Test-retest reliability of scores on the USVST will be > 0.70. Although Horswill et al. (2022) did not report test-retest reliability, we predict it will be acceptably high.
3	Scores on the USVST will correlate positively with scores on the Driving Style Questionnaire (speed subscale). Horswill et al. (2022) found a correlation of r = 0.31 between DSQ speed scores and scores on their video speed test.
4	Scores on the USVST will correlate negatively with age. Horswill et al. (2022) found a correlation of r = -0.33 between DSQ speed scores and scores on their video speed test.
5	Scores on the USVST will correlate negatively with scores on the cautious/patient driving style subscale of the MDSI. People who prefer faster speeds are expected to be less cautious in their driving style.
6	Scores on the USVST will correlate positively with scores on the SRAV. People who prefer faster speeds are expected to report greater numbers of accidents and violations, and police pullovers.

2. Methods

2.1 Preregistration

A time-stamped preregistration document (for an overview, see Simmons et al., 2021) was uploaded to the Open Science Framework before data collection began (see https://osf.io/kmygr/). Analyses that were not preregistered are reported as exploratory in section 3.3 below.

2.2 Sample Size Rationale

Hypotheses 1 and 2 relate to reliability, so we expected to have adequate power to detect (what we expected to be) high correlations. For Hypotheses 3 and 4, Horswill et al. (2022) reported correlations of $r = 0.31$ and $r = 0.33$ of the UQVST with DSQ speed scale scores and age, respectively. For Hypotheses 5 and 6, we were aware of no empirical basis by which to gauge expected correlations of MDSI subscales and the SRAV with USVST scores. For Hypotheses 3-6, a G*Power analysis indicated that correlations of $r = 0.30$ could be detected with power of 0.95 ($\alpha = 0.05$, one-tailed) using a Pearson correlation with a sample size of $N = 115$. A sample size of 400 was chosen to overshoot power of 0.80 to detect expected effects. This sample size also was within the practical limits of the funds available to pay participants.

2.3 Participants

Participants were recruited from the Prolific online recruitment platform (https://www.prolific.co/). The following screeners were applied in Prolific: (1) Participants were 18 years of age or older; (2) Participants answered "yes" to the question "Do you have a driving license?"; (3) Participants answered "yes" to the question "Do you use a car at least once a month?"; and (4) Participants were located within the United States. A brief study description was entered into the Prolific system in accordance with the suggestions and policies of Prolific. Prolific then used their own internal procedures to recruit participants (including via their own system-generated emails as well as postings on their website). The procedure took about 11 minutes for the median participant to complete. Data on participant sex and age were provided in the default Prolific participant demographics file at the end of the experiment.

The target sample size was 400. The final sample analyzed included N = 393 participants (M age = 37.77, mdn = 36, SD =12.42; n = 208 females, n = 182 males, sex data missing for n = 3 participants). The data file contains information for 500 participants. Per the preregistered exclusion criterion, 98 potential participants were excluded for opening the survey (which creates a case in the data file) but failing to finish the survey. Seven additional participants were excluded for failing the attention self-check. Participants were required to respond to the question “I read and answered all questions in this survey to the best of my ability” on a scale from 1 (strongly disagree) to 7 (strongly agree). Participants whose responses were <6 were excluded from all further analyses. Two additional participants completed the Qualtrics survey, but later revoked their consent in the Prolific system. Their data also were excluded from all analyses.

2.4 Materials

2.4.1 U.S. Video Speed Test

The U.S. Video Speed Test was modeled after the UQ Video Speed Test (UQVST; Horswill et al., 2022) with some adaptations. The UQVST used 16 8-second clips of driving scenes on Australian roadways, and participants used a slider to rate (in kph) how much faster or slower they would normally drive in the situation depicted in the video. The internal consistency reliability of the UQ test was reported as $\alpha = 0.90$. Since a shorter test is desirable for efficiency, we applied the Spearman Brown prophecy formula (e.g., Kelley, 1925) to the $\alpha = 0.90$ estimate to determine that reliability should remain acceptable (predicted $\alpha = 0.85$) if the test was reduced to 10 items.

The 10 video clips used in USVST test were each 8 seconds in duration and were filmed using a dashcam during drives near Easton, PA and surrounding areas. Clips showed driving scenes around residential and partially rural areas, and the vehicle was traveling at approximately the posted speed limit (ranging from approximately 25 to 45 mph) in all clips. The clips were intended to be similar to the types of clips used in the UQ test while allowing for unique characteristics of US streets and roadways to be depicted. No attempt was made to match the videos exactly to the scenes depicted in the UQ videos. A screen shot from a trial is shown in Figure 1. The order of presentation of the video clips was randomized for each participant. During analyses, scores on the USVST were transformed by adding 50 to each score (to remove negative signs for selections indicating a slower desired speed) such that the range of possible scores was 0 to 100.

Figure 1. Screenshot from a trial on the USVST.

2.4.2 Driving Style Questionnaire (DSQ) speed scale

The DSQ speed scale (French et al., 1993) consists of three items. Participants responded to three questions about speeding behavior on a 7-point scale ranging from 1 (*never or very infrequently*) to 7 (*very frequently or always*): (1) How often do you exceed the speed limit during a freeway or interstate journey?; (2) How often do you drive fast?; and (3) How often do you exceed the speed limit in areas with heavy traffic? The speed scale has been used regularly in the driving literature and shows validity for predicting speeding propensity (see Hill et al., 2023).

2.4.3 Self-reported Violations and Accidents (SRAV) scale

The SRAV scale (Nees et al., 2021) consists of three items. Participants responded to three questions about driving history with a number: (1) In the last three years, how many vehicle accidents have you been involved in as a driver in which you were fully or partially at fault?; (2) In the last three years, how many times have you been pulled over (i.e., stopped) by a police officer for committing moving violations? Moving violations include speeding, reckless driving, driving while intoxicated (DWI), driving under the influence (DUI), illegal lane changes, and failure to stop at a red light or traffic sign; and (3) In the last three years, how many tickets and/or citations have you received for moving violations? Moving violations include speeding, reckless driving, driving while intoxicated (DWI), driving under the influence (DUI), illegal lane changes, and failure to stop at a red light or traffic sign. The variable used in analyses was the sum of incidents across all responses after reliability examination was complete (see Results).

2.4.4 Multidimensional Driving Style Inventory (MDSI) cautious driving style subscale

The MDSI cautious driving style subscale (Taubman-Ben-Ari et al., 2004) consists of 10 questions. Questions were prefaced with the instructions “Please rate the extent to which this statement applies to your thoughts, feelings, and/or behavior during driving.” Participants responded on a 6-point scale ranging from 1 (*not at all*) to 6 (*very much)*. The questions were: (1) At an intersection where I have to give right-of-way to oncoming traffic, I wait patiently for cross-traffic to pass; (2) I base my driving behavior on the motto “better safe than sorry”; (3) When a traffic light turns green and the car in front of me doesn’t get going, I just wait for a while until it moves; (4) I plan long journeys in advance; (5) I tend to drive cautiously; (6) I drive cautiously; (7) I am always ready to react to unexpected maneuvers by other drivers; (8) I get distracted or preoccupied, realize the vehicle ahead has slowed down, and suddenly have to slam on the brakes to avoid a collision (reverse scored); (9) I get a thrill out of breaking the law (reverse scored); and (10) On a clear freeway, I usually drive at or a little below the speed limit.

Note that this list of questions combines the patient and careful driving styles as described in the original MDSI validation (Taubman-Ben-Ari et al., 2004), because some (not all) of these items have loaded on a single “cautious” driving style factor in previous research in our lab (Nees et al., 2021; Nees & Tian, 2022). Further, the item “On a clear freeway, I usually drive at or a little below the speed limit” contributed to a different factor in the original validation, but it has loaded on the cautious driving factor in our previous research. As such, we included this item on the cautious/patient scale here.

2.5 Procedure

Figure 2 presents an overview of the research procedure. Participants gave informed consent to volunteer for the research. Participants then experienced a pre-driving vignette photo sequence that showed a sequence of six photos (opening the car door, buckling the seatbelt, adjusting the mirrors, starting the ignition, acknowledging the center console infotainment screen start-up message, and placing hands on the wheel). In a separate (but embedded) experiment with a null finding, participants were randomly assigned to receive either an experimental or control console start-up safety message during this sequence. Details of the null finding experiment are reported elsewhere (Nees & Geiss, 2025) and will not be discussed further here given the null outcome.

Next, participants took the USVST for the first time. Then, participants completed the DSQ speed scale (French, 1993), the cautious/patient subscale of the MDSI (Taubman-Ben-Ari et al., 2004), and the SRAV (Nees et al., 2021). The order of presentation of scales and the order of questions within scales were randomized. Next, participants took the USVST for a second time. Finally, participants responded to a manipulation check question and an optional open-ended question for feedback about the study, then participants viewed a short debriefing paragraph.

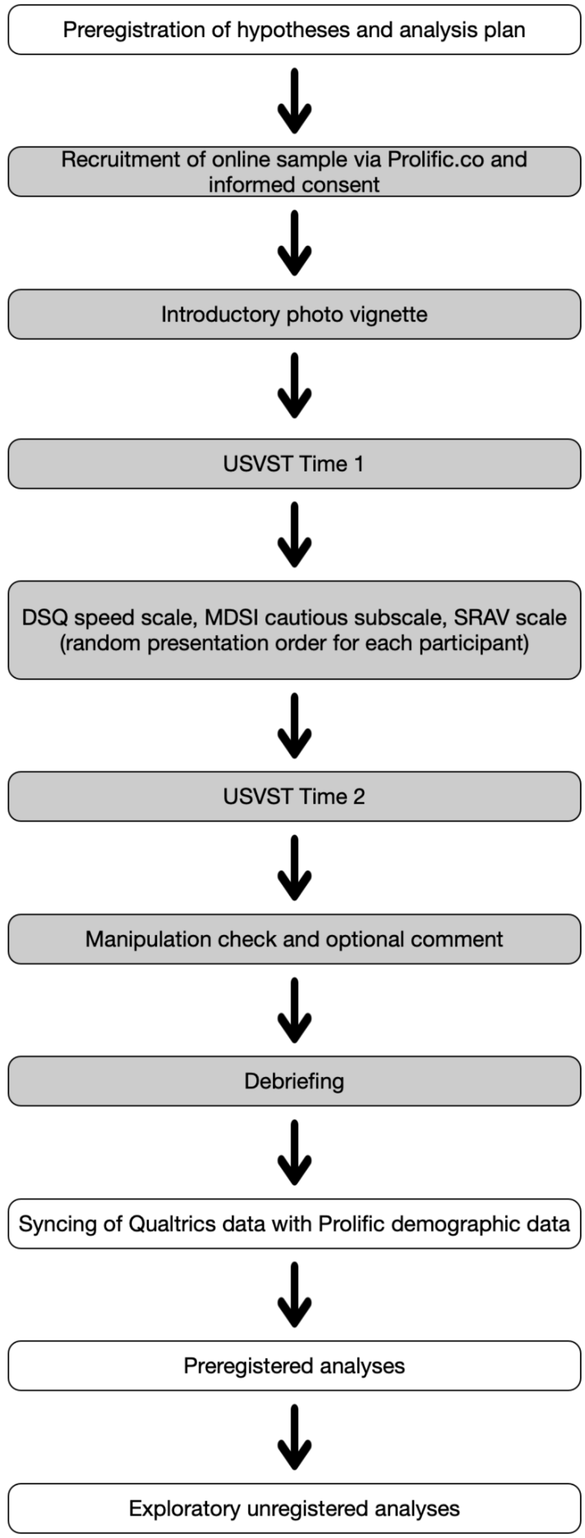

Figure 2. Research procedure overview. *Note:* Shaded boxes indicate procedures involving participants; unshaded boxes indicate procedures involving only the researchers

3.0 Results

3.1 Reliability Analyses

3.1.1 Reliability of the USVST

Skewness of responses to individual USVST trials ranged from 0.12 to 1.54 (*M* = 1.07, *SD* = 0.33). Internal consistency reliability was α = .93 for the first administration of the USVST and α = 0.95 for the second administration of the USVST. Test-retest reliability of the USVST (the correlation of the average score across all 10 trials at time 1 and time 2 administrations) was *r*(393) = 0.90, Spearman's ρ = 0.86.

3.1.2 Reliability of DSQ, MDSI, and SRAV scales

Skewness of responses to individual DSQ questions ranged from -0.10 to 0.30 (*M* = 0.05, *SD* = 0.21). Internal consistency reliability of the DSQ speed scale was α = 0.82. The variable used in further analyses was the mean of the DSQ scale ratings. Skewness of responses to individual MDSI questions ranged from -2.61 to 0.56 (*M* = -0.98, *SD* = 0.75). Internal consistency reliability of the cautious/patient subscale of the MDSI was α = 0.70. The variable used in further analyses was the mean of the MDSI scale ratings. Skewness of responses to individual SRAV questions ranged from 3.85 to 13.29 (*M* = 7.92, *SD* = 4.85). Internal reliability of the SRAV was α = 0.48. The lower reliability for the SRAV was due to the small number of items and especially the extreme skew of the SRAV data. Most participants reported 0 accidents, violations, or pull-overs. Skew decreases internal consistency of scales (Greer et al., 2006). The variable used in further analyses was the sum of the SRAV responses. In addition, given the low reliability of the SRAV items, an exploratory logistic regression was performed (see section 3.3) to supplement preregistered correlational analyses.

3.2 Concurrent Validity of USVST Scores with Scales and Demographic Variables

The grand mean of scores on the USVST (averaged across both administrations) was correlated with age, mean DSQ speed scale scores, mean MDSI cautious scale scores, and the sum of the SRAV responses. Correlations are shown in Table 2. In accordance with the preregistered analysis plan, both Pearson's *r* and Spearman's ρ are reported. Although *r* and ρ largely converge across analyses, ρ should be preferred in interpreting correlations with the SRAV, in particular, due to the extreme skew in the SRAV distribution.

Table 2

Correlations (Pearson's r and Spearman's ρ) of the USVST Scores with Other Measured Variables

	Age	DSQ Speed	MDSI Cautious	SRAV[a]
Age				
r	–			
ρ	–			
DSQ Speed				
r	-0.16*	–		
ρ	-0.17**	–		
MDSI Cautious				
r	0.23**	-0.51**	–	
ρ	0.22**	-0.50**	–	
SRAV[a]				
r	0.01	0.12*	-0.16*	–
ρ	-0.10*	0.17**	-0.20**	–
USVST				
r	**-0.26****	**0.18****	**-0.13***	**0.27****
ρ	**-0.33****	**0.27****	**-0.18****	**0.15***

Notes: The correlations representing concurrent validity of the USVST are in the bottom row in bold. * = p <0 .05; ** = p < 0.001
[a] Due to non-normality, SRAV correlations should be interpreted using the nonparametric Spearman's ρ. For other variables skewness statistics and visual inspections suggested a reasonable approximation of a normal distribution.

3.3 Unregistered Exploratory Analyses

3.3.1 Logistic Regression Using USVST Scores to Predict SRAV Sums and Accidents

Given the low reliability of the SRAV items due to most participants scoring zero, the SRAV variable was dichotomized into participants who reported any accidents, violations or police pullovers versus those who did not. A logistic regression was performed to examine the ability of USVST scores to predict this new dichotomous variable. The model was significant, X^2 (1) = 9.34, p = 0.002; USVST scores were a significant predictor of having had an accident, violation, or pullover, b = .045 (SE = .02), p = 0 .002. The model correctly classified 76.3% of cases. For each 1 mph increase in the USVST score, the odds of having had an accident, violation, or pullover increased about 5% (*odds ratio* = 1.05).

Since accidents represent perhaps the most crucial safety consequence of speeding, an additional analysis examined only the accidents SRAV question (dichotomized into those who reported an accident within the last 3 years and those who did not) using the same logistic regression approach. The model was significant, X^2 (1) = 4.07, p =0.04; USVST scores were a significant predictor of having had an accident, b = 0.039 (SE = 0.02), p = 0.04. The model correctly classified 89.6% of cases. For each 1 mph increase in the USVST score, the odds of having had an accident increased about 4% (*odds ratio* = 1.04).

3.3.2 Exploratory Comparison of Male versus Female USVST Scores

Since males tend to have higher speeding propensity than females (Kim et al., 2022; Perez et al., 2021; Teo & Gan, 2016), an exploratory independent samples t-test comparing USVST scores for female versus male participants was performed. Males (n = 182, M = 4.96 mph higher preference than videos, SD = 8.30) preferred significantly higher speeds than females (n = 208, M = 2.36 mph higher preference than videos, SD = 6.89), $t(388) = -3.38$, $p < 0.001$, d = 0.34.

3.3.3 Exploratory Item-level Analyses

To further understand how participants responded to individual video stimuli items, we conducted descriptive analyses to examine the mean, standard deviation, minimum, and maximum slider response in the original raw scale units for each video at each time of administration. Those results are shown in Table 3. The mean preferred speed was always higher than the speed shown in the video, ranging from 0.25 mph faster to 10.28 mph faster. Participants showed variability in their responses and used a wide range of the response scale for all videos.

Figure 3 shows the correlations of individual USVST video clips with the USVST grand mean as well as scores on all four criterion variables (Age, DSQ Speed Scale scores, MDSI scores, and SRAV scores) across both administrations of the USVST. As would be expected with extremely high internal consistency reliability (described above), all video clips showed reasonably comparable relationships with all outcomes as well as the grand mean of the USVST.

Table 3

Descriptive Statistics (Mean, Standard Deviation, Minimum, and Maximum) for Responses to Each Video Stimulus

Video	Time	*M*	*SD*	Min	Max
1	1	2.58	10.91	-40	45
2	1	0.25	8.96	-37	42
3	1	5.51	9.64	-20	42
4	1	6.41	11.67	-25	50
5	1	1.30	8.71	-38	37
6	1	4.31	9.37	-30	50
7	1	10.28	9.11	-10	50
8	1	2.03	10.00	-25	46
9	1	1.01	9.47	-37	32
10	1	3.65	10.81	-23	50
1	2	2.36	10.21	-23	50
2	2	0.54	9.23	-41	41
3	2	3.95	9.55	-28	42
4	2	5.51	11.88	-31	50
5	2	1.70	9.29	-42	50
6	2	4.78	9.15	-40	48
7	2	8.50	8.94	-31	50
8	2	2.55	9.45	-28	42
9	2	1.94	9.06	-42	46
10	2	2.51	10.31	-42	50

Notes: *N* = 393; the means show the average amount faster (in mph) participants would prefer to drive as compared to the speed shown in the video.

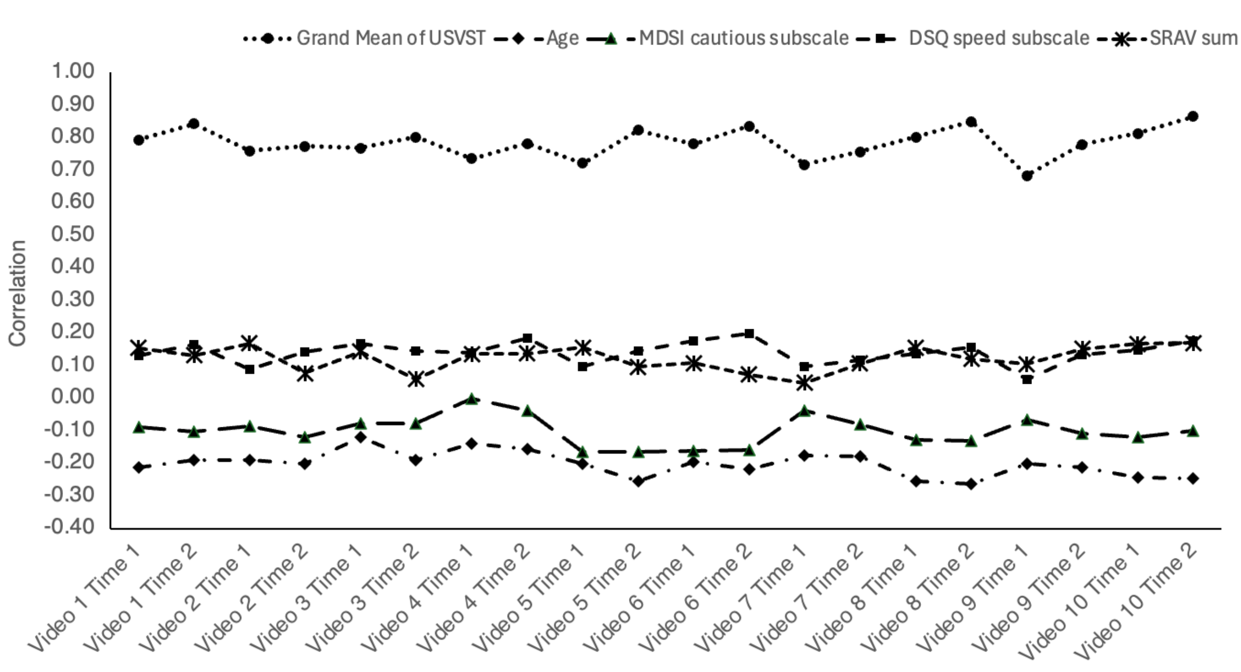

Figure 3. Correlations of each video stimulus with the grand mean USVST score as well as all criterion variables. *Notes.* All correlations shown Pearson's *r* except the SRAV correlations, which used Spearman's ρ.

4.0 Discussion

4.1 Reliability and Validity of the USVST

All six preregistered hypotheses were supported in the data, which provides initial evidence to suggest that the USVST demonstrates reasonably sound psychometric properties. The USVST demonstrated high reliability (>.90) across measures of two different types of reliability (internal consistency and test-retest), with the potential limitation that the test-retest procedures were given close together in time (see Figure 2). The USVST also demonstrated the predicted pattern of correlations to support concurrent validity across all other variables examined.

We were able to mirror two of the findings of Horswill et al (2022) regarding their video speed test. Specifically, we found that age was negatively correlated with USVST scores, while DSQ speed scale scores were positively correlated with USVST scores. The magnitude of these relationships was comparable to the magnitude of the same relationships for the UQVST. We further showed that USVST scores had a negative relationship with the cautious subscale of the MDSI. Despite low reliability in the SRAV scale, we demonstrated that USVST scores correlated positively with the number of accidents, violations, or pullovers reported by drivers. A follow-up logistic regression confirmed that USVST scores were significant predictors of reporting involvement in an accident, violation, or pullover. Finally, an exploratory analysis confirmed that male drivers showed significantly higher USVST scores than female drivers.

This study adds to the growing literature demonstrating the potential utility of video speed tests to measure speeding propensity in driving research (e.g., Carey & Sarma, 2016; Horswill et al., 2022; Horswill & McKenna, 1999; McKenna et al., 2006; McKenna & Horswill, 2006; Steinbakk et al., 2016; Thornton & Rossiter, 2003). Possible applications of the USVST include quantifying the propensity to speed for individuals (e.g., for idiographic approaches) in U.S.-based driving research. Further, since there is interest in developing interventions to mitigate speeding behaviors (e.g., Richard et al., 2013), the USVST might also be used as a dependent variable in experimental investigations of speed reductions interventions.

Video simulated tests can offer possible advantages over traditional ratings scales methods for measuring speed propensity in online research. The use of real driving footage may increase external validity (as compared to text ratings scales) while still allowing for precise control of stimuli (as compared to naturalistic observation of driving behaviors) (see Horswill & McKenna, 1999; Steinbakk et al., 2016). In research that measures multiple constructs via ratings scales, video simulations can introduce methodological separation, meaning participants experience different stimulus and response formats than traditional Likert scales. Such novelty might decrease common methods biases (see Kock et al., 2021; Podsakoff et al., 2003) in online research as compared to using monotonous survey questions alone and might increase participant engagement.

4.2 Limitations

Due to equipment and resource limitations, we were not able to validate the USVST against speeding data from instrumented vehicles, which was a major strength of the approach used by Horswill et al. (2022). Still, for the measures that were directly comparable, our findings regarding validity for the USVST mirror their findings for validity for the UQVST. Further, although the relationships observed here were typical for driving research, the absolute magnitude of the observed relationships was modest to moderate, which means a good deal of the variability in concurrent measures is not accounted for by knowing USVST scores. The usefulness of questionnaires, self-reported metrics, and even simulations as proxy measures of actual driving safety has been debated (af Wåhlberg, 2009; af Wåhlberg et al., 2015) as well as defended (de Winter et al., 2015; de Winter & Dodou, 2012; Taubman – Ben-Ari et al., 2016). As the evaluation of validity is an on-going process, future research might be able to more directly link performance on the USVST to actual safe or unsafe driving behaviors in naturalistic settings. As Horswill et al. noted, it would not be appropriate to use the

USVST as a licensing test, as examinees would have a strong motivation to make socially desirable responses during a high stakes test.

Another potential limitation could be the narrow range of scenarios presented in the 10 video stimuli, as all were filmed in the same area. Yet the online sample recruited participants located anywhere in the United States, and we still found the expected relationships between USVST scores and other measures of speed propensity. We were initially struck by the lack of variety in the video stimuli used by Horswill et al. (2022) for their test. The UQVST does not use any video stimuli showing freeway driving, for example, so we did not show freeway driving in the USVST. Based on the collective evidence from research on both tests, however, we believe it is possible that the specific content of the video may not be especially important so long as floor and ceiling effects are avoided. That is, if the videos depict driving scenes that can elicit variability in responses (as ours did, see Table 3), then the absolute mean speed preferences and scenarios depicted may not be especially important. Although future research should examine tests with a wider variety of driving scenarios, we suspect that most video stimuli would elicit higher speed preferences from drivers with higher speed propensity, regardless of the driving context or speed depicted in the video (within reason).

Finally, we point to a theoretical ambiguity that might be resolved in future research. Speeding propensity has been described as a trait (e.g., Horswill et al., 2022), which indicates that it is an enduring and consistent individual disposition. Yet researchers also have used video speed test tools to study more fleeting situational factors that might affect speed preferences (Horswill & McKenna, 1999, Experiment 2;

Nees & Geiss, 2025). Indeed, research on motivations for speeding has indicated that both dispositional and situational factors contribute to speeding behaviors (Richard et al., 2013). Although it is reasonable to expect that speeding propensity could function as both a trait and a state, future theoretical work elaborating on this distinction could perhaps be worthwhile for understanding the appropriate types and levels of interventions to reduce speeding.

4.3 Conclusions

A study showed that a new video speed test using US driving scenes showed good reliability and reasonable concurrent validity with related constructs in accordance with all preregistered hypotheses. Limitations of this study included the lack of validation against a naturalistic driving criterion, and future research might further clarify whether speed propensity is a state, trait, or both. The USVST may be a useful research tool for measuring speed propensity in samples of US drivers, and the tool is freely available for use by other researchers. This study contributed to a growing literature showing the validity of video simulation tests for understanding driving behaviors.

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