

Reliability Testing of the Star Rating for Schools (SR4S)

Mobile Application: Results from a pilot study

Ashley Hunt^{1,2}, MPH (c); Amira Roess, PhD, MPH¹; Morag MacKay²

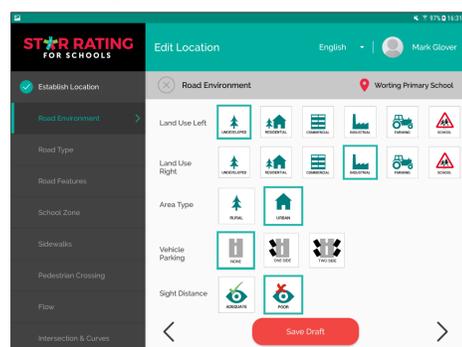
¹George Washington University; ²Safe Kids Worldwide



Public Health

BACKGROUND

- Globally, approximately 3500 individuals are killed due to a road traffic injury each day- nearly 1.3 million deaths each year.
- School zones are locations where there may be high concentrations of children at certain hours of the day, thereby increasing their exposure to road and pedestrian injuries.
- Young children do not possess the cognitive and developmental abilities to assess risk and make safe pedestrian behavior choices therefore interventions must address the built environment of school zones
- Road features that influence pedestrian safety include: lack of marked pedestrian crossing locations, vehicle parking availability along the side of the road, lack of crossing guard during peak travel hours, commercial land use, vehicle speed, and high traffic density.
- The International Road Assessment Programme (iRAP) has recently developed the Star Rating for Schools (SR4S) mobile application (an app), to measure and communicate road and pedestrian safety risks that children and adolescents are exposed to on their journey to and from school by assessing the built environment of various road segments within a school zone.



OBJECTIVES

iRAP has brought together several global organizations to pilot test the SR4S mobile application tool. This project, in collaboration with Safe Kids Worldwide (SKW), a U.S.-based NGO focusing on the prevention of unintentional child injury examined whether the tool is a reliable and user-friendly method to assess these risks. The programmatic research questions were:

- Does the SR4S app produce consistent Star Ratings for the same road segments across multiple users
- Does training users of the app increase the reliability of the SR4S assessments of road and pedestrian safety in local school zones?
- What lessons learned from pilot testing can be applied to global use of the SR4S app?

METHODS

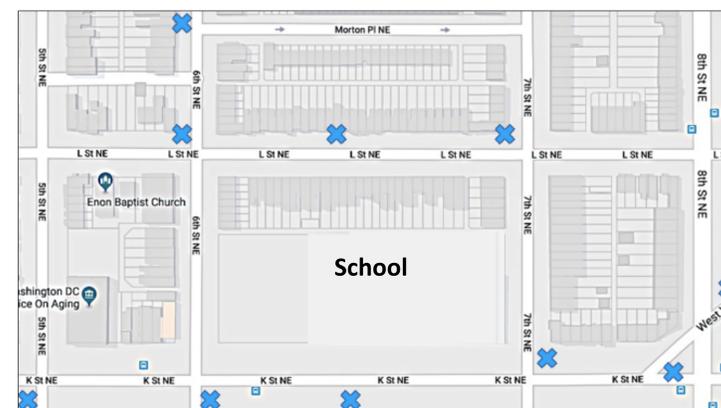
Participants: 9 child injury experts (3 Safe Kids Worldwide Staff; 6 local coalition coordinators representing 6 U.S. states)

Data Collection: Two-day training workshop in Washington, D.C. where participants were trained on how to use the SR4S app and provided practice using the app in a local elementary school. 10 distinct road segments were assessed (8 intersections; 2 mid-block locations). At each assessment point, 41 road features were assessed representing 9 categories

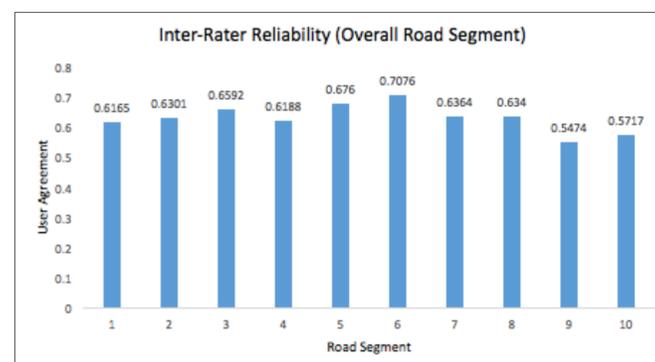
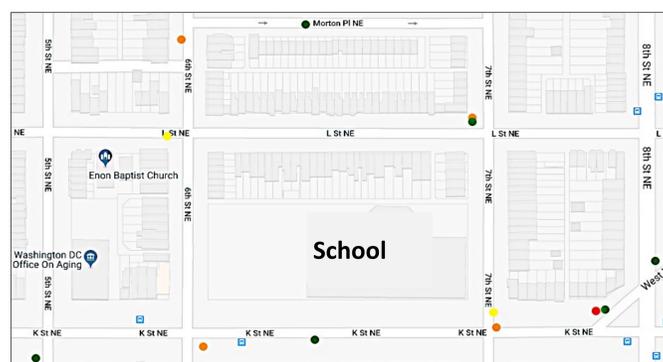
Data Analysis: 8 out of 9 participants' data was used for the analysis. Out of the 41 road features assessed at each road segment, 29 features were kept for analysis. This was due to technical issues with the SR4S app and the expected high variation in participant responses for continuous variables (i.e. observed vehicle speed)

Inter-rater reliability (IRR) and test-retest reliability (TRR) were assessed using STATA/IC 15.1 to compare IRR:

- For the overall assessment for each road segment
- By road feature
- Pre/Post Training Session Comparison



RESULTS



Road features with poor inter-rater agreement (<40%)

- School Zone Warning and Crossing Guard Presence
- Intersection Quality
- Pedestrian Crossing Quality
- Intersection Features

Road features with good inter-rater agreement (100%)

- Area Type
- Land Use (Right and Left)
- Street Lighting
- Pedestrian Crossing Features

CONCLUSIONS

- Inter-rater reliability (IRR) ranged from moderate to high (based on Landis & Koch (1977)) for the 10 road segments (Percent Agreement: 64.29%-76.32%; Fleiss' Kappa: 0.547-0.708), showing good agreement between SR4S users.
- Test-retest reliability (TRR) ranged from moderate to high, showing consistency in SR4S app use among raters.
- SR4S user agreement (IRR) improved post-training session; therefore training SR4S app users may be beneficial to improving reliability.
- SR4S training should include clear criteria for road features with poor user agreement including those asking for quality judgments (i.e. intersection quality), could include multiple answers, and school zone markings.
- Receiving accurate Star Ratings may be difficult in low and middle income countries (LMICs) where internet access is more scarce.

LIMITATIONS

- This pilot test used a small sample size (N=9), thus greatly reducing the generalizability of these results to the greater population.
- Technological difficulties significantly limited participants' ability to fully complete the assessments at each road segment and therefore impacted the amount of data collected. At the time of data collection, participants did not have access to the most up-to-date version of the SR4S app, and were using a version that had several major technical issues. Because of these issues, only 5/9 participants were able to fully complete data collection for all segments.
- The assessments at the elementary school in Washington, D.C. were not completed at peak hours before and after school. Therefore, some of the responses at each road segment may not be representative of peak hour pedestrian and vehicle traffic, thus resulting in inaccurate Star Ratings.

CONTACT INFORMATION

For more information, please contact Ashley Hunt at ahunt@safekids.org



THE GEORGE WASHINGTON UNIVERSITY

WASHINGTON, DC