Clinical Utility of the Fitness-to-Drive Screening Measure© for identifying at-risk older drivers

Sherrilene Classen PhD, MPH, OTR/L, FAOTA, FGSA
Sandra Winter, PhD, OTR/L
Shabnam Medhizadah, MRS, BSc
Luther King, Dr. OT., CDRS, CDI, OTR/L
Department of Occupational Therapy
University of Florida
04 November 2017
Acknowledgement

**Academic Institutions**
University of Florida, USA
University of Western Ontario, Canada
Lakehead University, Thunder bay, ON, Canada

**Mentors**
Craig Velozo, PhD, FAOTA
William C. Mann, PhD

**Funders**
U.S. Government: NIH; CDC; US DOT
State: FL DOT

**Research Labs**
I-MAP, University of Florida, USA
i-Mobile Research Lab, Western University, ON, Canada
Centre for Safe Driving, Lakehead University, Thunder Bay, ON, Canada
Sunnybrook Rehab, Toronto, ON

**Collaborators**
U.S.
Canada
Japan
Korea

**Technical Support**
Jason Rogers
Steve Beaulac

**Students**
Post-Docs
Doctoral
MSc(OT)
Research Assistants
<table>
<thead>
<tr>
<th>Outline</th>
<th>Duration</th>
</tr>
</thead>
<tbody>
<tr>
<td>• Welcome and Introduction</td>
<td>5 min</td>
</tr>
<tr>
<td>• Phase 1 - Overview of FTDS</td>
<td>10 min</td>
</tr>
<tr>
<td>• Phase 2 – Item development</td>
<td>10 min</td>
</tr>
<tr>
<td>• Phase 3 - Psychometrics of the FTDS</td>
<td>10 min</td>
</tr>
<tr>
<td>• Phase 4/5 - Beta-testing/web based</td>
<td>10 min</td>
</tr>
<tr>
<td>• Phase 6 - Canadian FTDS</td>
<td>15 min</td>
</tr>
<tr>
<td>- Canadian user patterns</td>
<td></td>
</tr>
<tr>
<td>• Phase 7 - 32 item FTDS</td>
<td>7 min</td>
</tr>
<tr>
<td>• Phase 8-9</td>
<td>3 min</td>
</tr>
<tr>
<td>• Case Studies</td>
<td>25 min</td>
</tr>
<tr>
<td>• Wrap Up</td>
<td>5 min</td>
</tr>
</tbody>
</table>
Older Drivers in the U.S. & Canada

- About 36M older drivers (>65 yrs.) in U.S. → increase to 76M by 2030¹
- About 3M drivers (of 22M) in Canada > 65 ² → double in the 10 years
- North-America 1 of 4 people will be > 65
- Leading cause of accidental deaths for persons 65-75 years old is motor vehicle crashes³
- Individuals > 75 yrs. have a 3.5 times higher crash rate compared to 35 to 44 year old ⁴
- Want to continue to drive

1. NHTSA, 2015
4. National Blueprint for Injury Prevention in Older Drivers
• Older drivers are overall safe
• A high risk group for crash related injuries and deaths:
  – Age related declines
  – Chronic conditions
  – Comorbidities
  – Frailty
  – Medications
• Living longer and driving longer
• Capacity
  – 350 CDRS in USA $\rightarrow$ 1: 102,857
  – 25 CDRS Canada $\rightarrow$ 1:120,000
• Access
• On-road assessment
  – Benefits
  – Limitations
• Overcome these issues......
Fitness-to-Drive Screening Measure
http://fitnesstodrive.phhp.ufl.edu

- Developed a paper and pen version
- Web-based
- To identify at-risk older drivers
FTDS Measure

http://fitnesstodrive.phhp.ufl.edu/us/

Four sections

A 1= Demographics rater
A 2= Demographics driver
B= Driving history and habits
C= 54 Driving behaviors
FTDS Measure

http://fitnesstodrive.phhp.ufl.edu/us/

Four sections

A 1= Demographics rater
A 2= Demographics driver
B= Driving history and habits
C= 54 Driving behaviors

54 Items

• Observable behaviors
• Progress in the level of difficulty
• 4-point adjectival scale
• Very difficult, somewhat, little, no difficulty
FTDS Results

- Key Form
- Cut-points
  - >72.53
  - 55.69-72.53
  - < 55.69
- Classification
  - Accomplished driver
  - Routine Driver
  - At-risk Driver

Recommendations
- E.g., driving challenges experienced

Resources
- E.g., Listing of CDRSs
Easiest

No Difficulty

A little difficulty

Hardest

Rating Scale—0-100

Person Measure: 74.28 out of 100

Accomplished Driver

Overall rating: Based on your rating, this driver is classified within the "Accomplished Driver" Group. The driver is able to perform highly challenging driving skills. However, difficulty may be experienced with some items, e.g.: 1. Drive in a thunderstorm with heavy rains and wind? 2. Drive when there is glare or the sun is in his or her eyes? 3. Drive at night on a dark road with faded or absent lane lines?

Specific Recommendations: It may be helpful to avoid or limit driving situations that are challenging. Based on your ratings, we do not think that a comprehensive driving evaluation is critical at this time. We do recommend repeating his self-screening annually, or when the driver experiences changes in health or functional status.

General Recommendations: Additionally, The American Geriatrics Society recommends a physical and eye exam annually, or earlier, when needed. We recommend taking a class for mature drivers such as those offered by AAA, AARP or a local driving school.

Click on the links below:

Resources:
- Certified Driving Rehabilitation Specialists/Occupational Therapists providing the Comprehensive Driving Evaluations
  - American Occupational Therapy Association
    http://www.aota.org/Older-Driver/Specialists.aspx
- AAA Resources for Mature Drivers
  - American Automobile Association (AAA)
    http://www.seniordrivers.org/home/
- AARP Mature Driver Courses
  - AARP
    http://www.aarpdriversafety.org/

Drive with paper map

Drive in heavy rain

Obey traffic lights

Look L & R before exiting

24 Use paper map
25 Obey traffic signals
26 Look L & R before exiting
27 Drive with paper map
28 Drive in heavy rain
29 Drive at night
30 Pass larger vehicle no passing in
31 Drive when fog
32 Drive when upset
33 Pass no passing in
34 Exit an expressway
35 Turn L across no traf light
36 Drive in dense traffic
37 Drive with conversation
38 Control car avoid collisions
39 Drive at night
40 Drive a different car
41 Drive at night
42 Drive in heavy rain
43 Drive when fog
44 Drive at night
45 Drive when fog
46 Avoid dangerous situations
47 Back out of parking
48 Drive heavy rain
49 Drive heavy rain
50 Control car wet road
51 Drive heavy rain
52 Control car wet road
53 Drive heavy rain
54 Read road signs ad to react
55 Back out of parking
56 Maintain in when turn
57 Change his moderate traffic
58 Change onto a Way
59 Stay with in without markings
60 Keep distance
61 Drive in construction zone
62 Keep up with flow
63 Control car when going down
64 Control car when going down
65 Stop sign
66 Control car when going down
67 Control car when going down
68 Check mirror change L
69 Share road
70 Drive on highway 2+ lanes
71 Stay in the proper L
72 Keep distance when change L
73 Drive cautiously
74 Drive cautiously
75 Change onto a Way
76 Change onto a Way
77 Change onto a Way
78 Change onto a Way
79 Change onto a Way
80 Change onto a Way
81 Change onto a Way
82 Change onto a Way
83 Change onto a Way
84 Change onto a Way
85 Change onto a Way
86 Change onto a Way
87 Change onto a Way
88 Change onto a Way
89 Change onto a Way
90 Change onto a Way
91 Change onto a Way
92 Change onto a Way
93 Change onto a Way
94 Change onto a Way
95 Change onto a Way
96 Change onto a Way
97 Change onto a Way
98 Change onto a Way
99 Change onto a Way
100 Change onto a Way
Example of Web-Based Keyform and Recommendations

Person Measure: 50.91 out of 100
Basic Driver who has difficulty with one or more critical driving error(s)

Overall rating: Based on your rating, the driver is classified within the "Basic Driver" Group with one or more critical driving error(s). Although the driver can perform some basic driving skills, the driver requires immediate attention to address the safety concerns and critical driving errors. The driving skills causing serious concerns are:

1. Stay in the proper lane?
2. Change lanes in moderate traffic?
3. Maintain lane when turning (not cut corner or go wide)?

Specific Recommendations: We recommend the driver to see a doctor as soon as possible, and not drive until he/she undergoes a comprehensive driving evaluation conducted by a Certified Driving Rehabilitation Specialist. Information on the use and access to alternative transportation (other than the personal automobile) may be available from the local Area Agency on Aging.

General Recommendations: Based on guidelines of The American Geriatrics Society, we recommend an eye exam annually, or earlier if there are changes in health or vision.

Click on the links below:

Resources:
Certified Driving Rehabilitation Specialists/ Occupational Therapists providing the Comprehensive Driving Evaluations
- American Occupational Therapy Association
  [http://www.aota.org/Older-Driver/Specialists.aspx]

AAA Resources for Mature Drivers
- American Automobile Association (AAA)
  [http://www.seniordrivers.org/home/]

AARP Mature Driver Courses
- AARP
  [http://www.aarpdriversafety.org/]

<table>
<thead>
<tr>
<th>Rating Scale</th>
<th>Item Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>0 10 20 30</td>
<td>1 2 3 4</td>
</tr>
<tr>
<td>1 2 3 4</td>
<td>24 Use paper map</td>
</tr>
<tr>
<td>1 2 3 4</td>
<td>51 Drive heavy rain/wind</td>
</tr>
<tr>
<td>1 2 3 4</td>
<td>49 Drive glare</td>
</tr>
<tr>
<td>1 2 3 4</td>
<td>48 Drive night absent lane lines</td>
</tr>
<tr>
<td>1 2 3 4</td>
<td>38 Drive complex situation</td>
</tr>
<tr>
<td>1 2 3 4</td>
<td>44 Drive unfamiliar area</td>
</tr>
<tr>
<td>1 2 3 4</td>
<td>45 Drive at night</td>
</tr>
<tr>
<td>1 2 3 4</td>
<td>47 Drive when fog</td>
</tr>
<tr>
<td>1 2 3 4</td>
<td>26 Parallel park</td>
</tr>
<tr>
<td>1 2 3 4</td>
<td>14 Pass larger vehicle no passing</td>
</tr>
<tr>
<td>1 2 3 4</td>
<td>42 Drive when upset</td>
</tr>
<tr>
<td>1 2 3 4</td>
<td>50 Turn L across fn no traf light</td>
</tr>
<tr>
<td>1 2 3 4</td>
<td>43 Stay focused</td>
</tr>
<tr>
<td>1 2 3 4</td>
<td>41 Alter driving health changes</td>
</tr>
<tr>
<td>1 2 3 4</td>
<td>40 Drive a different car</td>
</tr>
<tr>
<td>1 2 3 4</td>
<td>25 Enter traf with left turn</td>
</tr>
<tr>
<td>1 2 3 4</td>
<td>46 Avoid dangerous situations</td>
</tr>
<tr>
<td>1 2 3 4</td>
<td>33 Pass car no passing in</td>
</tr>
<tr>
<td>1 2 3 4</td>
<td>27 Exit an expressway</td>
</tr>
<tr>
<td>1 2 3 4</td>
<td>32 Drive in dense traffic</td>
</tr>
<tr>
<td>1 2 3 4</td>
<td>7 Drive with conversation</td>
</tr>
<tr>
<td>1 2 3 4</td>
<td>39 Control car avoid collisions</td>
</tr>
<tr>
<td>1 2 3 4</td>
<td>8 Drive with assistance</td>
</tr>
<tr>
<td>1 2 3 4</td>
<td>22 Drive with tractor</td>
</tr>
<tr>
<td>1 2 3 4</td>
<td>21 Check blind spots of change</td>
</tr>
<tr>
<td>1 2 3 4</td>
<td>52 Control car wet road</td>
</tr>
<tr>
<td>1 2 3 4</td>
<td>5 Read road signs ad to react</td>
</tr>
<tr>
<td>1 2 3 4</td>
<td>17 Back out of parking</td>
</tr>
<tr>
<td>1 2 3 4</td>
<td>16 Maintain in when turn</td>
</tr>
<tr>
<td>1 2 3 4</td>
<td>13 Change his moderate traffic</td>
</tr>
<tr>
<td>1 2 3 4</td>
<td>23 Merge onto a Hwy</td>
</tr>
<tr>
<td>1 2 3 4</td>
<td>28 Stay with in without markings</td>
</tr>
<tr>
<td>1 2 3 4</td>
<td>29 Keep distance</td>
</tr>
<tr>
<td>1 2 3 4</td>
<td>31 Drive in construction zone</td>
</tr>
<tr>
<td>1 2 3 4</td>
<td>11 Keep up with flow</td>
</tr>
<tr>
<td>1 2 3 4</td>
<td>2 Check when back out</td>
</tr>
<tr>
<td>1 2 3 4</td>
<td>15 Stop Sign</td>
</tr>
<tr>
<td>1 2 3 4</td>
<td>4 Check mirror change Ln</td>
</tr>
<tr>
<td>1 2 3 4</td>
<td>19 Share road</td>
</tr>
<tr>
<td>1 2 3 4</td>
<td>10 Drive on highway 2+ lanes</td>
</tr>
<tr>
<td>1 2 3 4</td>
<td>1 Stay in the proper Ln</td>
</tr>
<tr>
<td>1 2 3 4</td>
<td>12 Keep distance when change Ln</td>
</tr>
<tr>
<td>1 2 3 4</td>
<td>14 Drive cautiously</td>
</tr>
<tr>
<td>1 2 3 4</td>
<td>3 Use car controls</td>
</tr>
<tr>
<td>1 2 3 4</td>
<td>27 Stay within I marks</td>
</tr>
<tr>
<td>1 2 3 4</td>
<td>18 Enter flow when turn R</td>
</tr>
<tr>
<td>1 2 3 4</td>
<td>9 Drive in light rain</td>
</tr>
<tr>
<td>1 2 3 4</td>
<td>6 Obey forms of traf lights</td>
</tr>
<tr>
<td>1 2 3 4</td>
<td>30 Look LBR BF crossing</td>
</tr>
</tbody>
</table>
Overview Research

PHASE 1

Theoretical Frameworks
FARS
Meta-Synthesis
Mixed Methods

Preparation
Enrollment
Data Collection
Analyses
Dissemination

Three manuscripts
1. Determinants of Safety
2. Qualitative meta-Synthesis
3. PH Model

2004-2007
K-01
Overview Research

PHASE 1
Theoretical Frameworks
FARS
Meta-Synthesis
Mixed Methods

PHASE 2
Item generation
Face validity
Content validity

Preparation

Enrollment

Data Collection

Analyses

Dissemination

Three manuscripts
1. Determinants of Safety
2. Qualitative meta-Synthesis
3. PH Model

Two manuscripts
1. Classen et al. (2010), AJOT
2. Winter et al. (2011), CJOT

2004-2007
Dec 2008-Dec 2012
K-01
NIA: R-21

Sherrilene Classen, Sandra M. Winter, Craig A. Velozo, Michel Bédard, Desiree N. Lanford, Babette Brumback, Barbara J. Lutz

OBJECTIVE. We report on item development and validity testing of a self-report older adult safe driving behaviors measure (SDBM).

METHOD. On the basis of theoretical frameworks (Precede-Proceed Model of Health Promotion, Haddon’s matrix, and Michon’s model), existing driving measures, and previous research and guided by measurement theory, we developed items capturing safe driving behavior. Item development was further informed by focus groups. We established face validity using peer reviewers and content validity using expert raters.

RESULTS. Peer review indicated acceptable face validity. Initial expert rater review yielded a scale content validity index (CVI) rating of 0.78, with 44 of 60 items rated ≥0.75. Sixteen unacceptable items (≤0.5) required major revision or deletion. The next CVI scale average was 0.84, indicating acceptable content validity.

CONCLUSION. The SDBM has relevance as a self-report to rate older drivers. Future pilot testing of the SDBM comparing results with on-road testing will define criterion validity.

Item Development

- Community Based Participatory Research Approach
- Previous Research
- Existing Measures
Add items capturing vehicle and environmental factors based on previous research

Brainstorm to generate item ideas

Place items on continuum of hierarchical difficulty

Add items capturing vehicle and environmental factors based on previous research

Re-write items to capture safe driving behaviors

Revise item set

Assess face validity through peer review

Assess content validity through Content Validity Index (CVI)

Focus groups: Add items from field notes

Frameworks:
1) Precede-Proceed Model
2) Haddons’ Matrix
3) Michon’s Model

Hierarchical difficulty obtained from principles of Item Response Theory (IRT)

Previous research:
1) Systematic Literature Review
2) Actuarial data (FARS- Fatality Analysis Rating System)
3) Metasynthesis
4) Existing Measures

Add or delete items, revise item descriptions, revise rating scale

Acceptable face and content validity (CVI of 0.80) reached?

No, repeat steps from “Revise item set"

Yes, accept item set

Steps in Process of Item Development and Testing
Results

• Peer review - face validity
• Expert rater review - content validity index
  – CVI rating of 0.78
  – 44/60 items rated ≥ 0.75.
  – Sixteen unacceptable items (≤ 0.5)
  – Items revised or deleted
  – Second-round CVI rating of 0.84
Strengths & Limitations

**Strengths**

- Item Development
  - Theory driven
  - Review of existing measures
  - Team input/5 month process
  - Advisory Committee

**Limitations**

- Number of items
- Expert Review
- CVI rating process
Focus Groups: Item Refinement

• What are the domains, constructs, and items that comprise older adults’ safe driving from the perspective of older drivers and families?
Focus Groups

• Focus Groups One and Two
  – Evaluate or generate items based on respondents’ driving experiences
  – Moderated using Focus Group guide

• Focus Group Three
  – Refine the FTDS items based on feedback

Winter et al., OJOT, 2011
Focus Groups: Methods

• Recruited Participants
  • 23 older drivers (mean age 70.27, SD=5.1)
  • 8 family members (mean age 50, SD=21.61)

• Digitally record and transcribe responses
• Use of Atlas.ti
• Content and thematic analyses
Results

• Focus Groups One and Two
  – supported 46 of 72 existing items
  – generated 16 new items

• Focus Group Three
  – supported 40 existing items
  – generated 13 item revisions
Strengths & Limitations

• Strengths
  – Guide and moderation
  – Utility of findings
  – Community Participation

• Limitations
  – Drivers and family members were together
  – Lack of cognitive interviewing
  – Organizational stakeholders not represented
Psychometrics of the Fitness-to-Drive Screening Measure

Sherrilene Classen, PhD, MPH, OT Reg. (Ont.), FAOTA1,2, Craig A. Velozo, PhD, OTR3, Sandra M. Winter, PhD, OTR/L2,4, Michel Bédard, PhD5, and Yanning Wang, MS2

Abstract
We employed item response theory (IRT), specifically using Rasch modeling, to determine the measurement precision of the Fitness-to-Drive Screening Measure (FTDS), a tool that can be used by caregivers and occupational therapists to help detect at-risk drivers. We examined unidimensionality through the factor structure (how items contribute to the central construct of fitness to drive), rating scale (use of the categories of the rating scale), item/person-level separation (distinguishing between items with different difficulty levels or persons with different ability levels) and reliability, item hierarchy (easier driving items advancing to more difficult driving items), rater reliability, rater effects (severity vs. leniency of a rater), and criterion validity of the FTDS to an on-road assessment, via three rater groups (n = 200 older drivers; n = 200 caregivers; n = 2 evaluators). The FTDS is unidimensional, the rating scale performed well, has good person (>3.07) and item (>5.43) separation, good person (>0.90) and item reliability (>0.97), with <10% misfitting items for two rater groups (caregivers and drivers). The intraclass correlation (ICC) coefficient among the three rater groups was significant (.253, p < .001) and the evaluators were the most severe raters. When comparing the caregivers’ FTDS rating with the drivers’ on-road assessment, the areas under the curve (index of discriminability; caregivers .726, p < .001) suggested concurrent validity between the FTDS and the on-road assessment. Despite limitations, the FTDS is a reliable and accurate screening measure for caregivers to help identify at-risk older drivers and for occupational therapy practitioners to start conversations about driving.

Keywords
Methods

• Participants
  – North Central Florida & Thunder Bay, Ontario, Canada
  – 200 older licensed drivers
    • 65-85 years
    • mean age =72.64, SD=5.35
  – 200 family members/ caregivers
    • 18-85 years
    • 62.44, SD= 14.76
  – 2 driving evaluators

• Mixed methods design

Classen et al., OTJR. 2015
Procedure

**Drivers**

- Informed consent
- FTDS measure
- Standardized clinical battery
- Standardized on-road test
  - Protocol standardized across sites
  - IRR driving evaluators = 100%

**Caregivers/Family Members**

- Informed consent
- FTDS measure

Classen et al., OTJR. 2015
Overview Research

PHASE 1
- Theoretical Frameworks
- FARS
- Meta-Synthesis
- Mixed Methods

PHASE 2
- Item generation
- Face validity
- Content validity

PHASE 3
- FINAL PSYCHOMETRICS N= 400

Preparation
- Three manuscripts
  1. Determinants of Safety
  2. Qualitative meta-Synthesis
  3. PH Model

Enrollment
- Dec 2008- Dec 2012

Data Collection
- 2004- 2007

Analyses
- 2004- 2007

Dissemination
- K-01
- NIA: R-21
- DOT
- FDOT

Two manuscripts
1. Classen et al. (2010), AJOT
2. Winter et al. (2011), CJOT

Four manuscripts
1. Classen et al. (2012), AJOT
2. Classen et al. (2012), AJOT
3. Classen et al. (2013), AJOT
4. Classen et al. (2015), OTJR
**Table 1. Demographics and Driving Characteristics of Older Drivers and their F/C**

<table>
<thead>
<tr>
<th></th>
<th>Older driver (N = 200)</th>
<th>Family members/caregivers (N = 200)</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Age mean (SD) year</strong></td>
<td>72.64 (5.35)</td>
<td>62.44 (14.76)</td>
</tr>
<tr>
<td><strong>Age range year</strong></td>
<td>65-85</td>
<td>18-85</td>
</tr>
<tr>
<td><strong>Gender: Male</strong></td>
<td>110 (55.0%)</td>
<td>55 (27.5%)</td>
</tr>
<tr>
<td><strong>Race</strong></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Caucasian</td>
<td>177 (88.5%)</td>
<td>180 (90.0%)</td>
</tr>
<tr>
<td>African-American</td>
<td>12 (6%)</td>
<td>12 (6.0%)</td>
</tr>
<tr>
<td>Others</td>
<td>11 (5.5%)</td>
<td>8 (4%)</td>
</tr>
<tr>
<td><strong>Education</strong></td>
<td></td>
<td></td>
</tr>
<tr>
<td>College or university</td>
<td>114 (57.0%)</td>
<td>93 (46.5%)</td>
</tr>
<tr>
<td>Vocational /Associate</td>
<td>43 (21.5%)</td>
<td>75 (37.5%)</td>
</tr>
<tr>
<td>Degree</td>
<td>43 (21.5%)</td>
<td>32 (16.0%)</td>
</tr>
<tr>
<td>≤ High school</td>
<td></td>
<td></td>
</tr>
<tr>
<td><strong>Drive 7 days/week</strong></td>
<td>102 (51.0%)</td>
<td>27 (13.5%)</td>
</tr>
<tr>
<td>Licensed driver</td>
<td>200 (100%)</td>
<td>197 (98.5%)</td>
</tr>
<tr>
<td>Living alone</td>
<td>52 (26.0%)</td>
<td>25 (12.5%)</td>
</tr>
<tr>
<td>Living with partner/spouse</td>
<td>129 (64.5%)</td>
<td>111 (55.5%)</td>
</tr>
<tr>
<td>MMSE mean (SD)</td>
<td>27.99 (1.84)</td>
<td>NA</td>
</tr>
<tr>
<td>Self reported number of medications used</td>
<td>6.73 (4.45)</td>
<td>NA</td>
</tr>
</tbody>
</table>

Note: MMSE = Mini Mental State Examination; NA = Not applicable; SD = standard deviation

Median of age for F/C = 67.0;

*a*: Ride with the driver 7 days per week.

*b*: The relationship with the driver is spouse or partner.
Overview Research

PHASE 1
Theoretical Frameworks
FARS
Meta-Synthesis
Mixed Methods

PHASE 2
Item generation
Face validity
Content validity

PHASE 3
FINAL PSYCHOMETRICS N= 400
Factor Structure

Preparation
Three manuscripts
1. Determinants of Safety
2. Qualitative meta-Synthesis
3. PH Model

Enrollment
Dec 2008- Dec 2012

Data Collection

Analyses
Two manuscripts
1. Classen et al. (2010), AJOT
2. Winter et al. (2011), CJOT

Four manuscripts
1. Classen et al. (2012), AJOT
2. Classen et al. (2012), AJOT
3. Classen et al. (2013), AJOT
4. Classen et al. (2015), OTJR

Dissemination
2004- 2007
K-01

NIA: R-21
DOT
FDOT
Overview Research

**PHASE 1**

- Theoretical Frameworks
- FARS
- Meta-Synthesis
- Mixed Methods

**PHASE 2**

- Item generation
- Face validity
- Content validity

**PHASE 3**

- **FINAL PSYCHOMETRICS** N= 400
  - Factor Structure
  - Construct validity

**Preparation**

- Three manuscripts
  1. Determinants of Safety
  2. Qualitative meta-Synthesis
  3. PH Model

**Enrollment**

- Two manuscripts
  1. Classen et al. (2010), AJOT
  2. Winter et al. (2011), CJOT

**Data Collection**

- Dec 2008- Dec 2012

**Analyses**

- Four manuscripts
  1. Classen et al. (2012), AJOT
  2. Classen et al. (2012), AJOT
  3. Classen et al. (2013), AJOT
  4. Classen et al. (2015), OTJR

**Dissemination**

- 2004- 2007
- K-01
- NIA: R-21
- DOT
- FDOT
Overview Research

**PHASE 1**
- Theoretical Frameworks
- FARS
- Meta-Synthesis
- Mixed Methods

**PHASE 2**
- Item generation
- Face validity
- Content validity

**PHASE 3**
- **FINAL PSYCHOMETRICS** N= 400
  - Factor Structure
  - Construct validity
  - Rater Reliability

**Preparation**
- Three manuscripts
  1. Determinants of Safety
  2. Qualitative meta-Synthesis
  3. PH Model

**Enrollment**
- Two manuscripts
  1. Classen et al. (2010), AJOT
  2. Winter et al. (2011), CJOT

**Data Collection**
- Dec 2008 - Dec 2012

**Analyses**
- Four manuscripts
  1. Classen et al. (2012), AJOT
  2. Classen et al. (2012), AJOT
  3. Classen et al. (2013), AJOT
  4. Classen et al. (2015), OTJR

**Dissemination**
- 2004 - 2007
- K-01
- NIA: R-21
- DOT
- FDOT
Overview Research

PHASE 1
Theoretical Frameworks
FARS
Meta-Synthesis
Mixed Methods

PHASE 2
Item generation
Face validity
Content validity

PHASE 3
FINAL PSYCHOMETRICS N= 400
Factor Structure
Rater Effects
Construct validity
Rater Reliability

Preparation
Three manuscripts
1. Determinants of Safety
2. Qualitative meta-Synthesis
3. PH Model

Enrollment
Two manuscripts
1. Classen et al. (2010), AJOT
2. Winter et al. (2011), CJOT

Data Collection

Analyses
Four manuscripts
1. Classen et al. (2012), AJOT
2. Classen et al. (2012), AJOT
3. Classen et al. (2013), AJOT
4. Classen et al. (2015), OTJR

Dissemination

2004 - 2007
Dec 2008- Dec 2012
2004 - 2007
K-01
NIA: R-21
DOT
FDOT
Overview Research

PHASE 1
- Theoretical Frameworks
- FARS
- Meta-Synthesis
- Mixed Methods

PHASE 2
- Item generation
- Face validity
- Content validity

PHASE 3
- FINAL PSYCHOMETRICS N = 400
  - Factor Structure
  - Construct validity
  - Rater Reliability
  - Rater Effects
  - Criterion validity

Preparation
- Three manuscripts
  1. Determinants of Safety
  2. Qualitative meta-Synthesis
  3. PH Model

Enrollment
- Dec 2008- Dec 2012

Data Collection
- 2004- 2007
  - K-01

Analyses
- Two manuscripts
  1. Classen et al. (2010), AJOT
  2. Winter et al. (2011), CJOT

Dissemination
- Four manuscripts
  1. Classen et al. (2012), AJOT
  2. Classen et al. (2012), AJOT
  3. Classen et al. (2013), AJOT
  4. Classen et al. (2015), OTJR

Projects
- NIA: R-21
- DOT
- FDOT
Concurrent Criterion Validity of the Safe Driving Behavior Measure: A Predictor of On-Road Driving Outcomes

Sherrilene Classen, Yanning Wang, Sandra M. Winter, Craig A. Velozo, Desiree N. Lanford, Michel Bédard

MeSH TERMS
- aged
- automobile driving
- caregivers
- forecasting
- reproducibility of results
- safety

We determined the concurrent criterion validity of the Safe Driving Behavior Measure (SDBM) for on-road outcomes (passing or failing the on-road test as determined by a certified driving rehabilitation specialist) among older drivers and their family members–caregivers. On the basis of ratings from 168 older drivers and 168 family members–caregivers, we calculated receiver operating characteristic curves. The drivers' area under the curve (AUC) was .620 (95% confidence interval [CI] = .514–.725, p = .043). The family members–caregivers’ AUC was .726 (95% CI = .622–.829, p ≤ .01). Older drivers' ratings showed statistically significant yet poor concurrent criterion validity, but family members–caregivers' ratings showed good concurrent criterion validity for the criterion on-road driving test. Continuing research with a more representative sample is being pursued to confirm the SDBM's concurrent criterion validity. This screening tool may be useful for generalist practitioners to use in making decisions regarding driving.

### Criterion Validity

#### On-road test

<table>
<thead>
<tr>
<th>Screening test</th>
<th>On-road test</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>Failing</td>
</tr>
<tr>
<td>Failing</td>
<td>(a) True positive</td>
</tr>
<tr>
<td>Passing</td>
<td>(c) False negative</td>
</tr>
<tr>
<td></td>
<td>Passing</td>
</tr>
<tr>
<td>Failing</td>
<td>(b) False positive</td>
</tr>
<tr>
<td>Passing</td>
<td>(d) True Negative</td>
</tr>
</tbody>
</table>

- **Sensitivity** = \( \frac{a}{a + c} \)
- **Specificity** = \( \frac{d}{b + d} \)
- **Error** = (1-sensitivity) + (1-specificity)
- **PPV** = \( \frac{a}{a + b} \)
- **NPV** = \( \frac{d}{c + d} \)
- **AUC** = index discriminability

Classen et al., AJOT, 2013
Figure 8. Receiver Operating Characteristic Curves for Three Rater Groups

<table>
<thead>
<tr>
<th>Area under the Curve for Three Rater Groups</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
</tr>
<tr>
<td><strong>Area</strong></td>
</tr>
<tr>
<td>-----------</td>
</tr>
<tr>
<td>Driver</td>
</tr>
<tr>
<td>F/C</td>
</tr>
<tr>
<td>Evaluator</td>
</tr>
</tbody>
</table>
Table 7. Sensitivity, Specificity, PPV, NPV and error based on F/C Ratings

<table>
<thead>
<tr>
<th>Cutoff</th>
<th>1=52.630</th>
<th>2=68.795</th>
<th>3=70.795</th>
<th>4=71.915</th>
<th>5=73.465</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>Sensitivity</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td>0.194</td>
<td>0.581</td>
<td>0.677</td>
<td>0.742</td>
<td>0.806</td>
</tr>
<tr>
<td></td>
<td>Specificity</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td>0.982</td>
<td>0.763</td>
<td>0.680</td>
<td>0.633</td>
<td>0.604</td>
</tr>
<tr>
<td></td>
<td>PPV</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td>0.667</td>
<td>0.310</td>
<td>0.280</td>
<td>0.271</td>
<td>0.272</td>
</tr>
<tr>
<td></td>
<td>NPV</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td>0.869</td>
<td>0.908</td>
<td>0.920</td>
<td>0.930</td>
<td>0.944</td>
</tr>
<tr>
<td></td>
<td>Error</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td>0.824</td>
<td>0.656</td>
<td>0.642</td>
<td>0.625</td>
<td>0.590</td>
</tr>
<tr>
<td></td>
<td>False Positive</td>
<td>3</td>
<td>40</td>
<td>54</td>
<td>62</td>
</tr>
<tr>
<td></td>
<td>False Negative</td>
<td>25</td>
<td>13</td>
<td>10</td>
<td>8</td>
</tr>
<tr>
<td></td>
<td>Total Misclassification</td>
<td>28</td>
<td>53</td>
<td>64</td>
<td>70</td>
</tr>
</tbody>
</table>
Stakeholder Recommendations to Refine the Fitness-to-Drive Screening Measure

Sherrilene Classen PhD, MPH, OTR/L, FAOTA
*Elborn College, sclassen@uwo.ca*

Sandra M. Winter PhD, OTR/L
*University of Florida, smwinter@phhp.ufl.edu*

*See next page for additional authors*
Overview Research

- PHASE 4
  - Web-based FTDS & Keyform
  - Focus Groups
    - OTs
    - CDRS
    - Caregivers
  - Beta test
    - Manual
    - Videos
    - Pilot

- Wed-based version
- Pilot testing
- Implementation
- Translation
- Next Steps

Two Manuscripts
Focus groups

- April 2012
- October 2012

FDOT
Focus Groups to Develop Keyforms

**Group 1: OT/CDRS**
- April 2011
  - N= 12 (10 women)
  - 5 OTs
  - 7 OT/CDRS
- Results
  - Face validity
  - Appearance and Wording
  - Usability

**Group 2: Experts**
- October 2011
  - 5 CDRSs
- Results
  - “A screening tool that can trigger conversations and broad decisions about driving”
  - 10 Question VAS
    - VAS: Mean = 8.4 (SD ±0.8)

Classen et al., OJOT, 2013
Focus Groups to Develop Keyforms

Group 3: Family Members and Caregivers

- November 2011
- N=7
  - 5 spouses, 1 adult child, 1 friend
  - Age
    - range = 46-77 years
    - median age = 65
  - Females 57.1%
  - Race
    - Caucasian 42.9%
    - African-American 28.6%
    - Asian 28.6%
  - All at least high school
    - most having a Bachelor’s or higher degree (57.1%).

Results

- Changes
  - rename “caregiver” as “proxy”
  - revise instructional scripts for the Web
  - incorporate “drop down boxes”
  - clarify the race question
  - create a proxy version of the driving history
  - consider use of “not applicable” versus forced response
  - customer satisfaction survey

- Responses six questions regarding purpose, clarity, understandability and meaningfulness of the keyform

Classen, et al., OJOT, 2013
Key Form Handout

• Explain Key Form
  – Rating scale

1. Cannot do/ Very difficult
2. Somewhat difficult
3. Little difficult
4. Not difficult
**Example of the Web-Based Keyform and Recommendations**

<table>
<thead>
<tr>
<th>Rating Scale</th>
<th>Item Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>0</td>
<td>1 Use paper map</td>
</tr>
<tr>
<td>1</td>
<td>2 Drive heavy rain/wind</td>
</tr>
<tr>
<td>2</td>
<td>3 Drive glare</td>
</tr>
<tr>
<td>3</td>
<td>4 Drive night absent lane lines</td>
</tr>
<tr>
<td>4</td>
<td>5 Drive unfamiliar urban</td>
</tr>
<tr>
<td>5</td>
<td>6 Drive unfamiliar area</td>
</tr>
<tr>
<td>6</td>
<td>7 Drive at night</td>
</tr>
<tr>
<td>7</td>
<td>8 Drive when fog</td>
</tr>
<tr>
<td>8</td>
<td>9 Parallel park</td>
</tr>
<tr>
<td>9</td>
<td>10 Pass larger vehicle no passing in</td>
</tr>
<tr>
<td>10</td>
<td>11 Drive when upset</td>
</tr>
<tr>
<td>11</td>
<td>12 Turn L across lns no traf light</td>
</tr>
<tr>
<td>12</td>
<td>13 Stay focused</td>
</tr>
<tr>
<td>13</td>
<td>14 After driving health changes</td>
</tr>
<tr>
<td>14</td>
<td>15 Drive a different car</td>
</tr>
<tr>
<td>15</td>
<td>16 Enter traf with left turn</td>
</tr>
<tr>
<td>16</td>
<td>17 Avoid dangerous situations</td>
</tr>
<tr>
<td>17</td>
<td>18 Pass car no passing in</td>
</tr>
<tr>
<td>18</td>
<td>19 Exit an expressway</td>
</tr>
<tr>
<td>19</td>
<td>20 Drive in dense traffic</td>
</tr>
<tr>
<td>20</td>
<td>21 Drive with conversation</td>
</tr>
<tr>
<td>21</td>
<td>22 Control car avoid collisions</td>
</tr>
<tr>
<td>22</td>
<td>23 Drive with assistance</td>
</tr>
<tr>
<td>23</td>
<td>24 Control car wet road</td>
</tr>
<tr>
<td>24</td>
<td>25 Read road signs ad to react</td>
</tr>
<tr>
<td>25</td>
<td>26 Back out of parking</td>
</tr>
<tr>
<td>26</td>
<td>27 Maintain L in turn</td>
</tr>
<tr>
<td>27</td>
<td>28 Change Lns moderate traffic</td>
</tr>
<tr>
<td>28</td>
<td>29 Merge onto a Hwy</td>
</tr>
<tr>
<td>29</td>
<td>30 Stand in without markings</td>
</tr>
<tr>
<td>30</td>
<td>31 Drive in construction zone</td>
</tr>
<tr>
<td>31</td>
<td>32 Keep distance</td>
</tr>
<tr>
<td>32</td>
<td>33 Drive in construction zone</td>
</tr>
<tr>
<td>33</td>
<td>34 Keep up with flow</td>
</tr>
<tr>
<td>34</td>
<td>35 Check when back out</td>
</tr>
<tr>
<td>35</td>
<td>36 Stop Sign</td>
</tr>
<tr>
<td>36</td>
<td>37 Check mirror change Lns</td>
</tr>
<tr>
<td>37</td>
<td>38 Share road</td>
</tr>
<tr>
<td>38</td>
<td>39 Drive on highway 2- lanes</td>
</tr>
<tr>
<td>39</td>
<td>40 Stay in proper lane</td>
</tr>
<tr>
<td>40</td>
<td>41 Keep distance</td>
</tr>
<tr>
<td>41</td>
<td>42 Drive cautiously</td>
</tr>
<tr>
<td>42</td>
<td>43 Use car controls</td>
</tr>
<tr>
<td>43</td>
<td>44 Stay with in markings</td>
</tr>
<tr>
<td>44</td>
<td>45 Enter flow when turn R</td>
</tr>
<tr>
<td>45</td>
<td>46 Drive in light rain</td>
</tr>
<tr>
<td>46</td>
<td>47 Obey forms of traf lights</td>
</tr>
<tr>
<td>47</td>
<td>48 Look L&amp;R of crossing</td>
</tr>
</tbody>
</table>

**Person Measure: 66.95 out of 100**

**Routine Driver**

**Overall rating:** Based on your rating, this driver is classified within the "Routine Driver" Group and shows early signs of needing intervention. There are driving skills that are causing concern. For example:

1. Drive in a thunderstorm with heavy rains and wind?
2. Drive when there is glare or the sun is in his or her eyes?
3. Drive at night on a dark road with faded or absent lane lines?

**Specific Recommendations:** We recommend a doctor's appointment to start a conversation about conditions that may impact driving safety. The driver will also benefit from a comprehensive driving evaluation to address safety concerns. We do recommend repeating this self-screening annually, or when the driver experience changes in health or functional status.

**General Recommendations:** The American Geriatrics Society recommends a physical and eye exam annually, or earlier, when needed. We recommend taking a class for mature drivers such as those offered by AAA, AARP or a local driving school.

**Click on the links below:**

**Resources:**

**Certified Driving Rehabilitation Specialists/ Occupational Therapists providing the Comprehensive Driving Evaluations**

- American Occupational Therapy Association

**AAA Resources for Mature Drivers**

- American Automobile Association (AAA)
  [http://www.seniordrivers.org/home/](http://www.seniordrivers.org/home/)

**AARP Mature Driver Courses**

- AARP

1. Very Difficult
2. Somewhat Difficult
3. A Little Difficult
4. Not Difficult
Findings Meetings

Objective: Share results of FTDS development and obtain feedback

Methods: Three moderated focus groups with n=8 F/C (prior raters)
- Visual Analog Scale / Rating Form (VAS, 0-10, 10 being excellent)
- Assess FTDS formatting, instructions, wording, web features, clarity, and understandability
- Audio-recorded and transcribed prior to content analysis

Results: Overall VAS score, Mean of 9.13, SD±0.52 (excellent ratings)
- Revision request - clarification of proxy rater instructions
- FTDS feedback:
  - clear and understandable
  - well explained with “informative” video
  - enhanced with visuals (result outputs) that “greatly enhance tool”
  - “meaningful tool to aid at-risk drivers”

Winter et al., POTG, 2015
Overview Research

**PHASE 4**
- Web-based FTDS & Keyform
- Focus Groups
  - OTs
  - CDRS
  - Caregivers
- Beta test
  - Manual
  - Videos
  - Pilot

**PHASE 5**
- Implement
  - AARP
  - AOTA
  - AAA
  - FDOT

**PHASE 6**
- Canadian Context

**Summary**
- **Wed-based version**
  - **Pilot testing**
    - Two Manuscripts
      - Focus groups
    - Manuscript
      - Final psychometrics
    - Three Manuscripts

**Timeline**
- April 2012
- October 2012
- Dec 2013
- Jan 2014-Dec 2015
- Jan 2016→

**Abbreviations**
- FDOT
Developing a Canadian-Specific Version of the Fitness-to-Drive Screening Measure


Abstract
The Fitness-to-Drive Screening Measure (FTDS) is a valid and reliable screening tool that identifies at-risk older drivers. Although 12,300 Canadians have used the FTDS in the last 2 years, the resources/recommendations targeted the U.S. context. The objective of this article is to identify the FTDS resources/recommendations appropriate for Canadian users and the barriers that Canadian stakeholders experience when promoting older driver fitness. Twenty stakeholders from three provinces (eight occupational therapists, three certified driver rehabilitation specialists, four physicians, and five members of advocacy organizations) participated in semi-structured interviews. We conducted summative and thematic content analysis. A comprehensive set of resources/recommendations was identified. Barriers to older driver fitness decisions included fear of losing the license, compromising the physician–client relationship, insufficient training/resources for health care professionals, and inadequate alternative transportation. Canadian context-specific resources/recommendations were integrated into a Canadian version of the FTDS. This version may better serve Canadian older drivers, caregivers, and health care professionals.

Keywords
fitness to drive, aging, screening, automobile driving
Purpose

To identify:

- available resources and recommendations fitting to the Canadian context
- potential barriers that could limit the uptake of these resources and recommendations by users
- stakeholders’ perceived barriers for fitness-to-drive decisions
Method

Qualitative study

• Semi-structured interviews with Canadian stakeholders and summative qualitative approach
  • Physicians
  • Occupational therapists
  • Representatives from professional/advocacy groups
  • Certified driver rehabilitation specialists

• Thematic content analysis (Ryan & Bernard, 2003)
Participants

Recruitment

- Convenience sample
- Critical case sampling
Procedure

- Standardized semi-structured interviews
- Summative qualitative approach
- Thematic analysis
Results

- 20 stakeholders participated
- 6 categories of resources and recommendations identified
- 4 barriers to promoting fitness to drive identified

https://programsucces.files.wordpress.com/2011/08/stakeholders.jpg
In Summary

• Resulted in a Canadian-specific version of the FTDS
  – Canadian resources and recommendations provided for Canadian users
• Future research and knowledge of the FTDS may help overcome some of the identified barriers
Overview Research

PHASE 4
- Web-based FTDS & Keyform
- Focus Groups: OTs, CDRS, Caregivers
- Beta testing: Manual, Videos, Pilot

PHASE 5
- Implement: AARP, AOTA, AAA, FDOT

PHASE 6
- Canadian Version
- Consumer Patterns

Implementation timeline:
- April 2012: FDOT
- October 2012: Beta test
- Dec 2013: Final psychometrics
- Jan 2014-Dec 2015: Three Manuscripts
- Jan 2016→: Three Manuscripts

Two Manuscripts: Focus groups

Manuscript: Final psychometrics

Three Manuscripts: Consumer Patterns
# Overview Research

<table>
<thead>
<tr>
<th>PHASE 4</th>
<th>PHASE 5</th>
<th>PHASE 6</th>
</tr>
</thead>
<tbody>
<tr>
<td>Web-based FTDS &amp; Keyform</td>
<td>Implement</td>
<td>Canadian Version</td>
</tr>
<tr>
<td>Focus Groups</td>
<td>Beta test</td>
<td>Consumer Patterns</td>
</tr>
<tr>
<td>OTs</td>
<td>Manual</td>
<td>AAA Version</td>
</tr>
<tr>
<td>CDRS</td>
<td>Videos</td>
<td>Korean Version</td>
</tr>
<tr>
<td>Caregivers</td>
<td>Pilot</td>
<td></td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

- **Web-based version**
- **Pilot testing**
- **Implementation**
- **Translation**
- **Next Steps**

<table>
<thead>
<tr>
<th>Wed-based version</th>
<th>Pilot testing</th>
<th>Implementation</th>
<th>Translation</th>
<th>Next Steps</th>
</tr>
</thead>
<tbody>
<tr>
<td>FDOT</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

- **Two Manuscripts**
  - Focus groups

- **Manuscript**
  - Final psychometrics

- **Three Manuscripts**
Abstract

**Objective:**
To develop a Korean version of the Safe Driving Behavior Measure (K-SDBM) and verify its reliability.

**Methods:**
SDBM was adapted to the Korean context. Driving behaviors fitting Korean culture were collected. Drivers and a therapist verified the validity of the content.

**Results:**
A total of 37/40 items remained after verifying the content validity.
N= 211 drivers > 65, a valid driver’s license, and drove in last 3 months.
Internal consistency (Cronbach’s α) for the elderly drivers was .97
Test-retest reliability (intra-class correlation coefficient) was .75.

**Conclusion:**
This study demonstrated reliability of the K-SDBM, and is expected to be useful in planning and intervention for elderly people in the area of driving rehabilitation.
Overview Research

PHASE 4
Web-based FTDS & Keyform
- Focus Groups
  - OTs
  - CDRS
  - Caregivers
- Beta test
  - Manual
  - Videos
  - Pilot

PHASE 5
Implement
- AARP
- AOTA
- AAA
- You

PHASE 6
Canadian Version
- Consumer Patterns
- Korean Version

PHASE 7
Japanese Version

Wed-based version
- Two Manuscripts
- Focus groups

Pilot testing
- Manuscript
  - Final psychometrics

Implementation
- Three Manuscripts

Translation
- Jan 2014-Dec 2015

Next Steps
- Jan 2016

April 2012
- FDOT

October 2012

Dec 2013

Jan 2014-Dec 2015

Jan 2016
Japanese version!

Aug 2<sup>nd</sup> 2017
- Translated
- Back translated
- Pilot testing
- Policy development

運転適性評価テスト

フロリダ大学の研究者によって開発された運転適性評価テストへようこそ。運転適性評価テストは、介護人及び／または高齢者ドライバーの家族、作業療法士のために、リスクを伴ったドライバーを識別する、インターネットを利用した手段です。最近3か月間で、運転者の方に同乗した介護人及び／または家族は、このテストを通じて、54の運転技能について、運転者の方が抱える問題点をチェックすることができます。テストを完了したら、運転者は、キーフォームか質問ごとの得点を見ることができます。そして運転者は、「リスクを伴った運転者」「一般的な運転者」「熟練運転者」のうちの1つに分類されます。この分類に基づいて、推奨事項としてのさらなる情報を得ることができます。
Overview Research

**PHASE 4**
- Web-based FTDS & Keyform
- Focus Groups
  - OTs
  - CDRS
  - Caregivers
- Beta test
  - Manual
  - Videos
  - Pilot
- You

**PHASE 5**
- Implement
  - AARP
  - AOTA
  - AAA
  - **You**

**PHASE 6**
- Canadian Version
- Consumer Patterns
  - Korean Version

**PHASE 7**
- Japanese Version
- 32-item FTDS

---

**Web-based version**
- Two Manuscripts
- Focus groups

**Pilot testing**
- Manuscript
- Final psychometrics

**Implementation**
- Three Manuscripts

**Translation**
- Two manuscripts

**Next Steps**
- April 2012
- October 2012
- Dec 2013
- Jan 2014-Dec 2015
- Jan 2016
Drivers are living beyond their driving lifetime
Proxy raters (e.g., caregivers) can provide valuable information about the fitness to drive of older adults
Assessments tools should be an appropriate length
Purpose

• Construct a shorter FTDS
• Examine the shorter FTDS’ predictive validity against the gold standard on-road assessment
Constructing the short form FTDS

Exploratory Factor Analysis (EFA)

Yong, et al., 2013
Exploratory Factor Analysis

PERSON

ENVIRONMENT

VEHICLE
Classical Test theory

Portney, et al., 2009
#### Receiver Operating Characteristic Curve

<table>
<thead>
<tr>
<th>Test</th>
<th>Present (Fail on-road assessment)</th>
<th>Absent (Pass on-road assessment)</th>
<th>Total</th>
</tr>
</thead>
<tbody>
<tr>
<td>Positive (FTDS Score &lt; 4.88)</td>
<td><img src="#" alt="a" /></td>
<td><img src="#" alt="c" /></td>
<td>a + c</td>
</tr>
<tr>
<td>Negative (FTDS Score &gt; 4.88)</td>
<td><img src="#" alt="b" /></td>
<td><img src="#" alt="d" /></td>
<td>b + d</td>
</tr>
<tr>
<td>Total</td>
<td><img src="#" alt="a + b" /></td>
<td><img src="#" alt="c + d" /></td>
<td></td>
</tr>
</tbody>
</table>

Streiner, et al., 2007
Results for FTDS short form

- AUC = .75, $p < .05$
- Sensitivity = .74
- Specificity = .69
- PPV = .30
- NPV = .93
- Misclassifications = 61/200 (30%)
In summary

- 32-item FTDS has the potential to be incorporated and used in clinical settings in the future
- Next steps:
  - Further development of the measure using item response theory
Overview Research

PHASE 8

Usefulness Clinicians/CG
Focus groups; Interviews
Short Form/ CAT
Clinical utility
Implementation/ Dissemination

Web-based version Implementation Knowledge Translation Uptake

One manuscript in development

Aug 2017

NIH/AHRQ R-18 proposal
Overview Research

PHASE 8

Usefulness Clinicians/CG
Focus groups; interviews
Short Form/ CAT
Clinical utility
Implementation/ Dissemination Science

PHASE 9

RCT Clinicians
Implementation
Dissemination

Web-based version
Implementation
Knowledge Translation
Uptake

One manuscript in development

Aug 2017

NIH/AHRQ R-18 proposal

Jan 2021

NIH-R-01
Fitness to Drive Screening Measure (FTDS)

Case Studies
Questions

On-line FTDS

http://fitnesstodrive.phhp.ufl.edu/

Contact Information

Dr. Sherrilene Classen
sclassen@phhp.ufl.edu