low (very poor or poor) for overall scientific validity and reliability. In terms of appropriateness of the human-computer interface for an older adult population, the majority of tests (10/16) scored fair across all criteria. The scores for ethics-associated factors were the lowest - over all criteria evaluation, the majority of tests (10/16) scored fair across all criteria. The issues uncovered suggest that further evidence and informed policy are needed to promote the greatest benefits from tools and information available on the Internet.

O2-12-05  ACCEPTANCE OF SOCIAL ASSISTIVE ROBOTS TO SUPPORT OLDER ADULTS WITH COGNITIVE IMPAIRMENT AND THEIR CAREGIVERS

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Background: Social assistive robots (SAR) are systems that provide assistance by means of social interaction. Their use to support autonomy, health-care, and social participation of individuals with MCI or Alzheimer’s disease, and caregivers on their tasks, is a growing research field. Successful SAR design and implementation depends on the understanding of user needs and factors influencing technology acceptance. However, little is known about how caregivers and care-recipients perspectives on SAR converge or diverge. This mixed-method study investigated perceived usefulness and acceptance of SAR for domestic use in these populations with a particular interest in the influence of individual factors on users opinions.

Methods: Twenty-five individuals (M = 72.6 years): Alzheimer’s disease caregivers, persons with MCI, and healthy older adults, participated in seven focus groups. Topics discussed included SAR technical and physical features, user characteristics, and societal and ethical issues linked to SAR use. Material support comprised a questionnaire (socio-demographic, health and technology factors), a robot prototype and use-case scenarios (pictures and videos). Qualitative and quantitative content analysis of the discussions transcripts was carried out. Results: Caregivers and people with MCI had a higher perceived usefulness and acceptance of the system than healthy elderly individuals. Participants in the three groups were more likely to accept to use SAR in the future than at the present time (Figure 1). A key theme that emerged in the discussions was the importance of personalizing SAR services, appearance, and social capabilities. Also, cognitive support, opportunities for social interaction, and safety monitoring at home were identified as the most useful services for SAR. Mismatch between needs and solutions offered by SAR, usability issues, and lack of technology experience technology were seen as the most important barriers for SAR adoption. Conclusions: Overall, participants recognized SAR potential to support everyday functioning and social participation in individuals with cognitive impairment. Results from this study demonstrated the relevance of gathering subjective users needs for SAR design. The assessment of individual factors that influence technology acceptance and perceived usefulness of SAR is a fundamental step to conceive design solutions that meet a wide range of users' needs, as well as technical, social, and ethical challenges.

O2-12-06  SELF-REPORTED ACTIVITY IN OLDER ADULTS: CHALLENGES AND INNOVATIONS

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Background: Retrospective self-reports of daily activity, health status, clinical symptomatology, and other important health related variables have been shown to be disconcertingly inaccurate in a variety of populations, including older adults. In previous work the Day Reconstruction Method was used to obtain detailed and accurate descriptions of daily activity in community residing adults in diary form. However, in older adults, there may be limitations to this method of data collection that may be circumvented by a less onerous approach. Real-time in-home monitoring of activities and behaviors using sensor technologies has become increasingly acceptable and may represent a new strategy for obtaining reliable health information.

Methods: Participants were enrolled in the Intelligent Systems for Assessing Aging Change study. All participants had standardized clinical and cognitive assessments. In an online survey, participants were asked to report their activities, location of those activities in the home, and time and duration of activity for the two hours immediately prior to completion of the survey. Time-stamped sensor based motion-activity data were obtained for the same two hours. Accuracy of self-report was gauged relative to the sensed home-based data. Results: Of the 95 cognitively intact participants who completed the activity log, nearly one quarter (n=22) did not include at least one complete entry, that is, with activity, location, and time that could be compared with sensor-based data. Group comparisons showed significantly lower mental status and verbal memory scores in those without a useable entry, 64 respondents were single-residing and had in-home activity data recorded on the same day as their diary entry. Of these, 49 had usable diary entries. Initial review of sensor data showed that approximately 60% of this subset of 49 participants had sensor firings that matched self-reported activity. In general, sensor-based data revealed more activity throughout the living space than was reported in the online survey. Conclusions: While experience sampling approaches have been shown to be a reasonable alternative to retrospective self reports, there may still be limitations to the fidelity of recalled events and behaviors. Unobtrusive in-home monitoring could be a preferred approach for establishing behavior and activity patterns in older adults.

ORAL SESSIONS: O2-13

PUBLIC HEALTH: GENERAL ISSUES IN PUBLIC HEALTH

O2-13-01  OLDER AGE AT RETIREMENT IS ASSOCIATED WITH DECREASED RISK OF DEMENTIA: ANALYSIS OF A HEALTH CARE INSURANCE DATABASE OF SELF-EMPLOYED WORKERS

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Background: Intellectual stimulation and mental engagement throughout life might be protective against dementia. We investigated whether age at retirement influences dementia risk among self-employed workers in France. Methods: We linked health and pension databases including self-employed workers who were living and retired as of December 31st 2010. Dementia cases were defined based either on ICD-10th diagnosis or on claim for one of the medication against dementia (donepezil, galantamine, rivastigmine). Data were analysed using Cox proportional hazard model
where age at dementia diagnosis or age at censoring (31st December 2010) was the dependent variable and age of retirement was the independent variable. Hazard ratios were computed adjusting for gender, marital status, occupational category, type of retirement, pension amount, diagnosis of hypertension, diabetes. Sensitivity analyses to assess potential reverse causation and differential cohort or temporal diagnosis biases were undertaken.

**Results:** Among the 429,803 retired self-employed workers alive on December 31st 2010, prevalence of dementia was 2.65%. Workers had been retired on average for more than 12 years. Multivariable analyses showed that the hazard ratio (HR) of dementia was 0.968 (95% Confidence Interval = [0.962-0.973]) per each extra year of age at retirement. After excluding workers who had dementia diagnosed within the 5 years following retirement, the results remained unchanged and highly significant (p<0.0001).

Results were also similar in further analyses stratified by age categories or year of dementia diagnosis. **Conclusions:** Professional activity may be an important determinant of mental exercise and social integration. Our data show strong evidence of a significant decrease in the risk of developing dementia associated with older age at retirement, in line with the “use it or lose it” hypothesis. This health perspective should be taken into consideration when the age of cessation of professional activity is discussed. Our results thus highlight the importance of maintaining high levels of cognitive and social stimulation throughout work and retiree life and emphasize the need for interventions and policies to help older individuals achieve such cognitive and social engagement.

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**O2-13-02** ASSESSING LONG-TERM POSTOPERATIVE COGNITIVE DECLINE USING CONVENTIONAL AND QUASI-EXPERIMENTAL APPROACHES: A MONTE CARLO SIMULATION STUDY

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**Table 1**

<table>
<thead>
<tr>
<th>Scenario</th>
<th>True effect†</th>
<th>β</th>
<th>95% CI</th>
<th>p</th>
<th>% of estimates correct</th>
<th>β</th>
<th>95% CI</th>
<th>p</th>
<th>% of estimates correct</th>
</tr>
</thead>
<tbody>
<tr>
<td>1 (Harmful effect)</td>
<td>-0.2</td>
<td>-0.240</td>
<td>-0.291 to -0.189</td>
<td>6.2x10^-13</td>
<td>100.0</td>
<td>-0.200</td>
<td>-0.274 to -0.127</td>
<td>0.00015</td>
<td>99.9</td>
</tr>
<tr>
<td>2 (No effect)</td>
<td>0.0</td>
<td>-0.241</td>
<td>-0.292 to -0.190</td>
<td>8.7x10^-13</td>
<td>0.0</td>
<td>-0.002</td>
<td>-0.075 to 0.072</td>
<td>0.483</td>
<td>93.7</td>
</tr>
<tr>
<td>3 (Protective effect)</td>
<td>0.2</td>
<td>-0.240</td>
<td>-0.291 to -0.189</td>
<td>2.3x10^-12</td>
<td>0.0</td>
<td>0.200</td>
<td>0.126 to 0.273</td>
<td>0.00033</td>
<td>99.9</td>
</tr>
</tbody>
</table>

*Based on mean values from 1,000 simulated datasets per scenario by conventional approach (ordinary least squares regression of postoperative cognitive changes adjusted for baseline cognition) and by quasi-experimental approach (difference-in-differences between preoperative and postoperative cognitive changes using linear spline regression).

†True underlying effect on annual rates of cognitive decline on a 0 to 35 point scale where higher values represent better cognition.

Methods: We simulated outcomes for 500 CABG patients and 500 matched controls with 1,000 datasets for each conventional (ordinary least-squares regression) and quasi-experimental (linear-spline regression) analysis. Cognitive generation was before surgery (years 1, 3, and 5) and after surgery (years 1, 3, and 5) on a 0-35 point scale. Baseline cognition was lower in CABG patients (25.0 [SD=2.0] versus 27.0 [SD=2.0] points) and annual POCD was higher (0.64 versus 0.4 points). Individual variation was introduced into intercepts (within-group SD of 1.41 points) and slopes (SD of 0.05 points annually). Annual preoperative cognitive decline in controls was held constant at 0.32 points. Annual preoperative cognitive decline in CABG patients was set at 0.36 points in Scenario 1 (-0.2 point true harmful effect of CABG), 0.56 points in Scenario 2 (no true effect of CABG), and 0.76 points in Scenario 3 (0.2 point true protective effect of CABG).

**Results:** Conventional analyses suggested surgery increases POCD by a mean of 0.24 points annually (Table 1): correctly identifying the true association in 100% of simulations in Scenario 1, though 0% in Scenarios 2 and 3. By taking into account the difference-in-differences between preoperative cognitive decline and POCD, quasi-experimental models gave highly accurate estimates across all three Scenarios (94-100% correct). Figure 1 illustrates observed and expected POCD in CABG patients in Scenarios 1 and 3 on the basis of preoperative cognitive trajectories and the difference between prior and postoperative periods in the control group. **Conclusions:** This study demonstrates the potential for bias when the effect of CABG on cognitive decline is estimated from rates of POCD without taking into account preoperative cognitive trajectories. Our findings have important implications for other inter-

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**Background:** Previous studies of postoperative cognitive decline (POCD) may have produced biased estimates because they did not take into account preoperative cognitive trajectories. We investigated the accuracy of conventional and quasi-experimental approaches in estimating the effect of coronary artery bypass graft surgery (CABG) on POCD in a Monte Carlo simulation study in which the underlying true effects are known. **Methods:** We simulated outcomes for 500 CABG patients and 500 matched controls with 1,000 datasets for each conventional (ordinary least-squares regression) and quasi-experimental (linear-spline regression) analysis. Cognitive generation was before surgery (years 1, 3, and 5) and after surgery (years 1, 3, and 5) on a 0-35 point scale. Baseline cognition was lower in CABG patients (25.0 [SD=2.0] versus 27.0 [SD=2.0] points) and annual POCD was higher (0.64 versus 0.4 points). Individual variation was introduced into intercepts (within-group SD of 1.41 points) and slopes (SD of 0.05 points annually). Annual preoperative cognitive decline in controls was held constant at 0.32 points. Annual preoperative cognitive decline in CABG patients was set at 0.36 points in Scenario 1 (-0.2 point true harmful effect of CABG), 0.56 points in Scenario 2 (no true effect of CABG), and 0.76 points in Scenario 3 (0.2 point true protective effect of CABG). **Results:** Conventional analyses suggested surgery increases POCD by a mean of 0.24 points annually (Table 1): correctly identifying the true association in 100% of simulations in Scenario 1, though 0% in Scenarios 2 and 3. By taking into account the difference-in-differences between preoperative cognitive decline and POCD, quasi-experimental models gave highly accurate estimates across all three Scenarios (94-100% correct). Figure 1 illustrates observed and expected POCD in CABG patients in Scenarios 1 and 3 on the basis of preoperative cognitive trajectories and the difference between prior and postoperative periods in the control group. **Conclusions:** This study demonstrates the potential for bias when the effect of CABG on cognitive decline is estimated from rates of POCD without taking into account preoperative cognitive trajectories. Our findings have important implications for other inter-

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**O2-13-03** DO SOCIOECONOMIC DISPARITIES EXPLAIN HIGHER DEMENTIA INCIDENCE AMONG BLACK OLDER ADULTS?

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**Figure 1.** Harmful (A) and protective (B) effects of CABG on postoperative cognitive decline depending upon different trajectories of preoperative cognitive decline in CABG patients.