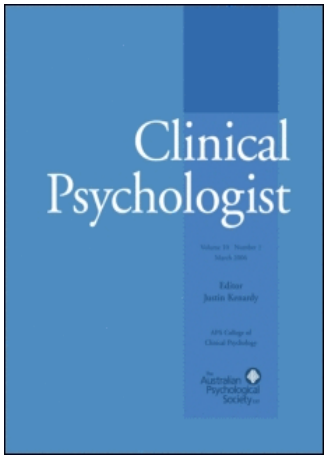

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Social Vulnerability Scale for older adults: Validation study

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Social Vulnerability Scale for older adults: Validation study*

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Abstract

The Social Vulnerability Scale (SVS), an informant-report of social vulnerability for older adults, was piloted in a sample of 167 undergraduate students (63 male, 104 female) from the University of Queensland. Participants aged 18–53 ($M = 25.53$ years, $SD = 7.83$ years) completed the SVS by rating a relative or friend aged $\geq$50 years ($M = 71.65$ years, $SD = 12.49$ years): either someone with memory problems, stroke, dementia, or other neurological condition ($n = 85$); or a healthy older adult ($n = 82$). Excellent internal consistency and test–retest reliability were demonstrated, and the SVS effectively differentiated healthy older adults from those with a neurological condition based on proxy ratings of social vulnerability. The SVS is a potentially useful adjunct measure of older adults' capacity to reside independently.

Keywords: *Aging, assessment, cognitive disorder, memory and cognition, neuropsychology, rehabilitation, social cognition, social vulnerability*

A pervasive stereotype surrounding older people is that they represent easy targets for acts of deception, fraud, and exploitation. This arises from a perception of older adults as frail, dependent, and isolated, and from the notion that cognitive deterioration is an inevitable part of the ageing process. Although older people can be victimised through fraud and deception, old age per se does not predispose a person to exploitation. Rather, the degree of exploitation is in proportion to the vulnerabilities that arise out of the person's physical, cognitive, social, and financial circumstances (Kurrle, Sadler, & Cameron, 1992; Smith, 1999). For example, the cognitive deficits associated with various dementia syndromes can impair the ability to detect or avoid potentially harmful social interactions, placing the older person at elevated risk of exploitation by predatory criminals. In this case, social vulnerability is promoted by the presence of a neurological disorder, and not just advancing age.

The proportion of older people in the community is increasing. In 1998, around 12% of Australia's population was aged $\geq$65 years, and this is expected to double by the year 2051 (Australian Bureau of Statistics, 1999b). In response to this demographic shift, government policy has favoured the expansion of support services for older people who are residing at home rather than in aged-care facilities (Smith, 1999). Indeed, almost 84% of men and 75% of women aged $\geq$80 years continue to reside in the community, as well as around 70% of older adults with moderate and even severe disabilities (Australian Bureau of Statistics, 1999a). The demographics of other industrialised countries such as the United States (Federal Interagency Forum on Aging-Related Statistics, 2004), Canada, and United Kingdom are similar (Gibson, Gregory, & Pandya, 2003). With spiraling costs of aged care, community living for older adults is a worthwhile aim in terms of minimising the economic burden. However, it is essential that individuals who are living independently in the community can do so competently and safely.

While independent living for older people is an important objective, an ethical dilemma arises when a person's competency to make decisions is in question. Society emphasises the ethical principles of autonomy and privacy but, at the same time, seeks to balance these with values of beneficence (achieving

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good) and nonmaleficence (preventing self-harm; Tueth, 2000). When the welfare of a child is at stake, there is a consensus that children are unable to protect themselves, and that intervention by a parent, guardian, or custodian is needed (Tueth, 2000). With children, the principle of nonmaleficence is deemed more important than that of autonomy.

However, when older people are involved, the debate becomes rather more complex. There is little doubt that healthy older adults are capable of making their own decisions, but those who develop physical, emotional, or cognitive impairment raise considerable uncertainty. At what point is the older person with dementia or cognitive impairment no longer capable of functioning safely and independently? At what point should autonomy be relinquished in the interests of harm prevention? In order to make these difficult decisions, a judgment of competency or decisional capacity is required. Nevertheless, to date, there is a lack of consensus regarding a universal and empirically substantiated definition of competency (Baker, Lichtenberg, & Moye, 1998), and the quest to achieve this end has been equated to a ''search for the holy grail'' (Roth, Meisel, & Lidz, 1977, p. 280).

When the decisional capacity of an older adult is called into question, determination of competency is largely based on the person's presentation at a clinical interview, and/or performance on standard neuropsychological tests. However, these assessments predominantly focus on memory and frontal executive tasks. While these tests may be sensitive to pathology in certain regions of the brain, they are relatively insensitive to degeneration in other brain regions that may be involved in social cognition and emotion, such as the orbitofrontal cortex (Gregory et al., 2002; Gregory, Serra-Mestres, & Hodges, 1999; Rahman, Sahakian, Hodges, Rogers, & Robbins, 1999). Damage to orbitofrontal areas can produce marked changes in personality and emotion reactivity, inappropriate affect, lack of insight and initiative, and difficulty with the pragmatics of conversation (Baron-Cohen et al., 1999; Benson & Miller, 1997; Blair & Cipolotti, 2000; Eslinger & Damasio, 1985; Frith & Frith, 1999; Luria, 1980; Stone, 2000). As a result, affected individuals can experience a severe breakdown in everyday social conduct. At the same time, they can continue to perform within the normal range on tests of IQ and executive functioning (Blair & Cipolotti, 2000; Eslinger & Damasio, 1985; Gregory et al., 2002; Happe, Malhi, & Checkley, 2001; Lough, Gregory, & Hodges, 2001). Thus, many traditional cognitive measures represent poor predictors of everyday functioning (Cicerone & Tanenbaum, 1997; Eslinger & Damasio, 1985). Sole reliance on these tests when evaluating competency potentially compromises the utility of the assessment process.

It is encouraging to note that several instruments other than neuropsychological measures have recently been developed to improve the reliability and validity of clinical evaluations of older adults' decisional capacity. These include competency guidelines, structured tools, and clinical vignettes, which have been developed with specific relevance to informed consent (Grisso & Appelbaum, 1991; Janofsky, McCarthy, & Holstein, 1992), consent for medical treatment (Appelbaum & Grisso, 1988; Edelstein, 1999; Grisso & Appelbaum, 1998; Marson, Ingram, Cody, & Harrell, 1995; Marson, McInturff, Hawkins, Bartolucci, & Harrell, 1997), guardianship and conservator arrangements (Anderer, 1997; Edelstein, 1999), and financial capacity (Edelstein, 1999; Marson et al., 2000). A significant advantage of many of these instruments is an attempt to integrate both psychological and legal definitions of competency (Moye, 1996) and, although not routinely used by a majority of physicians at present (Ganzini, Ladislav, Nelson, & Derse, 2003; Grisso, 2003), they offer promise for improving the ecological validity of capacity assessments of older adults in the future. Nevertheless, the issue of social judgement is not addressed by any of these instruments. Although someone may have ''financial competence'' in being able to balance a cheque book, avoiding exploitation also requires social judgement.

Systematic investigations regarding the prevalence of elder exploitation in Australia are limited. Based on information from multiple sources, one study estimated that 4.6% of older Australians are abused or exploited in some form (Kurrle et al., 1992). Similar estimates have been reported in the United States and Canada, with prevalence rates estimated to be 3.2% (Pillemer & Finkelhor, 1988) and 4% (Podnieks, 1990), respectively. Nevertheless, for various reasons, these rates are likely to be underestimates; older people may be reluctant to report offences due to fear of reprisal by the offender, or a threat of institutionalisation (Smith, 1999). Alternatively, people with dementia may be unaware that they have been defrauded or exploited, and may die without the crime ever having been discovered (Smith, 1999). Thus, estimates of the actual extent of elder exploitation are undoubtedly conservative at best. In terms of the nature of exploitive acts, avenues commonly include door-to-door scams, telemarketing fraud, investment fraud, bogus lottery wins requiring an initial payment, and the purchase of unneeded or overpriced home maintenance services (Kemp & Mosqueda, 2005; Lewis, 2001). Irrespective of the method used, all involve a deliberate intent to take advantage of another person for one's own ends.

A potentially important precipitant of exploitation is social vulnerability, which will be defined in this research as *an impaired ability to detect or avoid potentially harmful interpersonal interactions*. At any

age, various factors can promote social vulnerability including changes in social support, a need for social approval, or even underlying personality attributes such as timidity (Greenspan, Loughlin, & Black, 2001). However, the cognitive deficits that commonly result from dementia and stroke such as problems with memory, executive functioning, and social reasoning heighten the risk of exploitation further for older neurological patients.

Memory deficits can interfere with the recall of important information such as previous perpetration by a social predator. Lewis (2001) describes an incident in which an elderly couple, who both had short-term memory impairment, were defrauded by an opportunistic group of career exploiters. The older man and his wife had difficulty remembering details of events in the afternoon that had occurred the same morning. They were approached by three men offering home maintenance services. The men were hired and, despite performing only minimal work, requested and received payment numerous times. Multiple cheques were issued to the men within the same day and, in total, $27,000 was misappropriated from the older couple (Lewis, 2001).

Dysexecutive syndromes can limit the ability to plan and problem-solve, and can therefore also affect vulnerability. Consider an alternative scenario posed by Jacoby (1999) in which the con artist contacts the older person by telephone and converses with them at length to obtain as much personal information as possible. In a subsequent call, the con artist questions the senior regarding information obtained from the first call. If the victim fails to recall the previous conversation, the con artist exploits the memory deficit using a false claim to the effect: ''We received your cheque for $1,000 but the correct amount was $850. Send us a cheque for $850 and we'll return your $1,000 cheque to you.'' Although no cheque for $1,000 had actually been sent, the couple respond to the request out of embarrassment or guilt. Avoiding the scam would simply require terminating the call, or generating an alternative solution such as making the issue of a replacement cheque conditional upon the original cheque being returned (Jacoby, 1999). However, cognitive deficits in executive functioning can potentially compromise the generation of even such simple solutions.

Similarly, cognitive deficits in social intelligence can limit a person's ability to make inferences about the thoughts, beliefs, and intentions of others in order to understand and predict their behaviour (Baron-Cohen, 1995; Leslie, 1987; Premack & Woodruff, 1978), and can thereby also affect social vulnerability. Such deficits can compromise the person's capacity to recognise potentially deceitful or harmful social exchanges (Stone, Cosmides, Tooby, Kroll, & Knight, 2002), for example, those initiated by the con artists in the preceding scenarios. Thus, cognitive deficits in memory, executive functioning, or social intelligence can each cultivate social vulnerability but in different ways. Accordingly, cognitive impairment has been identified as a major risk factor for elder exploitation (Cripps, 1999; Lachs & Pillemer, 1995; Pillemer & Finkelhor, 1988; Podnieks, 1992).

With this in mind, assessing specific behaviours in everyday life that represent potential markers of vulnerability, for example, the ease with which a person can be coerced, ripped off, or deceived, could help identify circumstances under which he or she may be most at risk. This would be particularly prudent for older people with dementia or cognitive impairment. In turn, increased vigilance on the part of family members, friends, and neighbours could aid in preventing exploitation by reducing the opportunities for predatory criminals to carry out exploitive acts. In addition, evidence of social vulnerability may provide an early indicator of cognitive deterioration or a developing dementia, particularly when it represents a change from previous functioning. At present, early stage dementia can be exceedingly difficult to detect using standard cognitive tests (Gregory et al., 2002; Guarch, Marcos, Salamero, & Blesa, 2004; Lough et al., 2001; Spaan, Raaijmakers, & Jonker, 2005; Walker, Meares, Sachdev, & Brodaty, 2005). A high score on a measure of social vulnerability could assist within the diagnostic process.

To recap, the capacity of older neurological patients to live independently has generally been inferred using either nonstandard, non-empirically validated standards of clinical judgment, or standard cognitive tests conducted in a clinical environment. Although a neuropsychological work-up is an important part of any competency assessment, the process of extrapolating functional ability from cognitive test scores is largely inferential in nature. Cognitive tests are also insensitive to damage in certain neurological regions, such as orbitofrontal cortex. For both of these reasons, standard neuropsychological tests may be relatively poor predictors of everyday functioning. Supplementary information regarding the person's everyday behaviour is likely to improve the validity of assessment beyond that achieved by cognitive tests alone. Accordingly, the purpose of this study was to develop and psychometrically evaluate an instrument to assess social vulnerability in older adults based on everyday behaviour.

Due to the fact that certain neurological conditions can compromise a person's insight into his or her own behaviour (e.g., McKhann et al., 2001; Miller et al., 2001; Rankin, Baldwin, Pace-Savitsky, Kramer, & Miller, 2004; Stuss, Picton, & Alexander,

2001), the Social Vulnerability Scale (SVS) was designed for completion by an informant. Unlike clinicians, who have only limited contact with the patient, relatives, friends, and carers are in an ideal position to observe the person in a variety of contexts. They therefore constitute an important source of information.

In validating the SVS, two hypotheses are advanced. First, because vulnerability in later life is not necessarily an evitable part of the ageing process but is in proportion to the vulnerabilities that arise out of the individual's own circumstances (Kurrle et al., 1992), it is hypothesised that social vulnerability in healthy older adults will not be related to advancing age. In contrast, because cognitive impairment has been identified as a major risk factor for elder exploitation (Cripps, 1999; Lachs & Pillemer, 1995; Pillemer & Finkelhor, 1988; Podnieks, 1992), it is hypothesised that the presence of a neurological disorder will predict social vulnerability in older adults.

Methods

Participants

A sample of 167 undergraduate students (63 male, 104 female) from the University of Queensland participated in this study. Participants were aged between 18 and 53 years ($M = 25.07$ years, $SD = 7.83$ years), and acted in the capacity of informants by rating the social vulnerability of another person aged $\geq$50 years with whom they were well acquainted. To ensure that the sample was more representative of the SVS target population (i.e., older neurological patients), participants were asked to rate a person with memory problems, stroke, dementia, or other neurological disorder if they knew such a person well ($n = 85$). If they were not well acquainted with such a person, they were asked to rate a healthy older adult ($n = 82$). Independent contact was not made with the subjects who were rated. Thus, we were unable to verify the diagnostic category nominated by informants or the presence of cognitive impairment, and relied solely on reports by proxy for this information.

Demographic features of participants (informants) and the subjects they rated appear in Table I. On average, there were no significant differences in age between informants who rated a healthy older adult ($M = 26.00$ years, $SD = 8.17$ years) and those who rated a person with a neurological condition ($M = 25.05$ years, $SD = 7.53$ years), $p > .05$. However, subjects with a neurological condition ($M = 74.95$ years, $SD = 11.58$ years) were significantly older than healthy subjects ($M = 68.22$ years, $SD = 12.54$ years), $t(165) = 3.61$, $p < .01$ and, on average, had less frequent interpersonal contact with their respective informants, $t(165) = 4.00$, $p < .01$. In subsequent analyses, appropriate statistical techniques were used to control for these differences.

Table I. Demographic features of participants (informants) and subjects

	Neurological group ($n = 85$)		Control group ($n = 82$)	
Participant (Informant)				
Sex	Male	Female	Male	Female
	35	50	28	54
	M	*SD*	*M*	*SD*
Age (years)	25.05	7.53	26.00	8.17
Relation of subject (*n*)				
Grandmother	36		14	
Grandfather	17		7	
Mother	9		25	
Father	5		23	
Other	18		13	
	M	*SD*	*M*	*SD*
Contact days/month	6.49	8.51	13.11	12.19
Years acquainted	22.04	8.93	22.04	8.18
Subject				
Sex (*n*)	Male	Female	Male	Female
	30	55	39	43
	M	*SD*	*M*	*SD*
Age (years)	74.95	11.58	68.22	12.54
Diagnosis/symptom (*n*)				
Memory problems	31			
Stroke	21			
Alzheimer's disease	12			
Other dementia	16			
Other	5			

Materials

Development of the Social Vulnerability Scale. The SVS was based on an existing 18-item measure for assessing what might otherwise be referred to as ''gullibility'' in everyday language (Greenspan & Stone, 2002). The original measure was designed for use with patients diagnosed with mental retardation and autism but was adapted in this research for use specifically with older adults. To achieve this aim, several original scale items were removed, some items were modified, and several new items were added. For example, the items ''Cannot be tricked into doing things others can laugh at'' and ''Can be tricked easily into giving sexual behaviours or favours'' were judged to be more applicable to children and younger adults, and were therefore eliminated.

In an effort to enhance construct validity, the wording of some original items was modified. For example, a low score on the item ''(S)he is difficult to deceive'' could simply describe a person who is

excessively trusting. Modifying the item to ''Has been deceived by someone who has deceived him/her before'' indicates that the person has failed to learn from previous experience and, thus, is more likely to be gullible than just trusting. Specific regard was also given to the clarity of items. For example, in the item ''Believes everything (s)he reads e.g., in newspapers, magazines, books, advertisements'', the source of the material was specified for clarification.

In addition, the original scale was extended by generating several new items. Careful consideration was given to the wording of the new items, and to the context of situations that older adults might ordinarily encounter. Owing to the fact that financial exploitation may be one of the most common forms of elder abuse (Lewis, 2001; Podnieks, 1992), six new items of a financial nature were added such as ''How often has (s)he been persuaded to purchase unneeded products or services e.g., things (s)he already owns or can't use?'' and ''How often has (s)he been taken in by postal scams e.g., prize draws or sweepstakes requiring an initial purchase or cash outlay?''. Based on literature searches, a further seven items applicable to various other situations that older adults might encounter, and which involve potentially harmful interactions, were generated. Examples of these items include ''. . . has been tricked into taking the blame for something (s)he didn't do'' and ''. . . believes rumours that come from a questionable source''. In total, 28 items were included in the pilot version of the scale.

As mentioned in a preceding paragraph, the SVS was designed as an informant-based behaviour rating scale due to the fact that certain neurological disorders are associated with impaired self-insight (e.g., McKhann et al., 2001; Miller et al., 2001; Rankin et al., 2004; Stuss et al., 2001). Nevertheless, the reliability of informant measures can also be limited by certain rating biases. In an effort to minimise such biases and reduce the ambiguity of scale, examples of overt behaviours or vulnerable outcomes were included wherever possible, although the distinction between overt behaviours and cognitions was subtle in some items.

Scoring of the SVS is based on a 5-point Likert-type scale corresponding to the frequency with which the subject exhibits the behaviour of interest, where $0 = never$, $1 = rarely$, $2 = sometimes$, $3 = often$, and $4 = always$. Thus, higher scores on most items indicate greater social vulnerability, although four of the items were reverse-scored. Items were pitched at an average adult reading level. Prior to administering the SVS to a development sample, two independent colleagues reviewed the instrument for adequate and appropriate content. Only minor alterations were suggested to the wording and/or reverse-scoring of some items.

Design and procedure

This study used a non-experimental, known-groups design to psychometrically evaluate the SVS and its scale items. Participants completed the SVS in the capacity of informants by rating the behaviour of another person aged $\geq$50 years who they knew well. If they were well acquainted with someone with memory problems, a dementia, stroke, or other neurological problem, they were asked to rate that person, otherwise they were asked to rate a healthy older adult.

Participants were given a brief description of the study, advised that their participation was voluntary, and that they would remain anonymous at all times. In addition to the 28 SVS items, information was obtained from participants regarding their own and the subject's gender, their relation to the subject, how many years they have known the subject, contact days per month, subject's age, and neurological condition (e.g., stroke, Alzheimer's etc.) if they knew it. On completion of the SVS, they were debriefed regarding the aims of the study. A separate small group of participants ($n = 14$) had volunteered for an independent concurrent study at the University of Queensland and, as part of that study, were required to return after 1 week for a second testing session. During both sessions, they completed the SVS for test–retest evaluation purposes. The subjects who were rated by this group were all healthy older adults.

Results

Data were analysed using SPSS (version 11.5.0), and the probability of a Type I error was maintained at .05 for all analyses. There were no missing data.

Properties of the scale

Item correlations. An inspection of the correlation matrix revealed moderate to high intercorrelations between the majority of scale items, indicating that most items were related but not redundant. Exceptions to this were each of the four reverse-scored items, and two other items that were uncorrelated with around half of the remaining items. Of the correlations that were statistically significant, the majority were relatively modest. A post hoc examination of the wording of these items indicated that they may relate more to superstition than to social vulnerability per se and, thus, were more likely to be tapping a different underlying factor. Nevertheless, because a factor analysis was not conducted, this remains speculative. The reverse-scored items generally correlated positively with each other and negatively with other scale items. However, these relationships were neither strong nor consistent.

The wording of these items was relatively straightforward and unambiguous, so it is unlikely that respondents found them difficult to understand. Rather, the items may have been assessing a different underlying factor or factors. Thus, changing the scoring direction would potentially achieve little in psychometric terms.

Individual SVS item variances were examined and were generally low, with an overall mean of .81 for the 28-item scale. Accordingly, distributions for most items were significantly skewed and kurtosed. Although higher variances would be desirable, the scale was developed to use with neurological patients and assesses behaviours that depart from normal functioning, so healthy adults will tend to score nearer to floor level. When the groups were examined separately, individual item variances were higher for neurological ($M = .91$) versus healthy subjects ($M = .62$). The relatively small pilot sample and infrequent nature of behaviours assessed by some items are also likely to have suppressed item variances.

Reliability

Internal consistency. Using Cronbach's alpha, internal consistency of the 28-item SVS was .88. To examine the effect of individual items on the reliability coefficient, item–total correlations were calculated. To prevent artificial inflation of the correlation coefficient, the corrected item–total correlation was used. This represents the correlation of each item with all other scale items excluding itself, and thereby avoids the spurious effect of a part–whole correlation (Cohen & Cohen, 1975).

Given that no universal standard for determining item–total correlation cut-offs exists (Doll & Torkzadeh, 1988), an arbitrary value of .40 for item retention was assigned because this has been used in other research (e.g., Ista, van Dijk, Tibboel, & de Hoog, 2005). Six items placed well below this cut-off. Because these items also obtained poor inter-item correlations, and suppressed the value of alpha, they were eliminated. A resulting increase in alpha from .88 to .92 for the remaining 22 items indicates unidimensionality of the scale. To strengthen this claim, a factor analysis would be required. However, because the SVS was designed as a behaviour checklist, and because it is relatively high in face validity, investigation of the underlying latent variables was of less interest, and a factor analysis was not performed in this study.

Test–retest reliability. The stability of the SVS was assessed in a small subsample of participants ($n = 14$) who were tested 1 week apart. A Pearson's product moment correlation of .87 ($p < .01$) indicated that SVS scores remained relatively stable following a 1-week interval.

Validity: Effects of age and neurological impairment on social vulnerability

Effect of age. To assess whether SVS scores are indexed by advancing age independent of cognitive impairment, a standard bivariate regression analysis was performed using only the data from healthy subjects ($n = 82$), with age as the predictor and informant-rated social vulnerability scores as the criterion. Using the modified 22-item version of the SVS, results of an evaluation of the assumptions of normality, linearity, and homoscedasticity of residuals were all satisfactory, and no univariate or multivariate outliers were present in the data. With a criterion of $z = 3$, neither of the variables was significantly skewed or kurtosed, and there was no evidence of singularity or multicollinearity. The assumption of independence of successive observations was assessed using Durbin–Watson statistics for the autocorrelation of errors and, with a value of 1.52, independence was assumed.

When subject age was regressed on social vulnerability scores, R for regression was not significantly different from zero, $F(1, 80) = .13$, $p > .05$. Thus, subject age did not provide a significant contribution to predicting social vulnerability scores in healthy older adults, $\beta = .04$, $t(80) = -.36$, $p > .05$. This finding indicates that, in the apparent absence of cognitive impairment, advancing age alone is not necessarily associated with greater social vulnerability, at least insofar as vulnerability is quantifiable using the SVS. This finding also challenges traditional stereotypes, which portray old age as a period of inevitable decline and vulnerability even in the absence of cognitive impairment.

Effect of neurological impairment. Following on from the previous analysis, which indicated that age was not related to social vulnerability in healthy older adults, the impact of neurological impairment on vulnerability was assessed. Mean social vulnerability scores for each of the healthy and neurological groups were plotted and appear in Figure 1.

As shown in Figure 1, informants rated subjects with Alzheimer's disease as being highest in social vulnerability ($M = 29.25$, $SD = 15.38$), while healthy older adults were rated as being the least socially vulnerable ($M = 15.88$, $SD = 9.33$). Nevertheless, because the diagnostic category of subjects with a neurological condition was not independently verified in this study, group differences in vulnerability were assessed after the data for all subjects with a neurological condition were collapsed into a single group (mean for collapsed group = 24.81, $SD = 12.49$). Even when the data for neurological subjects were pooled, healthy subjects were still considerably less vulnerable than the average of subjects with a neurological condition.

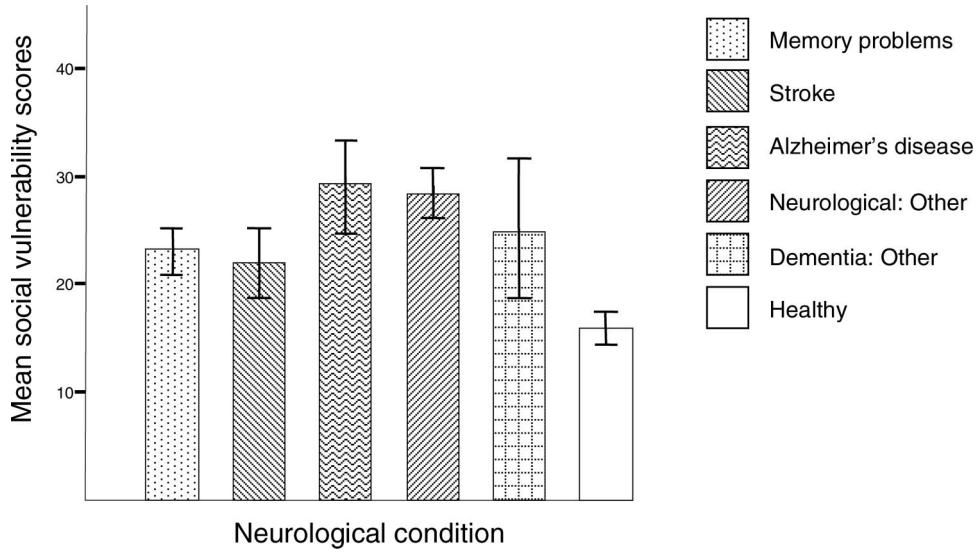

Figure 1. Mean social vulnerability scores for each subject group. Error bars indicate ± 1 SE of the mean.

Some limitations in these data should be noted. Healthy subjects ($M = 68.22$ years, $SD = 12.54$ years) were significantly younger than neurological subjects ($M = 74.95$ years, $SD = 11.58$ years), $t(165) = -3.61$, $p < .01$. On average, the healthy subjects also had more frequent interpersonal contact with their respective informants, $t(165) = 4.00$, $p < .01$. Owing to the fact that subject age and familiarity with the informant could potentially bias informants' perceptions of vulnerability, group differences were examined after controlling for these factors. Thus, differences in social vulnerability between neurological patients and healthy adults were examined after running subject age and contact frequency as covariates.

A one-way fixed-effects analysis of covariance (ANCOVA) was conducted with subject group (healthy vs. neurological condition) as the independent variable, social vulnerability scores as the dependent variable, and subject age and contact days per month with the participant as covariates. Results of an evaluation of the assumptions of linearity, homogeneity of regression slopes, and reliability of covariates were all satisfactory, and no outliers were present in the data. However, a significant Levene's test value indicated violation of the assumption of homogeneity of variances in social vulnerability between the groups, $F(1, 165) = 7.31$, $p < .01$. With a criterion of $z = 3$, this variable was also significantly, positively skewed overall, although less severe when the distributions for healthy subjects and neurological subjects were examined separately. Nevertheless, neither skewness nor heterogeneity of distributions was significant following a square-root transformation of the variable, so all subsequent analyses were performed on transformed social vulnerability scores.

The relationship between the covariate, subject age, and transformed social vulnerability scores was not significant, $F(1, 163) = .85$, $p > .05$. Similarly the relationship between frequency of contact and transformed social vulnerability was not significant, $F(1, 163) = .73$, $p > .05$. After adjusting for the two covariates, marginal mean scores for informant-rated social vulnerability were significantly higher for subjects with a neurological condition ($M = 23.19$) than for healthy subjects ($M = 14.23$), $F(1, 164) = 24.22$, $p < .001$, $\eta^2 = .13$. It should be acknowledged that assignment to groups was necessarily nonrandom, and analyses were performed on transformed social vulnerability scores. Nevertheless, these results indicate that the SVS may be effective in differentiating healthy older adults from those with a neurological condition in terms of proxy-rated social vulnerability, even after subject age and frequency of contact with the informant are taken into account.

Discussion

The present findings provide preliminary support for the SVS as a useful and psychometrically sound instrument for use with older adults. The measure is brief, easy to administer and score, places little burden on respondents, and demonstrated excellent internal consistency and test–retest reliability in this study. In addition, it was effective in differentiating healthy older adults from those with a neurological condition based on informant-rated social vulnerability and informant reports of neurological disorders. This result suggests that, on average, older people with memory impairment or a neurological condition are viewed by others as being significantly more vulnerable.

Various factors could account for this finding. The cognitive deficits associated with different neurological conditions (e.g., memory impairment, dysexecutive syndromes, and social intelligence deficits), and corresponding deterioration in different neuroanatomical regions could each contribute to social vulnerability. For example, the memory deficits that typify Alzheimer's disease due to deterioration in hippocampal and medial–temporal regions of the brain (Laakso, 2002) could impede the recall of a previous fraudulent or deceitful act committed by a con artist or social predator. Executive deficits, which commonly accompany vascular dementia when strokes affect cortical and subcortical circuits in dorsolateral prefrontal regions (Pohjasvaara, Mäntylä, Ylikoski, Kaste, & Erkinjuntti, 2003), could impede a person's ability to generate even a simple plan to avoid manipulation, for example, by an aggressive door-to-door marketer.

Alternatively, deterioration in cortical and subcortical circuits affecting orbitofrontal neurological regions, typically associated with a variant of frontotemporal dementia, can limit a person's ability to make inferences about the thoughts, beliefs, and intentions of other people (Gregory et al., 2002). In turn, such deficits in social reasoning can compromise the capacity to recognise potentially deceitful social exchanges (Stone et al., 2002). Thus, deficits in various cognitive domains could have contributed to the higher social vulnerability scores observed in the neurological group in this study.

In addition to cognitive deficits, the personality changes associated with neurological disorders such as frontotemporal dementia (e.g., Gregory et al., 2002; Hill, Kim, & Faber, 2003; Mychack, Rosen, & Miller, 2001; Rankin, Baldwin, Pace-Savitsky, Kramer, & Miller, 2005; Rankin, Kramer, Mychack, & Miller, 2003), vascular dementia (e.g., Golden & Golden, 2003; Verhey, Ponds, Rozendaal, & Jolles, 1995), and Alzheimer's disease (e.g., Bozzola, Gorelick, & Freels, 1992; Chatterjee, Strauss, Smyth, & Whitehouse, 1992; Petry, Cummings, Hill, & Shapira, 1988; Rubin, Morris, & Berg, 1987; Siegler, Dawson, & Welsh, 1994; Siegler et al., 1991; Strauss & Pasupathi, 1994) could also influence informants' perceptions of social vulnerability. For example, the onset of Alzheimer's disease has been associated with increased anxiety, and reduced sociability, openness, conscientiousness (Chatterjee et al., 1992; Siegler et al., 1991), and extraversion (Strauss & Pasupathi, 1994). Reduced expression of traits such as extraversion reflects a decrease in both positive emotionality (Larsen & Ketelaar, 1991) and socially adaptive behaviour (Strauss & Pasupathi, 1994), while reduced conscientiousness implies decreased cognitive capabilities (Strauss & Pasupathi, 1994). It therefore stands to reason that any of these changes in personality could influence others' perceptions of a subject's social vulnerability.

Equally, however, although a significant difference in rated social vulnerability scores was found between neurological patients and healthy older adults in this study, this finding does not indisputably confirm that older neurological patients are actually more socially vulnerable than healthy adults. Several rating biases could have factored in the results. For example, within a medical decision-making context, there is evidence to suggest that health-care practitioners will tend to rate the capacity of the patient as low across the board if that patient has been diagnosed with a neurological condition (Ganzini et al., 2003). This is despite the fact that a variety of cognitive functions may still be intact (Ganzini et al., 2003). Furthermore, judgments of capacity can be biased by negative feelings about the patient, regardless of actual capacity (Ganzini et al., 2003). It is therefore possible that the significant group difference in social vulnerability scores observed in this study could reflect a similar rating bias on the part of relatives and friends. Future research can clarify this issue by comparing the scale with objective data such as instances of exploitation. We note, however, that gathering data on instances of exploitation for people with dementia will depend, in many cases, on reports by informants. Nonetheless, this study represents an important empirical foundation on which future research can build.

An additional finding from this study was that advancing age was not associated with greater social vulnerability in healthy adults. This outcome challenges stereotypical images of ageing as linked with inevitable decline. It appears that as someone gets older, but remains intact neurologically, they do not necessarily experience greater vulnerability or exploitation.

Additional research is needed to validate the SVS further, for example, by assessing how effectively it predicts other measures of financial or social competence. More rigorous tests of the instrument's convergent, discriminant, concurrent, and predictive validities are also needed using larger, heterogeneous, and cross-cultural samples.

Several methodological limitations are evident in this research, and should be recognised. Owing to the fact that a convenience sample was used, participants (informants) self-selected into groups based on the diagnostic category of the subject they rated. Because of the methodology and procedures used, we were unable to obtain independent confirmation of subjects' neurological conditions and, instead, relied on the accuracy of informant reports. In order to draw more direct inferences between neurological condition and social vulnerability in

future research, independent confirmation of diagnosis should be obtained. In addition, although group differences in frequency of contact and subject age were controlled for in this study, these differences present a further potential limitation, and the present findings should be interpreted in context.

With regard to future research using the SVS, one further cautionary note is necessary: elder exploitation is commonly committed by a relative or carer (Choi, Kulick, & Mayer, 1999; Kurrle et al., 1992; Podnieks, 1992), potentially the same person who would be approached to complete the SVS. When the informant is also the perpetrator, he or she would be unlikely to complete the scale accurately. In all cases, but particularly if this situation is suspected, it would be prudent to seek additional information from multiple sources regarding the patient's behaviour, financial situation, living arrangements, and personal relationships.

Because autonomy and privacy are valued in our society, detection and intervention strategies to address exploitation of older adults are yet to be fully embraced. There is little research in this area, and evidence-based criteria for clinicians to use in assessing competency are largely lacking. This is despite the fact that exploitive acts can result in devastating consequences of both an emotional and financial nature. The SVS opens up new and important avenues for assessing skills for independent living, and may prove particularly useful for distinguishing older people who are at increased risk of exploitation in its various forms. Applications of the SVS could span routine mental health services, advocacy, competency, and guardianship issues. Future studies using the SVS could also provide an important contribution to the current paucity of literature on the social vulnerability of older adults.

In legal cases concerning guardianship and competency, courts and lawmakers have expressed a preference for competency judgments that are closely linked to particular skills (Willis, 1996). The need for a fiscal conservator or guardian, however, is typically grounded not in a concern that an impaired individual lacks the arithmetic skills to balance a cheque book (although that may be a consideration), but that he or she lacks the social judgment to see through and fend off those who would coerce him or her into writing a cheque (or signing a deed, etc.). A comprehensive review by Moye (2003) of forensic measures used in guardianship evaluations shows that considerably more emphasis is placed on arithmetic skills than on social skills. With respect to assessing geriatric patients, there has been a tendency to borrow from the various measures of ''adaptive behaviour'' that have been developed to aid in the diagnosis of mental retardation. One of us (Greenspan, 1999) has written extensively about adaptive behaviour, and such measures are generally quite inadequate as a guide to determining social incompetence. For example, they contain much emphasis on sociability (amount of socialising) and socioemotional stability (presence or absence of mental illness), but little or no emphasis on social intelligence and judgment of intentions. Furthermore, with respect to social vulnerability (the implicit reason why guardians are often sought, particularly in handling one's finances), this domain is simply not mentioned explicitly in any adaptive behaviour or guardianship assessment protocols.

Exploitation of older adults often remains hidden. Increased vigilance by relatives, health-care practitioners, and the community at large may help identify vulnerable people earlier to promote safer living for our expanding older population. Advancing age alone is not a predisposing factor for exploitation, and the data from this study support this conclusion. However, for older people who are vulnerable due to physical or psychological impairment, financial insecurity, or social isolation, it is reasonable and, indeed, imperative to ensure that victimisation and predatory crime do not compound these existing difficulties. The consequences of exploitive acts against older people can be devastating, so it is vital to detect or prevent such acts wherever possible. The SVS has been designed to assess older adults' social vulnerability, which may be an important precipitant of exploitation. Thus, the SVS may be a useful instrument for identifying older people who are at elevated risk of social and/or financial exploitation.

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