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Can the Mini-Mental State Examination Predict Capacity to Consent to Treatment?

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Abstract. This study aims to examine the relationship between capacity to consent to treatment as measured with the MacArthur competence assessment tool for treatment (MacCAT-T) and severity of cognitive impairment as measured with the Mini-Mental State Examination (MMSE), as well as the role of verbal retrieval in this relationship. We hypothesized that the often-quoted correlation between the MacCAT-T and the MMSE is due mainly to joint dependence on verbal retrieval ability. Potential subjects were recruited from

memory clinics, senior citizen meeting places, and a university program for seniors. Data of 149 people aged over 54, of whom 49 were diagnosed with Alzheimer's disease or mixed dementia, were used. The relationship between capacity to consent to treatment, verbal retrieval, and MMSE was examined using a structural equation modeling framework. The findings suggest that verbal retrieval is a confounding method factor. In the informed consent process for people with dementia, verbal memory loads should be minimized to provide a more valid measure of their capacity to consent to treatment.

Keywords: dementia, capacity, informed consent, MMSE, verbal retrieval

Introduction

The assessment of capacity to consent to treatment is a challenge that physicians have to face several times a day. Medical treatment without legally valid informed consent constitutes bodily harm (German law: § 228, StGB; § 630d, BGB). In order to provide legally valid informed consent, the individual concerned must have the capacity to consent to the treatment in question. However, when several physicians assess the capacity to consent of an Alzheimer's disease (AD) patient to one and the same treatment, the level of agreement is no greater than random (56 %; Marson, McInturff, Hawkins, Bartolucci, & Harrell, 1997).

Reliability of standardized tests

To enhance the reliability of capacity judgments, some standardized tests have been designed, of which the MacArthur Competence Assessment Tool-Treatment (MacCAT-T) is the most widely used (Appelbaum, 2007). However, even studies that use standardized tests report very different results with respect to the relationship between capacity to consent to treatment and the severity of cognitive impairment. While Moye, Karel, Azar, & Gurrera (2004) report that on the basis of measurements made using the MacCAT-T, 85.4 % of

participants with mild dementia and 48.7 % of participants with moderate dementia performed within normal limits, other studies report that capacity to consent was already questionable in participants with even mild dementia (Etchells et al., 1999; Karlawish, Casarett, James, Xie, & Kim, 2005), or even mild cognitive impairment (Pruchno, Smyer, Rose, Hartman-Stein, & Henderson-Laribee, 1995). In these examples, Karlawish et al. (2005) used a modified version of the MacCAT-T; Etchells et al. (1999) used the self-constructed Aid to Capacity Evaluation; Pruchno et al. (1995) used Edelstein's (1993) Hopemont Capacity Assessment Inventory, and Grisso and Appelbaum's (1991) Understanding of Treatment Disclosure.

Nevertheless, the use of standardized tests has been shown to improve the inter-rater reliability of capacity assessment, and the inter-rater reliability of the instruments we quote in this paper is fair to good (American Bar Association/American Psychological Association Assessment of Capacity in Older Adults Project Working Group, 2008). However, standardized tests are time-consuming and a challenge for everyday clinical practice, where time is short.

Mini-mental state examination as a screening instrument for capacity to consent

Hence, reports that capacity to consent to treatment can be predicted on the basis of the Mini-Mental State Examination (MMSE; Folstein, Folstein, & McHugh, 1975), a screening instrument which can be used in only 10 minutes, have met with considerable interest among practitioners (e.g. Felnhofer, Kothgassner, & Kryspin-Exner, 2013; Karlawish et al., 2005). Although the authors of these studies stress that the MMSE cannot be used as a substitute for a full capacity assessment, they propose cut-off scores to indicate an increased likelihood of being capable or incapable of providing informed consent. These cut-off scores vary between studies. While Karlawish et al. (2005) report that MMSE scores of below 19 are unlikely to indicate that many capable persons are incapable, Felnhofer et al. (2013) recommend a cut-off score of below 23. Felnhofer et al. (2013) convincingly explain how this

discrepancy might have come about (for more information see ibidem, p. 271, 273). However, we would like to extend the discussion to include one important difference between the two studies: while Karlawish et al. (2005) use structured procedures and provide written materials to the participants to use during the assessment of their capacity to consent, Felnhofer et al. (2013) do not. Although written materials are not often used in clinical practice, this approach makes it possible "to better assess understanding as comprehension rather than mere short-term memory" (Karlawish et al., 2005, p. 1515).

Verbal (memory) loads in standardized capacity assessments and the MMSE

Providing written materials as a memory aid makes sense in the light of other studies that report a strong association between capacity to consent to treatment measured with the MacCAT-T and verbal abilities (e.g. Dymek, Marson, & Harrell, 1999; Gurrera, Moye, Karel, Azar, & Armesto, 2006; Marson, Chatterjee, Ingram, & Harrell, 1996; Moye & Marson, 2007). Gurrera et al. (2006) report that verbal retrieval (represented by measures of immediate and delayed verbal memory, and naming) was the strongest single predictor of decisional ability, as measured using three standardized instruments (MacCAT-T; Hopemont Capacity Assessment Interview; Capacity to Consent to Treatment Interview). Their interpretation of the results was that: "This may reflect the fact that all of these instruments present information in an exclusively verbal format, and so draw heavily upon verbal information processing mechanisms, including retrieval; or it may be that decision-making is an intrinsically verbal process." (p. 1371)

Gurrera et al.'s (2006) first point interprets the high association of capacity to consent to treatment with verbal retrieval as a method effect; the second point sees verbal retrieval capabilities as indicative of the capacity to consent construct. The first interpretation of Gurrera et al. (2006) leads to the conclusion that people with dementia are disadvantaged in standardized capacity assessments, because verbal abilities are significantly impaired in most

dementias, e.g. AD, Frontotemporal dementia, primary progressive aphasia (Roudier, Marcie, Grancher, Tzortzis, Starkstein, & Boller, 1998). In this context, Bayles (2003) concludes that language comprehension and expression rely on working memory, and people with AD therefore perform poorer than people without AD on communication tasks. Bayles (2003) reckons clinicians may improve communicative function by using techniques that reduce encoding, storage, and retrieval demands and thereby promote comprehension and the expression of linguistic information among AD patients.

Both the MMSE and the MacCAT-T present information in an exclusively verbal format, and require complex verbal information processing, including retrieval from the subject. During an examination with the MMSE, the subject must analyze each test item and retain it in his or her working memory in order to answer the question or execute the task; hence each item indirectly requires immediate verbal retrieval. Two categories of the MMSE (registration and recall) can explicitly be interpreted as immediate or delayed verbal retrieval (see Figure 1). In the registration task, the rater names three words, and the subject is asked to repeat them immediately. For the recall task, the subject is asked to recall the three words after a delay during which he is given a distraction task.

MMSE

- registration
- recall *

- orientation to place
- orientation to time
- attention and concentration
- language
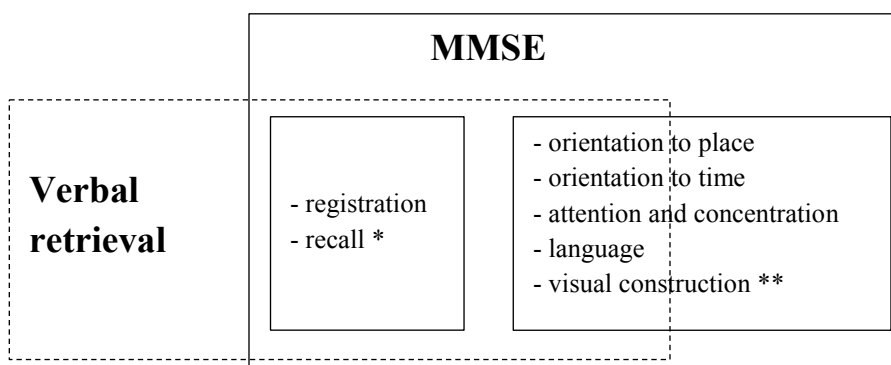- visual construction **

Verbal retrieval

Figure 1. The MMSE consists of seven categories. The MMSE subscales registration and recall explicitly refer to verbal retrieval. The MMSE subscales orientation to place,

orientation to time, attention and concentration, language, and visual construction only implicitly demand verbal retrieval.

The MacCAT-T demands verbal retrieval from the subject, especially on the understanding subscale (knowing the disease and the meaning of the treatment's benefits, risks, and purpose). But the appreciation (recognizing how treatment risks and benefits apply to the person), reasoning (comparing the options of taking vs not taking the treatment and describing personal consequences of the treatment to the person), and making a choice (deciding whether to take the treatment) subscales also require the subject to consciously retain a large quantity of information. It should be noted, that under German Law verbal retrieval is not a criterion for capacity to consent.

Objective of the study and hypotheses

The aim of this study was to examine the relationship between capacity to consent to treatment, as measured with the MacCAT-T, and the severity of cognitive impairment, as measured with the MMSE, as well as the role of verbal retrieval in this relationship. We hypothesized that verbal retrieval is a confounding variable in the association of the MacCAT-T and the MMSE, and that the often-quoted correlation of both measures is mainly due to their joint reliance on verbal retrieval ability. Cross-sectional memory clinic data and regression analysis with latent variables were used to examine the relationship between the MacCAT-T, verbal retrieval, and the MMSE. MMSE scores were statistically controlled for differences in individuals' verbal retrieval abilities to evaluate the remaining predictive value for capacity to consent, as measured with the MacCAT-T. Should verbal retrieval be a key factor in the association of standardized capacity to consent measures with MMSE, it would clearly indicate the need for an enhanced consent procedure that facilitates verbal retrieval, or uses different methods of representation and communication.

The study reported here is part of the comprehensive research project EmMa, which aims to enable people with dementia to benefit from their right to self-determination as much as possible.

Method

Subjects

The sample consisted of 149 persons: 90 women and 59 men, who were all native German speakers. Mean age was 70.5 ± 7.7 (54-91) years, 30.2 % had been to school for eight years, 26.2 % for nine to ten years, 42.2 % for more than 11 years, and 1.3 % did not provide information on their school education. 100 participants were cognitively unimpaired, and 49 suffered from dementia.

Participants with dementia were diagnosed using the standard ICD-10 and NINCDS/ADRDA criteria. Routine diagnostics included neuroimaging (magnetic resonance imaging, computer tomography and positron emission tomography), routine laboratory parameters, neuropsychological test examinations and further examinations such as lumbar puncture, as medically indicated. Among the participants with dementia, 29 were diagnosed with AD, and 20 were diagnosed with mixed dementia (MD). Table 1 summarizes the demographic characteristics and cognitive performance of people with and without dementia who participated in this study.

Table 1

Characteristics of people with and without dementia.

	Participants with dementia,	Participants without dementia,

	n = 49	n = 100	
Sex			
Female	34 (69.4 %)	56 (56 %)	
Male	15 (30.6 %)	44 (44 %)	$P^* = .15$, n.s.
Age (years)	76.8 ± 7.0 (58-91)	67.4 ± 6.0 (54-84)	$t (1, 147) = 1.58, p < 0.001$
Education (years)	9.7 ± 3.2 (8-17)	13.1 ± 3.5 (8-17)	$t (1, 145) = 10.42, p < 0.001$
MMSE	21.19 ± 3.34 (13-28)	29.1 ± 1.1 (26-30)	$t (1, 145) = 15.99, p < .001$
Word List Memory	9.27 ± 3.25 (0-18)	21.63 ± 4.09 (12-30)	$t (1, 145) = 19.82, p < .001$
Word List Recall	1.19 ± 1.48 (0-5)	7.55 ± 1.80 (3-10)	$t (1, 144) = 22.54, p < .001$
Boston Naming Test	11.23 ± 3.11 (1-15)	14.52 ± .95 (9-15)	$t (1, 145) = 7.16, p < .001$
Understanding	2.97 ± 1.34 (.25-6)	5.68 ± .48 (3.25-6)	$t (1, 146) = 13.71, p < .001$
Appreciation	3.04 ± 1.04 (0-4)	3.93 ± .29 (2-4)	$t (1, 147) = 5.87, p < .001$
Reasoning	4.62 ± 2.50 (0-8)	7.64 ± .84 (4-8)	$t (1, 145) = 8.24, p < .001$
Communicating a choice	1.92 ± .40 (0-2)	2 ± 0 (2)	$t (1, 147) = 2.05$, *n.s.*

Values are frequency (%) or mean ± SD (range).

MMSE = Mini-Mental State Examination.

n.s. = not significant.

[*] two-tailed P value from Fisher's exact test.

Sampling procedure

Potential subjects were recruited from two German memory clinics (Heidelberg,

Schluechtern), senior citizen meeting places, and a university program for seniors. A total of

165 persons were recruited (53 had dementia), of whom 11 persons that did not have

dementia and four that did were excluded. To exclude individuals with psychiatric conditions

that might interfere with cognition, all potential participants were screened using the Geriatric

Depression Scale (GDS; Yesavage, Brink, Rose, Lum, Huang, Adey, & Leirer, 1983) and all

provided their medical history (physical and mental). Memory clinic patients with AChE

inhibitor prescriptions were invited to participate in the study. Eleven persons were excluded

because they had psychiatric or neurological diseases other than dementia, two were excluded

because their mother tongue was not German, and three were excluded for administrative

reasons.

Informed consent procedure

To maximize comprehension, information about the study was disclosed in simple

direct language, both orally and in a written format (Dunn & Jeste, 2001). Written informed

consent was only obtained after the study had been described in detail, and participants were

informed that participation in the study could be discontinued at any time. If a participant had

a guardian, both participant and guardian took part in the written informed consent procedure.

The ethics committees of the involved institutions (University Hospitals in Heidelberg and

Frankfurt am Main, and the State medical association) approved this study.

Procedure

Participating memory clinic patients underwent the whole standard memory clinic

process, including the procedures mentioned above, an interview on their demographic,

medical, and psychosocial history, the Consortium to Establish a Register for Alzheimer's

Disease-Neuropsychological Battery (CERAD-NP), and the GDS. They also took part in the

MacCAT-T interview.

For the cognitively unimpaired comparison group, we simulated memory clinic attendance and interviewed participants on their demographic, medical, and psychosocial history, the CERAD-NP, the GDS, and the MacCAT-T interview. Test sessions for the comparison group lasted approximately 90 minutes. Participants were offered breaks throughout testing to minimize fatigue.

Measures

MacCAT-T (Grisso & Appelbaum, 1998)

The MacCAT-T is a structured interview that generates quantitative scores for four criteria related to decision-making capacity: the ability to understand the relevant information, to appreciate the diagnosis and likely consequences of treatment options, to reason about treatment choices, and to communicate a choice (Grisso & Appelbaum, 1998). A German translation of the MacCAT-T interview was manualized for our study, based on the translation by Vollmann (2008). For memory clinic patients diagnosed with AD or MD, a psychologist utilized the semi-structured interview to assess their capacity to make an actual treatment decision about whether or not to take acetylcholinesterase inhibitors. For the comparison group we worked with a corresponding hypothetical clinical vignette (Alzheimer´s Disease, antidementiva therapy with acetylcholinesterase inhibitors). The MacCAT-T can be administered in about 20-30 minutes. The inter-rater reliability is reported to vary between r = .59 and r = .99 (ABA/APA, 2008; Grisso & Appelbaum, 1998).

It should be noted that the MacCAT-T subscale on communicating a choice is a three-point scale (0-2), but the raters of our study only rated dichotomously (0, 2). This was taken into consideration in our analysis.

CERAD-NP (Welsh et al., 1994)

The CERAD-NP test battery measures cognitive functions that are recognized as being

impaired in AD. It consists of eight subtests: Verbal Fluency, Boston Naming Test, MMSE, Word List Memory, Constructional Praxis, Word List Recall, Word List Recognition, and Recall of Constructional Praxis. In accordance with Gurrera et al. (2006), we proposed a verbal retrieval subscale within the CERAD-NP that is represented by the three subtests Word List Memory, Word List Recall, and Boston Naming Test. The Word List Test consists of 10 items to be memorized three times in a row in a different order (Word List Memory), to be recalled after a delay (Word List Recall), and to be recognized in a list of 20 words (Word List Recognition). In a short version of the Boston Naming Test (Kaplan, Goodglass, Weintraub, 1978) examinees are asked to name objects shown in 15 line drawings. The battery takes approximately 30 minutes to administer. The subtests are reported to have inter-rater reliability ranging from $r = .92$ (constructional praxis) to 1.0 (word list recall) and one-month test-retest reliability ranging from $r = .16$ to $r = .91$ (Welsh-Bohmer & Mohs, 1997).

MMSE (Folstein et al., 1975)

The MMSE is part of the CERAD-NP (see above; Welsh et al., 1994). The MMSE is a structured scale that consists of seven categories and 22 items, on which a maximum of 30 points can be reached: orientation to place (state, county, town, hospital, and floor), orientation to time (year, season, month, day, and date), registration (repeating three words immediately), attention and concentration (spelling a five-letter word backwards), recall (recalling the formerly repeated three words), language (naming two items, repeating a phrase, reading aloud and understanding a sentence, writing a sentence, and following a three-step command), and visual construction (copying a design).

The MMSE takes about 10 minutes to administer. A cut-off score of 23 is most frequently used to indicate cognitive impairment. The inter-rater reliability is reported at $r > .65$ and two-month test-retest reliability at $r > .80$ (Folstein et al., 1975).

Analytical procedures

Descriptives for all observed variables were computed using SPSS 21.0 software (SPSS Inc., 2014). Latent variable modeling was conducted using Mplus 6.1 software (Muthén & Muthén, 1998–2011).

Results

Descriptive statistics

Participants were recruited from June 2012 until April 2014. All 149 Persons, 49 with and 100 without dementia, were included in the analysis. Table 1 presents descriptive statistics for all variables used in the analyses. Only two of the 149 participants were unable to communicate a choice. This result corresponds with results from other studies (e.g. Moye, Karel, Gurrera, & Azar, 2006).

As expected, all observed variables showed significant zero-order correlation (see Table 2). Correlations between MMSE, Word List Memory, Word List Recall, and Boston Naming Test ranged from .60 to .90 (all ps < .01); these high correlations supported our theoretical argument that verbal retrieval is relevant to the MMSE and should be considered as a latent factor in our modeling.

Table 2

Correlations between study variables

Measure	1	2	3	4	5	6	7	8
1. MMSE	-							
2. Word List Memory	.82**	-						

	1	2	3	4	5	6	7	8
3. Word List Recall	.83**	.90**	-					
4. Boston Naming Test	.60**	.61**	.60**	-				
5. Understanding	.76**	.78**	.76**	.61**	-			
6. Appreciation	.52**	.53**	.49**	.37**	.61**	-		
7. Reasoning	.67**	.63**	.61**	.49**	.74**	.70**	-	
8. Communicating a choice	.28**	.25**	.17*	.38**	.31**	.33**	.31**	-

Note. N=149; * $p < .05$; ** $p < .01$

1–7: Pearson product-moment correlation; 8: Point-biserial correlation

With the exception of the MacCAT-T subtest on communicating a choice, correlations between MacCAT-T subtests and subtests including verbal retrieval as a latent factor were moderate to high and thus supported our hypothesis that the factors MacCAT-T and verbal retrieval have a substantial amount of common variance.

Regression analysis with latent variables

One categorical (dichotomous: communicating a choice) and three continuous (understanding, appreciation, reasoning), observed variables were used to indicate the latent outcome, capacity to consent to treatment (a discussion of categorical factor indicators can be found in Muthén, & Asparouhov, 2002). In accordance with our theoretical argumentation, MMSE was used as an additional indicator for the latent verbal retrieval construct, and capacity to consent to treatment was regressed simultaneously on both the latent verbal retrieval construct and the MMSE residuals that represent differences in cognitive functioning

that are unaffected by verbal retrieval (see Figures 1 and 2). We note in passing that this

approach is more comprehensive than merely discarding the MMSE subscales that explicitly

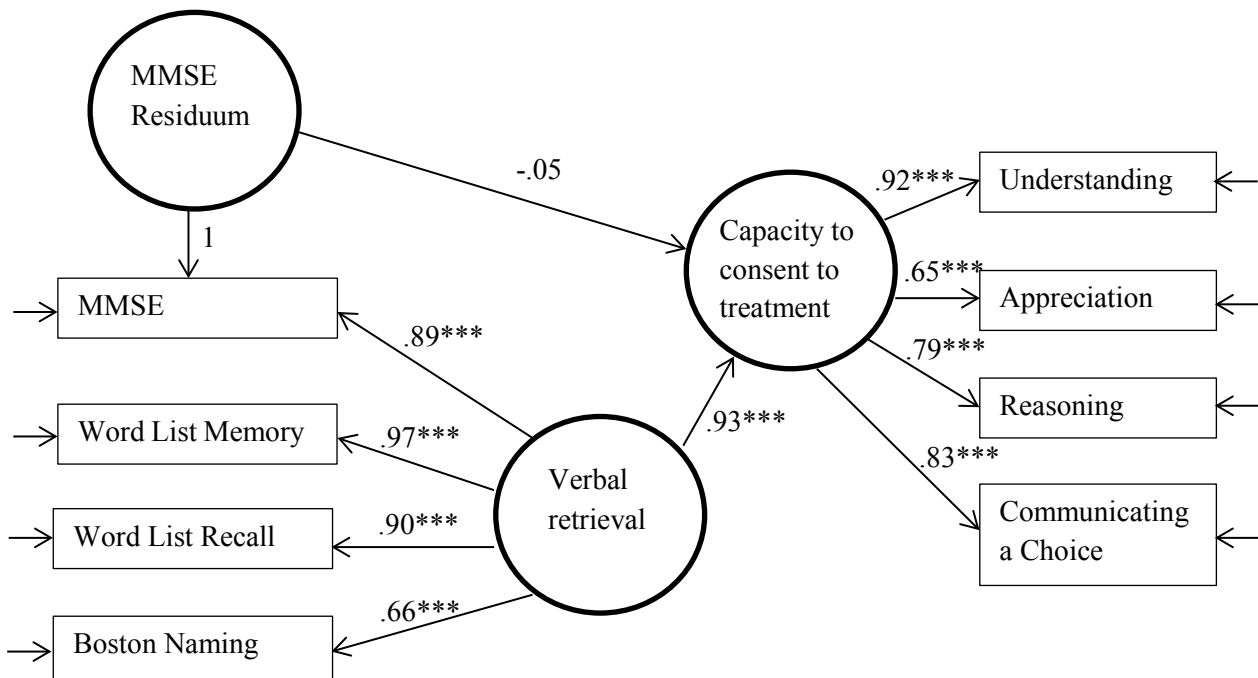refer to verbal retrieval (registration and recall).

Figure 2. The relationship between capacity to consent to treatment, verbal retrieval, and

MMSE was examined using a structural equation modeling framework. In estimating the

value of the MMSE as a predictor of capacity to consent to treatment, we controlled for

MMSE variability that was attributable to verbal retrieval.

*** p < .001

An adequate fit of our statistical model to the empirical data is supported by both a

non-significant chi² test statistic (chi² (18, 149) = 25.7, *p* = .11) and an RMSEA value of

0.054 (CI90 = 0.000-0.097), in addition to values of above 0.96 for the Tucker-Lewis and the

Comparative Fit Indices. The factor loadings for the two latent factors, capacity to consent to

treatment and verbal retrieval, were all large in magnitude (see Figure 2). Interestingly, as much as 79 % of the variance in observed MMSE scores may be attributed to individual differences in verbal retrieval. In the structural part of the model, the verbal retrieval factor explains 86 % of the variance in capacity to consent to treatment, whereas the predictive value of the MMSE residual for capacity to consent to treatment was negligible.

Discussion

The aim of this study was to examine the often-quoted association between capacity to consent to treatment, as measured with standardized measures such as the MacCAT-T, and cognitive impairment, as measured with the MMSE. As expected, verbal retrieval turned out to be a critical confounder in the association between capacity to consent, as measured with the MacCAT-T, and cognitive impairment, as measured with the MMSE. Little information on capacity to consent to treatment can be gained from the MMSE once this concept has been rigorously separated out. Only 14 % of the MacCAT-T score was estimated to vary independently of verbal retrieval.

Hence, the high association of capacity to consent to treatment with the MMSE appears to be a method effect. High verbal memory loads of the measurement procedures in both the MacCAT-T and the MMSE appear to contribute variance to scores beyond what is attributable to variance in the attributes of interest. They thus confound the assessment of capacity to consent and cognitive impairment. This result challenges the current emphasis on MMSE as a screening instrument in decision-making situations and the conclusion that low MMSE scores predict impaired capacity to consent. Moreover, subsequent structured, verbal-based assessments of decision-making abilities, as provided by the MacCAT-T, may not comprehensively reflect the capabilities of people with dementia. We postulate that the huge dependency of both the MMSE and capacity assessment on verbal retrieval leads inevitably to the following conclusion: a low MMSE warrants an enhanced consent procedure that

minimizes verbal memory load in the informed consent process and facilitates verbal retrieval for people with dementia. Hence, it is not primarily the abilities of the individual that should be questioned but rather the adequacy of the contextual conditions in the decision-making situation. For instance, Moye et al. (2006) found lower rates of incapacity in people with dementia than reported in other studies and attributes this to the use of a short vignette divided into small segments to reduce memory demands during the assessment. Moye et al. (2006) recommends further strategies to maximize capacity performance. Our study emphasizes the need for such enhanced consent procedures and supports recommendations for memory-based strategies, such as: Use cues, such as bulleted lists with key information, pictures, and diagrams; Repeat and rephrase information that may not be understood; Summarize key aspects by, for example, reviewing the main risks and benefits of each treatment, prior to asking the patient to indicate his or her preference; Focus on the most salient information for the patient in view of personal preferences and values in order to minimize the amount of information the patient must consider when weighing up preferences (Moye et al., 2006). In addition to these strategies, a bulleted list of key information could be written in easy-to-read language with corresponding pictograms that visualize what is said (Inclusion Europe, 2009). Written notes taken by the patient, the guardian, or the informing physician can be used easily in daily clinical practice. In everyday clinical practice, it is also easy and may be supportive to appoint relatives or the guardian as interpreters, assistants, and personified memory aids during the informed consent process. Furthermore, semantic elaborations and a reduction in the use of subordinate and embedded clauses throughout the informed consent procedure may be beneficial (Kemper & Harden, 1999). Besides, including professional expertise in augmentative and alternative communication may be helpful in challenging cases. Corresponding intervention studies are pending (see Table 3).

Table 3

Possible memory-based enhanced consent procedures to maximize capacity to consent

Bulleted list with key information - written in easy-to-read language - with corresponding pictograms that visualize what is said (Inclusion Europe, 2009)
Patient, guardian, and/or physician take notes
Relatives and/or the guardian appointed as interpreters, assistants, and personified memory aids
Semantic elaborations provided and the use of subordinate and embedded clauses reduced (Kemper, & Harden, 1999)
Professional expertise included in augmentative and alternative communication

In clinical and legal practice, the predictive value of the MMSE for capacity to consent to treatment appears to be over-estimated. Stoppe (2005) even goes so far as to recommend the MMSE be used by legal practitioners to estimate the mental capacity of a client. However, besides the doubtful value of the MMSE as a predictor of capacity to consent to treatment, we doubt whether legal practitioners would be able to conduct an MMSE and interpret the results appropriately. Then again, some of the above mentioned ideas for verbal memory-based enhanced consent procedures could be implemented quickly and easily (e.g. summary with key words) by everyone concerned, including legal practitioners. To investigate this, further intervention studies will be necessary.

Limitations of the study

Firstly, it is difficult to generalize our results because of the low number of people with dementia in the study. Furthermore, the participants without dementia were better

educated and younger than the participants with dementia.

Secondly, for people without dementia, the decision whether or not to take an antidementia drug was hypothetical, whereas people with dementia had to decide about real medication. We decided to accept this limitation for neuropsychological and ethical reasons: people with dementia suffer from impaired abstraction capabilities, hence to immerse oneself in a hypothetical vignette would probably exceed the capacities of a person with dementia. This may distort the results of a capacity to consent assessment, but, on the other hand, a hypothetical vignette might frighten or confuse people with dementia, as they might imagine themselves to be genuinely afflicted by the disease described in the hypothetical vignette. This would surely burden people with dementia and affect the results of an assessment with the MacCAT-T.

Thirdly, the verbal retrieval factor was based on the factorial analysis of Gurrera et al. (2006), but was modified for this study. While the original verbal retrieval factor used the immediate and delayed logical memory subtests (Wechsler, 1997) in addition to the Boston Naming Test, we used the Word List Memory (immediate memory) and Word List Recall (delayed memory) subtests of the CERAD-NP.

Fourthly, we suggest that the high association of capacity to consent to treatment with the MMSE is a method effect without having conducted a multi-trait-multi-method-matrix. For a closer analysis of the method effect this should be carried out.

Furthermore, it should be noted, that Grisso, Appelbaum, & Hill-Fotouhi (1997) do not claim the MacCAT-T is the only factor that is relevant to make final clinical or legal judgments of capacity. They rather recommend combining the MacCAT-T with further important determinants such as the evaluation of the clinical condition of the patient, and the context of the treatment situation.

Conclusion

Article 12 (3) of the United Nations Convention on the Rights of Persons with Disabilities (Office of the High Commissioner for Human Rights, 2006) "recognizes the right of persons with disabilities to support for the exercise of legal capacity. States must refrain from denying legal capacity, and instead must provide access to the support that may be necessary to make decisions that have legal effect." (Committee on the Rights of Persons with Disabilities, 2014, p.4) However, the problem of how to promote the right to support for the exercise of legal capacity for certain target groups is unsolved. The results of this study suggest that the use of verbal memory-based approaches to enhance consent procedures for people with AD or MD would be helpful.

We therefore recommend the use and development of verbal memory-based, enhanced consent procedures and the evaluation of their effect on the capacity to consent to treatment of people with dementia (see Table 3). Effective enhanced consent procedures could improve the autonomy of dementia patients, and (by using them in parallel to standardized consent assessments e.g. with the MacCAT-T) provide a more valid measure of capacity to consent to treatment by reducing the confounding caused by the importance of verbal retrieval.

Declaration of conflicts of interest

The authors declare that no conflicts of interest exist.

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