

UCLA

UCLA Previously Published Works

Title

Enhancing tolerability of a measure of social perception in schizophrenia: comparison of short and long Norwegian versions of the Relationships Across Domains test

Permalink

<https://escholarship.org/uc/item/8p50r9qv>

Journal

Cognitive Neuropsychiatry, 22(3)

ISSN

1354-6805

Authors

Vaskinn, Anja
Fiske, Alan P
Green, Michael F

Publication Date

2017-05-04

DOI

10.1080/13546805.2017.1307174

Peer reviewed



Enhancing tolerability of a measure of social perception in schizophrenia: comparison of short and long Norwegian versions of the Relationships Across Domains test

Anja Vaskinn^{a,b}, Alan P. Fiske^c and Michael F. Green^{d,e}

^aDepartment of Psychology, University of Oslo, Oslo, Norway; ^bNORMENT KG Jebsen Centre for Psychosis Research, Oslo University Hospital, Oslo, Norway; ^cDepartment of Anthropology, University of California Los Angeles, Los Angeles, CA, USA; ^dVeterans Affairs Greater Los Angeles Healthcare System, Los Angeles, CA, USA; ^eDepartment of Psychiatry and Biobehavioral Sciences, University of California Los Angeles, Los Angeles, CA, USA

ABSTRACT

Introduction: Relationship perception focuses on social interactions, is reduced in schizophrenia and is related to daily functioning. It can be assessed with the Relationships Across Domains (RAD) test, built on Relational Models Theory which states that people use four relational models to interpret social interaction. RAD is time consuming, low on tolerability and only used in English-speaking countries. We evaluated the psychometric properties of a translated, abbreviated Norwegian version.

Methods: Sixty-two schizophrenia participants and 56 healthy controls underwent assessments of social and non-social cognition. The schizophrenia group completed functional and clinical measures. RAD's internal consistency was investigated with Cronbach's alphas, group differences with logistic regressions and associations between study variables with Pearson's correlations.

Results: RAD was reduced from 25 (Cronbach's alpha = .809) to 12 vignettes (Cronbach's alpha = .815). Schizophrenia participants had significant impairments, with larger effect sizes for the full version. Associations of RAD with study variables were similar for the two versions: smaller for clinical measures and larger for functional and cognitive measures. Results were comparable to results for the English version.

Conclusions: The length of the Norwegian RAD was reduced while retaining its psychometric properties, which were similar to the English version. This suggests the test's cross-cultural utility.

ARTICLE HISTORY

Received 16 June 2016
Accepted 9 March 2017

KEYWORDS

Schizophrenia; social cognition; social perception; relationship perception; cross-cultural assessment

Introduction

Social cognition has emerged as a substantial area within schizophrenia research, partly due to its role as a strong predictor of functioning in the disorder. It has a closer association with functional outcome than non-social cognition (Fett et al., 2011) and acts as a mediator between non-social cognition and outcome (Schmidt, Mueller, & Roder, 2011). It can be defined as the processing of “representations of the intentions and

dispositions of others” (Brothers, 1990), and research on the topic within the schizophrenia field has focused largely on four domains: emotion processing, theory of mind (ToM), social perception/knowledge and attributional style (Pinkham, 2014).

Most assessments of social cognition in schizophrenia research examine how people perceive and categorise others. Relationship perception, which is part of social perception, goes beyond the evaluation of a single individual to understand the structure of and rules for social interaction, for example, to interpret the type of relationship operating in a social interaction (Fiske & Haslam, 2005).

The Relationships Across Domains (RAD) test was developed to assess relationship perception in schizophrenia (Sergi et al., 2009). This paper-and-pencil test presents short written vignettes describing the relationship between a male and a female, and asks participants if statements about that relationship are correct or incorrect. The RAD assesses a person’s perception and implicit knowledge of interpersonal relations and is built on Relational Models Theory (Fiske, 1991; Fiske & Haslam, 2005; www.rmt.ucla.edu). This well-validated model posits that people use four relational models to interpret and coordinate social interaction; communal sharing (CS), authority ranking (AR), equality matching (EM) and market pricing (MP). In CS relationships, members are equivalent and share resources without counting; groups seek consensus decisions. AR relationships are legitimate hierarchies, and EM describes balanced relationships where members keep track of giving and taking (turn-taking or in-kind reciprocity). MP relationships are based on ratios or rates where each member gets what they deserve based on input (people are compensated/punished in proportion to their effort/wrong-doing). The RAD assesses whether someone implicitly recognises the relational model presented in the vignette and knows that a dyad is likely to use the same relational model in other situations.

The RAD differentiates between individuals with schizophrenia and healthy controls, and is associated with daily functioning (Sergi et al., 2009). The degree of impairment appears to be the same across illness phase (Green et al., 2012) and over time (Horan et al., 2012), even in individuals at clinical high risk for psychosis (Piskulic et al., 2016). One advantage of the test is that it yields information on a specific domain of social cognition not assessed by other tests, whereas a disadvantage is that it is not as well tolerated as other social cognitive tests (Pinkham, Penn, Green, & Harvey, 2016). Hence, it would be valuable to have a shorter and more tolerable version of the test. Further, research on relationship perception in schizophrenia has taken place in English-speaking, Western countries. Research from other countries and languages can evaluate relationship perception in schizophrenia across cultures.

The aim of the current study is to evaluate the psychometric properties of a translated and abbreviated Norwegian version of the RAD. Specifically, we investigated if an abbreviated version distinguishes persons with schizophrenia from healthy controls, and whether associations with other cognitive and functional measures are similar to those of the full version.

Methods

Participants

Sixty-two individuals with schizophrenia ($n = 46$) or schizoaffective disorder ($n = 16$) according to the Diagnostic and Statistical Manual for Mental Disorders (4th ed.; DSM-

IV), and 56 healthy control participants were included from 2010 to 2014. Assessments were conducted within the Thematically Organised Psychosis research (TOP) study at NORMENT KG Jepsen Centre for Psychosis Research at the University of Oslo, Norway. Diagnostic assessments were undertaken by trained clinicians using the SCID interview (First, Spitzer, Gibbon, & Williams, 1995). Healthy controls were screened with the Primary Care Evaluation of Mental Disorders interview (PRIME-MD) (Spitzer et al., 1994), and excluded if mental, neurological or somatic disorder was confirmed or suspected. All participants had an $IQ \geq 70$ as assessed with the Wechsler Abbreviated Scale of Intelligence (WASI) (Wechsler, 2007). Participants received oral and written information on the study before signing informed consent. The study was approved by Norway's Regional Ethics Committee South-East and conducted in accordance with the Helsinki Declaration. Demographic information is presented in Table 1.

Cognitive measures

All participants underwent assessments with a battery consisting of neuropsychological and social cognitive tests. *Current IQ* was measured with the two-test WASI (Wechsler, 2007). *Neurocognition* was measured with the MATRICS Consensus Cognitive Battery (MCCB; Nuechterlein & Green, 2009). The MCCB includes the following neuropsychological tests (*domain* assessed in parentheses): Trail Making Test A, BACS Symbol Coding and Category Fluency (*speed of processing*), Spatial Span and Letter Number Span (*working memory*), NAB Mazes (*reasoning and problem-solving*), CPT-IP (*attention*), Hopkins Verbal Learning Test and Brief Visual Memory Test (*learning and memory*). The MCCB social cognition subtest was excluded to enable us to use the MCCB as a measure of non-social cognition. For social cognition, we assessed *ToM* with the Movie for the Assessment of Social Cognition (MASC; Dziobek et al., 2006), and *social perception* with the RAD. The RAD test was translated into Norwegian by the first author (native Norwegian speaker) in close collaboration with the second author (native English speaker), who developed Relational Models Theory. Administration time for the RAD is 35–45 minutes.

Functional measures

Functional capacity was assessed with an abbreviated version (Vaskinn, Ventura, Andreasen, Melle, & Sundet, 2015) of the Assessment of Interpersonal Problem-Solving Skills (AIPSS; Donahoe et al., 1990) and the University of California San Diego Performance-Based Skills Assessment, brief version (UPSA; Mausbach, Harvey, Goldman, Jeste, & Patterson, 2007). The UPSA-BN is the version adapted to Norwegian conditions (different

Table 1. Participants—demographic information.

	Schizophrenia, $n = 62$	Healthy controls, $n = 56$	Statistics
Age	29.0 (8.5)	28.7 (7.8)	$t = .24, p = .814$
Gender (males/females)	38/24	36/20	$\chi^2 = 0.11, p = .737$
Education (years)	12.0 (2.7)	14.5 (2.7)	$t = -5.14, p < .001$
WASI IQ (two subtest version)	99.7 (12.6)	112.7 (9.6)	$t = -6.24, p < .001$
Illness duration ^a	6.2 (6.3)	—	—

^a $n = 58$ due to missing data.

currency and emergency telephone numbers). *Global functioning* was assessed with the Global Assessment of Functioning-Split version (Pedersen, Hagtvet, & Karterud, 2007), function subscale.

Clinical measures

Participants with schizophrenia/schizoaffective disorder were clinically interviewed with the Positive and Negative Syndrome Scale (PANSS; Kay, Fiszbein, & Opler, 1987) and the Calgary Scale for Depression (Addington, Addington, & Schissel, 1990). In addition, *global symptoms* were assessed with the Global Assessment of Functioning-Split version (Pedersen et al., 2007), symptoms subscale.

Procedure

The full RAD consists of 25 vignettes with 75 items: 3 items (or statements) for each vignette. Every item belongs to a vignette and cannot be administered without it. An abbreviated version must therefore be constructed by removing a vignette along with the three items belonging to it, and cannot be reduced by removing individual items. Consequently, new mean scores for each of the vignettes were computed based on the results on the three items belonging to that vignette.

It was considered important that the abbreviated version (a) had an equal number of vignettes from each of the four relational models, and (b) required substantially less administration time than the full version. Therefore, the decision was to reduce the test to a total of 12 vignettes; 3 from each of the 4 relational models.

Two criteria were used to decide which vignettes to retain. First, it was considered important to keep vignettes with satisfactory internal consistency (Cronbach's alpha). Second, the desire for an equal number of vignettes from each of the four relational models required taking into account the frequency of vignettes from the different models in the full version. Therefore, more vignettes were removed from the most frequent relational models: for CS 5 (of 8) vignettes were removed, for AR 3 (of 6), for EM 3 (of 6) and for MP 2 (of 5) vignettes.

Statistical analyses

Analyses were conducted with SPSS 22.0. We estimated internal consistency using Cronbach's alphas, including all participants ($n = 118$). Most variables followed a non-normal distribution. Group differences between schizophrenia participants and healthy controls were investigated with simple logistic regressions with RAD variables as independent and diagnostic group membership as dependent variable. Effect sizes were calculated using the combined mean of the two groups (Cohen's d). Associations of the two RAD versions with symptoms, non-social and social cognition, and functioning in persons with schizophrenia were examined with Pearson's bivariate correlations, as was their internal association. Partial correlations for the association between the abbreviated RAD and measures of social cognition and functioning after controlling for IQ were also calculated. Adjustments for multiple testing were not performed because this was an exploratory study of a test's psychometric properties.

Results

The baseline measure of internal consistency for the full version, that is, the overall Cronbach's alpha for the 25 vignettes, was .81, indicating good internal consistency. Because CS vignettes outnumbered vignettes from other relational models, we started by removing the five CS vignettes that gave higher Cronbach's alpha levels when deleted. The new Cronbach's alpha level was .78. The same procedure was followed first for the AR vignettes (new Cronbach's alpha = .77); second, the EM vignettes (new Cronbach's alpha = .78); and finally for the MP vignettes (new and final Cronbach's alpha = .82). The final value for internal consistency is satisfactory, although lower for controls (.59) than for schizophrenia participants (.85). The association between the full and abbreviated version was very strong (Pearson's $r = .93$).

Persons with schizophrenia were significantly impaired on all RAD variables compared to healthy controls (see Table 2). For the full RAD, effect sizes were moderate to large, with the exception for the MP vignettes, which were small. Effect sizes were smaller for the abbreviated RAD, but still large for the overall score and the CS vignettes. The effect size for the AR vignettes was moderate, whereas effect sizes for the EM and the MP vignettes were small.

Associations with symptoms, social and non-social cognition, and functioning, are reported in Table 3 for the full and abbreviated RAD. Associations were very similar for the abbreviated compared to the full version. They were smaller for clinical measures and larger for functional and cognitive measures. For the abbreviated version, the association with MASC was reduced after controlling for IQ, but remained statistically significant ($r = .38$, $p = .003$). Associations with functional capacity were reduced to a non-significant level (AIPSS receiving: $r = .22$, $p = .096$; AIPSS processing: $r = .17$, $p = .214$; AIPSS sending: $r = .19$, $p = .156$; UPSA-BN: $r = .18$, $p = .168$).

Discussion

This study evaluated an abbreviated version of the RAD test for social perception. We found that the test could be reduced from 75 to 36 items without losing its psychometric properties. The abbreviated version was able to discriminate between persons with schizophrenia and healthy controls, and associations with other study variables were similar in the abbreviated and full versions. Effect sizes were smaller for some of the relational models using the abbreviated version, so investigators may prefer to use the overall score when utilising the abbreviated version.

As expected, the abbreviated RAD showed a strong correlation with our other measure of social cognition, the MASC test ($r = .54$), indicating good convergent validity. The fact that the associations with symptoms were small further supports the notion that the RAD assesses a dimension of schizophrenia psychopathology distinct from clinical symptoms. However, the association with IQ was quite strong ($r = .62$ for the abbreviated version). Although the association with the MASC remained significant after controlling for IQ, associations with functional capacity were reduced to a non-significant level. This indicates that the RAD is dependent upon IQ, but a closer investigation of the specific nature of these associations is outside the scope of this paper.

Table 2. Case-control differences in relationship perception using the full 75-item/25-vignette RAD and the abbreviated 36-item/12-vignette RAD.

	Schizophrenia, <i>n</i> = 62		Healthy controls, <i>n</i> = 56		Statistics: logistic regressions			Effect size
	Mean (SD)	Mean (SD)	χ^2	<i>p</i> -Value	<i>r</i> ²	Correctly classified %	Cohen's <i>d</i>	
Full version								
RAD total score	50.5 (9.2)	58.0 (5.3)	26.8	<i>p</i> < .001	.20–.27	72.9	1.03	
RAD AR vignettes	4.4 (0.95)	4.9 (0.69)	12.8	<i>p</i> < .001	.10–.14	60.2	0.61	
RAD EM vignettes	3.7 (0.89)	4.2 (0.65)	12.2	<i>p</i> < .001	.10–.13	61.0	0.65	
RAD CS vignettes	5.7 (1.30)	6.8 (0.69)	27.8	<i>p</i> < .001	.21–.28	70.3	1.11	
RAD MP vignettes	3.0 (0.78)	3.4 (0.73)	5.2	<i>p</i> = .023	.04–.06	58.8	0.26	
Abbreviated version								
RADshort total score	24.7 (6.2)	28.8 (3.60)	17.9	<i>p</i> < .001	.14–.19	67.8	0.84	
RADshort AR vignettes	2.2 (0.59)	2.5 (0.43)	9.4	<i>p</i> = .002	.08–.10	56.8	0.59	
RADshort EM vignettes	2.1 (0.59)	2.3 (0.74)	7.0	<i>p</i> = .008	.06–.08	56.8	0.15	
RADshort CS vignettes	2.2 (0.74)	2.7 (0.41)	16.6	<i>p</i> < .001	.13–.18	64.4	0.87	
RADshort MP vignettes	1.8 (0.66)	2.2 (0.58)	9.2	<i>p</i> = .002	.08–.10	62.7	0.32	

χ^2 = omnibus test of model (one degree of freedom for all).

*r*² = Cox & Snell *r*²—Nagelkerke *r*².

Table 3. Bivariate associations (Pearson's r) with relevant variables for full and abbreviated RAD—in participants with schizophrenia ($n = 62$).

	RAD	RADshort
<i>Clinical features</i>		
PANSS pos	-.14	-.13
PANSS neg	-.14	-.20
CDSS ^a	.19	.22
GAF-s ^a	.09	.10
<i>Functioning</i>		
AIPSS receiving skills ^b	.28*	.32*
AIPSS processing skills ^b	.19	.20
AIPSS sending skills ^b	.29*	.32*
UPSA-BN ^a	.42**	.46**
GAF-f ^a	.13	.17
<i>Neurocognition</i>		
WASI	.60**	.61**
MCCB TMT	-.10	-.12
MCCB BASC	.19	.24
MCCB Fluency	.22	.25*
MCCB Mazes	.21	.22
MCCB HVT	.33**	.40**
MCCB BVMT	.34**	.37**
MCCB Spatial Span	.32*	.34**
MCCB CPT ^a	.13	.21
MCCB LNS ^a	.24	.26*
<i>Social cognition</i>		
MASC ^b	.52**	.54**

^a $n = 61$ due to missing data.^b $n = 59$ due to missing data.* $p < .05$.** $p < .01$.

The deficit in relationship perception in a Norwegian sample of participants with schizophrenia was comparable in size to the deficit seen in US studies (Green et al., 2012: Cohen's $d = 0.73$; Pinkham et al., 2016: Cohen's $d = 0.93$). The association with cognition (Sergi et al., 2009: premorbid IQ $r = .49$) and functioning (Pinkham et al., 2016: UPSA-BN $r = .44$) was also similar to previous US findings. The comparable psychometric properties suggest that the test can be used cross-culturally and that our Norwegian results can be generalised to other languages.

Acknowledgment

The authors would like to thank the participants for their time and effort as well as the NORMENT personnel involved in data collection and management.

Disclosure statement

No potential conflict of interest was reported by the authors.

Funding

This work was supported by the South-Eastern Norway Regional Health Authority (#2010007 to A.V., #2013123), the Fulbright Foundation for Educational Exchange (to A.V.), the Research Council of Norway (#223273) and the K.G. Jebsen Foundation.

References

- Addington, D., Addington, J., & Schissel, B. (1990). A depression rating scale of schizophrenics. *Schizophrenia Research*, 3(4), 247–251.
- Brothers, L. (1990). The neural basis of primate social communication. *Motivation and Emotion*, 14, 81–91.
- Donahoe, C. P., Carter, M. J., Bloem, W. D., Hirsch, G. L., Laasi, N., & Wallace, C. J. (1990). Assessment of interpersonal problem-solving skills. *Psychiatry*, 53, 329–339.
- Dziobek, I., Fleck, S., Kalbe, E., Rogers, K., Hassenstab, J., Brand, M., ... Convit, A. (2006). Introducing MASC: A movie for the assessment of social cognition. *Journal of Autism and Developmental Disorders*, 36(5), 623–636.
- Fett, A. K., Viechtbauer, W., Dominguez, M. D., Penn, D. L., van Os, J., & Krabbendam, L. (2011). The relationship between neurocognition and social cognition with functional outcomes in schizophrenia: A meta-analysis. *Neuroscience & Biobehavioral Reviews*, 35(3), 573–588.
- First, M. B., Spitzer, R. L., Gibbon, M., & Williams, J. B. W. (1995). *Structural clinical interview for axis I disorders, patient edition (SCID-P), version 2*. New York, NY: New York State Psychiatric Institute, Biometrics Research.
- Fiske, A. P. (1991). *Structures of social life: The four elementary forms of human relations*. New York, NY: Free Press.
- Fiske, A. P., & Haslam, N. (2005). The four basic social bonds: Structures for coordinating interaction. In M. Baldwin (Ed.), *Interpersonal cognition* (pp. 267–298). New York, NY: Guilford.
- Green, M. F., Bearden, C. E., Cannon, T. D., Fiske, A. P., Helleman, G. S., Horan, W. P., ... Nuechterlein, K. H. (2012). Social cognition in schizophrenia, part 1: Performance across phase of illness. *Schizophrenia Bulletin*, 38(4), 854–864.
- Horan, W. P., Green, M. F., DeGroot, M., Fiske, A., Helleman, G., Kee, K., ... Nuechterlein, K. H. (2012). Social cognition in schizophrenia, part 2: 12-month stability and prediction of functional outcome in first-episode patients. *Schizophrenia Bulletin*, 38(4), 865–872.
- Kay, S. R., Fiszbein, A., & Opler, L. A. (1987). The positive and negative syndrome scale (PANSS) for schizophrenia. *Schizophrenia Bulletin*, 13, 261–276.
- Mausbach, B. T., Harvey, P. D., Goldman, S. R., Jeste, D. V., & Patterson, T. L. (2007). Development of a brief scale of everyday functioning in persons with serious mental illness. *Schizophrenia Bulletin*, 33, 1364–1372.
- Nuechterlein, K. H., & Green, M. F. (2009). *MATRICES consensus cognitive battery. Norwegian version*. (B. R. Rund & K. Sundet, Eds.). Los Angeles, CA: MATRICS Assessment.
- Pedersen, G., Hagtvet, K. A., & Karterud, S. (2007). Generalizability studies of the global assessment of functioning-split version. *Comprehensive Psychiatry*, 48, 88–94.
- Pinkham, A. E. (2014). Social cognition in schizophrenia. *Journal of Clinical Psychiatry*, 75(Suppl. 2), 14–19.
- Pinkham, A. E., Penn, D. L., Green, M. F., & Harvey, P. D. (2016). Social cognition psychometric evaluation: Results of the initial psychometric study. *Schizophrenia Bulletin*, 42(2), 494–504.
- Piskulic, D., Liu, L., Cadenhead, K. S., Cannon, T. D., Cornblatt, B. A., McGlashan, T. H., ... Addington, J. (2016). Social cognition over time in individuals at clinical high risk for psychosis: Findings from the NAPLS-2 cohort. *Schizophrenia Research*, 171(1-3), 176–181.
- Schmidt, S. J., Mueller, D. R., & Roder, V. (2011). Social cognition as a mediator variable between neurocognition and functional outcome in schizophrenia: Empirical review and new results by structural equation modeling. *Schizophrenia Bulletin*, 37(Suppl. 2), S41–54.
- Sergi, M. J., Fiske, A. P., Horan, W. P., Kern, R. S., Kee, K. S., Subotnik, K. L., ... Green, M. F. (2009). Development of a measure of relationship perception in schizophrenia. *Psychiatry Research*, 166(1), 54–62.
- Spitzer, R. L., Williams, J. B., Kroenke, K., Linzer, M., deGruy, F. V., & Hahn, S. R., et al. (1994). Utility of a new procedure for diagnosing mental disorders in primary care. The PRIME-MD 1000 study. *JAMA*, 272, 1749–1756.

- Vaskinn, A., Ventura, J., Andreassen, O. A., Melle, I., & Sundet, K. (2015). A social path to functioning in schizophrenia: From social self-efficacy through negative symptoms to social functional capacity. *Psychiatry Research*, 228(3), 803–807.
- Wechsler, D. (2007). *Wechsler Adult Intelligence Scale, WAIS-III, Norwegian manual*. Stockholm: Pearson Assessment.