Measuring rapport in neuropsychological assessment: the Barnett Rapport Questionnaire

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ABSTRACT
Rapport is an important component of neuropsychological test administration; however, there is a lack of psychometrically sound measures of rapport in the context of neuropsychological assessment. The purpose of this study was to explore adapting measures of the psychotherapeutic alliance specifically to neuropsychological test administration and investigate their feasibility and construct validity. College students ($N = 126$) were administered a brief battery of neuropsychological tests in either a high-rapport or low-rapport condition. Participants in the high-rapport condition rated rapport as being higher, suggesting that the items captured the nature of the interpersonal interaction between examiner and examinee. The results suggest the feasibility of adapting items from measures of the psychotherapeutic alliance for measuring rapport in neuropsychological testing. This article introduces the Barnett Rapport Questionnaire, a measure of rapport in the context of neuropsychological assessment.

In the context of neuropsychological assessment, rapport denotes quality of the therapeutic alliance or working relationship between the examiner and the examinee (Kamphaus & Frick, 2005). Most neuropsychological test manuals and instructions emphasize the importance of establishing rapport (Delis, Kaplan, & Kramer, 2001a; Wechsler, 2008), yet there is relatively little empirical research on rapport in relation to neuropsychological testing. Previous research has experimentally manipulated the examiner's aloofness and friendliness and found that it impacts intelligence test scores in children (Exner, 1966; Feldman & Sullivan, 1971). Subsequent research has experimentally manipulated rapport among adults and found a 20% variances in the composite dependent variable between groups, neuropsychological test performance revealed moderate to medium-large effect sizes, and participant ratings on an ad-hoc measure of rapport were higher among the high-rapport group in comparison to low-rapport group (Barnett, Parsons, Reynolds, & Bedford, 2018). Given that establishing rapport is part of standardized test administration, and that rapport may impact performance on neuropsychological tests, greater attention to rapport as a factor in neuropsychological assessment is needed. Psychometrically sound measures of rapport specific to neuropsychological test administration will offer better assessment of rapport’s impact on neuropsychological test performance. The purpose of this study was to adapt measures of the working alliance in psychotherapy for use in the context of neuropsychological testing and to investigate, with an experimental paradigm, whether the resulting scale is sensitive to differences in rapport between examiner and examinee.

Working alliance
The interaction, connectedness, synchrony, and working relationship between client and practitioner in psychotherapy which is facilitated through communication and collaboration, may be referred to as a therapeutic alliance, therapeutic relationship, or rapport (Koole & Tschacher, 2016; Leach, 2005). The main components are forming bonds, establishing goals, and setting tasks (Bordin, 1979; Wampold, 2015). Research indicates a strong therapeutic alliance is linked to positive outcomes in psychotherapy.

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(Horvath, Del Re, Flückiger, & Symonds, 2011; Horvath & Symonds, 1991; Martin, Garske, & Davis, 2000). In psychotherapy, the therapist’s personal qualities (e.g., warm, honest, trustworthy), responsiveness, as well as displaying competence have been found to influence the working alliance (for review, see Ackerman & Hilsenroth, 2003). Neuropsychologists are emphasizing the importance of interpersonal interactions in the context of neuropsychological assessment. For example, collaborative neuropsychological assessment (Gorske & Smith, 2008; Poston & Hanson, 2010) emphasizes individualized, interactive communication as well as greatly detailed test feedback that is given in an atmosphere of respect and empathy thereby generating positive treatment results.

Rapport in the context of assessment/testing may be different than rapport in the context of psychotherapy for several reasons. First, neuropsychological assessment involves different time constraints (Eisman et al., 2000; Kamphaus & Frick, 2005). Neuropsychological assessment tends to be more limited in terms of duration. Neuropsychologists typically see patients for limited number of appointments to answer specific questions which may include differential diagnoses, identifying cognitive deficits, prognosis, and remediation recommendations (AACN Board of Directors, 2007; Harvey, 2012). On the other hand, A complete neuropsychological evaluation session usually lasts longer than one typical psychotherapy session which last approximately an hour. Whereas neuropsychological assessments are more intensive, typically taking over 3 hours (Bennett-Levy, Klein-Boonschate, Batchelor, McCarter, & Walton, 1994; Westervelt, Brown, Tremont, Javorsky, & Stern, 2007) and, depending upon the referral questions, may take up to 8 hours (Hanks, Jackson, & Crisanti, 2016). This long single-shot amount of time makes for a heavy but relatively short dose of interpersonal interaction when compared to the overall extent of time spent in psychotherapy. Rapport in the context of neuropsychological assessment may also be different than psychotherapy because there is typically more of a concrete task at hand to accomplish: namely, the administration of the neuropsychological tests. The examiner tells the examinee what to do, when to start, and helps keep the examinee on task (Bennett, 2001). This may impact rapport in a number of ways: competence in administering the assessments may have an impact on the nature of the interpersonal interaction beyond “people skills” or psychotherapeutic techniques. There is often a need to move participants through tasks quickly but efficiently while still maintaining rapport. Additionally, from a practical standpoint, neuropsychological tests have accoutrements that may interfere with rapport. Examiners may, despite the warnings in the manuals, bury their head in administration manuals or be distracted with testing materials (Clark, Gulin, Heller, & Vrana, 2017; Wechsler, 2008). Similar to psychotherapy, establishing rapport in testing has been found to help gain the client’s cooperation, create an optimal testing climate, and maximize effort (Vanderploeg, 2014).

**Current study**

The purpose of this study was to explore the development of a psychometrically sound measure of rapport in the context of neuropsychological assessment. Participants referred to as examinees were randomly assigned to take a brief battery of neuropsychological tests in either a high-rapport condition or a low-rapport condition. The neuropsychological battery included selected subtests from the Delis–Kaplan Executive Function System (D-KEFS; Delis, Kaplan, & Kramer, 2001b), Grooved Pegboard Test (GPT; Kløve, 1963), Trail Making Test Part A & B (TMT; Reitan, 1992), California Verbal Learning Test (CVLT; Delis, Kramer, Kaplan, & Ober, 1987), Wechsler Digit Span Task (Wechsler, 2008), and the Rey-15 Item Memory Test (RMT; Rey, 1964). Participants rated rapport, both on the ad-hoc measure used and on a selection of items from two measures of therapeutic alliance adapted to be testing-specific. We hypothesized that individuals in the high-rapport condition would rate the working alliance (i.e., rapport between examiner and examinee) higher than in the low-rapport condition. We factor analyzed the different rapport measures to gain understanding of the construct of rapport in the context of neuropsychological assessment. Finally, we propose the Barnett Rapport Questionnaire, a measure of rapport in the context of neuropsychological assessment.

**Methods**

**Participants**

Participants consisted of undergraduate students age 18–49 (\(M = 21.71, \ SD = 5.14\); 69.8% female, 30.2% male) enrolled in a psychology course (\(N = 126\)) at a large public university in the southern United States. Participants were recruited from the department research website and received course credit upon completion of the study. Participants signed up to participate in a study investigating biopsychosocial...
Factors related to neuropsychological test performance. This title was chosen so as not to alert participants to the purpose of the study. Regarding race/ethnicity, 31.0% of participants identified as white/Caucasian, 21.4% as black/African American, 15.9% as Latinx, 11.1% as Asian/Pacific Islander, 7.9% as multiracial, and 12.7% identified as another race/ethnic group or did not specify.

Measures

In this study, we selected items from two widely used measures of the therapeutic alliance as well as an ad-hoc measure of rapport in the context of neuropsychological assessment. One question of interest in this study was the suitability of the items for the purpose of the experiment (i.e., where college students participating in a research study for extra credit and not seeking information about their neuropsychological functioning) as opposed to the long-term goal of creating a measure of rapport that can be used in clinical settings. The purpose of this study was to investigate adapting the items from measures of therapeutic alliance in psychotherapy for the purposes of ultimately building a measure of rapport that could be used in clinical settings. Therefore, we chose a “middle path” in selecting the items from the measures of therapeutic alliance: we removed items that clearly did not pertain to testing but retained items that would apply to testing in neuropsychological assessment, even if they did not directly correspond to the experiment in hand (e.g., “I believe my examiner has an understanding of what my experiences have meant to me”).

The Scale to Assess Therapeutic Relationships in Community Mental Health Care (STAR; McGuire-Snieckus, McCabe, Catty, Hansson, & Priebe, 2007) is a 12-item measure used to evaluate the relationship between clinicians and patients in community care settings. For our study, we excluded items 6, 8, and 11 that were based specifically on the goal of therapy. Participants are provided statements that evaluated their experience with the examiner during this study and asked to respond on a Likert-type scale ranging from 1 = never to 5 = always. After reverse scoring the appropriate items, we averaged the item scores so that a higher score indicated a more positive evaluation of the relationship between the examiner and examinee (Cronbach’s α = .80).

The Working Alliance Inventory – Short Form (WAI-SF; Tracey & Kokotovic, 1989) is a self-report measure used to ascertain the strength of the therapeutic relationship. The WAI-SF consists of 12 items taken from the Working Alliance Inventory (WAI; Horvath & Greenberg, 1989) based upon Bordin’s theory (1979; e.g., bond, goals, task). In this study, we adapted 5 items (3, 5, 7, 9, and 10) specifically related to bond and performed an exploratory factor analysis. These items were rated on a 7-point Likert-like scale, in which 1 = never and 7 = always. After reverse scoring the appropriate items, we averaged the item scores so that a higher score indicated a more positive evaluation of the relationship between the examiner and examinee (Cronbach’s α = .80).

Ad Hoc Rapport Measure (AHRM; Barnett et al., 2018) consists of a list of 19 positive and negative adjectives (e.g., nice, competent, strict, mean). The measure was originally created to measure the participant’s opinions of the examiner during participation in the experimental manipulation study. Participants were asked to what extent each adjective described their examiner on a 5-point Likert-like scale, in which 1 = never and 5 = always. The negative adjective scores were reversed, and scores were averaged so that higher scores indicated that the examinee perceived the examiner as warmer and more positive (Cronbach’s α = .94).

Procedures

This study was approved by the university committee for the protection of human subjects. Informed consent was obtained from all participants. Participants were randomly assigned to either a high-rapport condition or a low-rapport condition. The participants in the study were blind to the true nature of the study. However, we chose not to blind the examiners which consisted of undergraduate and graduate research team members. In this study for experimental manipulation, it was critical that examiners know to establish rapport in one condition and not establish rapport in the other. In order to control experimental conditions, examiners were trained in, as well as administered, both scripted rapport conditions. This study used guidelines suggests for establishing good rapport found in assessment manuals (e.g., good eye contact, small talk prior to test, reassuring statements; Hebben & Milberg, 2009; Lichtenberger & Kaufman, 2012). Additionally, Lichtenberger and Kaufman (2012) suggest offering praise for working hard during the test however do not just give feedback when the examinee is struggling and avoid feedback on weather an answer was right or wrong. Sessions between the examiner and examinee were audio recorded and
checked to ensure that the protocol was followed and that the nature of the interactions was different in the high and low rapport conditions.

In the high-rapport condition, the examiner greeted participants warmly with a handshake, introduced themselves, asked, “How is your semester going?”, which was briefly followed by small talk. After general directions, the examiner was reassuring and told the participant “Just relax and try your best.” In contrast, during the low-rapport condition, the examiner was interpersonally cold and distant, and did not offer encouragement. After the examiner administered a brief battery of neuropsychological tests, the participants were given the rating scales. They were told that the examiner would not see their responses and to place them in a sealed envelope. Hence, participants would feel uninhibited to rate the examiner freely without fear of offending the examiner. Finally, participants were debriefed about the purpose of the experiment and were asked not to discuss any aspect of the study with others in order to protect the integrity of the experiment.

Results

We transformed the item scores for the STAR and the AHRM to a 7-point scale so they would be equivalent to those of the WAI-SF. This left 33 items: 19 from the AHRM, 9 from the STAR, and 5 from the WAI-SF. These 28 items appeared suitable for exploratory factor analysis: KMO = .94; Bartlett’s Test of Sphericity $\chi^2 (df = 231) = 2676.50$, $p < .001$. Principal axis factoring using varimax rotation was performed on the 41 items.

Several items had low communalities (less than .35) and did not load on factors well. These items also tended to reflect content that was more applicable to therapeutic applications (WAI-SF10: “The examiner and I had different ideas on what my problems are;” STAR4: “I believe my examiner withheld the truth from me;” STAR7: “My examiner was stern when I spoke about things that are important to me and my situation;” AHRM9: “Lenient;” WAI-SF5: “I am confident the examiner was capable of helping me;” AHRM3: “Strict;” AHRM7: “Professional;” AHRM15: “Aloof;” AHRM11: “Unprofessional;” STAR1: “My examiner spoke with me about my personal goals and thoughts about the tests;” STAR9: “My examiner was impatient with me;”). These items were removed.

The final scale consisted of 22 items with three primary components (Cronbach’s $\alpha = .96$). These factors appeared to correspond to examiner’s qualities (11 items), working relationship (8 items), and examiner’s capability (3 items). The factor loadings are displayed in Table 1.

Finally, we conducted four one-way ANOVAs comparing the high-rapport group and the low-rapport group on the total scale as well as the three subscales. The results of the four ANOVAs as well as descriptive statistics are displayed in Table 2. Results revealed that the high-rapport group rated total rapport as well as examiner’s qualities, working relationship, and examiner’s capability as higher than the low-rapport condition.

Discussion

The purpose of this study was to adapt measures of the working alliance in psychotherapy for use in the context of neuropsychological testing and to investigate, with an experimental paradigm, whether the resulting scale is sensitive to differences in rapport between examiner and examinee. Based on Bordin’s theory (1979), working alliance and positive outcome research (Horvath et al., 2011; Horvath & Symonds, 1991; Martin et al., 2000), as well as the recommendations for establishing rapport in testing manuals (Delis et al., 2001a; Wechsler, 2008), this study sought to create a psychometrically sound measure of rapport in the context of neuropsychological assessment.

Results revealed a three-factor model of rapport: examiner’s qualities, working relationship, and examiner’s capability. The examiner’s qualities scale consists of 12 items consisting of positive and negative adjectives (e.g., warm, friendly, cold, mean). Examiner’s positive characteristics may help examiners connect to the examinee and ease situational anxiety while the inverse may occur under negative rapport situations (Exner, 1966; Feldman & Sullivan, 1971). The working relationship factor – which contains six items adapted from the STAR and two items from the WAI-SF – are representative of the connectedness between the examiner and examinee. This perceived rapport includes items relating to mutual trust, mutual honesty, acceptance, and confidence between the examiner and examinee. The examiner’s capability factor consists of two items measuring the degree to which the examinee felt confident in the examiner’s competency. Bachelor (1995) found therapist’s competence and respect were important to a good working relationship with psychotherapy clients. Since the examiner helps guide and keep the examinee on track during testing (Bennett, 2001), believing the examiner to be competent helps provide a conducive testing
<table>
<thead>
<tr>
<th>Item</th>
<th>Examiner's Qualities</th>
<th>Working Relationship</th>
<th>Examiner's Capability</th>
</tr>
</thead>
<tbody>
<tr>
<td>Warm^A^6</td>
<td>.81</td>
<td>.37</td>
<td></td>
</tr>
<tr>
<td>Easy-going^A^18</td>
<td>.79</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Inviting^A^14</td>
<td>.79</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Friendly^A^5</td>
<td>.79</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Nice^A^7</td>
<td>.77</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Stiff^A^17</td>
<td>.69</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Cold^A^10</td>
<td>.64</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Helpful^A^19</td>
<td>.60</td>
<td></td>
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<tr>
<td>Wanted me to do well^A^12</td>
<td>.59</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Irritated^A^16</td>
<td>.56</td>
<td>.46</td>
<td></td>
</tr>
<tr>
<td>Mean^A^16</td>
<td>.50</td>
<td>.50</td>
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<tr>
<td>My examiner and I share an honest relationship^S^55</td>
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<td>.78</td>
<td></td>
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<tr>
<td>My examiner and I share a trusting relationship^S^31</td>
<td></td>
<td>.76</td>
<td></td>
</tr>
<tr>
<td>I believe my examiner has an understanding of what my experiences have meant to me^S^72</td>
<td></td>
<td>.76</td>
<td></td>
</tr>
<tr>
<td>My examiner was open with me^W^3</td>
<td>.35</td>
<td>.74</td>
<td></td>
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<tr>
<td>I believe my examiner liked me^W^9</td>
<td>.48</td>
<td>.72</td>
<td></td>
</tr>
<tr>
<td>I feel the examiner and I trusted one another^W^9</td>
<td></td>
<td>.72</td>
<td>.36</td>
</tr>
<tr>
<td>My examiner seemed to like me regardless of what I did or said^W^10</td>
<td></td>
<td>.69</td>
<td></td>
</tr>
<tr>
<td>I feel the examiner appreciated me^W^7</td>
<td>.46</td>
<td>.69</td>
<td></td>
</tr>
<tr>
<td>Incompetent^E^8</td>
<td>.49</td>
<td>.66</td>
<td></td>
</tr>
<tr>
<td>Competent^E^2</td>
<td></td>
<td></td>
<td>.78</td>
</tr>
<tr>
<td>Did not want me to do well^E^13</td>
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<td></td>
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<td>Eigenvalues</td>
<td>Total</td>
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<td>Cumulative %</td>
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<td>Factor 1</td>
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<td>58.79%</td>
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<td>Factor 3</td>
<td>1.367</td>
<td>6.22%</td>
<td>72.61%</td>
</tr>
</tbody>
</table>

Bold values represent the factor loadings.

Note: Coefficients < .35 were suppressed.

A = Ad Hoc Rapport Measure.

S = The Scale To Assess Therapeutic Relationships in Community Mental Health Care (STAR).

W = The Working Alliance Inventory – Short Form (WAI-SF).
environment. The three-factor structure of the Barnett Rapport Questionnaire (BRQ) is supported by research showing positive characteristics, connectedness, and perceived competency are significant to forming and maintaining a good working alliance (Ackerman & Hilsenroth, 2003).

Similar to Barnett et al. (2018), this study found examinees in the high-rapport experimental group rated rapport – both overall rapport as well as the three subfacets of examiner’s qualities, working relationship, and examiner’s capabilities – as being higher than those in the low-rapport group. This provides experimental evidence of the construct validity of the BRQ since the measure was sensitive to the different interpersonal interactions between examiner and examinees.

It should be noted that this study was limited in several ways. This study utilized a convenience sample of undergraduate students; therefore, the results may not generalize to other populations. Future studies should investigate rapport and its measurement with the BRQ in other samples, particularly in other age groups. It is also particularly relevant that this was not a clinical sample. Participants in this study were not referred for testing for any neurocognitive symptoms. It is possible that clinical samples may respond differently in terms of rapport because the results (e.g., a possible diagnosis) are likely more personally salient to them, and they may be more sensitive to interactions with the examiner in order to gauge their performance on the tests. Future studies should investigate the utility of the BRQ in clinical samples. Additionally, the neuropsychological battery in this study was fairly brief. Neuropsychological batteries are often lengthy, meaning that examiners and examinees interact over a longer period of time and during a wider variety of tasks. Future studies in this area could examine the measurement of rapport during a longer neuropsychological battery. Finally, in this study examinees rated rapport with the examiner, and the examiner did not rate rapport with the examinee. While this was explicitly part of the research design in this study (i.e., level of rapport was an experimental manipulation), future studies could expand the Barnett Rapport Questionnaire to include an examiner rating of rapport with the examinee in a context in which rapport is not experimentally manipulated. Such studies would provide information about how the congruence (or lack thereof) of rapport between examiner and examinee might impact neuropsychological test performance. Future work can build upon this static approach to a more dynamic assessment of rapport (for review see, Caffrey, Fuchs, & Fuchs, 2008; Grigorenko, & Sternberg, 1998) using biometric data analytics available in noninvasive assessment of autonomic responding (e.g., eye-tracking using pupillometry and blinks) and natural language processing (e.g., speech and emotion estimation using acoustic parameters).

Despite these limitations, the results of this study suggest that it is possible to measure rapport in the context of neuropsychological testing with psychometric rigor. Standardized assessment of rapport in the context of neuropsychological evaluations is an important vector in considering the validity of patient profiles. Results from this study on rapport may have crucial implications in other assessment circumstances, particularly in potentially adversarial forensic cases. Additionally, the BRQ may serve as a training instrument for graduate students learning to conduct neuropsychological evaluations, allowing for the measurement of rapport to provide students with feedback as to the extent to which they have established interpersonal rapport with examinees.

Our aspiration is that this study and the Barnett Rapport Questionnaire will serve as an introduction to further study in this area and greater consideration of the impact of rapport in the context of neuropsychological assessment.

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References


