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Dawson, N.; Bain, K.; Mesman, J.

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Comparing two measures of maternal sensitivity: goodness of fit with a South African cultural context

Nicola Dawson[a,b], Katherine Bain[a] and Judi Mesman[c]

[a]School of Human and Community Development, University of Witwatersrand, Johannesburg, South Africa; [b]Ububele Educational and Psychotherapy Trust, Johannesburg, South Africa; [c]Centre for Child and Family Studies, Leiden University, Netherlands

ABSTRACT

Recent scholarly insights show that nonverbal and subtle forms of sensitive responsiveness are more applicable to describing and assessing non-Western parent–infant interactions than the more extraverted Western varieties of responsiveness. This paper examines whether the original Ainsworth scale (that does not specify particular manifestations of sensitivity) reveals different patterns of results in 50 South African mothers when compared to the Maternal Behavior Q-sort mini that assesses a more specified array of behaviors that may vary in their goodness of fit regarding the cultural context. The analysis reveals that there are key differences in the way the two measures operationalize maternal sensitivity, as seen in the incongruence of sensitivity ratings. The two measures are also shown to relate differently to maternal education and reflective functioning in this sample. The paper concludes that the Ainsworth sensitivity scale is better suited for use in the context of Alexandra Township, Johannesburg.

KEYWORDS

Maternal sensitivity; South Africa; culture-sensitive assessment; video

As in the rest of the world, the delivery of early parenting support in the South African context of Alexandra Township relies heavily on assessments of sensitive maternal caregiving (Cooper et al., 2009; Juffer, Bakermans-Kranenburg, & Van IJzendoorn, 2016; Nugent, Bartlett, Von Ende, & Valim, 2017). Central to the definition and assessment of maternal sensitivity is responsiveness to infant's signals (Ainsworth, Bell, & Stayton, 1974). However, various studies have shown that the modality of responding to infant signals differs from context to context (Kärtner, Keller, & Yovsi, 2010; Lancy & Grove, 2011; Richman, Miller, & LeVine, 1992), with overt expressions of positive affect and verbal responses being less common in non-Western than Western settings (Dixon, LeVine, Richman, & Brazelton, 1984; Lancy, 2012; Mesman, Van IJzendoorn, Behrens, Carbonell, & Carcamo, 2015). Recently, questions have been raised about the universal applicability of some sensitivity measures, given that certain tools specify maternal behaviors more commonly found in Western settings (Dawson, in press; Mesman et al., 2017). When attempting to assess maternal sensitivity in mothers from a non-Western setting such as Alexandra Township, researchers as well as care professionals

CONTACT Nicola Dawson nicki@ububele.org School of Human and Community Development, University of Witwatersrand, South Africa

need to consider a measure's "goodness of fit" with the cultural context. Failure to do so can result in invalid research conclusions, the development of culturally biased parenting interventions, and even the stigmatizing of non-Western parenting as problematic. This paper examines maternal sensitivity in Alexandra Township using two different observation instruments and addresses the applicability of each measure to this cultural context.

Alexandra Township

On the outskirts of South Africa's economic hub (Johannesburg, Gauteng) is the underdeveloped, semi-informal, urban settlement of Alexandra Township. The township is a densely populated hybrid of formal dwellings and informal shacks, with a notable lack of infrastructure (Davie, 2003; Statistics South Africa, 2011b; Wilson, 2011). High school dropout rates (55%), unemployment rates (over 25%), and levels of violent crime are high (Crime Statistics South Africa, 2016; Davie, 2003). The absence of fathers and failure to acknowledge paternity is common, resulting in high numbers (34%) of female-headed households (Coovadia, Jewkes, Barron, Sanders, & McIntyre, 2009; Nduna, 2014; statistics South Africa , 2011a). Alexandra is starkly juxtaposed against its neighboring suburb Sandton – the wealthiest square mile in the entire African continent (Davie, 2003; Morris, 2000; Wilson, 2011). These two suburbs stand as symbols for the economic and racial inequality left by Apartheid. In 2011, 20 years after the end of Apartheid, the population of Alexandra is still almost exclusively black African (99%), in contrast to the national proportion of 80% black South Africans (Statistics South Africa, 2011a).

Family life in Alexandra Township

The majority of black South African ethnic groups were traditionally patriarchal, delineating parenting as the work and sole responsibility of women (Barbarin & Richter, 2013; Walker, 1995). The belief that "parenting is women's work" still largely persists, despite the fact that large numbers of mothers now work, and children are consequently either placed in day-care centers or sent to live with relatives at around 3 months of age (Barbain & Richter, 2013; Coovadia et al., 2009). Nevertheless, the traditional close proximity between mothers and infants persists, and most mothers continue to carry their infants on their backs and to co-sleep with their infants well into their childhood. Parenting practices are largely authoritarian (Barbarin & Richter, 2013; Dawes, Kafaar, De Sas Kropiwnicki, Pather, & Richter, 2004). Traditional cultural practices such as *imbeleko* (presenting an infant to the ancestors), *inkhaba* (burying of the umbilical cord), and *ibhala* (the cutting of the back of the infant's neck to release evil spirits and protect the baby from death) (Barbarin & Richter, 2013) are all common practice in Alexandra Township.

The current study

This paper addresses the observational challenge of understanding the nature and meaning of sensitivity scores obtained by different observation instruments that may vary in their applicability to the South African context of Alexandra Township. The two measures are the original Ainsworth sensitivity scale (as described in the

Introduction to this special issue) and the MBQS-mini, a 25-item Q-sort-type measure of maternal sensitivity (Pederson, Moran, & Bento, 2011). Although the MBQS has been evaluated as showing high content overlap with the original Ainsworth scale (Mesman & Emmen, 2013), we expect some disparities in score distributions, given that the MBQS specifies quite specific behavioral manifestations of sensitivity that include verbal responsiveness, positive affect, and teaching activities, which have previously been found to be less common in African settings than in Western settings (Mesman et al., 2017). Consequently, significantly different associations are expected for scores on the two sensitivity measures with other key variables commonly shown to be related to maternal sensitivity, including reflective functioning (more related to Ainsworth than MBQS-mini), maternal education, and maternal income (more related to MBQS-mini than Ainsworth).

Method

Sample

A sample of 50 mother–infant dyads from Alexandra Township participated in this study. The video footage used was generated as part of a separate study into the efficacy of a home visiting project (see Bain, Dawson, Esterhuizen, Frost, & Pininski, 2016). Pregnant mothers were recruited by local home visitors during prenatal visits to the Township's birthing clinic and invited to volunteer for the study. Mothers not adhering to prenatal care procedures were absent from the sample, and as such, the sample is subject to bias. At the time of observation, mothers ranged in age from 17 to 38 years (M = 25.5 years), while infants ranged from 2.76 (84 days) to 15 months (458 days) (M = 4.6 months). The wide age range in infants is due to data being drawn from two time points in the study. Twenty six of the infants were boys and the remaining 24 were girls. Parity ranged from 1 to 3 (M = 1.68). Fifty-two percent of the mothers in the sample had not completed high school, while 18% of the mothers had some tertiary level education. Of the 42 mothers not currently completing school or further studies, 64% were unemployed.

Observation procedure

The video observations conducted for this study comprised mothers interacting with their babies in a "laboratory setting." Although a natural setting was preferable (i.e. in the infant's home), there was insufficient space and lighting to record inside or even outside the majority of the homes. In addition, there was concern regarding the safety of the researchers utilizing costly technology (i.e. hand-held video recorders or smartphones) inside the Township. Mothers were transported from their homes to the research venue in the organization's car, accompanied by a female research assistant. The observation procedure consisted of (a) 5-min free interaction, "just be with your baby, as you would at home;" (b) 5-min playing with toys; (c) 3-min reading a picture book; (d) 3-min play with a "challenging toy" (i.e. a shape sorter); (e) 5 min divided attention with mother being interviewed; and (f) 5 min feeding if applicable to the situation (see manual by Pederson et al., 2011). Mothers were given a picture of themselves and their baby together, taken after the filming. The research assistants were educated, professional females, the majority of whom were white.

Coding sensitivity

The first measure of maternal sensitivity used was the original Ainsworth sensitivity scale as described in the Introduction of this special issue. All 50 videos were coded by a single, reliable South African Ainsworth coder. Reliability was obtained by coding 10 local videos and comparing the scores with scores assigned by an experienced and reliable Ainsworth coder. Intraclass correlations (absolute agreement, single coder) were .83 for sensitivity and .87 for noninterference.

The second measure was the MBQS-mini, a 25-item Q-sort type measure of maternal sensitivity (Pederson et al., 2011). Reliable, certified coders sort the 25 items based on a 20-min video recording of mother–infant interactions. Scores are the result of a correlation between the measures' "ideal sensitive mother" and the sort of statements considered to be most like the mother, somewhat like the mother, neutral, somewhat unlike the mother, and most unlike the mother (Pederson et al., 2011). The videos were coded according to the MBQS-mini computerized card sort, by five reliable South African MBQS-mini coders. Inter-rater reliability was established across the five coders before individual coding commenced (.8). All videos were double coded. In the event of coding discrepancies, the video was watched again and discussed amongst the two coders, and the video was re-coded until consensus was reached.

Parental reflective functioning

In addition to collecting demographic data, an assessment of the mother's maternal reflective functioning was completed using the Parent Development Interview (PDI; Slade, Aber, Berger, Bresgi, & Kaplan, 2003). The PDI is a 45-item, semi-structured clinical interview that is used to measure parental reflective functioning (Slade et al., 2003). Reflective functioning was measured on the PDI using the validated coding system developed by Fonagy, Target, Steele, and Steele (1998). Reflective functioning scores using this system have been shown to be related to attachment security (Fonagy et al., 1998). All videos were coded by two accredited South African PDI coders.

Camera-related behavior

The videos were also screened for camera-related behavior (see Introduction to this special issue), although in the form of overall impressions instead of the specific scales because they were not part of the original research protocol.

Results

Mothers generally appeared comfortable with being video-recorded. They largely appeared quite confident, with only a small number of mothers looking frequently at the camera, commenting on being filmed or expressing anxiety about being filmed. However, there appeared to be some degree of initial performance anxiety from many mothers related to being part of a research study more generally. Teenage mothers appeared to be more prone to looking at the camera frequently.

A significant, albeit modest, correlation was found between sensitivity observed with the MBQS-mini and with the Ainsworth scale, $r(48) = .30$, $p < .05$. When comparing mothers rated as insensitive on the Ainsworth scale (scores 1–4) to those rated as (somewhat) sensitive (scores 5–9), we see a significant difference in their MBQS scores, $t(48) = -3.04$, $p < .01$. The MBQS scores for mothers with low Ainsworth ratings are close to zero ($M = -.05$; SD = .38), indicating no congruence with the profile of a sensitive caregiver, whereas the mothers with higher Ainsworth ratings have MBQS scores ($M = .30$; SD = .41) that are much lower than the mean of volunteer-based samples internationally (see Pederson et al., 1990, $M = .73$; Pederson, Gleason, Moran, & Bento, 1998). No comparative scores could be found for levels of sensitivity in South Africa.

Fourteen out of the 23 mothers with a high score on the Ainsworth sensitivity scale (score between 7 and 9) also had high MBQS-mini scores, but the remaining 9 received low scores on the MBQS-mini. The MBQS items that contributed most strongly and commonly to these low MBQS scores are listed in Table 1. On the low end of the Ainsworth scale, 8 of the 13 mothers scoring between 1 and 3 also had a low score on the MBQS, whereas the other 5 had quite high scores. The MBQS items that contributed most strongly and commonly to these high MBQS scores are listed in Table 2. Of the items listed in both tables, four items (items 2, 6, 7, and 19) relate most directly to Ainsworth's sensitivity scale. However, items 2 and 6 imply that the mother should be overtly focused on the infant at all times, even in the absence of signals. Further, items 2 and 7 focus only on availability and awareness of infant signals, with a contingent responsive not required to score highly. Similarly, in item 19, the focus is on responsiveness to infant signals, whereas the appropriateness of the response is not a consideration for this highly weighted item. This contrasts the grading for the Ainsworth sensitivity scale, where appropriateness is a central factor for a high score. The other items relate less directly to Ainsworth's

Table 1. MBQS items that contributed to low MBQS-mini scores of mothers who scored high on the Ainsworth sensitivity scale.

MBQS items
2. Monitors baby's activities during visit
5. Content and pace of interaction set by mom rather than according to baby's responses
6. Appears to tune out and not notice bids for attention
17. Able to accept baby's behavior even if it is not consistent with her wishes
18. Scolds or criticizes baby
21. Notices when baby smiles and vocalizes
23. Distressed by baby's demands

Table 2. MBQS items that contributed to high MBQS-mini scores of mothers who scored low on the Ainsworth sensitivity scale.

MBQS items
2. Monitors baby's activities during visit
3. Speaks to baby directly
7. Arranges her location so she can perceive baby's signals
12. Interactions with baby are object oriented, e.g. with toys, food
16. Points to and identifies interesting things in baby's environment
18. Scolds or criticizes baby
19. Responds to baby's signals
21. Notices when baby smiles and vocalizes

definition of maternal sensitivity. Items 5 and 17 are items that relate to intrusiveness and are more coherent with Ainsworth's cooperation scale than her sensitivity scale. Other items specify behaviors as sensitive or insensitive, with two items showing a preference for verbal responsiveness (item 3 and 12), specifying the use of objects or food in interaction with baby as less ideal, another highlighting scolding as insensitive (item 18), and another highlighting teaching as important (item 16). Item 21 places emphasis on responsiveness to positive signals and implies the need to respond to the baby even when it is content. Item 23 is about affectual states in the mother (rather than response to signals).

The associations of the two sensitivity measures with pertinent background variables were also considered. Maternal educational level was significantly related to MBQS-mini sensitivity $r(48) = .34$, $p < .05$, but not Ainsworth sensitivity, $r(47) = .16$, $p = .28$. There were no significant relations with maternal employment status, maternal age, infant age, or infant gender on either sensitivity measure. Finally, correlation analyses showed a near-significant association of maternal reflective functioning with Ainsworth sensitivity, $r(48) = .24$, $p = .09$, but not with MBQS-mini sensitivity, $r(47) = -.02$, $p = .91$. This finding reflects a near-significant difference between correlations, $z = 1.48$, p (one tailed) = .07.

Discussion

The finding of a significant, albeit modest, correlation between sensitivity observed with the MBQS-mini and with the Ainsworth scale, as well as a significant co-occurrence of high Ainsworth and high MBQS scores suggests that there is an overall relation between the constructs measured by the two scales when used with mothers from Alexandra Township. There is, however, a lack of congruence regarding the profile of a sensitive caregiver between the two measures, as indicated by groups of mothers scoring high on one measure and low on the other measure. An analysis of the MBQS-mini item scores in such cases revealed that these discrepancies appear to be due to two main factors. First, the MQBS-mini includes behaviors reflecting co-operation and intrusiveness. While associated with sensitivity, co-operation and intrusiveness are separate constructs that may be more culturally and contextually determined. Second, numerous items are found in the MBQS-mini which specify behaviors shown in the literature to carry very different meaning across contexts, including scolding, verbal responsiveness, and teaching. Such specific behavioral manifestations of sensitivity are not specified in the Ainsworth scale, leaving room for assigning higher scores based on other, more subtle forms of responsiveness (Mesman et al., 2017).

Maternal educational level related to higher levels of sensitivity as measured by the MBQS-mini, but not when measured by the Ainsworth scale. It is possible that the more educated mothers in Alexandra may be more acculturated into Western models of infant development and parenting. These mothers may also have greater access to parenting guidance and information online and in books (which are largely generated in developed countries). The adoption of more "Westernized" ways of being with their babies may account for their higher scores on the MBQS-mini. Given that education has been historically compromised along racial lines in South Africa, it may be argued that measures which are not related to educational level may provide a better fit with the context of Alexandra, so as not to unfairly disadvantage mothers.

Theory and research indicate that more reflective mothers behave more sensitively in their interactions with their infants (Fonagy & Target, 1997; Meins, Fernyhough, Fradley, & Tuckey, 2001; Rosenblum, McDonough, Sameroff, & Muzik, 2008; Suchman, DeCoste, Leigh, & Borelli, 2010). In attempting to understand why the Ainsworth sensitivity scale and MBQS-mini relate differently to maternal reflective functioning in the sample of mothers from Alexandra Township, it can be argued that the Ainsworth scale is capturing more "reflective behavior" (Shai & Belsky, 2011) than the MBQS-mini. It is possible that the overall sensitivity score on the MBQS-mini correlates with maternal reflective functioning scores less than the Ainsworth scale score, due to the diluting effect of highly weighted items that refer only to signal perception or responsiveness without consideration of contingency (items 2, 6, 8, 19, and 21), as well as items which focus on facilitation of learning (items 4 and 16) and affect regulation (items 14, 24),[1] rather than on reflective functioning. These diverse foci in the MBQS-mini appear to capture a broader conceptualization of sensitivity, which, although appropriate in Canadian and other more developed settings, seems to complicate cross-cultural application. However, the fact that neither measure reached statistically significant association with maternal reflective functioning implies that the two concepts remain discrete and that further research is required to investigate links between reflective functioning and sensitivity in the South African context. Overall, impressions regarding the participants' camera-related behavior suggest that the collection of video data is appropriate in the studied context. However, future studies should strive to record participants in naturalistic settings and to minimize the racial, language, and educational differences between participants and camera operators, in an attempt to further reduce performance anxiety.

In conclusion, whereas the MBQS-mini has clear value for coding sensitivity in cultural contexts where verbal interaction and a focus on infant learning are culturally appropriate and normative, the Ainsworth sensitivity scale seemed to more contextually appropriate for the measurement of maternal sensitivity in the context of Alexandra Township. A clear strength of this study is that it marks one of the first studies to investigate the goodness of fit of infant mental health research tools and to scrutinize observational analysis of mother–infant interactions in the South African context. The study also has some limitations, including the small sample size, sample selection biased toward mothers who access antenatal care, and use of coders who, despite having sensitivity around cultural and contextual difference, were not from the context of Alexandra Township. Nevertheless, the findings of this study are important for future research into maternal sensitivity in the South African context, in light of the need to make use of measures well suited to the context, in order to avoid pathologizing non-Western cultural practices and to ensure valid interpretation of research results. These findings also serve to promote the in-depth investigation of the goodness of fit of all observation-based measures when conducting parenting research in contexts that are starkly different from that in which the tool was developed.

Notes

1. 2. Monitors B's activities during visit.

   4. Repeats words carefully and slowly to B as if teaching meaning or labeling an activity or object.

6. Appears to tune out and not notice bids for attention.

14. Realistic expectations regarding B's self control of affect.

16. Points to and identifies interesting things in B's environment.

19. Responds to B's signals.

21. Notices when B smiles and vocalizes.

24. Display of affect does not match B's display of affect (e.g. smiles when B is distressed).

Disclosure statement

No potential conflict of interest was reported by the authors.

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