Mother-Neonate Interactions: Reliability of Measures

Misti Unruh

Faculty: Lyn Goldberg, Douglas F. Parham, Nancy G. Powers

Abstract. The purpose of this study was to assess the reliability of coding mother-neonate interactions. Two coders independently examined videos of two mother-neonate dyads and coded five interactions: mother looking at neonate’s face, mother smiling at neonate, mother joggling neonate, mother talking to neonate, and mother touching neonate. High inter-rater reliability was predicted for the first three interactions, which were presumed easy to identify and measure. Reliability analysis of 1,427 interactions revealed that the two coders agreed less than would be expected by chance alone. This suggests that the process was highly dependent on the individual coders. Reevaluating current coding methods will be essential to develop meaningful standards for reliable coding, which in turn should help us better understand mother-neonate bonding.

1. Introduction

An important area of infant development research is the interaction between a mother and her neonate [1-2]. Maternal behaviors toward the neonate ideally should support the latter’s viability [3] and increase the bonding of the mother-neonate pair [1-2, 4]. In addition to talking to her neonate, a mother will often look at, smile at, touch, and joggle the newborn. All of these maternal behaviors help develop the bond between the mother and her infant [5-8].

Coding these behaviors during observation of the birthing event is not practical due to their complexity; coding of a video recording of the event overcomes that problem. Video coding is a common practice in behavioral research [9-10], including that involving infants [11]. An essential component of video coding is reliability between coders to ensure that data interpretation is valid, consistent, and accurate.

The purpose of this study was to assess the inter-rater reliability of two coders’ ability to identify mother-neonate interactions. It was predicted that the coding of certain interactions, such as looking at and joggling the neonate, would result in high reliability because those behaviors were presumed easier to identify and measure using the video recordings.

2. Experiment, Results, Discussion, and Significance

The study’s recording protocols were explained in detail to each mother prior to her infant’s birth; each mother signed consent forms (approved by both WSU and the birthing hospital) that allowed video recording. The signals analyzed in this study were digital video recordings of two mother-neonate dyads during the first two hours after birth. The digital camera used for the recordings focused primarily on the mothers, thus providing an ideal view of the mother’s behaviors toward the neonate. After an initial meeting to discuss which interactions would be coded, two coders independently examined the recordings. Focusing on the mothers, each coder identified the following maternal interactive behaviors: (1) looking at the neonate’s face, (2) smiling at the neonate, (3) joggling the neonate, (4) talking to the neonate, and (5) touching the neonate. Using the digital timestamp of each video as a reference, each coder recorded the start and end times of each identified behavior.

The two coders identified a combined total of 2,166 unique interactions, of which 1,427 were interactions identified by either both coders or a single coder. Table 1 summarizes the frequency of coded behaviors identified by the coders.

<table>
<thead>
<tr>
<th>Coder</th>
<th>Looking</th>
<th>Smiling</th>
<th>Joggling</th>
<th>Talking</th>
<th>Touching</th>
<th>Total</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>862</td>
<td>27</td>
<td>72</td>
<td>273</td>
<td>44</td>
<td>1278</td>
</tr>
<tr>
<td>2</td>
<td>489</td>
<td>33</td>
<td>129</td>
<td>196</td>
<td>41</td>
<td>888</td>
</tr>
<tr>
<td>Total</td>
<td>1351</td>
<td>60</td>
<td>201</td>
<td>469</td>
<td>85</td>
<td>2166</td>
</tr>
</tbody>
</table>
Statistical analysis of inter-rater reliability—using Cohen’s kappa coefficient as the measure of agreement—revealed no effective agreement between the two coders either across all five interactions (z = -1.96) or within any one interaction (looking = -.049, smiling = -.258, joggling = -.208, talking = -.199, and touching = -.265). Negative measure of agreement values indicate that the two coders agreed less than would be expected by chance alone.

Despite the prediction that certain interactions would be easy to identify and code, the results suggest that the process was highly dependent on the individual coders. The results can be attributed not only to disagreement between the coders, but also shortcomings in the coding methods. Whereas the coders had initially agreed upon the maternal behaviors of interest, there was low consensus as to how the behaviors would manifest themselves in the video coding process. For example, one coder identified the mother as looking at her neonate for a period of ten seconds, yet the other coder identified three separate instances of the looking behavior within the same time period. In other situations, only one coder identified a behavior as occurring. It is also possible that during certain portions of the video coding process, the coders responded differently due to fatigue and attention level. A reevaluation of the coding methods will be essential to develop meaningful standards for reliable coding. These findings represent an important first step in the development of reliable measures of the early interactions that will help us better understand how mothers and their neonates bond soon after birth [1-3].

3. Conclusions

This study examined the inter-rater reliability of coding of mother-neonate interactions. It was predicted that reliability would be high between the study’s two coders, given that some interactions—such as looking and smiling—would presumably be easier to identify. The results were contrary to prediction: the coders agreed less than would be expected by chance alone. These findings will help further the development of coding procedures that not only are reliable but also inform future research.

4. Acknowledgements

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5. References