

Exploring health visiting professionals' evaluations of early parent-infant interactions

Abstract

Objective: To examine the accuracy of Health Visitors (HVs) evaluations of the quality of parent-infant interactions.

Background: HVs have been identified as key professionals in the early identification of difficulties in parent-infant interactions. The aim of this study was to explore how accurately HVs, Family Health Nurses (FHNs) and Community Nursery Nurses (CNNs) evaluate early parent-infant interactions.

Method: A sample of 56 HVs, 4 FHNs and 14 CNN recruited from two National Health Service (NHS) Trusts, viewed video footage of six parent-infant interactions which had been categorised as 'sensitive', 'mixed', and 'problematic' using the CARE-Index. Participants evaluated the quality of the parent-infant interactions shown in these videos using the Parent-Infant Interaction Rating Questionnaire (PIIRQ).

Results: On average, participants correctly rated the problematic videos as lowest in quality, the mixed as higher in quality than the problematic videos, and the sensitive videos as highest in quality. Interestingly, within the problematic category participants rated the 'unresponsive' pattern of interaction as significantly lower in quality than the 'controlling' interaction.

Conclusions: The findings suggest participants were relatively accurate in their evaluations of parent-infant interactions. However, they indicate that participants were more likely to be concerned about unresponsive, as opposed to controlling, interactive behaviours. Recommendations for further research include exploration of potential differences in how health-visiting professionals evaluate particular *patterns* of parent-infant interactions.

Keywords: Health visitors; parent-infant interactions; assessment; evaluation; CARE-index

Conflict of interest: none

Introduction

It is now widely accepted that emotional experiences in infancy play a central role in later development and well-being. Similarly, there is evidence to suggest that parental sensitivity and the quality of early caregiver interactions can play an enduring role in children's social and cognitive development, extending throughout childhood and adolescence into adulthood (e.g. Fraley, Roisman & Haltigan, 2013; Raby, Roisman, Fraley & Simpson, 2015). 'Normal' or 'optimal' parent-infant interactions are described as reciprocal and synchronous, and infants are seen as active contributors to these interactions (Tronick, 1989). 'Dyssynchrony' occurs when a caregiver perceives and responds to their infant in insensitive ways, e.g. withdrawn or intrusive interaction styles (Field, Hernandez-Reif & Diego, 2006). Withdrawn mothers may appear disengaged and unresponsive, whereas intrusive mothers may respond to their infant in an angry, irritated, or controlling fashion (Field et al., 2006).

The quality of early parent-infant interactions has been linked to later attachment style. Interactions characterised as being sensitive, coordinated, warm and able to repair 'ruptures' are associated with secure attachment relationships (Braungart-Rieker, Garwood, Powers & Wang, 2001; De Wolff & Van IJzendorrn, 1997). Secure attachments are associated with improved emotion regulation, self-reflective skills (Fonagy, 2003) and increased resilience (Belsky & Fearon, 2002; Edwards, Eiden & Leonard, 2006; Fonagy, 2003). Conversely, insecure attachments, particularly disorganised patterns, are associated with long-term negative outcomes including behavioural problems (Fearon & Belsky, 2011), relationship difficulties (Simpson, Rholes & Phillips, 1996), and later psychopathology (Fonagy, 2003).

Within the UK the significance of early parent-infant relationships and the link to later attachment security has led to the argument for effective intervention programmes aimed at enhancing the sensitivity of early parent-infant interactions (e.g. 'Future in Mind', DOH, 2015; '1001 Critical Days', Leadsom, Field & Lucas, 2013). It has been argued that services aimed at supporting sensitive early parent-infant interactions should operate at both primary care level, through liaison and training of Health Visitors (HVs), and at a secondary care level, which provide more specialist perinatal interventions (Barlow, McMillan, Kirkpatrick, Ghate, Barnes & Smith, 2010; DOH, 2009).

HVs are registered nurses who provide universal health care to children during their first five years of life. Within the UK, HVs have been identified as key professionals involved in supporting the development of sensitive parent-infant interactions. For instance, the Healthy Child Programme (DOH, 2009) recommends HVs should provide practical advice in relation to sensitive parenting and should screen for more significant difficulties, referring to specialist services when necessary.

HVs have been recognised as being well placed to identify and support difficulties in parent-infant interactions for several reasons. First, HVs have contact with all new mothers, providing the opportunity to screen widely. Second, it is suggested that because HVs provide a universal service, families may feel less stigmatised by their involvement and more likely to accept their support (Svanberg, Mennet & Spieker, 2010). Third, HVs' on-going involvement with families means they have opportunity to develop positive working alliances with families, thus increasing their chances of recognizing and supporting any possible difficulties (Svanberg, 2009).

Given that HVs have been identified as key professionals involved in identifying difficulties in parent-infant interactions, it is important to understand how HVs and the health professionals who work with them evaluate these interactions. Qualitative research suggests that HVs recognise the complexity of assessing the parent-infant relationship and consider a range of factors when trying to understand it, relying largely on clinical experience rather than formal training (McAtamney, 2011; Pettit, 2008; Wilson, Barbour, Graham, Currie, Puckering, & Minnis, 2008). Nevertheless, within these studies HVs consistently expressed the need for more formal training in relation to assessing parent-infant relationships. Newly qualified HVs reported feeling 'ill-equipped' (Wilson et al., 2008, p.1143) and Appleton, Harris, Oates and Kelly (2013) found that HVs felt their training was not sufficient in supporting them to assess parent-infant interactions. Similarly, Kristensen, Trillingsgaard, Simonsen and Kronborg (2017) reported 54% of Danish HVs expressed a need for further qualifications in early parent-infant relationships. Indeed, evidence suggests that HVs who receive specific training on parent-infant interactions are more accurate in their assessment (Jennings, 2004; Kristensen et al., 2017; Svanberg & Barlow, 2013; Wilson, Puckering, McConnachie, Holden, Cassidy & Gilberg, 2010). However, many of the specialist tools that have been developed for assessing parent-infant interactions (e.g. The Infant Child-

Adult Relationship Experimental Index; Crittenden, 2007) are becoming increasingly complex and require considerable training, making it impractical for busy front-line practitioners and the financial burden of funding extensive training can be prohibitive.

Despite HVs' role in assessing and supporting parent-infant interactions, research has rarely investigated how accurately health visitors assess parent-infant interactions and there appears to be an even greater lack of research on the health professionals who work alongside HVs. In an unpublished doctoral thesis, Jennings (2004) found that HVs who had not received specific training in assessing parent-infant interactions estimated almost all the interactions they viewed as sensitive. Research with untrained student samples suggested that the accuracy of their evaluations of parent-infant behaviour vary considerably, and that certain aspects of parent-infant behaviour, e.g. affect and emotional warmth, may be more difficult to rate than more objective aspects of an interaction (Baker et al., 2010a; 2010b). Wilson et al. (2010) found levels of agreement between HVs on whether there appeared to be problems in the parent-infant relationship tended to be higher for interactions characterised as having either low or high levels of positive interactive behaviour but reduced when interactive behaviour was mixed. Appleton et al. (2013) found that HVs' evaluations of early parent-infant interactions varied considerably and were only significantly correlated with expert ratings of interactions for four out of a possible nine interactions.

In summary, research suggests that accuracy of HVs' assessments of parent-infant interactions is varied. However due to small sample sizes and methodological differences it is not possible to draw firm conclusions from the research. The current study aims to build on previous research by utilizing a larger sample and presenting participants with a wider range of standardised parent-infant interactions. Given that Community Nursery Nurses (CNNs) and Family Health Nurses (FHNs) also work alongside HVs in providing services it was decided that they would also be included in the study.

Objectives:

a) To identify whether participants' overall evaluations of parent-infant interactions categorised as sensitive, mixed and problematic are rated as being significantly different from one another.

b) To explore how participants' ratings of different elements of the interaction relate to their overall rating of the parent-infant interaction.

Method**Design**

HVs, FHNs and CNNs viewed video footage of six parent-infant interactions categorised as 'sensitive', 'mixed', and 'problematic' and evaluated the quality of the interactions using a pen-and-paper questionnaire.

Participants

73 participants were recruited from two NHS Trusts within Northwest England. Approval was granted by the NHS National Research Ethics Service (NRES) and relevant Research Governance departments. Staff were recruited via email sent from team managers. A total of 73 staff responded and participated in the study.

Materials

Parent-infant interaction videos. Videos were sourced from Wirral Child Health and Development Study (WCHADS; Hill, Sharp, Lancaster & Pickles, 2006-2010). Mothers had been filmed engaging in a fifteen-minute playful interaction with their six-month-old babies. The WCHAD study team agreed that twenty parent-infant interaction videos could be sourced from the study to provide enough to ensure six suitable videos could be identified. Consent was sought from the mothers from the WCHADS to use this footage.

The Infant Child-Adult Relationship Experimental Index (CARE-Index; Crittenden, 2007) was used to code segments of these twenty videos. This coding system is designed to assess a playful parent-infant

interaction and can be used with infants from birth to 15 months. Adult and infant are assessed in relation to seven aspects of interactional behaviour, comprising four affective and three cognitive items, to describe the interactional pattern between parent and infant. The CARE-Index also provides an overall Dyadic Synchrony (DS) score. Scores range from 14 (mutual delight, joy in one another) to 0 (total failure to perceive or attempt to soothe the infants distressed state) (Crittenden, 2007, p. 15). Crittenden (2007) developed cut-offs for DS scores, which are grouped into four categories and can be used to guide intervention decisions. Svanberg (2009) adapted these cut-offs into three categories: 'good enough' (14-8), 'of concern' (7-4) and 'seriously compromised' (0-3). For the current study Svanberg's (2009) cut-offs were used to allocate the videos from the WCHADS into 'sensitive', 'mixed' or 'problematic' categories.

The videos were coded by a clinical psychologist within the research team (ROS) who is trained to use the CARE-Index and has evidence of reliability. This main coder was blind to all information regarding the parents and their infants. To check reliability, a third of the interactions were scored by a second CARE-Index trained coder and showed 100% agreement on all variables. In line with the research design, only a three-minute segment from the fifteen-minute video clip was chosen from the clip and then coded. The coding and selection procedure used is presented in Figure 1. Information relating to the final six videos selected is presented in Table 1.

INSERT FIGURE 1

INSERT TABLE 1

The Parent-Infant Interaction Rating Questionnaire (PIIRQ). The PIIRQ was developed by the research team for this study. It is a brief pen-and-paper questionnaire based on the CARE-Index (Crittenden, 2007). Participants rate their perception of the quality of the interaction. It has eight five-point Likert scale items. Seven items relate to the seven aspects of interactional behaviour the CARE-Index assesses and an overall rating item asked participants to rate the overall quality of the interaction using a five-point Likert scale, ranging from 'very low quality' to 'very high quality'.

Five clinical psychologists with a specialist interest in infant mental health gave qualitative feedback on face validity and usability. This led to minor modifications in layout and wording of the questionnaire.

Procedure

Group data collection sessions were arranged. Participants completed brief demographic questionnaires then the researcher introduced the PIIRQ and participants familiarised themselves with the questionnaire. After watching each video, participants completed the PIIRQ. Participants were asked not to talk or confer. Order of presentation of videos was counterbalanced to minimise order effects.

Results

Sample demographics

Participants included 55 HVs, 14 CNNs and 4 FHNs aged 25 to 64 years old. Time in current job ranged from three months to 30 years (mean 10 years, $SD=8.90$). Participants reported a range of previous job roles working with children and families, most commonly, midwife ($n=23$), paediatric nurse ($n=17$) and children's nursery nurse ($n=9$). The majority (63%) reported having undertaken specific training relevant to parent-infant relationships, including specific courses such as the Solihull approach ($n=28$), parent-infant interaction courses ($n=5$), infant massage ($n=7$), and general courses relating to attachment theory ($n=11$), infant mental health ($n=1$) and bonding ($n=1$).

Missing data

There were a total of 25 missing data points out of a possible 5256 (0.48%). Given the particularly small percentage of missing data mean substitutions were employed in inferential statistics (Tabachnick & Fidell, 2000).

Ratings of overall quality of interactions

On average, participants rated the problematic videos as lowest in overall quality, the mixed videos as higher in quality than the problematic videos, and the sensitive videos as highest in quality (Table 2).

INSERT TABLE 2

To explore whether differences in overall quality ratings of the six videos were statistically significant a one-way repeated measures ANOVA was used with 'video' as the independent variable and overall quality rating as dependent variable, with six levels corresponding to the different videos. Mauchly's test indicated assumption of sphericity had been violated (χ^2 , 14=31.51, $p<.05$); therefore degrees of freedom were corrected using Greenhouse-Geisser estimates ($\epsilon=.85$). Results showed that video had a significant effect on overall quality rating ($F(4.26, 306.74) = 204.57$, $p<.01$, $\eta_p^2=.74$). Bonferroni t-tests (to correct for multiple comparisons) were used to test which videos were rated significantly differently from one another (Table 3).

INSERT TABLE 3

The analysis showed some significant differences between ratings of videos assigned to the same category. P1 was rated significantly higher in quality than video P2 and M2 significantly higher in quality than M1 but there was no significant difference between S1 and S2.

When comparing the ratings of the problematic and mixed category, analysis showed that respondents rated both M2 and M1 significantly higher than P2, however, only M2 was rated significantly higher than P1.

When comparing the problematic and sensitive category, both video S1 and S2 were rated as being significantly higher in quality than videos P1 and P2. When comparing the mixed and sensitive category, both videos S1 and S2 were rated as being significantly higher in quality than videos M1 and M2.

How ratings of different elements of the interaction relate to overall quality ratings

Pearson Correlation Coefficients were used to assess the relationship between participants' ratings of the affective and cognitive items (items 1-7 on the PIIRQ) and their overall quality ratings for the six videos. As can be seen from Table 4, PIIRQ items based on the CARE-index showed moderate to strong (and highly significant) relationships with overall ratings for all interactions.

INSERT TABLE 4

Discussion

These findings indicate participants were relatively accurate in distinguishing the quality of interaction in the different videos (objective a). This contrasts with previous research indicating that without training in a specific assessment tool, HVs are not accurate in assessing parent-infant interactions (Appleton et al., 2013; Jennings, 2004; Svanberg & Barlow, 2013). Whilst a majority of these participants reported training relevant to parent-infant interactions, none reported training in specific assessment tools or how to assess parent-infant interactions.

Whilst this study did not specifically seek to investigate differences in how participants evaluated patterns of interactions, interesting findings emerged. Participants successfully distinguished between interactions with different CARE-Index ratings but also gave significantly different ratings to videos (in the problematic and mixed categories) with very similar overall CARE-Index scores. However, the CARE-Index *patterns* for the videos were markedly different. Video P1 was evaluated as having a controlling (mother) and difficult (infant) pattern, whereas video P2 was rated as unresponsive (mother) and passive/cooperative (infant). Thus, findings suggest that participants evaluated the unresponsive interaction as being lower in quality than the controlling interaction. Similarly, video M1 was rated significantly lower than M2. Examination of CARE-Index patterns shows that M1 scored as having elements of unresponsiveness whilst M2 was not. Again, participants may have rated M1 as lower because it displayed elements of unresponsiveness. Wilson et al. (2010) found the reasons most commonly identified by HVs for problems in the parent-infant relationship related to unresponsive behaviours (e.g. 'little or no vocalisation', 'no eye contact'). In contrast, the problematic behaviour least likely to be identified was 'parent handled baby roughly', which is typical of a controlling interaction.

This study potentially provides a new insight: health-visiting professionals may focus on unresponsive behaviours in evaluating the quality of parent-infant interactions and less likely to identify controlling behavior as problematic. HVs may be more concerned about a parent who appears withdrawn than one apparently 'trying hard' but not engaging sensitively with their child. One explanation may be the emphasis placed upon identification of postnatal depression (e.g. DOH, 2009), which is commonly associated with withdrawn behaviours. More generally, qualities such as affection and attending to the

child's needs are associated with 'good mothers' (Bemiller, 2010; Breheny & Stephens, 2006; Christopher, 2012), thus, absence of these features may be more alarming than the presence of controlling, albeit insensitive behaviours. Nevertheless, both abuse (controlling) and neglect (unresponsive) are concerning and given the role of HVs in frontline child protection work, it is vital these behaviours are assessed as equally problematic.

Ratings of a range of interactional behaviours (and non-interactional factors) were associated with overall evaluations of the interaction and the strength of the correlation between individual PIIRQ items and overall quality ratings varied for each video (objective b), suggesting participants drew on a range of information in judging the quality of an interaction. This mirrors research exploring how HVs make more general assessments (Appleton & Cowley, 2008) and suggests that HVs are skilled at incorporating a range of holistic information into assessments. However it is not possible to determine whether participants' ratings of elements of the interaction informed their overall evaluation or vice versa or whether both were determined by a third variable.

Methodological limitations

This is the first study using the PIIRQ. Further examination of the validity of this measure is needed and there were noticeable floor and ceiling effects for some items. It is possible that recruitment created a self-selecting bias, with those interested in infant mental health more likely to participate. Experimental conditions were different to conditions in routine practice, limiting applicability of findings. Although cultural differences in nature and style of parent-infant interactions have previously been found (Bornstein et al., 2008; McCollum, Ree & Chen, 2000), it was not possible to include cultural factors in this study. The dyads in the videos were all White British (reflecting the demographics of the original study population) and no data regarding participants' ethnicity were collected, making it difficult to draw conclusions about the translatability of this study to multicultural populations.

Clinical Implications

The findings suggest that health-visiting professionals were relatively accurate in evaluations of parent-infant interactions. This study provides support for the suggestion that HVs are well placed to screen for difficulties in parent-infant interactions (DOH, 2009; Kemp, 2008; Svanberg, 2009; Wilson et al., 2008). The findings suggest participants were more likely to be concerned about unresponsive, rather than controlling interactive behaviours. Whilst these findings need to be viewed tentatively, they have important clinical implications as both controlling and unresponsive patterns have been found to have negative implications for the parent-infant relationship and subsequent infant development (Field et al., 2006; Jacobvitz & Sroufe, 1987; Morrell & Murray, 2003). This highlights the need for specific training aimed at increasing awareness of controlling interactions. Participants fed back that they valued the opportunity to observe and reflect on the videos, suggesting that this as a useful medium for learning and development. Supervision involving the use of reflective video work could represent a possible way of achieving this.

Areas for Future Research

Exploring differences in the way people evaluate particular patterns of parent-infant interactions and the reasons for this appears to be an important avenue for further research. Specifically, it might be helpful to systematically examine a wider range of controlling and unresponsive interactions. Secondly, to explore how parent-infant interactions are evaluated within routine practice. This may present a greater methodological challenge but studies exploring how HVs make clinical judgments within routine practice have been undertaken (Appleton & Cowley, 2008).

Conclusions

Health-visiting professionals have a key role to play in identifying difficulties in early parent-infant interactions but there has been minimal research into their ability to assess the quality of these interactions. Previous research has largely been based on interviews exploring HV's perspectives rather than testing the accuracy of their assessments. This innovative study demonstrated an effective methodology and the findings are encouraging as they demonstrate that health-visiting professionals are able to distinguish between the sensitivity of parent-infant interactions. It provides suggestive new evidence that these professionals may attend more to unresponsive than controlling patterns of interaction.

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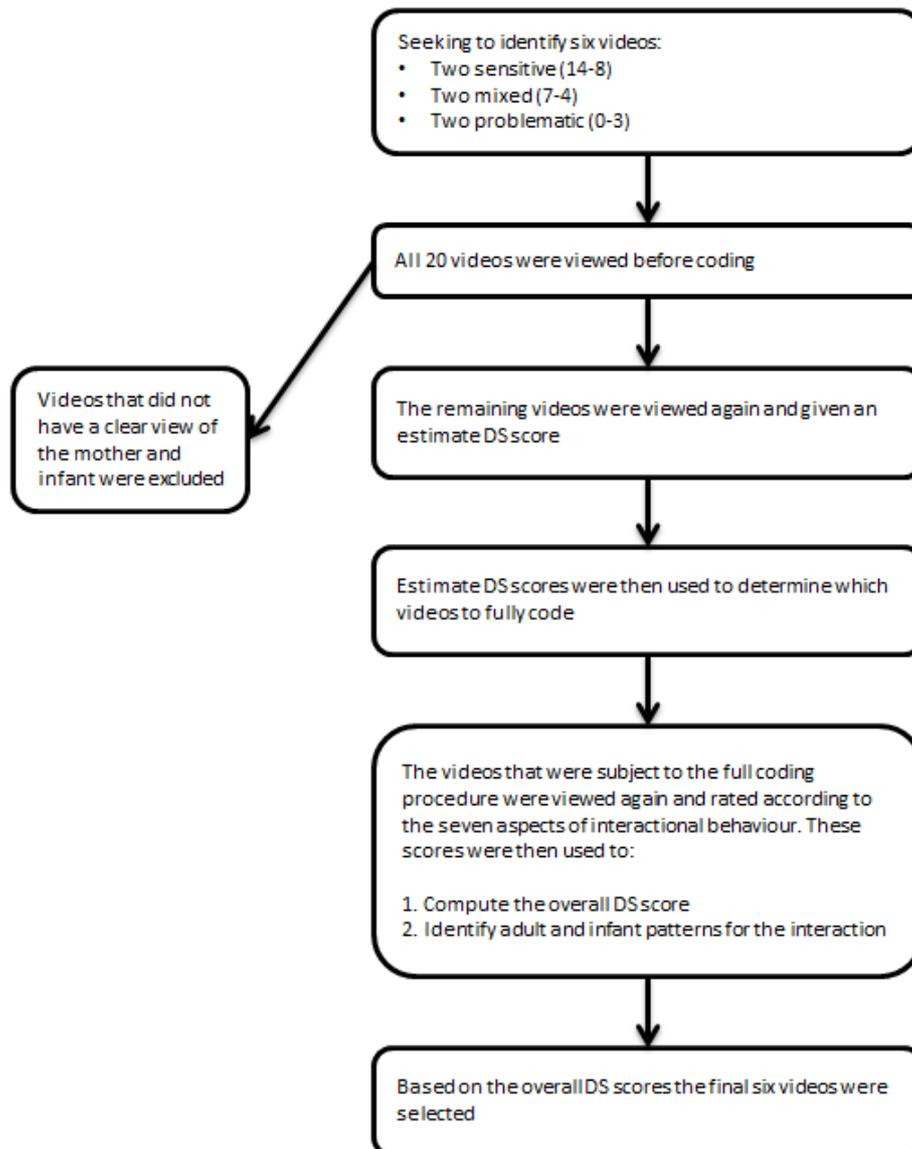


Figure 1. Overview of the video selection and coding procedure.

Table 1. Summary of CARE-Index coding information relating to the six videos used in the study.

Category	Video label	Dyadic Synchrony Score	CARE-Index Primary pattern	
			Mother	Infant
Sensitive	S1	12	Sensitive	Cooperative
	S2	13	Sensitive	Cooperative
Mixed	M1	6	Controlling/unresponsive /sensitive ^a	Cooperative/passive /compulsive ^a
	M2	7	Controlling/sensitive ^a	Cooperative/difficult ^a
Problematic	P1	2	Controlling	Difficult
	P2	3	Unresponsive	Passive/cooperative ^a

^a Indicates a mixed pattern

Table 2. Summary of means and standard deviations for participants' overall quality ratings of the six videos ($N = 73$).

Video	Mean (SD)
<i>Sensitive</i>	
S1	3.92 (0.81)
S2	4.18 (0.75)
<i>Mixed</i>	
M1	2.18 (0.75)
M2	3.23 (0.66)
<i>Problematic</i>	
P1	2.04 (0.79)
P2	1.44 (0.58)

Note: The values correspond to '1'=very low quality, '2'=low quality, '3'=average quality, '4'=high quality, '5'=very high quality.

Table 3. Summary of t Values for t-test comparisons of participants' overall quality ratings of the six videos ($N = 73$).

		S2	M1	M2	P1	P2
Sensitive	S1	-1.91	15.76**	6.78**	-15.03**	-23.16**
	S2		15.82**	9.18**	-17.04**	-24.08**
Mixed	M1			-10.24**	-1.30	-7.70**
	M2				-11.83**	-19.20**
Problematic	P1					6.5**

Note: $df=72$

*=significant at 0.05 level (2-tailed)

**=significant at 0.01 level (2-tailed)

Table 4. Pearson correlation coefficients showing the relationship between individual item ratings and overall quality ratings on the PIIRQ for the six videos.

PIIRQ items		Problematic		Mixed		Sensitive	
		P1	P2	M1	M2	S1	S2
Affective Items	Facial expression	.53**	.59**	.57**	.74**	.69**	.57**
	Position	.53**	.46**	.60**	.61**	.64**	.64**
	Vocal expression	.65**	.59**	.62**	.67**	.64**	.74**
	Affection	.58**	.59**	.61**	.68**	.70**	.63**
Cognitive Items	Turn-taking	.58**	.51**	.65**	.70**	.70**	.68**
	Control	.43**	.81**	.55**	.62**	.72**	.62**
	Choice of activity	.71**	.56**	.77**	.66**	.74**	.86**

*=significant at the 0.05 level (1-tailed)

**=significant at the 0.01 level (1-tailed)