

A Process Investigation of an Internet-Delivered Parent-Infant Interaction Intervention

Betsy Davis¹, Kathleen Baggett², Edward Feil¹, Lisa Sheeber¹, Susan Landry³, Judith Carta²

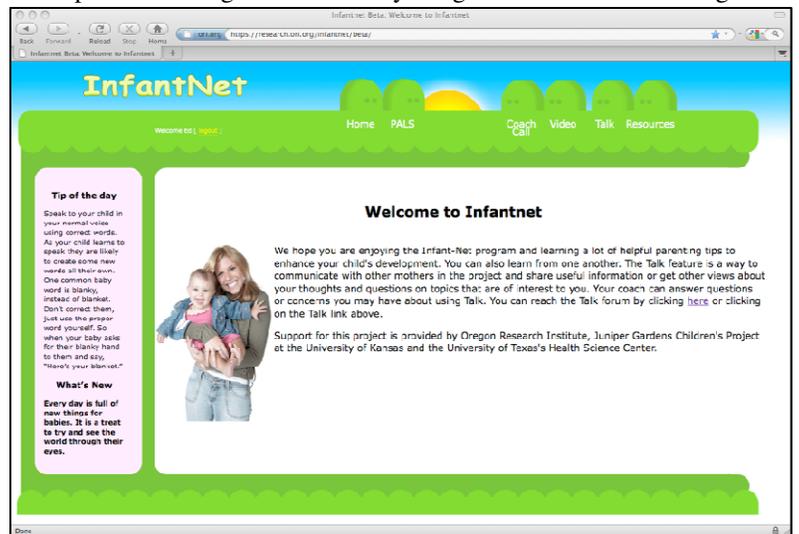
¹Oregon Research Institute, ²University of Kansas, ³University of Texas Health Science

Background

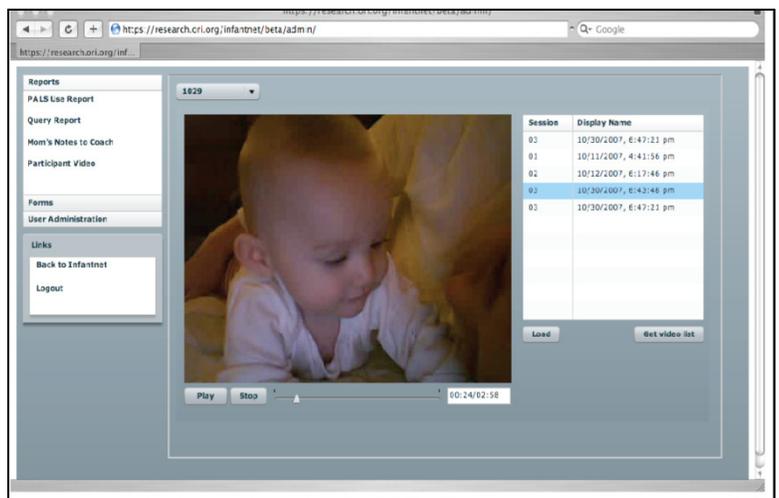
Research indicates that behavioral parent training (BPT) is the single most effective intervention available to improve parent-child relationships and reduce the potential for child maltreatment (Taylor and Biglan, 1998, Haugaard & Feerick, 1996). Unfortunately, access to effective behavioral interventions is severely limited for many of those most in need, especially mothers of very young children living in rural areas. Through the use of recent advances in multimedia technology and the rise of computer networking via the Internet, there now exists an opportunity to provide interventions to families with limited access to traditional services. However, little is known about the role that intervention process variables, such as long-distance parent engagement, may play in Internet-delivered interventions. This presentation will describe the structure and process of the developing coach-parent relationship in an Internet delivered intervention, InfantNet, shown to promote sensitive responding parent engagement and infant social engagement (Feil, et al., 2008; Baggett et al., 2010).

Method

Sample: The sample for this investigation included nineteen low income mothers-infant dyads that constituted the treatment group of a small randomized control trial. Mothers within the sample were living in Lane County Oregon and were income-eligible for EHS and the Women Infants and Children program (WIC) as defined by an annual gross income at or below 185% of the U.S. Poverty Income Guidelines. At the time of enrollment, infants ranged in age from 3 to 8 months and on average were 4 months of age. Fifteen percent of the mothers were Hispanic/Latina, 2.5% were American Indian, 5% were African American, 82.5% were White, 7.5% reported more than one race category, and 2.5% did not report race or ethnicity. Based on mothers' report, infants were 45% female, 25% Hispanic/Latino, 5% American Indian, 2.5% Asian, 5% African American, 65% White, and 22.5% reported more than one race category. The sample reflected a high prevalence of significant maternal depressive symptoms, 31% obtaining Post-Partum Depression Screening Scale (PDSS) scores indicating significant postpartum depression symptoms.

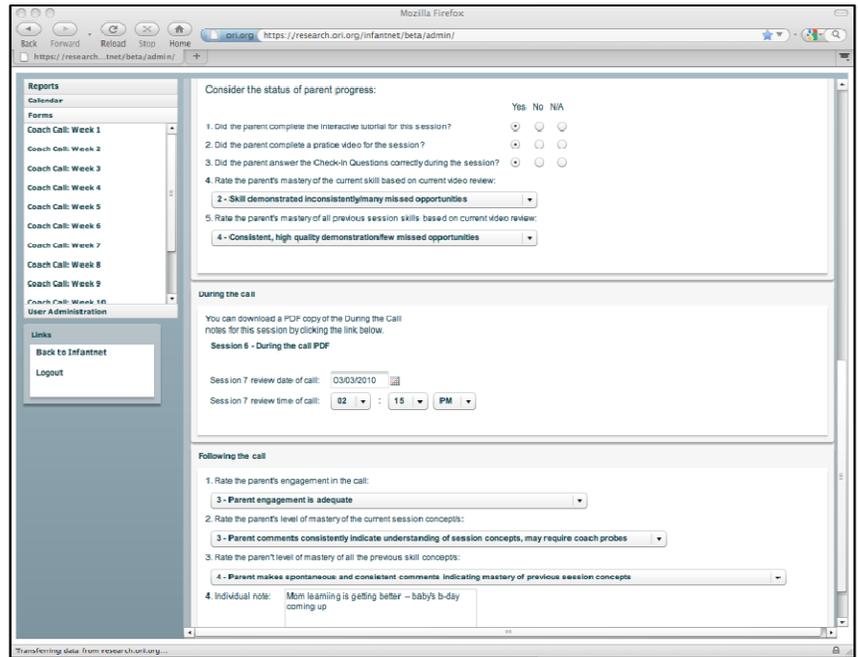


InfantNet Program. Data for the current study results from an RCT that was designed to evaluate Infant Net, an Internet adaptation of the Play and Learning Strategies (PALS; Landry et al., 2008) program. Within the RCT, mothers were assigned to either the InfantNet or a computer control condition. The Infant-Net program included the following elements: (a) a multimedia, instructional presentation of concepts, behaviors, and skills via video examples featuring parents and infants diverse in race, ethnicity, and age; this presentation adhered to principles found in the literature to be associated with the effective design of teacher-led classroom instructional materials (Kameenui & Carnine, 1998) as well as the principles more recently found to be associated with effective distance learning (Clark, 2002); (b) check-in questions dispersed throughout each session, with answers recorded to a database for review by both parent and coach after each session's self-directed learning period; (c) a summary of key session concepts; (d) daily activities (homework) based on skills taught in each session; (e) the creation of a 5-minute computer-collected video of mother-infant interactions implementing session skills for later remote co-review by coach and parent; and (f) a weekly telephone coach call to co-review mother-infant computer-administered video and session content and provide individualized support in skill practice and acquisition.



InfantNet Process. Weekly session phone conversations between mothers and their coach are centered on mothers': a) responses to session check-in questions, b) behavior during observational interaction with their infant as they display the skills learned; c) the quality of mother's comments during discussion with the coach; and d) engagement with the program material and coach (see screen shots). During the InfantNet RCT, ratings were made by coaches after each call and 20% were double-coded by an independent coder.

Current and previous session skills mastery was rated by the coach based on a 1-4 scale (1 'skill not demonstrated' to 4 'high quality demonstration of skill, with no missed opportunities) and reflected how well mothers demonstrated the skills being taught during the video-recorded mother-infant interaction. Concept mastery of current and previous session PALS material was rated based on a 1-4 scale (1 'no understanding of session concepts' to 4 'spontaneous & consistent mastery comments') and reflected mothers' ability to verbalize to the coach the concepts being taught (e.g., recognizing baby's signals). Maternal engagement was rated on a 1-4 scale (1 'parent engagement very low regardless of strong coach support' to 4 'parent engages easily and stays on topic with minimal coach support') and reflected how connected the mother was to both the material and coach.



Purpose of the Study

In the current study, intervention process variables related to intervention quality were defined by the variables of maternal engagement and concept mastery, both rated on the long-distance verbal interaction between coach and mother wherein the coach must engage the mother with the material taught and connect with her in such a manner as to extract the highest quality information relative to maternal comprehension of the skills and knowledge to be learned.

Gaining a better understanding of the nature of the long-distance, mother-coach relationship, in terms of the quality of this relationship as it progresses over the course of intervention, and how this relationship relates not only to maternal skills acquisition during intervention but also to maternal and infant behavior outside of intervention, are important first steps toward identifying the critical aspects of internet-delivered interventions that can maximally support successful learning and behavior change.

In the current study, we examined the relation between quality of mother-coach relationship and behavior change by viewing verbal engagement and concept mastery indicants relative to: a) behavioral skills mastery over the course of intervention as rated by the coach; as well as b) maternal and infant behavior outside of direct intervention, assessed during the RCT, reflecting maternal warmth and infant engagement with the environment.

Results

Relation of mother-coach quality of interaction and maternal skills mastery during intervention

Sessions 1-3: Early Sessions Quality: Combined maternal engagement and
 Sessions 4-8: Mid Sessions concept mastery coach ratings at each session
 Sessions 9-11: Late Sessions Skills Mastery: Coach rating of mastery at each session

Early Sessions Quality of Verbal Interaction X Early Sessions Skills Mastery

		Skills Mastery		
		NO	YES	
Quality of Interaction	NO	5 100% 83% 26%	0 0% 0% 0%	n=5
	YES	1 7% 17% 5%	13 93% 100% 68%	n=14
		n=6	n=13	

$X^2=14.70, p < .001$

Early Sessions Quality of Interaction X Mid Sessions Skills Mastery

		Skills Mastery		
		NO	YES	
Quality of Interaction	NO	4 80% 57% 22%	1 20% 9% 5%	n=5
	YES	3 23% 43% 17%	10 77% 91% 56%	n=13
		n=7	n=11	

X²=4.92, p < .05

Late Sessions Quality of Interaction X Late Sessions Skills Mastery

		Skills Mastery		
		NO	YES	
Quality of Interaction	NO	1 100% 100% 7%	0 0% 0% 0%	n=1
	YES	0 0% 0% 0%	14 100% 100% 93%	n=14
		n=1	n=14	

X²=15.00, p < .001

The quality of early mother-coach interactions during InfantNet implementation was significantly related to both concurrent and mid-session skills mastery. Quality of interaction continued to influence skills acquisition through later sessions.

Relation of mother-coach quality of interaction during intervention with mother and infant behavior outside intervention

In the current analysis, skills mastery and mother-coach interaction indicants above were examined relative to maternal and infant behavior as observed during parent-child interactions at pre- and post assessment during the RCT pilot test of the InfantNet intervention. Quality indicants were averaged across all intervention sessions in order to produce a more continuous distribution of scores to relate to maternal and infant observed behavior. Given the small sample size both Pearson and non-parametric correlations were performed, with the most conservative correlation being reported.

Variables	Correlation (n=19)
Maternal Skills Mastery Across Intervention with observed:	
1) Maternal Warmth at post assessment	r= .40*
2) Maternal Responsiveness at post assessment	r= .51**
3) Increases in Infant Positive Play from pre-to-post assessment	r= .54**
Quality of Mother-Coach Interactions Across Intervention with:	
1) Maternal Total Positive Play at post assessment	
2) Increases in Maternal Positive Play from pre-to-post assessment	r= .54**
Relation of Change in Maternal Positive and Infant Positive Behavior from pre-to-post assessment	r= .37*
	r= .35*

* p < .05

** p < .10

Skills Mastery achieved by mothers across the course of interaction was significantly related to observed maternal positive behavior at the end of intervention as well as observed positive change in infant behavior across the course of intervention. Quality of the mother-coach interaction, on the other hand, was related to observed positive change in maternal behavior across the course of intervention as well as to mother's level of positive play observed at the end of intervention. It is possible that skills mastery, being the behavior mothers learn to perform with their infants, results in increases in positive infant behavior. It is the quality of the mother-coach interaction, however, that relates to acquisition of these positive maternal behaviors in interaction with her infant; these contentions are supported by the correlation found between change in maternal and infant positive behavior.

Discussion

The current results demonstrate not only the possibility of achieving high levels of maternal engagement and quality responding via internet-delivery of an evidence-based parenting intervention to promote infant social emotional development, but also that the quality of the distant mother-coach relationship is essential to skills mastery during and outside of intervention. This study supports the viability of internet-delivery of interventions but also highlights the importance and viability of developing successful parent-coach relationships at a distance that can support maternal learning.

References

- Baggett, K. M., Davis, B., Feil, E. G., Sheeber, L., Landry, S., Carta, J., et al. (2010). Technologies for expanding the reach of evidence-based interventions: Preliminary results for promoting social-emotional development in early childhood. *Topics in Early Childhood Special Education, 29*(4), 226-238.
- Clark, D. (2002). Psychological myths in e-learning. *Medical Teacher, 24* (6), 598-604.
- Feil, E. G., Baggett, K. M., Davis, B., Sheeber, L., Landry, S., Carta, J., et al. (2008). Expanding the reach of preventive interventions: Development of an Internet-based training for parents of infants. *Child Maltreatment, 13*(4), 334-346. PMID: PMC2744504
- Haugaard, J., & Feerick, M. (1996). The influence of child abuse and family violence on violence in the schools. In A. M. Hoffman (Ed.), *Schools, violence and society* (pp. 79-97). Westport, CT: Praeger Publishers/Greenwood Pub. Group, Inc.
- Kameenui, E. J., & Carnine, D. W. (1998). *Effective teaching strategies that accommodate diverse learners*. Des Moines, IA: Prentice-Hall.
- Landry, S. H., Smith, K. E., Swank, P., & Guttentag, C. (2008). A responsive parenting intervention: The optimal timing across early childhood for impacting maternal behaviors and child outcomes. *Developmental Psychology, 44*, 1335-1353.
- Taylor, T., & Biglan, A. (1998). Behavioral family interventions for improving childrearing: A review of the literature for clinicians and policy makers. *Clinical Child and Family Psychology Review, 1*(1), 41-60.