Methods for Retaining Underrepresented and Economically Disadvantaged Families in Developmental Research

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Introduction

- Since *The National Center on Minority Health and Health Disparities* (NCMHD) was established by the initiation of the Minority Health and Health Disparities Research and Education Act of 2000, Public Law 106-525, **there has been a steady increase in the demand for research amongst underrepresented populations**. Nevertheless, there remains a shortage of research examining these populations despite initiatives driven by several national organizations (George, Duran, & Norris, 2014). Therefore, these populations continue to be understudied and underserved (Rivas-Drake, Camacho, & Guillaume, 2016), further perpetuating problematic inequity in empirical representation. **Studying underrepresented populations is imperative to achieving more generalizable conclusions in developmental research as well as cultivating culturally, socioeconomically, and ethnically sensitive interventions and policies** (Knight et al., 2009).
- However, retaining underrepresented and economically disadvantaged families in longitudinal research presents unique methodological challenges to researchers leading to elevated attrition rates. This is especially true amongst higher-risk families due to higher rates of transient housing, unstable phone service, and other stressful life events (Zook et al., 2010).
- Existing literature reports wide differences in the retention of participants in longitudinal developmental research. Despite some extraordinary exceptions (Pittsburg Girls Study; Project Competence Longitudinal Study), **researchers have struggled to evade elevated attrition rates**.
- Few studies have provided a thorough record and report of specific tracking measures and procedures. Some existing studies highlight researcher efforts including developing trust through the continuity of interviewers across waves and cooperation with referring agencies (e.g., Gregory, Lohr, & Gilchrist, 1992), offering participant-specific incentives (Katz et al., 2001), implementing a tracking database and assigning a tracking coordinator (McCuller et al., 2002), maintaining multiple forms of updated contact information including that of family and friends of participants (e.g., Zook et al., 2010), and emphasizing impact of the study to participants directly (Graziotti et al., 2012). Fewer studies have examined specific and detailed participant characteristics that may contribute to the need for more extensive tracking efforts.
- **The aim of the current study is to examine participant characteristics that may contribute to risk for elevated attrition rates and the consequential need for more extensive tracking efforts put forth by researchers. The current study also aims to describe in detail such tracking procedures from a longitudinal study of at-risk women and their children from pregnancy through 2 years postpartum.**

Method

Participants
120 women followed from pregnancy through the first two years of their child's life; age range: 18-42 yrs., $M = 26$, $SD = 5.7$

- Race: 47% African–American, 36% Caucasian, 13% Biracial, 4% Other (see Figure 1)
- Marital Status: 64% single/never married, 28% married, 4% divorced, 4% separated
- Education: 20% had a high school diploma or less, 44% some college, 36% college degree
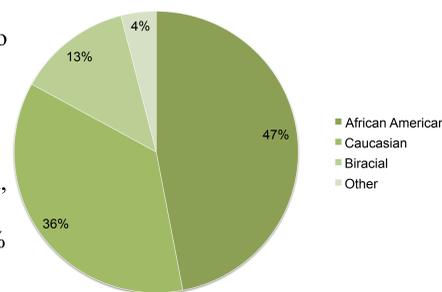- Income: Median monthly household income = $1500; 73% received services from WIC, and 76% had public health insurance

Figure 1. Participant Race

Procedures
- A community sample of pregnant women was recruited for a prospective longitudinal study on parenting. Data collection occurred during the mothers' third trimester of pregnancy (T1), and at 3 months (T2), 1 year (T3), and 2 years (T4) postpartum.

Measures
- Maternal age, education, and household income were assessed at T1 using a demographics questionnaire.
- Income-to-needs ratio was defined as the family's income divided by the poverty threshold for that composition of family.
- Maternal depression was measured at T1 ($\alpha = .76$) using the Edinburgh Postnatal Depression Scale (EPDS) (Cox, Holden, & Sagovsky, 1987).
- Maternal anxiety and hostility were assessed at T1 ($\alpha = .77; .80$) using the Brief Symptom Inventory, Anxiety and Hostility Scales (BSI-A & BSI-H, Derogatis, 1992).
- PTSD symptoms were assessed at T1 ($\alpha = .87$) using the PTSD Checklist - Civilian version (Weathers et al., 1994).
- The Perceived Social Support Scale (Procidano & Heller, 1983) was used at T1 to assess for total perceived social support ($\alpha = .91$).

Tracking Methods

- Between major data collection waves, researchers "tracked" participants every 3 months, i.e., 6, 9, 15, 18, and 21-months postpartum, to maximize retention across the study. High retention rates were achieved due to extensive tracking strategies and efforts: 99% (T2), 94% (T3), and 88% (T4).
- Researchers from the present study coded extensive tracking efforts and procedures by analyzing data from paper and electronic tracking records from the original study. Researchers coded data on phone calls, home visits, letters, and e-mails to participants and their re-contact person/people (up to 3 individuals whom the participant indicated would know where to find her if researchers were unable to locate her). They also coded contact information changes and days spent attempting to contact participants during each tracking period and across the entire study.
- On average, researchers spent 10 days per tracking period attempting to contact participants ($M = 10.40$, $SD = 10.99$, Range = $1 - 81$). The most common final contact method was by phone at every period. However, other methods were often required. Participants received 15 calls on average throughout the study ($M = 15.10$, $SD = 8.61$, Range = $2 - 42$), with an average of three calls per tracking period ($M = 3.32$, $SD = 2.02$, Range = $1 - 12$). Sixty percent of women (60%) were sent a letter throughout the study to assist with contact. As technology advanced with time, e-mail also emerged as a helpful tracking method, used with 34% of women at one or more tracking periods.
- Throughout the study, 21% of women were unwilling/unable to identify a primary re-contact person at some point; 5% did not provide one during *any* tracking period. Due to difficulty reaching participants, researchers contacted 61% of re-contact people by phone, and 6% received home visits. Furthermore, 45% of secondary and 33% of tertiary re-contact people were contacted. Additionally, contact information changed often, with 62% and 48% of participants changing their phone number and address, respectively, at least once; 67% of participants' re-contact people also had changes in their contact information.

Results

- Bivariate correlations revealed significant relationships between several demographic risk variables and tracking outcomes (see Table 1).
- Subsequently, variables that were significantly related to participant phone number changes, number of re-contact person/people changes, and number of changes in re-contacts persons' contact information were further examined using multiple regression.
  - Results showed that less maternal education ($\beta = -.24$, $p < .05$) and less perceived social support ($\beta = -.21$, $p < .05$) significantly predicted more changes in participant phone numbers.
  - Additionally, lower income to needs ($\beta = -.28$, $p < .01$) and greater PTSD – Avoidance ($\beta = .33$, $p < .01$) significantly predicted more changes in participants' re-contact individuals across the study, with greater anxiety ($\beta = .23$, $p < .06$) and less perceived social support ($\beta = -.14$, $p < .10$) trending toward significance.
  - Lastly, less perceived social support ($\beta = -.19$, $p < .05$) significantly predicted greater changes in participants' re-contact persons' contact information, with greater anxiety ($\beta = .21$, $p < .10$) trending toward significance.

Table 1.
Correlations Between Participant Characteristics and Tracking Variables

	Average Days to Contact	Total Participant Calls	Total Participant Letters	Total Participant Home Visits	Participant Address Changes	Participant Phone Number Changes	Re-Contact Person Changes	Re-Contact Information Changes
Income to Needs Ratio	-.17	-.15	-.23**	-.07	-.14	-.21*	-.32***	-.24**
Maternal Age	-.13	-.10	-.12	-.15	-.12	-.14	-.25**	-.26**
Maternal Education	-.26**	-.10	-.29**	-.21*	-.09	-.38***	-.35***	-.39***
Depression	.03	-.16	.08	-.02	.06	.15	.24**	.30**
Anxiety	.003	-.03	.01	.12	.14	.19*	.25**	.34***
Hostility	.08	-.01	.13	.08	-.01	.10	.23**	.36***
PTSD - Intrusion	-.03	-.15	.02	.05	.14	.24**	.26**	.30**
PTSD - Avoidance	-.02	-.16	.03	.18†	.08	.24**	.39***	.25**
PTSD - Dysphoria	.06	-.06	-.04	.08	.16	.22*	.28**	.30***
PTSD - Hyperarousal	.07	.03	.03	.14	.04	.19*	.14	.15
Perceived Social Support	-.03	.16	-.06	.03	-.10	-.34***	-.28**	-.36***

*$p < .05$. **$p < .01$. ***$p < .001$.

Results, continued

- Final multiple regression analyses were conducted using significant ($p < .05$) and marginally significant ($p < .10$) variables from preliminary regression analyses as predictors (see Table 2).
  - Less maternal education and perceived social support both significantly predicted greater changes in participants' phone numbers across the study, explaining 18% of the variance.
  - Lower income to needs, higher anxiety and PTSD – Avoidance, along with less perceived social support (trend) significantly predicted greater changes in participants' re-contact persons, explaining 27% of the variance.
  - Lastly, higher anxiety and less perceived social support significantly predicted changes in participants' re-contact persons' contact information, explaining 19% of the variance.

Table 2.
Predictors of Participant Phone Number Change, Re-contact Person Change, and Re-contact Information Change

Predictor Variable	SE(B)	β	Adjusted R^2	F
Participant Phone Number Change				
Overall model			.18***	14.16
Maternal Education	.08	-.30***		
Perceived Social Support	.02	-.24**		
Re-contact Person/People Change				
Overall model			.27***	12.07
Income:Needs	.16	-.30***		
Anxiety	.02	.17*		
PTSD – Avoidance	.04	.30***		
Perceived Social Support	.01	-.14†		
Re-contact Information Change				
Overall model			.19***	14.58
Anxiety	.02	.28***		
Perceived Social Support	.01	-.29***		

* $p < .05$. ** $p < .01$. *** $p < .002$. † $p < .10$

Discussion

- Maintaining contact and minimizing attrition rates among high-risk participants in developmental research poses unique methodological challenges to researchers.
- Moreover, effective tracking methods have rarely been detailed and published in existing literature apart from publications that are methodological in nature. Results of the current study provide a comprehensive record of extensive, multimodal tracking efforts in order to: 1) disseminate effective tracking strategies that may contribute to higher retention rates in future longitudinal research, and 2) encourage developmental researchers to record and publish tracking data.
- Findings from the current study highlight a theme of social instability among underrepresented and economically disadvantaged participants and their social support systems. The majority of women in this study were unable or unwilling to identify 3 consistent members of their social support system. Not only did participants' contact information change frequently, but participants' social network and their own contact information was also inconsistent thereby indicating a broader network of mobility. Such mobility, if left unaccounted for, has the potential to render contact with researchers unstable thus increasing risk of attrition across data collection periods.
- Furthermore, examining predictors of changes in participant and re-contact persons' contact information contributes to a deeper understanding of participant characteristics that may serve as risk factors for inconsistent contact with researchers. Findings from the current study suggest that mothers who feel unsupported, have lower levels of education, have fewer economic resources, and experience more mental health symptoms may be more difficult to maintain contact with due to frequent changes in contact information. Further research in this area is needed.
- Limitations: The current study yielded a relatively small sample size ($N = 120$). Furthermore given the time of data collection of the study, results lack representation of modern networking technology (i.e., social media, texting, etc.) that may be incorporated into tracking efforts. Future research is encouraged to pursue such methods of maintaining contact with participants.

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