

# Caregiver's social relations and children's oral health in a low-income urban setting

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**Aim:** This paper seeks to describe the social networks and support available to caregivers of young children, and their links to behavioural and clinical dimensions of children's oral health. **Design:** A cross-sectional study was conducted on the third wave of a cohort of 612 child-caregiver pairs of the Detroit Dental Health Project (DDHP). Caregivers and their children came to a central location in Detroit where they completed interviewer-administered questionnaires, health and nutritional assessments, and received an oral examination. Caregiver's social networks were measured using the hierarchical mapping technique. Child's oral health measures included previous dental visits and untreated decay. **Results:** Caregivers reported an average network size of approximately seven people, who on average were 37 years old. Ninety percent of members in the network lived within an hour's drive, and contact frequency occurred on average between once a week and daily. Caregivers reported receiving emotional support most frequently and money support least frequently. Caregivers with larger networks had a slightly higher probability of reporting frequent errand support. Child's age interacted with money support to predict whether or not the child had visited the dentist since the last DDHP visit and to predict the number of untreated decayed surfaces. **Conclusions:** The association between network characteristics and types of social support appear to be limited. There are no main effects of caregiver social network characteristics or support type on child's oral health. Having no money support appears most influential on children's oral health depending on their age.

*Key words:* Social relations, social networks, social support, African American, oral health

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## INTRODUCTION

Recent theoretical arguments advance that a more complete understanding of oral health may be achieved by attending to social determinants such as social integration, social support, and social capital (Watt, 2002; Newton and Bower, 2005; Patrick et al., 2006). These factors reflect elements of social relations, an umbrella term meant to reflect its multi-dimensional nature (Antonucci, 2001). An established body of research highlights the importance of social relations in better predicting physical and mental health outcomes (Kahn and Antonucci, 1980; Cohen and Syme, 1985; Russell and Cutrona, 1991; Seeman, 1996), but little attention has focused on its role in oral health promotion or dental outcomes. This study aims to examine characteristics of social relations among caregivers of young children, and the influence of caregivers' social relations on their children's oral health.

### *Theoretical framework*

AThe convoy model of social relations (Kahn and Antonucci, 1980; Antonucci, 2001) posits the multidimensional nature

of social relations, proposing direct links with health. We extend these tenets to oral health (Sarmant and Antonucci, 2002).

Convoys include various aspects of social relations. The structure of a convoy, i.e., social networks, is influenced by the personal and situational characteristics of the individual. Personal characteristics involve properties of the person such as age, gender, race, and income. Situational characteristics refer to properties that depend on role expectations, life events, and daily encounters. Characteristics of a social network include size, contact frequency, geographic proximity, and composition; dimensions of support type include instrumental (e.g., money support, child-care support) and emotional (e.g., having a confidant) aspects. According to the tenets of the convoy model, network characteristics influence receipt of support. For instance, having a large network may be associated with perceiving more types of support available since there are more people from whom to potentially access support during times of need. Personal and situational characteristics may directly influence receipt of support.

An accumulating body of research illustrates that both social network and social support characteristics potentially influence health (see Berkman *et al.*, 2000 for a review). For instance, social network characteristics have been associated with mortality across adulthood (Berkman and Syme, 1979; House *et al.*, 1982). Recent research suggests network composition is important, with diverse networks (composed of family and friends) related to positive health outcomes (Fiori *et al.*, 2008). Support type, such as having high levels of emotional and instrumental support also positively influence both mental health (Lincoln *et al.*, 2005; Ajrouch *et al.*, 2010) and physical health (Berkman *et al.*, 1992; Antonucci *et al.*, 2003). Social relations may be conceptualised as a resource that influences health and well-being (Ajrouch, 2007). Documenting social network and support characteristics among African-American caregivers living in poverty-stricken urban areas may provide key insights into the health status of the children for whom they care.

## Background

Oral health disparities continue to exist where children from low income and racial/ethnic minority groups report higher rates of dental caries, untreated caries, low dental services utilisation and higher periodontal disease prevalence (Vargas, *et al.*, 1998; Mouradian, *et al.*, 2000; Edelstein, 2002; Mouradian *et al.*, 2007). According to the National Health and Nutrition Examination Surveys, oral health trends of children aged 2-11 years suggest that 41% experience caries in their primary teeth, 21% untreated tooth decay, and the mean number of decayed and filled teeth (dft) hovers at 1.4 (Beltran-Aguilar *et al.*, 2005). African Americans and those living in low-income areas report higher incidence of each condition (caries, untreated tooth decay, and higher mean number of dft) than whites and those living in higher-income areas (Beltran-Aguilar *et al.*, 2005). Moreover, low-income and minority children visit dentists less often, receive care and treatment that less likely meets their dental needs, and exhibit dental visit patterns that vary by age group; elementary school-aged children are most likely to visit the dentist (Edelstein, 2002). According to Edelstein, approximately 15% of non-white children aged 0-6 years, 40% between the ages of 6-10, and 30% between the ages of 11-18 report visiting a dentist.

Investigators assessing risk factors associated with Early Childhood Caries (ECC) have long appreciated the importance of psychosocial factors in the caries process. Early studies of children enrolled in Head Start programs (O'Sullivan and Tinanaoff, 1993; Reisine and Litt, 1993; Reisine and Douglass, 1998) recognised the significance of socioeconomic status and cultural norms on risk of caries among preschool children. Over time, researchers investigating the attitudinal and behavioural processes that might mediate or moderate the effects of socioeconomic status and culture on ECC at an individual level developed conceptual models that delineated the additional contribution of family level, community level, and environment factors influencing risk of caries (Fisher-Owens *et al.*, 2007; Mouradian *et al.*,

2007; Nahouraii *et al.*, 2008). Several studies investigated the effects of neighbourhood level factors on ECC risk (Pattussi *et al.*, 2001; Willems *et al.*, 2005; Tellez *et al.*, 2006; Aida *et al.*, 2008). These studies found that neighbourhood factors can have both positive and negative effects of caries experience among young children. Children living in neighbourhoods characterised by high social deprivation and high crime rates tended to have higher caries rates than children living in more affluent and safer neighbourhoods. Children living in neighbourhoods with more churches, a possible source of social support, tended to have lower caries rates. Neighbourhood level factors contribute something unique to the health risks among their residents, but it is difficult to interpret these results on an individual level.

A small number of studies examine direct effects of social support on assorted oral health outcomes among children of various ages. In a sample of Brazilian adolescents, positive effects of social support appeared significantly associated with self-rated oral health in bi-variate analyses, yet were confounded by gender, behaviour problems and self-rated health (Pattussi *et al.*, 2007). Nahouraii and colleagues (2008) conceptualise social support as an enabling factor, and found in a sample of church-going Latinas that odds of visiting the dentist were 3.1 times greater among those whose mothers who had received instrumental support compared to children whose mothers received no instrumental support. A comprehensive examination of social relations within an urban, low-income population will provide critical insights into the nature of this resource among a group at high-risk for ECC, and perhaps more critically the links it has with children's oral health status.

Social relations among African Americans living in poverty-stricken urban areas are thought to be strong, yet vulnerable to economic hardship. Schulz and Lempert (2004) documented how African-American women living in economically divested and racially segregated areas were especially likely to rely on social support as a resource. Yet, some aspects of social support (e.g., instrumental) tend to be lower when financial strain is high (Schulz *et al.*, 2006). Finlayson and colleagues (2007) report that though instrumental support tends to be more prevalent for low-income African-American caregivers of children ages 1-3 than those ages 4-5, there was no correlation between instrumental support and ECC. Research that systematically assesses the influence of multiple dimensions of social relations on children's oral health is lacking. The social relations of their caregivers possibly hold particular importance, particularly at different ages of the child. Caregivers enjoy special positions in that they shape and influence children's behaviours, especially related to dental health behaviours (Blinkhorn, 1978). Their social relations encompass complex processes that may uniquely influence children's oral health outcomes.

## Study goals

This paper seeks to describe the social networks and social support available to caregivers of young children, and their links to two dimensions of children's oral health: dentist

visits and clinical evaluation of tooth decay severity. We hypothesise that larger networks, those with higher contact frequency and geographic proximity, as well as older networks will be associated with more instrumental and emotional support. Given the paucity of data on how social relations influence oral health, we next explore associations between social relations available to caregivers (network characteristics and social support type) and children's oral health. Finally, we test whether social relations available to caregivers differentially influence younger (as opposed to older) children's oral health.

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## MATERIALS AND METHODS

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### *Sample*

Based on 2000 Census data, the project sampled children from low-income families using a two-stage area probability sample to represent low-income African American children in low-income areas of the City of Detroit. (For details on the sample selection procedures see Ismail et al., 2008) Primary caregivers were recruited in the initial phase of the study (wave 1) and 1,021 child-caregiver pairs were interviewed and examined. A primary caregiver was defined as the person who has the decision-making authority about what the index child eats, how to take care of the index child's mouth and teeth, and when the index child visits the doctor or dentist, excluding those in a 'babysitting' capacity. The participants were re-interviewed and re-examined in two subsequent waves of data collection. We draw on data from wave 3 for this analysis because they have the most comprehensive measures of social relations.

### *Procedure*

Caregivers and their children came to a central location in Detroit where they completed interviewer administered questionnaires and an oral exam. In the third wave follow-up, 654 children returned (64.1% response rate). Forty-two were removed from the analysis due to either having arrived with a different primary caregiver from wave 1 or due to incomplete data. The final sample was 612 caregiver-child pairs. Children ranged in age from 4 to 9 years. Attrition analysis revealed no significant differences between respondents and non-respondents in the third wave data collection concerning caregiver demographic (gender, age, education, and income) and child demographic (gender and age) characteristics. Similarly, there were no significant differences concerning our outcome measures of whether a child ever visited a dentist, or the number of untreated decayed surfaces. There were differences, however, between respondents and non-respondents in the third wave data collection concerning emotional support and childcare support. Whereas at the first wave of data collection 91.81% and 91.59% of respondents respectively reported emotional and childcare support, 89.37% and 88.01% of non-respondents respectively reported emotional and childcare support available. Though this difference is statistically significant ( $p < .01$ ), the actual

observed difference remains rather small (2-3 percentage points). Moreover the use of non-response adjusted probability sample weights ensures that results are representative of low-income African American families with children ages 0-5 during the time frame of the study. It took approximately four hours to complete all portions of the interviews and examinations. This protocol was reviewed and approved by the University of Michigan Institutional Review Board and informed consent was obtained.

### *Measures*

#### *Dental Health*

Previous dental visit and clinical ratings of the child's oral health were the main dental outcome variables. Dental visits were measured by asking whether the caregiver had taken the child to a dentist since the last DHHP visit where 0=No and 1=Yes. Clinical evaluation of severity of tooth decay was measured using the International Caries Detection and Assessment System (ICDAS) (Ismail et al., 2008). This clinical measure included the number of untreated decayed surfaces, and is a sum of non-cavitated and cavitated lesion on primary and permanent teeth [0, 70]. The inter-rater reliability of seven examiners ranged from a kappa of .38 to 0.99. It should be noted that disagreements among examiners push results toward the null, signifying results are somewhat robust despite disagreement. Insignificant results may be under type 2 error because of random misclassification. The intra-rater reliability ranged from 0.65 to 0.86.

#### *Demographic characteristics*

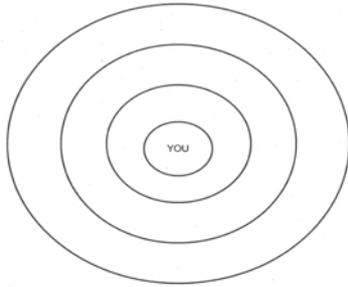
Marital status was dummy coded where 1= married or living with a partner; and 0=all others. Age and gender of the caregiver and age of the child were ascertained during the screening and selection by asking for birthdates. Child's age was centred at six years old to reduce chances of multicollinearity in the conducted analysis. Caregiver education was dummy coded into two categories for the analysis where 0= less than high school; and 1= high school or more. Income was assessed by asking respondents to indicate total combined family income in the last 12 months including resources from wages, salaries, social security, retirement, help from relatives, etc. In this analysis, income was coded such that 0= less than \$10,000; 1= \$10,000-\$19,999, and 2=\$20,000 and higher. Child dental insurance was assessed by asking the caregiver whether or not their child was covered by an insurance plan that pays for dental care including Medicaid or MICHild (0=no; 1=yes).

#### *Social networks*

Social networks were measured using the hierarchical mapping technique (Antonucci, 1986). Caregivers were asked to list those people who are important in their lives on a diagram of three concentric circles (Figure 1). The inner circle contains persons so close to the respondent that he or she could not imagine life without that person. The middle circle contains persons who are still very important in the respondent's life but not as close as those in the inner circle. The out-

side circle contains persons who are still close and important but are less so than those mentioned in the inner two circles. Caregivers then reported the following characteristics of the first ten network members: age, contact frequency, and geographic proximity. We exclude those younger than 13 years of age.

**Figure 1 Concentric circles**



### *Network characteristics*

*Size:* Total network size represents the number of people the respondent included in his/her network diagram with possible values ranging from 0 to 36. *Age of network:* Age of the network was calculated by averaging the age of network members named by respondents' network size. *Contact frequency:* Caregivers rated whether they had contact with each of the first ten network members 1: {irregularly}; 2: {once per year}; 3: {once per month}; 4: {once per week}; 5: {daily}. Contact scores were then averaged to indicate contact frequency. Scores ranged from 1 to 5. *Geographic proximity:* Caregivers reported whether each of the first ten network members lived within an hour's drive (0=No; 1=Yes). We then calculated the proportion who live within an hour's drive by adding the number of members mentioned up to a maximum of ten and dividing by the number of members mentioned.

### *Social support*

Instrumental and emotional dimensions of social support were assessed. First, we examined *instrumental support*, indicated by asking the participant to respond either yes or no as to whether there is someone: "...you could count on to run an errand for you if you needed them to; you could count on to lend you some money if you really needed it in a time of financial crisis; you could count on to lend you a car or give you a ride if you needed them to, you could count on to watch your (child/children) for you if you needed them to." We also examined *emotional support*, indicated by asking the participant to respond either yes or no as to whether there is someone: "...you could count on to give you encouragement and reassurance if you really needed it." Each question represented a separate social support item. Each measure is scored as follows: Scores: 0: {never}; 1: {rarely}; 2: {< than 1/2 the time}; 3: {about 1/2 the time}; 4: {> 1/2 the time}; 5: {almost always}. When social support is the dependent variable, it is dichotomized where 1=almost always, and 0=all other responses. We tested the inter-correlations of all social support variables and found the coefficients ranged from .23-.45,

minimising concerns related to multi-collinearity (Nunnally, 1978), and allowing for a reasonable statistical basis upon which to examine each type of support separately. Each support type is associated with one another, but the low coefficients suggest they measure separate aspects of support, and hence conceptually may signify unique importance.

### *Analysis*

Descriptive statistics concerning the parameters of social network characteristics, social support type frequencies, and oral health measures are summarised. We test associations between network characteristics and different social support types using separate multivariable logistic regression models for each social support type (errands, money, encouragement, childcare, car), controlling for income, marital status, education, gender, and age of the caregiver. Next, the influences of social relations on oral health measures are explored through multivariable regression models, controlling for insurance, income, marital status, education, gender, and child's age. Logistic regression models are developed for the dichotomous oral health outcome (visit dentist since last DDHP contact). Zero-Inflated Negative Binomial models were employed for untreated lesion count. All models were adjusted for the complex sampling design. Interaction effects between child's age and social relations were included separately.

For the multivariable models, likelihood ratios tests are used for overall model evaluation (against an intercept-only model) and to test the usefulness of adding network characteristics to a model containing only control covariates or control and first order covariates. Individual predictors are tested statistically with Wald tests. For the logistic models, pseudo r-squared (Nagelkerke) values are computed as a descriptive measure of fit. An overall F-statistic for model fit is used to evaluate the zero-inflated negative binomial model. For this model of counts, a significant over-dispersion parameter is considered proof of the superiority of negative binomial over Poisson regression (Gardner *et al.*, 1995). The zero-inflated model was deemed more appropriate than ordinary negative binomial by the Vuong test.

We examined the data for outliers and influential observations. Re-running each model with extreme observations deleted did not change our general conclusions. We used Lowess regression techniques to identify whether it is reasonable to assume that the effect of network size is linear in our models (Hosmer and Lemeshow, 2000). Though the effect of network size appears to be nonlinear for most models (changing effect size drastically in those with larger networks), there are relatively few caregivers (less than 5%) who reported more than 15 network members. To account for nonlinearity in network size, we also test models that include a spline function for network size larger than 10, however the alternate models did not change any significant findings.

All logistic regression models and correlations are run in SAS 9.1 adjusting for the complex sampling design using survey procedure commands and checked for consistency of estimation using STATA 10. Zero-Inflated Negative Binomial

Models are run using the survey features in STATA 10. For the small number of missing values (less than 4%) for any individual item, values were imputed with IVEware software before modification, to create dummy variables (Raghunathan et al., 2001).

## RESULTS

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### *Description of sample characteristics*

Table 1 presents the descriptive characteristics of the sample. In terms of demographics. Approximately one-third of caregivers were married (34%) and a little over half reported a high school education or more (57%). A majority of caregivers (96%) were women; 47% reported annual household income of under \$10,000, and 92% reported having dental insurance for their child. Caregivers reported an average age of 33 years old, and the average age (uncentred) of the study child was 6.57 years old.

The mean frequency involving key dimensions of social support (0=never; 5=almost always) include the following: running errands (3.90), lending money (3.67), providing child care (4.29), lending a car (4.04), and giving encouragement (4.52). The most prevalent type of support was of an emotional nature (giving encouragement), and the least prevalent was an instrumental dimension (lending money).

Caregivers reported having on average approximately seven people in their network. The average age of their network was slightly older than themselves at 37.67 years old. Caregivers reported average contact frequency of 4.55 (between once a week and daily) and slightly over 90% of their network lived within an hour's drive.

Finally, two dimensions of the study child's oral health are described. Approximately 87% of children visited a dental professional since the last wave of data collection. Untreated decayed surfaces of the study child's teeth ranged from 0 to 68, and averaged 10.77. Figure 2 presents distributions of untreated lesions among children by age. The likelihood of having untreated lesions is lower for each subsequent age group. Four year olds have the highest likelihood of 0 untreated lesions while 9 year olds have the lowest likelihood of no untreated lesions.

### *Network characteristics predicting social support types*

One network characteristic was significantly associated with one support type: errand support (Table 2). Those with larger networks had a slightly higher probability of reporting frequent errand support. Network characteristics did not predict the likelihood of reporting childcare, money, car, or emotional support, though caregiver age, income level, and marital status were significant. Those younger in age and those with higher income were more likely to report money support, and married caregivers were more likely to report emotional support (results not shown).

### *Caregiver's social relations predicting children's oral health status*

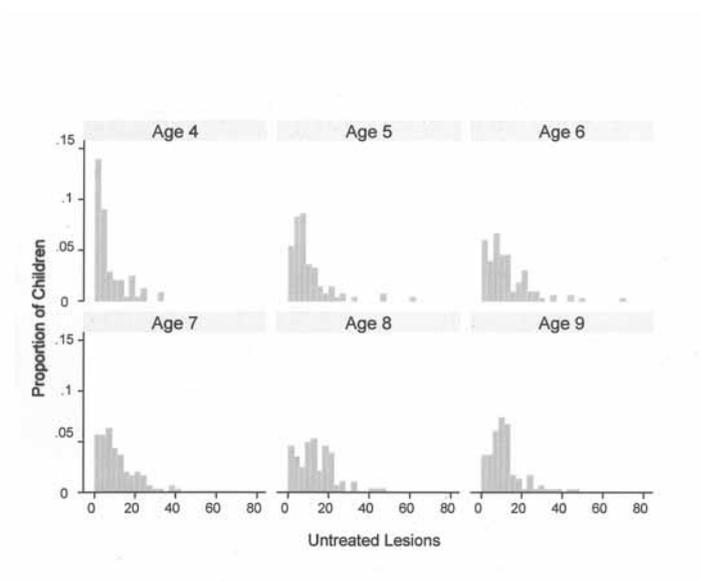
Multiple logistic regressions testing the association between caregiver's social relations (network characteristics and social support type) indicated no significant main effects of caregiver's social relations on children's oral health status. We included child's age in the models given that the dependent variable measured child's dental health outcomes. Child's age was significantly associated with both dental health outcomes. Younger children were less likely to have visited a dentist since the last DDHP visit, and less likely to have untreated tooth decay. Moreover, caregiver's age was positively correlated with clinical scores, so that older age of caregivers was associated with higher incidence of child's number of untreated decayed surfaces (results not shown).

Though there were no direct effects of caregiver social relations on either dental health outcomes, child's age interacted with money support to predict whether or not the child had visited the dentist since the last DDHP visit and to influence clinical oral health scores (Tables 3 and 4). Figures 3 and 4 illustrate these effects, plotting high and low levels of support.

Figure 3 illustrates that child age appears to make the biggest difference for those with no financial support. The probability of a dental visit is slightly higher in older children but still hovers fairly steadily around 80-90% among those with money support "almost always". However, among caregivers with no money support, there is a steep increase in dental visits between ages 4 and 6. For children 5 years of age and older, those whose caregivers report no money support appear to have the highest chance of visiting the dentist since the last data collection. Figure 4 presents the interaction between money support and child's age predicting the clinical oral health outcome of untreated tooth decay. Among children whose caregivers have no money support, the number of untreated lesions is relatively constant across age groups. Yet, among those whose caregivers report money support to be always available, a positive association exists between age and the number of untreated lesions (decayed surfaces).

# SOCIAL RELATIONS AND ORAL HEALTH

**Figure 2. Histograms: Distributions of untreated decayed surfaces by age**



**Table 1. Unweighted Sample Characteristics**

n=612				
Parameter	mean	sd	n	%
Married			207	34
High School Diploma			346	57
Female			586	96
Income (<\$10,000)			289	47
Income (\$10,000-\$19,999)			127	21
Income (≥\$20,000)			196	32
Child Dental Insurance			559	92
Caregiver Age	33.34	8.77		
Child Age (uncentred)	6.57	1.66		
Errands Rating	3.90	1.69		
Money Rating	3.67	1.69		
Childcare Rating	4.29	1.35		
Car Rating	4.04	1.50		
Emotional Rating	4.52	1.14		
Network Size	7.05	4.35		
Network Age	37.67	9.28		
% of Network within 1 hour drive	0.90	0.17		
Average Network Contact	4.55	0.53		
Dentist Visit			532	87
$d_t^a$	10.77	9.63		

a.  $d_t$ =total decayed surfaces

## SOCIAL RELATIONS AND ORAL HEALTH

**Table 2. Logistic Regression Model Results Network Characteristics Predicting Errand Support**

Parameter	Errand Support	
	Odds Ratio	95% CI
Income (<\$10,000)	ref	
Income (\$10,000-\$19,999)	1.41	0.62 – 3.20
Income (≥\$20,000)	1.10	0.39 – 3.06
Married	1.81	0.80 – 4.11
Education	1.46	0.88 – 2.45
Gender	0.56	0.19 – 1.62
Age	1.02	0.99 – 1.01
Network Size	1.09	1.02 – 1.17
Average Age	1.01	0.97 – 1.05
Average Contact	1.26	0.70 – 2.27
Network Proximity = 100%	1.61	0.76 – 3.41
Pseudo r-square	0.26	

**Table3. Logistic Regression Results-Social Support Predicting Dentist Visit**

Parameter	OR	95% CI	OR	95% CI
Insured	3.22	1.48 – 7.01	3.39	1.54 – 7.44
Income <sup>a</sup> (\$10,000-\$19,999)	1.22	0.65 – 2.27	1.30	0.69 – 2.47
Income <sup>a</sup> (≥\$20,000)	2.83	0.99 – 8.14	2.85	0.98 – 8.26
Education	1.39	0.84 – 2.32	1.36	0.79 – 2.32
Marriage	1.00	0.54 – 1.88	1.06	0.57 – 1.95
Caregiver gender	0.47	0.20 – 1.11	0.51	0.21 – 1.23
Caregiver age	1.00	1.00 – 1.02	1.00	1.00 – 1.03
Child age	1.24	1.03 – 1.50	2.14	1.31 – 3.48
Errand support	1.01	0.82 – 1.25	1.00	0.97 – 1.03
Money support	0.84	0.68 – 1.04	0.84	0.69 – 1.03
Encouragement	0.90	0.66 – 1.24	0.95	0.70 – 1.28
Childcare	0.85	0.64 – 1.13	0.80	0.60 – 1.07
Car support	1.21	0.94 – 1.55	1.20	0.94 – 1.54
Money support*Child age			0.87	0.77 – 0.99
Pseudo r-square	0.49		0.54	
Likelihood Ratio Test	410.96	p<0.0001	479.89	p<0.0001

<sup>a</sup>Reference category: Income <\$10,000

**Table 4. Zero-Inflated Negative Binomial Model Results Social Support Predicting Untreated Tooth Decay**

Parameter	IRR	95% CI	IRR	95% CI
Insured	1.34	0.96 – 1.86	1.34	0.97 – 1.85
Income (<\$10,000)				
Income (\$10,000-\$19,999)	0.97	0.79 – 1.18	0.97	0.79 – 1.18
Income (\$20,000)	1.10	0.92 – 1.32	1.10	0.92 – 1.32
Education	0.96	0.80 – 1.15	0.98	0.82 – 1.16
Marriage	1.00	0.83 – 1.21	1.00	0.82 – 1.22
Caregiver gender	1.01	0.73 – 1.40	1.00	0.87 – 1.04
Caregiver age	1.01	1.00 – 1.02	1.01	1.00 – 1.02
Child age	1.06	1.02 – 1.11	0.95	0.73 – 1.37
Errand support	0.99	0.95 – 1.04	0.99	0.95 – 1.04
Money support	0.97	0.91 – 1.03	0.95	0.89 – 1.01
Encouragement	1.02	0.94 – 1.11	1.01	0.94 – 1.10
Childcare	1.00	0.93 – 1.08	1.02	0.94 – 1.10
Car support	1.01	0.95 – 1.06	1.01	0.96 – 1.06
Money support*Child age			1.03	1.00 – 1.06

# SOCIAL RELATIONS AND ORAL HEALTH

Figure 3. Illustration of the interaction of child age x money support predicting dental visit

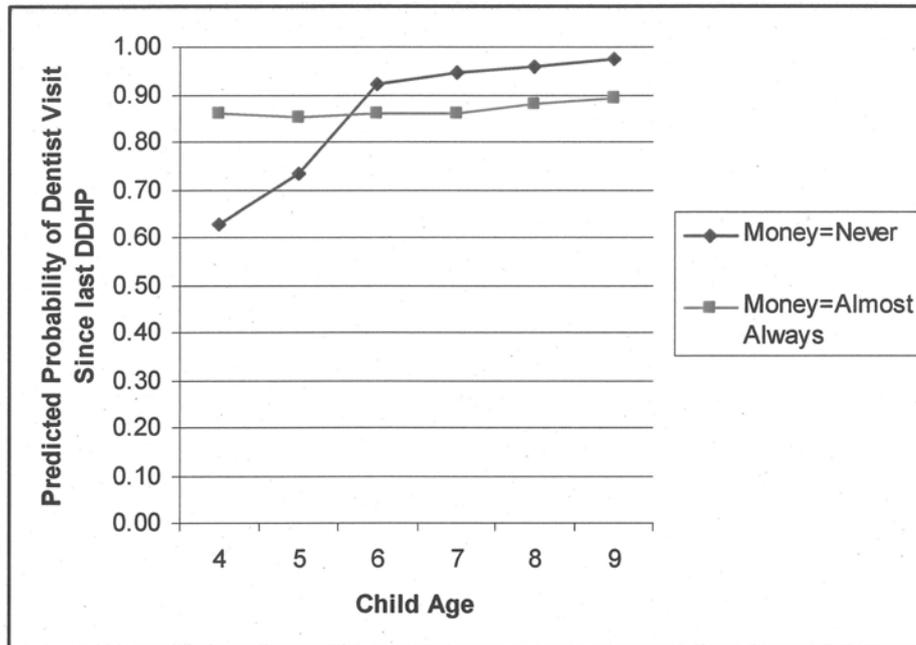
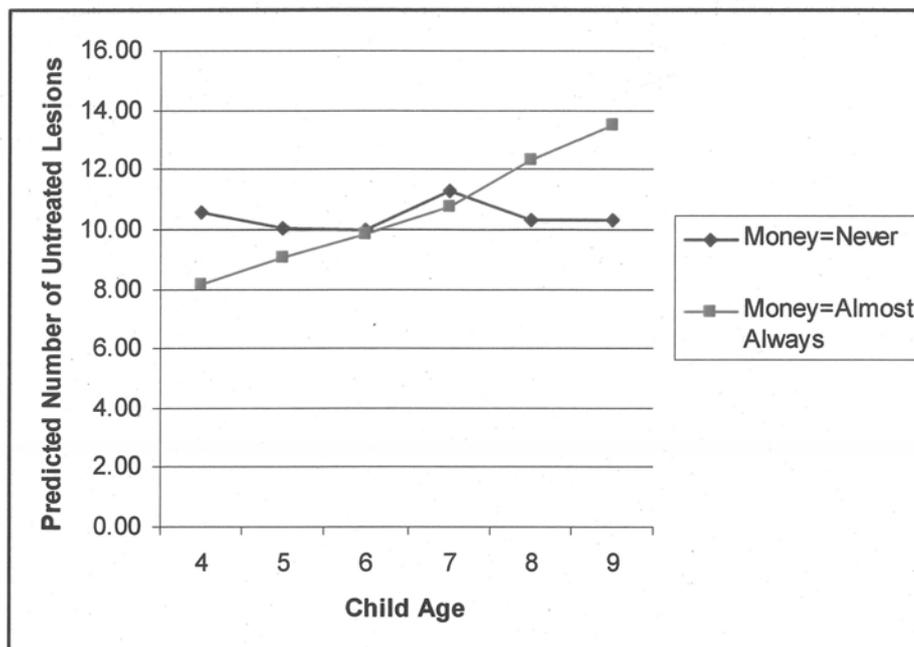


Figure 4. Illustration of the interaction of child age x money support predicting untreated decayed surfaces



## DISCUSSION

This paper reports results from one of few studies intending to examine links between social relations and oral health. The focus of the current study was to describe social relations among African-American caregivers of young children living in a high poverty urban area, and examine links those social relations have with dental health outcomes in a representative sample of children.

The structure of social relations is a critical issue for African-American caregivers of young children living in a high-poverty urban area. It has been suggested that in a context of economic inequality, strong social relationships are difficult to form (Newton and Bower, 2005). Our findings indicate that these caregivers have smaller networks that are more proximal and with whom they have more frequent contact than do the average African (as well as white) American living in metro Detroit (Ajrouch *et al.*, 2001). Such characteristics suggest that these caregivers are potentially vulnerable in the sense that their networks are smaller and closer (proximity and contact), so that they risk more immediate draining of the little social resources they have (Dominguez and Watkins 2003). Additionally, their networks are slightly older than the caregiver's themselves. This coupled with the lower prevalence of being married suggests that the primary significant network member consists of an older person, likely a parent or other close relative.

Analyses of social support types demonstrate on average high availability of multiple support types. Emotional support is extremely high, which may bode well for a study population with very little resources. Money support is lowest, but given the socioeconomic characteristics of the sample, expected.

Social network structure is thought to indicate both social integration as well as the likelihood of receiving social support—and ultimately the oral health of their children (Blinkhorn, 1978; Sarment and Antonucci, 2002). Interestingly, social network characteristics are not significant predictors of social support type generally. This suggests that support structure and support type tap two highly differentiated dimensions of social relations within this population, and hence have unique consequences for oral health. One exception involves errand support. Having a larger network predicted a higher likelihood of reporting frequent (almost always) errand support available. This link intimates the importance of network size as a resource for at least one type of instrumental support. Networks represent a form of social capital, a source of help in times of trouble, a source of comfort in times of pain, and a source of information in times of need. At the same time, as Granovetter (1973) noted, sometimes there is strength in weak ties. Thus, having a large network may be considerably more helpful in accessing support than one that is small.

Finally it appears that social relations have some consequences for oral health behaviours (visits to the dentist), and clinical ratings (untreated tooth decay). Money support is important when we consider the child's age in predicting

both dental visits and number of untreated decayed surfaces. Interestingly child's age does not differentially predict dental visits for those caregivers who report high levels of money support. Reasons as to why low money support caregivers are less likely to take their younger child to the dentist may reflect a critical effect of not having financial support during the early years of a child's life. The age at which a caregiver with no money support takes the child to the dentist since the last DHHP visit overlaps with those who do report money support is around age five, when a child typically enters school. These results may indicate an effect of school attendance, which not only constitutes an alternative source of information, but prompts caregivers to seek dental services due to school requirements. Moreover, those lacking financial support may take extra advantage of services provided by participating in the DDHP. Researchers have shown that participating in health studies link to changes in health behaviours (Schroer and Wilcox, 1996; Hilton *et al.*, 2007).

Older age is positively associated with a greater number of untreated decayed tooth surfaces among children whose caregivers report almost always having money support. This counterintuitive finding might reflect that financial support among underserved population groups at times have deleterious effects on health and well-being. In this case, it may be that always having access to money support indicates severe and/or chronic financial stress. As a result, receiving such support may indicate high levels of need, hence producing negative outcomes (Hobfoll *et al.*, 1990; Neighbors, 1997; Bolger *et al.*, 2000).

It should be noted that there are limitations to this research involving available oral health measures. Dental visits are measured in a dichotomous format, preventing the ability to separate, for example, between check-up visits as opposed to dental emergency. As a result, the measure may reflect disease patterns rather than the adoption of health-promoting behaviour. Moreover, variance in this outcome indicator was limited, with 87% reporting having visited the dentist since the last DHHP visit. This may have affected the nature of the examined associations, and partly explain the limited associations with our study variables. Consequently, future research should address the nature of dental visits with more detail.

Though data limitations exist, the results of this study nevertheless provide useful preliminary data on the role of caregiver's social relations in children's oral health within a population at-risk for heightened ECC. Finally, the effect of child's age on all oral health outcomes draws attention to a factor that is not directly modifiable (Nowjack-Raymer and Gift, 1990). Many of the children in this study sample were experiencing dental transitions from primary to permanent teeth, making this group somewhat distinctive. Nevertheless, our results indicate that future research more aggressively consider factors of importance at a young age. Special attention to interventions that support caregivers with very young children, especially those that are impoverished, may ultimately attenuate the higher preponderance of poor dental health as children come of age.

## CONCLUSIONS

- African-American caregivers living in high-poverty urban areas show social relations characteristics that suggest a limited association between networks characteristics and types of social support.
- There are no main effects of caregiver social relations on child's oral health.
- Caregivers reporting no money support appear most influential on the oral health children depending on their age.

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