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Ego-Dystonic Pregnancy and Prenatal Consumption of Alcohol Among First-Time Mothers

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Abstract

Objective—This study examines predictors of drinking during pregnancy among first-time mothers, in order to distinguish those in need of targeted screening and intervention.

Methods—Data from the prenatal panel of the Parenting for the First Time study were used in hierarchical linear regressions to determine likelihood of prenatal alcohol consumption among a sample of 645 women.

Results—African-American women and those of race/ethnicities other than White were less likely to drink, regardless of age or level of education. Among all women, being in school was associated with abstinence ($p = 0.05$). Among teens, endorsing a perception of feeling “pushed around” was a significant indicator of prenatal alcohol consumption ($p = 0.05$), as was not having plans for infant feeding shortly before delivery ($p = 0.05$). Among adults with some level of college education, having a first prenatal visit after the fourth month of pregnancy was a significant predictor of drinking ($p = 0.01$).

Conclusions—This study indicates that women who evidence behaviors or attitudes indicating an ego-dystonic pregnancy (one that is psychologically or emotionally uncomfortable), may be more likely to self-medicate and cope via avoidance through drinking. These behaviors and attitudes may be indicators of the need for targeted screening and intervention, as well as indicators of underlying problems to be targeted in treatment. Further, among all women for whom continued education is a possibility, retaining the ability to attend school during the pregnancy can be protective.

Keywords

Pregnancy; Alcohol; Risk Factors; Prenatal Substance Use; Adolescent

Introduction

Public health guidelines recommend that women not consume any alcohol during pregnancy [1–5]. Evidence suggests that increasing numbers of women have heard that message. Between 1995 and 2009, the National Survey on Drug Use and Health (NSDUH) revealed nearly a 50% decrease in self-reported past month alcohol consumption by pregnant women, with a 29% decrease among teens [6, 7]. Nonetheless, the most recent figures indicate that 9.8% of pregnant women between the ages of 15 and 44 reported drinking in the past month, with that number higher among those ages 15 through 17 (17.5%) [7].

Drinking during pregnancy can have different effects on the fetus, depending on timing, quantity, and frequency of consumption [8]. The evidence of damage caused to newborns by prenatal exposure to alcohol, however, is substantial. The spectrum of fetal alcohol disorders is well defined, with the most severe being Fetal Alcohol Syndrome (FAS). More subtle

variants of Fetal Alcohol Spectrum Disorder may not be apparent until well after birth [9]. Among the disabilities that may result from prenatal exposure to alcohol are: facial anomalies, congenital abnormalities, growth retardation, impaired cognition, poor socio-emotional development, and behavioral difficulties [10, 11]. Prenatal alcohol exposure also has been linked to preterm birth [12] and to miscarriage and stillbirth [2, 13, 14] and FAS is believed to be the leading preventable source of intellectual disability and neurologic deficits in the western world [15]. The lifetime effects on the child also have implications for family relationships and society, including increased burdens on the medical, educational and criminal justice systems, with lifetime costs per individual estimated at \$2 million or more [16]. Given the implications of prenatal alcohol consumption, it is crucial to understand why women do drink, in order to target pre-conception and prenatal prevention, screening and treatment.

The self-medication hypothesis, which suggests that substance use is a method of relieving emotional/psychological pain [17], offers one potential explanation for prenatal drinking. Evidence supporting the self-medication hypothesis may be found in the strong linkage between substance use and both traumatic history [18–27] and depression [28, 29], with trauma and depression also linked to prenatal substance use [30–35]. The related concept of “drinking to cope,” whereby drinking serves as a maladaptive coping mechanism fueled by motivation to avoid unpleasant affective states [36, 37], similarly suggests that prenatal drinking may reflect avoidance of an unwanted situation.

Related to maladaptive coping are the concepts of perceived self-mastery and locus of control. Mastery has been defined as “the extent to which people see themselves as being in control of the forces that importantly affect their lives” (p.340) [38], with perceived self-mastery indicative of an internal locus of control over important life events. These characteristics are linked with enhanced coping, while an external locus of control is linked with maladaptive coping [39], rendering those with little perceived self-mastery, including adolescents [40, 41], more vulnerable to reliance on substance use in response to stress [42]. One might theorize that an “ego-dystonic” pregnancy, or one that is psychologically uncomfortable, would encourage alcohol use in some pregnant women as a method of self-medication, and that women who do drink prenatally would evidence an external locus of control.

The limited work in this area has focused on adolescents and, while unplanned pregnancy may be viewed positively among some [43, 44], for others, unwanted pregnancies may be stigmatizing and aversive, possibly leading to school discontinuation, isolation, diminished self-esteem, or depression, due to perceived stigma [44]. Other than a 2005 study by Wiemann et al., minimal research has occurred on the subject of pregnancy stigma. Wiemann’s analysis revealed that adolescents who felt stigmatized by their pregnancy tended to be younger, white, in school, to report that the pregnancy was unplanned, and to have used alcohol at conception and during pregnancy. Wiemann suggested that those who drank did so before becoming aware of their pregnancy. Unfortunately, the study did not measure whether the adolescents who reported prenatal drinking only did so before discovering their pregnancy, examined substance use only tangentially, and did not focus on the internal experience of the adolescent, specifically self-mastery, which might have illuminated further the connection between a stigmatized pregnancy and alcohol use [44].

The present analysis focuses on alcohol use among women experiencing a first-time pregnancy, with consumption measured over the final two trimesters of pregnancy, a point at which most women would be cognizant of their state. The premise of this study is that a first pregnancy characterized by the woman as unplanned, coupled with self-reported behavior and/or endorsement of internal experiences indicative of an ego-dystonic pregnancy and an

external locus of control, may predict alcohol use during pregnancy. Self-reported behaviors, such as delaying prenatal care and failing to have feeding plans for the child shortly before delivery, are utilized as behavioral markers of a potentially ego-dystonic pregnancy. The women's internal experiences are indicated by responses to statements assessing locus of control or perceived self-mastery, endorsement of which during an unplanned pregnancy also may indicate an ego-dystonic state and alcohol use.

Given that prenatal drinking is strongly counter-indicated from a public health and medical perspective, those who do drink while pregnant, particularly once aware of their pregnancy, may have characteristics which reveal the experience of pregnancy to be, at best, ego-dystonic, and, at worst, traumatic. From the standpoint of prevention and intervention, indicators of an ego-dystonic pregnancy may then serve as markers for prioritized screening and, where appropriate, treatment.

Methods

Data

This study utilizes the prenatal wave of the Parenting for the First Time (PFT) dataset, gathered by the Centers for the Prevention of Child Neglect between 2001 and 2004 [45]. The PFT study received approval from the institutional review boards (IRBs) of the four universities involved in data collection, and the present study from the IRB of Brandeis University, and was conducted in accordance with prevailing ethical standards. The PFT study utilized a sample of 682 women, of whom 396 were adolescents (ages 19 and younger) and 286 were adults. The data include a geographically diverse sample of pregnant women recruited in South Bend, Indiana; Kansas City, Kansas and Missouri; Washington, D.C.; and Birmingham, Alabama.

From the initial sample of 682 pregnant women, 18 lacked data on the dependent variable and another 19 were missing values on explanatory variables, resulting in 645 women remaining in the analysis for all age groups, 371 teens and 274 adults. The demographic composition of this group was similar to that in the sample as a whole, and only one of the omitted women reported drinking in the prior six months.

Outcome Measure

The outcome measure for this study was a binary self-report of whether participants drank during the six months prior to the prenatal interview. The PFT study had the goal of conducting all prenatal interviews within two weeks pre-delivery. This target was achieved for 620 of the women in the sample used in this study, with the remaining 25 interviewed within 4.4 weeks post-delivery. Of those 25, all but four reported not drinking and those few were teens. For neither the total nor the teen sample were there significant drinking differences between the group interviewed within or outside the two week window ($p = 0.212$ and 0.198). The timing of the interview provides assurance that women who reported drinking were recounting alcohol consumption during the last two trimesters of pregnancy, with the possible exception of drinking that may have occurred among the four acknowledged drinkers who were not surveyed prenatally. This eliminates the concern that the woman's alcohol consumption might only have been before she was aware of her pregnancy, but raises the small possibility that four of the women were abstinent throughout pregnancy and resumed drinking thereafter.

Independent Variables

Fourteen independent variables, socio-demographic, behavioral, and attitudinal, were included in all preliminary regressions, with a subset retained in final models.

Socio-Demographic Variables

Race/Ethnicity: Dichotomous variables were used to control for race/ethnicity -- African-American and Other (Asian, Latina, Multi-Racial, Native American), with White being the reference. Given existing evidence that Whites are more likely to drink than are African-Americans [46, 47], as well as similar trends in pregnancy [48], it was hypothesized there would be greater consumption among Whites.

Education Status: This adjuster was comprised of variables measuring whether the woman had attended some college, had only a twelfth grade education, had less than a twelfth grade education, the latter being the reference. It was hypothesized, based on existing research [48], that women with some college education would be more likely to drink.

School Status: This variable indicated whether the woman reported being enrolled in school when interviewed. It was hypothesized that enrollment would be associated with less drinking, particularly among adolescents. This outcome was hypothesized based on the presumed influence of education and speculation that women who were in school might be coping more adaptively and have greater social supports. The predicted protective influence of enrollment corresponds to other findings [48], but is contrary to what might be anticipated from the Wiemann (2005) results related to pregnancy stigma.

Behavioral Variables

Pregnancy “just happened”: This variable indicates whether the woman reported planning to become pregnant, and measures overt feelings towards the pregnancy.

Late prenatal visit: This indicates whether the woman had her first prenatal visit after her fourth month of pregnancy. An initial prenatal visit should occur within the first trimester [49]. Some research has shown that failure to have an initial prenatal visit within the first trimester is correlated with increased drinking [48], although other research indicates that adolescents who drank recently were more likely to enter care during the first trimester [50]. It was hypothesized that delayed prenatal care would be associated with prenatal drinking, with both behaviors evidencing a propensity to cope through avoidance.

No feeding plans: This variable indicates whether the woman reported knowing the method she planned to use to feed her child. Because the interviews occurred late in pregnancy, it was hypothesized that not having plans for this important aspect of child care would indicate avoidance and increased drinking.

Attitudinal Variables

Self-mastery variables: Six five-point Likert variables derived from the Pearlin Self-Mastery scale [51] were included and it was hypothesized that endorsing these perceptions, each of which indicates limited perceived self-mastery and an external locus of control, would predict greater likelihood of drinking. The variables assessed perceived: 1) lack of control, 2) inability to solve problems, 3) helplessness in dealing with problems, 4) feelings of being pushed around, 5) insecurity about meeting material needs of her child, and 6) insecurity about meeting emotional needs of her child.

In addition to the variables measured in the multivariate models, a site variable was used as the group-level variable for hierarchical linear modeling, and age variables were used to permit independent analysis of subgroups. The age groupings were teen (14–19) and adult (20–36).

Analysis

Frequencies were computed for each variable included in the initial regressions. Frequencies of those with each characteristic who reporting drinking or not during the prior six months are provided, with p -values computed to determine whether drinkers differed significantly from non-drinkers. The bivariate analyses used Pearson's χ^2 , unless one or more cells contained fewer than six observations, in which case the Fisher's one-sided exact test was used. Intraclass Correlation Coefficients (ICC) were computed to determine whether there were significant differences by site as to whether a woman reported drinking. The ICCs for the unconditional models were variable between subgroups (ranging from less than 3.0% for teens, adults with some college, and the total sample, to 3.2% for all adults, and 19.2% for adults without any college education). Based upon these ICCs, a decision was made to use hierarchical linear modeling (HLM). Separate HLM regressions were run for the entire sample and then separately for the adolescent, low-education adult and high-education adult groups, as well as the entire adult group. Each initial model included all independent variables of interest, with self-mastery variables then excluded to the point where the most parsimonious model for each group could be defined.

Results

Sample Characteristics

Characteristics of the study sample ($n = 645$) are presented in Table 1. The sample was gleaned from geographically diverse sites and includes women ranging in age from 14 to 36, with 58% under age 20. A disproportionately large percentage of the sample was African-American (66%), but White women (18%) and women of other races/ethnicities (16%) also were well-represented. Among the total sample, 77% had never attended college and 52% had not attained a 12th grade education. Forty-four percent (44%) were enrolled in school at the time of the prenatal interview. Distinctions between drinkers and non-drinkers were generally significant for all demographic variables.

Behavioral and attitudinal characteristics included in the analyses indicate that 81% reported the pregnancy "just happened;" fewer than 8% attended a first prenatal visit after the fourth month; and only 0.8% reported no late-pregnancy feeding plans. Those endorsing agreement with the measures of limited self-mastery ranged from 6% to 18%. Distinctions between drinkers and non-drinkers were statistically insignificant for all behavioral characteristics and marginally significant for one of the self-mastery variables. As discussed below, however, variables that were insignificant for the entire sample, relying on bivariate analysis, sometimes proved significant in multivariate analysis of subgroups.

Drinking During Pregnancy

Table 2 contains results of the five final multivariate regressions estimating likelihood of drinking during pregnancy. Compared to Whites, being African-American was associated in all models with reduced alcohol consumption ($p = 0.10$ to 0.001), as was belonging to the "Other" race/ethnicity group ($p = 0.01$ to 0.001) in all but the teen and higher education adult groups. Education was not significantly associated with drinking, other than having attended some college, which increased the likelihood of drinking in the model containing teens and adults ($p = 0.05$). Being enrolled in school was only significant for the entire group ($p = 0.05$), and marginally so for the adult group ($p = 0.10$), linked to reduced drinking.

The behavioral characteristics present interesting variation in significance. Having an unplanned pregnancy was not statistically significant in any models, likely because an overwhelming percentage of the sample reported not planning the pregnancy (81%). Having

a first prenatal visit after the fourth month was a significant predictor of drinking among adults with some college education ($p = 0.01$), and having no feeding plans in place at the end of the pregnancy was significantly associated with adolescent drinking ($p = 0.05$).

The self-mastery variables were only significant in the teen model, with teens who reported feeling “pushed around” more likely to drink ($p = 0.05$), with those who reported feeling that they could not solve their problems less likely to drink ($p = 0.05$). None of these variables were significant in the three adult models, although, in Model 1 which included all ages, two were marginally so ($p = 0.10$).

Discussion

This study reveals several markers of prenatal alcohol use among a diverse group of first-time mothers. The analysis confirms certain indicators and presents new indicators for consideration and further study.

This study confirms what other studies of drinking have revealed, specifically that White women have greater likelihood of drinking than do members of other racial/ethnic groups, particularly more so than African-American women. As expected, having attained some college education is associated with increased likelihood of drinking, while actually being enrolled in school during pregnancy is associated with decreased drinking, although not significantly among teens. This non-significance among teens cannot be taken as either a confirmation or negation of the Wiemann [44] study, but the direction of the findings and the statistical significance in other groups indicates that the provision of educational programs for pregnant women enhances health as well as permitting continued opportunities for educational achievement.

This study does provide evidence that prenatal alcohol consumption is, in certain populations, associated with behaviors and attitudes indicative of an ego-dystonic pregnancy, thereby supporting the self-medication hypothesis in the context of first-time pregnancies. Although reporting an unplanned pregnancy was not significant, rendering that overt statement not useful, two behaviors specifically related to care of the child were clear and significant markers of prenatal alcohol consumption in particular populations.

First, among women with some college education, the likelihood of drinking was 59% higher if they delayed prenatal care. This suggests that delayed prenatal care is coupled with drinking because the woman seeks to avoid dealing with the reality of her situation, in part via self-medication. Prioritization for screening and intervention is warranted for any woman who has delayed prenatal care, as sensitive screening, education and other intervention may help those denying their situation to alter drinking behaviors for part of the pregnancy. Health care providers who serve more highly educated women particularly need to be cognizant of this relationship and to assure that both prenatal care and appropriate substance screening and intervention occur. This finding in an educated population highlights the need for providers to avoid subscription to stereotypes and to recognize risks for women of higher socio-economic status.

Second, teens who reported two weeks before giving birth that they had no idea of the mechanism by which they planned to feed their infant, were significantly more likely to drink. As with delayed prenatal care, this absence of plans for a basic element of child care evidences an inability to cope with the reality of pregnancy and increased tendency to avoid that reality via self-medication. At two weeks pre-delivery, intervention in terms of prenatal drinking is unlikely to be fruitful, but it is an indicator of the need for attention to both mother and child post-delivery. Proactively, however, providers of prenatal care should monitor teens' preparation for motherhood as the pregnancy advances, heeding warning

signs that the young woman is avoiding decisions that require realistic consideration of matters pertaining to child care and, among other things, assuring that screening and intervention occur.

The self-mastery variables were expected to indicate an ego-dystonic pregnancy, limited perceived control over an emotionally unpleasant situation, and increased propensity to drink while pregnant. None of these variables were significant among the adult models and, in Model 1, only two were marginally so. Among teens, however, two were indicators of drinking behavior; one (feeling “pushed around”) indicated somewhat increased likelihood of drinking and another (feeling unable to solve her problems) the opposite. Given the small magnitude of these relationships (2% difference in drinking) and the opposite direction of the relationships, one can only speculate about the meaning of the results and about whether a larger sample might have revealed more. Among the teens who felt “pushed around,” however, evidencing an external locus of coercive control, elevated likelihood of drinking while aware of their pregnancy may have been self-medication derived from perceiving the sexual experience that led to conception as having been “pushed” upon them or that other circumstances throughout pregnancy felt coercive. On the other hand, it is possible that these teens possessed a cognitive schema whereby they perceived much that happened to them as being hostile and controlling, even before the pregnancy. Whatever the reason, this result suggests that treatment providers for pregnant teens should attempt to ascertain whether the young woman feels coerced in important aspects of her life, with those so indicating prioritized for screening and intervention for prenatal substance use, as well as counseling related to their perceived powerlessness. This may be particularly important, given the strong evidence that women who experience domestic violence during pregnancy are more likely to use substances [23, 33]. Interventions that have proven useful in enhancing self-mastery include ones utilizing cognitive behavior therapy [52] (particularly coping skills training [53, 54]), behavior-image model interventions [55], motivational interviewing and enhancement [52], community reinforcement approaches [52], and twelve-step facilitation treatment [52].

Although this study provides quantitative evidence of behavioral and attitudinal indicators of alcohol use during pregnancy, it has three limitations. First, reliance on self-reported alcohol consumption, particularly prenatally, is a concern, as women often understand the stigma attached to drinking during pregnancy [1, 13]. If inaccurate self-reporting occurred in this study, bias should be in the direction of underreporting consumption. It is difficult to assess the degree to which underreporting might have occurred, but the percentage of women in this study who reported drinking during the past six months (9.6%) is similar for reports of past-month drinking by pregnant women in the 2009 NSDUH (9.8%) [7]. Second, it would have been ideal to have measures of pre-pregnancy drinking behavior, so as to determine change during pregnancy. The data, however, did not permit such analysis. Finally, the brief window of time between birth and four of the interviews with admitted drinkers leaves open the possibility that four of the women did not drink during pregnancy but only afterwards. Again, however, the close correspondence between national figures on prenatal past-month consumption and the results of this study minimizes that risk.

Conclusion

This study provides several indicators of propensity to drink during pregnancy among first-time mothers. Among specific groups of women, delayed prenatal care, lack of feeding plans, feeling pushed around, having attended some college, and being White are associated with prenatal drinking. While valid screening for alcohol use, coupled with necessary intervention, should occur for all pregnant women, evidence suggests this does not happen [1, 56]. Thus, identification of markers can be a useful tool for prioritizing screening.

Further, this study suggests that continued education during pregnancy may be protective against prenatal drinking. Costs associated with prenatal alcohol exposure are significant and any intervention designed to prevent exposure will have positive effects at multiple levels. Further, to the extent that prenatal drinking constitutes self-medication and avoidant coping, addressing the underlying stressor and associated emotional pain will enhance the well-being of both mother and child.

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Table 1

Characteristics of First-Time Mothers by Drinking Status (*N* = 645)

Characteristic	Category	Total	Number and Percent with Characteristic Who Were Drinkers (<i>n</i> = 62)	Number and Percent with Characteristic Who Were Non-Drinkers (<i>n</i> = 583)	<i>P</i> -Value
<i>Socio-demographic characteristics</i>					
Site:					
	Washington, D.C.	160 (24.8%)	14 (8.8%)	146 (91.3%)	0.004
	Birmingham, Alabama	207 (32.1%)	13 (6.3%)	194 (93.7%)	0.670
	Kansas City, Kansas & Missouri	149 (23.1%)	12 (8.1%)	137 (92.0%)	0.048
	South Bend, Indiana	129 (20.0%)	23 (17.8%)	106 (82.2%)	0.462
Age:					0.000
	<20	371 (57.5%)	26 (41.9%)	345 (59.2%)	0.009
	20–36	274 (42.5%)	36 (58.1%)	238 (40.8%)	0.009
Race/ethnicity:					0.002
	White	119 (18.4%)	25 (21.0%)	94 (79.0%)	0.000
	African-American	423 (65.5%)	29 (46.8%)	394 (67.5%)	0.001
	Other	104 (16.1%)	8 (7.7%)	96 (92.3%)	0.468
Education Status:					0.003
	Less than 12th grade	333 (51.6%)	27 (43.6%)	306 (52.5%)	0.181
	Twelfth grade only	161 (25.0%)	10 (16.1%)	151 (25.9%)	0.091
	Some college	151 (23.4%)	25 (40.3%)	126 (21.6%)	0.001
	Presently in school	281 (43.5%)	17 (27.4%)	264 (45.2%)	0.007
<i>Behavioral Characteristics</i>					
Pregnancy “just happened”		522 (80.8%)	48 (9.2%)	474 (81.2%)	0.481
First prenatal visit after 4th month		51 (7.9%)	6 (11.8%)	45 (88.2%)	0.587
No feeding plans by end of pregnancy		19 (0.8%)	3 (15.8%)	16 (84.2%)	0.273
<i>Attitudinal Characteristics</i>					
Agrees: “I have little control over the things that happen to me.”		114 (17.7%)	9 (7.9%)	105 (92.11%)	0.493
Agrees: “There is no way I can solve many of the problems I have.”		93 (14.4%)	5 (5.4%)	88 (94.6%)	0.090

Characteristic	Total	Number and Percent with Characteristic Who Were Drinkers (<i>n</i> = 62)	Number and Percent with Characteristic Who Were Non-Drinkers (<i>n</i> = 583)	<i>P</i> -Value
Agrees: "I often feel helpless in dealing with the problems of life."	92 (14.3%)	8 (8.7%)	84 (91.3%)	0.747
Agrees: "Sometimes I feel I'm being pushed around in life."	108 (16.7%)	12 (11.1%)	96 (88.9%)	0.563
Agrees: "I feel insecure about meeting the material needs of my children."	96 (14.9%)	9 (9.4%)	87 (90.63%)	0.932
Agrees: "I am uncertain about whether I can provide emotional support to my children."	39 (6.1%)	4 (10.3%)	35 (89.7%)	0.528

Table 2

Factors Associated With Drinking During Pregnancy Among First-Time Mothers

Variables	Model 1 All ages		Model 2 Teens		Model 3 All adults		Model 4 Adults with no college		Model 5 Adults with some college	
	Coef.	SE	Coef.	SE	Coef.	SE	Coef.	SE	Coef.	SE
Race/Ethnicity (White ref.)										
African-American	-.12***	.03	-.07 ⁺	.04	-.17***	.05	-.21**	.07	-.23**	.08
Other	-.12**	.04	-.04	.05	-.19**	.07	-.30***	.09	-.09	.11
Education Status (Less than 12th grade ref.)										
Twelfth grade only	-.01	.03	-.03	.03	-.02	.06	-.02	.05	--	--
Some college	.07*	.03	-.03	.12	.06	.05	--	--	--	--
In school	-.05*	.02	-.02	.03	-.11 ⁺	.06	-.11	.10	-.13 ⁺	.08
Pregnancy "just happened"	.04	.04	.05	.05	.05	.06	-.00	.06	.08	.09
First prenatal visit after 4th month	.04	.04	.03	.04	.14	.09	-.00	.09	.59**	.21
No feeding plans by end of pregnancy	.09	.07	.17*	.07	-.08	.15	-.05	.16	-.10	.26
"I have little control over the things that happen to me."	--	--	--	--	--	--	--	--	--	--
"There is no way I can solve many of the problems I have."	-.02 ⁺	.01	-.02*	.01	--	--	--	--	--	--
"I often feel helpless in dealing with the problems of life."	.02 ⁺	.01	--	--	--	--	--	--	--	--
"Sometimes I feel I'm being pushed around in life."	--	--	.02*	.01	--	--	--	--	--	--
"I feel insecure about meeting the material needs of my children."	--	--	--	--	--	--	--	--	--	--
"I am uncertain about whether I can provide emotional support to my children."	--	--	--	--	--	--	--	--	--	--
Number of Observations	645		371		274		128		146	
χ^2 (df) p-value	39.35(10)***		20.49(10)*		22.87 (8)**		14.49(7)*		18.05(6)**	

⁺ p-value 0.10

* p-value 0.05

** p-value 0.01

*** p-value 0.001