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Longitudinal Course of Risk for Parental Post-Adoption Depression

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Abstract

Objective—To determine whether the Postpartum Depression Predictors Inventory-Revised (PDPI-R) could be used to reveal distinct classes of adoptive parents across time.

Design—Longitudinal data were collected via online surveys at 4-6 weeks pre-placement, 4-6 weeks post-placement, and 5-6 months post-placement.

Setting—Participants were primarily clients of the largest adoption agency in the United States.

Participants—Participants included 127 adoptive parents (68 mothers and 59 fathers).

Methods—We applied a latent class growth analysis to the PDPI-R and conducted mixed effects modeling of class, time, and class×time interaction for the following categories of explanatory variables: parental expectations; interpersonal variables; psychological symptoms; and life orientation.

Results—Four latent trajectory classes were found. Class 1 (55% of sample) showed a stably low level of PDPI-R scores over time. Class 2 (32%) reported mean scores below the cut-off points at all three time points. Class 3 (8%) started at an intermediate level and increased after post-placement, but decreased at 5-6 months post-placement. Class 4 (5%) had high mean scores at all three time points. Significant main effects were found for almost all explanatory variables for class and for several variables for time. Significant interactions between class and time were found for expectations about the child and amount of love and ambivalence in parent's intimate relationship.

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Conclusion—Findings may assist nurses to be alert to trajectories of risk for post-adoption depression. Additional factors, not included in the PDPI-R, to determine risk for post-adoption depression may be needed for adoptive parents.

Keywords

Post-adoption depression; adoption; risk; anxiety; longitudinal; nursing

Approximately 2% of children in the United States join their families through adoption (Vandivere, Malm, & Radel, 2009). Adoptive families exhibit unique traits in comparison to non-adoptive families, including being more racially diverse, better educated, and more affluent (Adamec & Miller, 2007). Despite these advantages, adoptive families also require support, and almost 20% of adoptive families engage in counseling following adoption (Vandivere et al., 2009). As with birth parents, some adoptive parents struggle with depression symptoms after a child is placed in the home. In previous work, we used a modified version of the Postpartum Depression Risk Inventory-Revised (PDPI-R; Beck, 2002) to determine risk for post-adoption depression in adoptive parents (Foli, South, & Lim, 2012; Foli, South, Lim, & Hebdon, 2013). In the current study, we extend this work by using the adapted risk inventory to identify distinct classes of at-risk adoptive parents followed longitudinally from pre- to post-placement of the child.

Defining and Distinguishing Post-Adoption Depression

Parental post-adoption depression (PAD) was first noted in 1995 by June Bond, an adoption professional. She described symptoms such as panic, anxiety, and depression (Bond, 1995). Since Bond first identified the phenomenon, several research groups have attempted to measure the frequency of PAD. Of note, the rates of post-adoption depression are similar to or higher than rates of postpartum depression. Investigators estimate rates of postpartum depression between 10-15%, whereas rates of post-adoption depression are as high as 26% (Fields, Meuchel, Jaffe, Jha, & Payne, 2010; Foli, et al., 2012; Mott, Schiller, Richards, O'Hara, & Stuart, 2011; Senecky, et al., 2009).

Postpartum depression results from multiple mechanisms including personal, physiological, and social factors (Beck, 1998; Beck, 2002; Beck, Records, & Rice, 2006; O'Hara & Swain, 1996). Post-adoption depression is also a multi-faceted condition, but the contexts surrounding the adoption process are often quite different from the environments and experiences of birth parents. In two studies, investigators directly examined the differences between birth and adoptive parents. Levy-Shiff and colleagues (1991) compared 52 first-time adoptive couples with 52 first-time birthparent couples. For both groups, parental expectations and depressed mood were significant predictors of parental experiences. However, predictors for adoptive parents also included feelings of deprivation, social support, and self-concept. Mott and colleagues (2011) assessed symptoms of anxiety and depression in 147 adoptive mothers and 147 postpartum mothers at 12 months after placement in the home or birth. Rates of depression symptoms did not significantly differ between adoptive and birth mothers. For adoptive mothers, a regression model was used to explain 35% of the variance in depression symptoms with four significant variables: past psychological disorder, sleep deprivation, the degree to which the individual was bothered

by infertility, and marital adjustment. Thus, there is evidence to suggest that the risk factors for depression symptoms may be different in adoptive parents than in birth parents.

Assessment of Post-Adoption Depression

Measurement of postpartum and post-adoption depression requires a multi-modal approach due to the complex nature of these conditions. Beck (1998) developed the Postpartum Depression Predictors Inventory (PDPI) to identify women at risk for developing postpartum depression. In 2002, Beck conducted a meta-analysis to update the PDPI. The revised inventory included 13 risk factors related to postpartum depression: self-esteem, marital status, socioeconomic status (SES), unplanned/unwanted pregnancy, prenatal depression, child care stress, life stress, social support, prenatal anxiety, marital satisfaction/relationship, depression history, infant temperament, and maternity blues.

An adapted version of the PDPI-R was used by Foli and colleagues (2012) to assess risk for depression symptoms in 300 adoptive mothers. Adaptations included substituting the word *infant* for *infant/child* and measuring life stress with other items. A regression analysis using the Center for Epidemiological Studies Depression (CES-D; Radloff, 1977) and the Edinburgh Postnatal Depression Scale (EPDS; Cox, Holden, & Sagovsky, 1987) as dependent variables revealed several items from the PDPI-R as significant risk factors: self-esteem, history of depression, perception of friend support, and marital satisfaction (only for the EPDS). In a complementary analysis, 38 adoptive fathers' post-adoption depression symptoms were also predicted using the adapted PDPI-R (Foli et al., 2013). Perceived friend support, a PDPI-R variable, as well as older age of the child who was adopted, higher partner satisfaction scores, and lower scores on unmet expectations of the child were found to be significantly related to lower depression symptoms in the regression analysis (Foli et al., 2013). These findings demonstrated that the PDPI-R items provided valid explanatory variables when examining depression symptoms in adoptive parents. However, these studies were cross-sectional, utilizing samples of adoptive parents retrospectively reporting up to two years post-placement. To our knowledge, no researchers have examined how risk for depression, as assessed by the PDPI-R, may change longitudinally, particularly from pre- to post-placement of the child.

Current Study

In addition to the experiences of adoptive parenting being different *from* birth parents, the contexts of adoptive parenting *within* this population also differs, which we hypothesized creates different trajectories of risks for depression symptoms. For example, age of the child at placement varies between families, the level of support offered by family and friends, motivation to adopt, the length of time waiting for placement, and whether there is a history of infertility also vary among families who adopt children (Ishizawa & Kubo, 2014; Jones, 2009). As further support for the hypothesis, we point to the wide range of parental depression symptoms reported in the literature (see above). In our own work, we found that 18-26% of adoptive mothers and 11-24% of adoptive fathers experienced clinical rates of depression symptoms (Foli et al., 2012; Foli et al., 2013). Variable rates such as these lead to

speculation that there may be distinct classes of adoptive parents, by depressive risks, that may be elucidated by statistical analysis.

To address this gap, the objectives of this study were to identify how PDPI-R scores changed over time among adoptive parents, particularly from pre- to post-placement of the adopted child, to determine whether there were different trajectories (distinct classes) of PDPI-R scores *within* our sample of adoptive parents over time using latent class growth analysis (LCGA), and to examine variables that differ between these PDPI-R distinct classes. We examined the following variables for differences between trajectories: demographics, current psychological symptoms, feelings of rest, optimism, life satisfaction, romantic relationship functioning, and social support. Given previous work by Foli and colleagues that post-adoption depression may be triggered by a gap between expectations and the reality of the adoption experience (Foli, 2010; Foli et al., 2012; Foli et al., 2013; Foli, South, & Lim, 2014), we also examined whether expectations of parenting, the child, family, and society would differentiate the PDPI-R trajectories. This study was part of a larger investigation whose findings are reported elsewhere (Foli, South, Lim, & Jarnecke, under revision).

Methods

Study Design and Participant Recruitment

Data were collected via online surveys from adoptive parents, the majority of whom were clients of the largest adoption agency in the country. Participants were recruited in several ways, including electronic and hard copy recruitment flyers, advertisement in a quarterly adoption magazine, and a webinar on emotional health provided by one of the Principal Investigators. Any interested participant voluntarily contacted the investigators to enroll in the study either through electronic mail or phone calls. After obtaining information about the study, participants were directed to an online survey collection site (Qualtrics) where informed consent was obtained electronically; individuals who did not indicate consent were unable to proceed with the survey.

Inclusion criteria for participants were: access to the Internet; be at least 21 years of age; have the ability to speak, read, and understand English; and anticipate placement of the child within approximately 4-6 weeks after completion of pre-adoptive questionnaires. Data were collected between February 2013 and December 2014 at three time points: 4-6 weeks pre-placement (T1), 4-6 weeks post-placement (T2), and 5-6 months post-placement (T3). Each participant received a \$20 gift card for survey completion at each time point. This study was approved by the institutional review boards at Purdue University and the University of Hawaii.

Measures

All of the following measures were given at all three time points, with the exception of the demographic measures which were given at T1. For 114 participants, demographic items were collected at T1, and for 13 participants, demographic items were collected at T2.

Demographics and single-item measures—Demographic items included parent and child gender, parent and child age, parent and child race/ethnicity, income, education, job status (full- or part-time), history of infertility, how much the participant was bothered by infertility (rated 1-7; 1=strongly disagree, 7=strongly agree), religion, level of religiosity (rated 1-7; 1=not at all, 7=very strongly religious), number of adopted children, the type of adoption (public, private, and inter-country), and whether the parent considered the child to have special needs. A history of mental illness and partner's history of mental illness were also assessed; however, due to item wording being unclear to respondents, these variables were not included in our analysis.

Additionally, the following individual items were included and measured at all three time points: feelings of being rested (“I feel rested when I wake up”, 1=strongly disagree, 5=strongly agree); alcohol frequency (1=no drinking, 4=more than 4 alcoholic beverages per week); overall life satisfaction (rated 1= worst possible life overall, 10=best possible life overall); sexual relationship (how satisfied with sexual relationship with partner: rated 1=“very dissatisfied” to 7=“very satisfied”), partner enthusiasm toward being a parent (rated 1=“very strongly unenthusiastic” to 7=“very strongly enthusiastic”); and partner enthusiasm toward being an adoptive parent (rated 1=“very strongly unenthusiastic” to 7=“very strongly enthusiastic”). With the exception of the PDPI-R (higher score indicates higher risk), all items were recoded so that higher scores were in the more positive direction.

Postpartum Depression Predictors Inventory-Revised (PDPI-R)—The PDPI-R was designed to assess risk factors of postpartum depression identified from a meta-analysis as significantly related to postpartum depression (Beck, 2002). The PDPI-R includes ten risk factors (prenatal): marital status, socioeconomic status (SES), self-esteem, prenatal depression, prenatal anxiety, unwanted/unplanned pregnancy, history of depression, social support (partner, family, and friends), marital satisfaction, and life stress; and three additional risk factors (postnatal): child care stress, infant temperament, and maternity blues. Oppo et al. (2009) found the PDPI-R to be a valid screening tool for postpartum depression; the full version of the tool (10 items prenatal; 3 items postnatal) predicted depression in 83.4% of the mothers when administered at one month after delivery. The total score of the prenatal version can range from 0 to 32 and that of the postpartum version can range from 0 to 39. The higher the score, the more risk factors a woman has for developing depression. In previous research, the PDPI-R total score demonstrated good reliability (Cronbach's alpha=0.83) (Records & Rice, 2007).

Beck and colleagues (2006) initially found that the PDPI-R yielded a sensitivity of 0.76 and a specificity of 0.54 at a cutoff score of 10.5 when used *during pregnancy*. However, they were unable to recommend a cut-off score for the full version of the instrument used in the postnatal time period (2 and 6 months after childbirth). In contrast, Oppo et al. (2009) recommended a cut-point of 3.5 for the prenatal version and 5.5 for the full version of the PDPI-R at one month after childbirth. These cut-points showed good sensitivity and specificity (prenatal version: 0.737 and 0.675; full version: 0.763 and 0.706, respectively).

For the current study, the PDPI-R was adapted for an adoptive parent population, by changing the wording from “infant” to “infant/child.” A cut-off of 3.5 and 5.5 was used for

pre-placement and post-placement, respectively. Cronbach's alpha coefficients for our study were 0.66 at T1; 0.69 at T2; and 0.69 at T3. However, removing three items that demonstrated little variation in the sample (marital status, SES, and unplanned adoption, see Table 1) improved the Cronbach's alphas to 0.70 at T1; 0.73 at T2 and 0.74 at T3.

Parental expectations—Expectations were measured with 20 items, with four to six items measuring each domain of expectations (parents [six items], child [five items], family/friends [five items], and society [four items]). For example, regarding expectations of the child, one item asked, “I expect parenting this child will be easy” (Likert scale, ranging from 1=very strongly disagree to 7=very strongly agree). Cronbach's alpha coefficients of parent, child, family/friends, and society expectation for our study were 0.81, 0.68, 0.82, and 0.84 at T1; 0.82, 0.82, 0.81, and 0.82 at T2; and 0.77, 0.86, 0.82, and 0.84 at T3, respectively.

Perceived Social Support (PSS-Fa & PSS-Fr)—These two parallel scales measure perceived social support from family and friends; each scale consists of 20 items (example: “My family/friends give me the moral support I need.”), with responses of “Yes,” “No,” and “Don't Know” (Procidano & Heller, 1983). The scales were found to measure separate, but valid constructs (Procidano & Heller, 1983). Cronbach's alpha coefficients of PSS-Fa and PSS-Fr for our study were 0.96 and 0.95 at T1; 0.94 and 0.90 at T2; and 0.94, and 0.92 at T3, respectively.

Intimate Relations Questionnaire (IRQ)—This 25-item instrument has four subscales that measure love (10 items), conflict/negativity (5 items), ambivalence about whether to continue the relationship (5 items), and maintenance in a relationship (5 items) (Braiker & Kelly, 1979). These four dimensions have been found to reflect the various areas of a couple's relationship. Cronbach's alpha coefficients of love, conflict, ambivalence, and maintenance for our study were 0.86, 0.80, 0.83, and 0.75 at T1; 0.88, 0.80, 0.88, and 0.78 at T2; and 0.90, 0.85, 0.87, and 0.81 at T3, respectively.

Inventory of Depression and Anxiety Symptoms (IDAS)—The 64-item IDAS (Watson et al., 2007) contains 10 specific symptom scales: Suicidality, Lassitude, Insomnia, Appetite Loss, Appetite Gain, Ill Temper, Well-Being, Panic, Social Anxiety, and Traumatic Intrusions. To reduce participant burden, we included the following subscales, which were selected on dimensions not measured by the other tools used in the study: Ill Temper, Social Anxiety, Panic and Traumatic Intrusions. Cronbach's alpha coefficients of Ill Temper, Social Anxiety, Panic and Traumatic Intrusions for our study were 0.79, 0.52, 0.61, and 0.75 at T1; 0.84, 0.71, 0.63, and 0.85 at T2; and 0.83, 0.78, 0.55, and 0.79 at T3, respectively.

Life Orientation Test-Revised (LOT-R)—The LOT-R was developed to assess individual differences in generalized optimism versus pessimism. The total score reflects the extent to which people hold generalized favorable expectancies for their future, with a higher score indicating a higher level of optimism (Scheier, Carver, & Bridges, 1994). The total score can range from 0 to 24 and Cronbach's alpha coefficient for our study was 0.84 at T1, 0.87 at T2, and 0.83 at T3.

Analysis

Descriptive statistics for parent and child characteristics were generated. For the outcome variable of PDPI-R total, if a respondent completed at least 80% of PDPI-R items, any missing item was substituted with the item-median value; the only exception was socioeconomic status (SES), which was imputed from their spouse's SES.

Latent Class Growth Analysis (LCGA)

To identify distinct trajectories of total PDPI-R scores across the three time points, we used latent class growth analysis (LCGA). LCGA is a statistical technique that combines growth curve modeling and latent class modeling by allowing longitudinal change between different classes. We modeled a LCGA with linear and quadratic time effects, allowing different baseline PDPI-R scores (i.e., intercepts), linear rate of scores over time, and quadratic aspect of scores for each latent class. The number of trajectory classes was determined based on the two most reliable fit statistics: Bayesian information criterion (BIC) and bootstrap likelihood ratio test (BLRT). Selecting a model with the smallest BIC attempts to select a model with the highest Bayesian posterior probability (Neath & Cavanaugh, 2012). BLRT uses bootstrap resampling samples to compare distributions between k-1 and k class models and determines if there is a statistically significant improvement in fit for the inclusion of one more class (McLachlan and Peel, 2000). A simulation study showed that BLRT was the best fit statistic, followed by BIC (Nylund, Asparouhov, & Muthen, 2007). All LCGAs were implemented in Mplus version 7.31 (Muthén & Muthén, 1998-2010).

Mixed Effects Model Relating Class Grouping to Outcome Variables

After identifying classes within the sample that had different PDPI-R score trajectories, we next used mixed effects models with the latent classes (between-factor), time (within-factor), and their interaction as fixed effects and random intercepts and slopes by subject. Tukey's post-hoc test was used to adjust for multiple comparisons. To detect differences between the classes on subject characteristic variables (e.g., demographics), we conducted either a one-way analysis of variance or a Kruskal-Wallis test for continuous variables and a Chi-square test or Fisher's exact test for categorical variables. All analyses were conducted in Statistical Analysis System (SAS®) software, Version 9.4, and $p < 0.05$ was considered statistically significant.

Results

Descriptive Statistics

Table 1 displays demographic characteristics of the parents and their adopted children as reported by the participants. A total of 129 adoptive parent participants enrolled in the study and completed data collection for at least one time point. Two single adoptive parents were excluded from the current analysis because more than 20% of PDPI-R items were missing, mainly due to the marriage-related questions. Of the total sample of 127, 113 provided data at T2 and 102 at T3. Most of the sample (93%) were Caucasian or white, approximately three quarter (76%) were enrolled through a single, large adoption agency and over a third (37%) reported incomes of greater than \$100,000 per year or had completed education

(38%) past a four-year degree. Forty-five percent of the children were categorized by their parents as having special needs; almost half (47%) of the children were inter-country adoptions. The child's characteristics used were, in general, reported by the mother at Time 2.

The mean PDPI-R scores were 3.2 (SD=2.9; Range=0-15) at T1, 4.8 (SD=4.1; Range=0-19) at T2, and 5.0 (SD=4.2; Range=0-21) at T3, respectively. The number of subjects whose PDPI-R score was greater than the cut-off points (3.5 and 5.5; Oppo et al., 2009) were stable over time: 36 parents (32%) at T1; 39 parents (35%) at T2; and 34 parents (33%) at T3. There were 5 parents (4%) at T1 who scored above the 10.5 cut-off (Beck et al., 2006).

Latent Class Growth Analyses of PDPI-R

The fit statistics for the LCGAs are shown in Table 2, including log likelihood, BIC, and the p-value from BLRT. BIC identified the four-class model and BLRT identified the five-class model as the best-fitting. We further examined the distributions and profiles of the latent classes between the four and five class models, and found that all but three subjects remained in the same classes when moving from the four to five class models. The profiles of the three subjects in the new class of the five class model were not seriously deviated from the two classes of their corresponding membership in the four-class model. Hence, we selected the four-class model as our final model. The intercepts, linear and quadratic estimates for each latent class are provided in Table 3.

Figure 1 illustrates the four trajectories of our final model. Class 1, the “Stably Low” group, accounted for 55% of the sample (see Table 3) and their mean scores were below the cut-points at all three time points. Class 2, the “Slight Increase-Decrease” group (32% of sample), started near Oppo et al.'s cut-off point at pre-placement, increased above the cut-off point at T2, and decreased slightly, but still remained above cut-off at T3. Class 3, the “Increase-Maintain” group (8% of sample), started at a moderate level of risk, between Oppo et al. (2009)'s and Beck et al. (2006)'s cut-offs, at pre-placement, increased at T2 and maintained that level at T3. Class 4, the “Increase-Increase” group (5% of sample), had high mean scores, above both Oppo et al. (2009)'s and Beck et al. (2006)'s cut-points, at all three time points. Table 4 illustrates the PDPI-R scores and specific factors by time and latent class membership (mean and SD).

Mixed Effects Modeling of LCGA Classes

Mixed effects models were used to examine differences between the four latent classes on scores for all the measures and individual variables including expectations (of parent, child, family/friends, and society), interpersonal variables (family and friends support, partner's enthusiasm to being a parent and an adoptive parent, intimate relationship functioning, and sexual relationship), psychological symptoms (ill temper, social anxiety, panic, traumatic intrusion, feeling rested, and alcohol drinking), and life orientation (optimism and overall life satisfaction; Table 5). A significant main effect of class was detected for all variables except expectations of society, partner's enthusiasm for being an adoptive parent, and alcohol drinking. Compared to the “Stably Low” group, the “Increase-Maintain” and “Increase-Increase” group reported more psychological and interpersonal difficulties.

Significant time effects were found in many variables: (a) compared to T1, expectations of parent, maintenance, and feeling of rest decreased but expectations of family/friend and society, conflict, and ill temper increased at T2; (b) compared to T1, expectations of parent, maintenance, panic, sexual relationship, and partner's enthusiasm for being an adoptive parent decreased but expectations of family/friends and society and panic increased at T3; (c) compared to T2, expectations of parent and partner's enthusiasm for being an adoptive parent decreased at T3.

In addition, significant interactions between class and time were found in partner's enthusiasm for being a parent, love, ambivalence, and conflict. The mean love score of the "Increase-Increase" group was lower than the "Slight Increase-Decrease" and "Stably Low" groups at all three time points; the mean score of the "Increase-Maintain" group was lower than that of the "Stably Low" group at T2 but higher than that of the "Increase-Increase" group at T3. For ambivalence and conflict, the means of the "Increase-Increase" group were higher than that of the "Slight Increase-Decrease" and "Stably Low" groups at all three time points. Compared to the "Stably Low" group, the mean scores for ambivalence and conflict was lower than that of the "Increase-Maintain" group at T2 and T3, respectively. The "Increase-Increase" group also had a higher mean conflict score than the "Increase-Maintain" group at T3.

Comparison of Subject Characteristics among Trajectory Classes—For those variables collected at one time point, significant differences between trajectory classes were only found for parent gender ($p=0.007$). More male parents were included in the "Stably Low" group than the other groups (60% vs. 31%, $p=0.002$). Transracial is also significant by class when both parents are considered together ($p=0.020$). However, that significance is lost when fathers' and mothers' reports of race are analyzed separately due to small sample sizes (see Table 6: supplemental data file available at <http://jognn.org>).

Discussion

This study used a modified PDPI-R as a measure of risk for parental post-adoption depression symptoms across three time points, before and after placement of a child. We postulated the existence of different trajectory classes along the process of adoption and identified four classes using latent class growth analysis. Three of these classes met the Oppo et al. (2009) threshold for risk at all three time points, although a majority of the sample was below the threshold at each time point. Several PDPI-R risk factors showed little variability between classes (i.e., marital status, SES, and unplanned adoption), and future research should determine whether these risk factors need to be modified or excluded from PAD risk assessment in a larger sample. Additional risk factors, *not* included in the PDPI-R, were revealed to vary significantly across class, time, and the class*time interaction.

Results from the mixed effects model support previous findings that expectations held by parents are important factors in their risk for PAD. Significant main effects were found by both class (except expectations of society) and time (except child). The majority of the sample who scored the lowest on the PDPI-R and therefore, the least risk ("Stably Low"), held expectations that differed from the other groups in the sample. Pre-adoption, this class

held *higher* expectations for themselves as parents, of their child, and of family and friends, when compared with the classes of parents at higher risk for PAD (“Increase-Maintain” and “Increase-Increase”). Foli's Mid-Range Theory of Post-Adoption Depression asserts that expectations are influential in the matching of what was anticipated with what is experienced: a dissonance may cause or contribute to depression symptoms (Foli, 2010). Based on our findings, parental expectations of self, child, friends, and family, should be included in PAD risk assessments. Expectations of society should continue to be tested as a variable in a more heterogeneous sample.

Interpersonal variables also revealed significant differences between classes. Although the PDPI-R includes factors related to marital/partner satisfaction and support, we included specific explanatory measures of additional relational constructs. Support from family and friends differed by class, but appeared stable over time. This finding may indicate that support or the lack of support does not grow or diminish, remaining uninfluenced by the actual placement of the child. In general, the lowest-risk group (“Stably Low”) had the highest levels of support from family and friends, while the most at-risk group (“Increase-Increase”) showed significantly lower mean scores than the other three groups for family support. The least at-risk group (“Stably Low”) was distinguished by having the highest scores on intimate partner love and maintenance, and the lowest scores on ambivalence and conflict. Further, the quality of one's sexual relationship distinguished the least-risk group (Stably Low class) and one of the at-risk groups (Increase-Maintain). Given the extensive literature that supports the negative effects of having a child on intimate relationships in the postnatal time period in the birth parent population (Doss, Rhoades, Stanley & Markman, 2009; Lawrence, Rothman, Cobb & Bradbury, 2010; Lawrence, Rothman, Cobb, Rothman, & Bradbury, 2008), this is not a surprising finding. Significant findings were also found for partner's enthusiasm to being a parent (by class, time and class*time), more so than partner's enthusiasm to being an adoptive parent (by time). The question about becoming a parent may be more salient to the individual/couple than whether the path to parenthood is adoption versus birth. In general, adoptive parents who had the highest risk for post-adoption depression were characterized by lower family and friend support and greater distress in their intimate romantic relationship.

Several psychological symptoms also were significant, but primarily by trajectory classes, and particularly symptoms of anxiety as measured by the IDAS. In a systematic review addressing anxiety disorders in pregnancy and postpartum, Ross and McLean (2006) concluded that obsessive-compulsive disorder and generalized anxiety disorder are higher in postpartum women than in the general population. In the general population, some have proposed that generalized anxiety and major depression can be considered in one category of distress disorders due to their overlapping diagnostic criteria, co-morbidity, and etiological overlap (Crakse et al., 2009; Goldberg, Andrews, Krueger, & Hobbs, 2009; Watson, 2005), a suggestion that was reviewed during the development of the DSM-5 (First, 2007; Moffit et al., 2007). Crakse et al. (2009) concluded that the distinctions between anxiety disorders and depressive disorders warranted separation in the DSM-5. For adoptive parents who may be at risk for depression, symptoms of anxiety should be considered in risk assessment.

Our findings also showed that parents in the least-risk group (“Stably Low”) reported greater feelings of being rested than the other groups, a result which is consistent with the previous findings. Lack of sleep and rest are correlated with major depressive disorder (i.e., insomnia and fatigue or loss of energy; American Psychiatric Association, 2013). Feeling rested and sleep deprivation, items not included in the PDPI-R, have been found to be an important risk factor for PAD (Foli, South, Lim, & Hebdon, 2012; Mott et al., 2011), and hence, may need to be considered as risk factors in future studies.

Overall orientation to life was measured by level of optimism and life satisfaction, factors that could be considered buffers to depression symptoms. In a study that examined the role of optimism, Grote and Bledsoe (2007) used a “risk and resilience” theoretical framework. Optimism was associated with decreased depressive severity at 6 months and 12 months postpartum. Similarly, we found optimism to be significantly higher in the lowest-risk group (“Stably Low”) versus the highest-risk group (“Increase-Increase”). Life stress is assessed by the PDPI-R and may have an inverse relationship with life satisfaction (e.g., Trzcieniecka-Green, Gaczek, Pawlak, Ortowska, & Pochopin, 2012). Our findings revealed significant differences in life satisfaction by class; however, we found no significant differences by time and no time*class interaction. The PDPI-R life stress mean for the lowest risk group, “Stably Low,” ranged between 0.28 and 0.46 at each time point, while the mean for the highest risk group, “Increase-Increase,” ranged from 1.20 to 1.67 with time one being the highest, supporting the inverse relationship between life stress and life satisfaction (Pearson's correlation=-0.23, $P<0.001$).

Gender was also found to vary by class with more fathers in the “Stably Low” group. Although rates vary, approximately 10%-15% of new mothers experience *postpartum* depression (Gavin et al., 2005; O'Hara & Swain, 1996; Vesga-Lopez et al., 2008). Paternal postpartum depression has also been extensively examined; Paulson and Bazemore (2010) found a 10.4% meta-estimate for paternal postpartum depression; higher rates of depression (25.6%) were reported at 3 to 6 months postpartum. A correlation between maternal and paternal depression symptoms was also found (Paulson & Bazemore, 2010). Based on our findings, adoptive fathers may differ from birth fathers' depressive symptom trajectories in the pre-and postnatal time periods. Further research is needed to elucidate adoptive fathers' specific risk factors and buffers as well as the relationship between paternal and maternal symptoms.

Variables that do *not* indicate risk for PAD have implications for adoptive parents and caregivers. There are often assumptions made related to child characteristics (i.e., age, race, special needs) or paths to adoption (i.e., adoptions through the public welfare system/foster care). These assumptions imply that the parents may have more challenges as they enter parenthood; however, we found that these variables were not significant between PAD risk groups.

Limitations

Our study did have some limitations that might affect the results and interpretation of our findings. A recent simulation study by Twisk and Hoekstra (2012) suggested caution in use of clustering statistical methods because they failed to accurately identify developmental

patterns that had been artificially imposed on a real data set, although latent class analysis and LCGA seem to be preferable. Second, our sample size is relatively modest, lacks diversity in demographic characteristics, and reported relatively high levels of income and education. While adoptive parents tend to be older, have higher family incomes, and are more likely to be married than other parents (Jones, 2009), the possibility of the non-representative nature of our sample is present. Of note is the adoption agency from where the majority of the parents were recruited emphasizes pre-adoption preparation and education as well as full-disclosure to parents regarding their child's emotional and physical status. A high level of religiosity was also evident in our sample, which could have also influenced specific findings. Parents who responded to the study may have been motivated to “help other adoptive families.” These factors may limit generalizability and call for continued research in this area.

Conclusion

Our study is the first investigation into the longitudinal course of risk factors as assessed by the PDPI-R and other measures that may be associated with PAD. By employing latent class growth analysis and subsequent mixed effects model with data from both adoptive mothers and fathers who have adopted children through varying paths (i.e., domestic private, domestic public, and inter-country), we have filled a gap in the current literature.

Scores on the modified PDPI-R revealed four distinct trajectories of risk factors with the majority of adoptive parents assessed as low risk for depression symptoms from pre-to post-placement. However, for those parents who were at risk, additional factors not currently assessed by the PDPI-R may be necessary to comprehensively assess for PAD during the pre-to post-placement time period. These risks include unmet expectations, interpersonal variables (support, intimate relationships, and partner enthusiasm to parent), psychological symptoms (ill temper, social anxiety, panic, traumatic intrusion, and feeling rested), and orientation to life (level of optimism and overall life satisfaction).

Supplementary Material

Refer to Web version on PubMed Central for supplementary material.

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Call-Outs

1. Longitudinal data analysis addressed Postpartum Depression Predictors Inventory-Revised scores from pre- to post-placement. The majority of adoptive parents scored below risk cut-off points.
2. Four groups (classes) within the sample demonstrated distinct patterns of risk through latent class growth analysis: stably low, slight increase-decrease, increase-maintain, and increase-increase.
3. Health care providers should be aware of the potential need assess for post adoption depression during the pre-to post-placement time period.

Figure 1.

Time Trajectory Plots for Classes Determined by Latent Class Growth Curve Analysis. PDPI-R = Postpartum Depression Predictors Inventory-Revised. The total score of pre-placement can range from 0 to 32 and that of post-placement can range from 0 to 39. The gray dashed line indicates the cut-point of PDPI-R for prenatal version (score of 3.5) and for the full version (score of 5.5) of PDPI-R (Oppo et al., 2009). The orange dashed line indicates the cut-point for the prenatal version (score of 10.5) suggested by Beck et al. (2008).

Table 1
Subject Characteristics

Parent Variable ^a	n (%)	Child Variable ^b	n (%)
Gender		Gender	
Male	59 (46)	Male	33 (53)
Female	68 (54)	Female	29 (47)
Parent Age (yrs.), mean (SD)	38.0 (5.3)	Age (mos.), mean (SD)	28.1 (38.3)
Race/Ethnicity		Child's Race/Ethnicity	
White	118 (93)	White	17 (27)
Other	9 (7)	Black or African	12 (19)
Income		Hispanic	2 (3)
Under \$75,000	41 (33)	Asian or Pacific Islander	22 (35)
\$75,000 to under \$100,000	37 (30)	Multiracial	8 (13)
More than \$100,000	45 (37)	Other	1 (2)
Education		Transracial Family	
Less than four year college graduate	23 (18)	No (Same as at least one parent)	18 (29)
Four-year college graduate	56 (44)	Yes (Different from both parents)	44 (71)
Post-graduate	48 (38)	# of Adopted children	
Job Status		1	56 (90)
Full time	83 (65)	2	5 (8)
Part time	14 (11)	3	1 (2)
Other	30 (24)	Special Need	
Infertility		Yes	28 (44)
Yes	55 (45)	No	34 (55)
No	67 (55)	Type of Special Need	
Bothered by infertility ^c , mean (SD)	2.5 (1.2)	Physical	13 (21)
Religion		Emotional/Psychological	6 (10)
Protestant	56 (44)	Developmental/Cognitive	5 (8)
Roman Catholic	14 (11)	Other	12 (19)
Non-denominational Christian	44 (35)	Missing	26 (42)
Other	13 (10)	Type of Adoption	
Level of Religiosity ^d , mean (SD)	6.1 (1.2)	Public (domestic)	7 (11)
Motivation of Adoption		Private (domestic)	20 (32)
Build family through adoption	97 (76)	Inter-country	29 (47)
God's calling	90 (71)	Other	6 (10)

Parent Variable ^a	n (%)	Child Variable ^b	n (%)
Want a child of specific gender	9 (7)	Length of Waiting Time (mos.),	10.7 (11.5)
Other	16 (13)	mean (SD)	

Note.

^a n=127 parents; n=62 couples.

^b Child variables were reported based on the older child if more than one child was adopted at the same time. Five couples adopted 2 children and one couple adopted 3 children at the same time.

^c 1=strongly disagree-5=strongly agree.

^d 1=not at all-7=very strongly religious.

Table 2
Model Fit Statistics of Latent Class Growth Analysis with 1-9 Classes

Number of Classes	LL	BIC	BLRT p-value
1 class	-890.24	1809.54	-
2 class	-809.41	1667.26	<0.001
3 class	-768.42	1604.65	<0.001
4 class	-751.74	1590.68	<0.001
5 class	-744.43	1595.43	0.030
6 class	-741.37	1608.69	1.000
7 class	-729.51	1604.35	0.077
8 class	-726.05	1616.80	0.207
9 class	-722.09	1628.26	0.429

Note. LL=log-likelihood. BIC=Bayesian information criterion (smaller better). BLRT=Bootstrap likelihood ratio test (significant p-value but insignificant p-value for (k+1)-class model). The final model selected for interpretation is shown in bold.

Table 3
Parameter Estimates for Four Trajectory Latent Classes

Trajectory Class	n (%)	Estimate (Standard Error)		
		Intercept	Linear	Quadratic
Class 1: Stably Low	70 (55%)	1.66 (0.16) ****	0.30 (0.36)	0.06 (0.18)
Class 2: Slight Increase-Moderate	41 (32%)	3.72 (0.31) ****	4.67 (0.99) ****	-1.84 (0.51) ****
Class 3: Increase-Maintain	10 (8%)	6.17 (0.73) ****	6.85 (1.49) ****	-2.48 (0.77) ****
Class 4: Increase-Increase	6 (5%)	12.01 (0.96) ****	5.59 (3.09) *	-1.60 (1.45)

*
p<0.10;

**
p<0.05;

p<0.01;

p<0.001

Table 4

PDP-L-R Factors by Latent Class Membership

Subscale (Potential Range)		Time	Trajectory Class, Mean (SD)			
			Class 1 (n=70): Stably Low	Class 2 (n=41): Slight Increase-Decrease	Class 3 (n=10): Increase-Maintain	Class 4 (n=6): Increase-Increase
PDP-L-R (0-39)	1		1.66 (1.12)	3.86 (1.63)	6.22 (1.99)	12.00 (2.53)
	2		1.95 (1.24)	6.61 (1.85)	10.67 (1.66)	16.00 (3.54)
	3		2.44 (1.87)	5.73 (2.15)	10.20 (2.39)	16.80 (2.49)
Marital Status (0-1)	1		0.02 (0.13)	0.00 (0.00)	0.00 (0.00)	0.00 (0.00)
	2		0.00 (0.00)	0.00 (0.00)	0.00 (0.00)	0.00 (0.00)
	3		0.00 (0.00)	0.00 (0.00)	0.00 (0.00)	0.00 (0.00)
SES (0-1)	1		0.00 (0.00)	0.00 (0.00)	0.00 (0.00)	0.17 (0.41)
	2		0.00 (0.00)	0.00 (0.00)	0.00 (0.00)	0.00 (0.00)
	3		0.00 (0.00)	0.00 (0.00)	0.00 (0.00)	0.20 (0.45)
Self-esteem (0-3)	1		0.00 (0.00)	0.03 (0.17)	0.11 (0.33)	0.50 (0.55)
	2		0.00 (0.00)	0.03 (0.16)	0.33 (0.71)	1.00 (1.00)
	3		0.00 (0.00)	0.09 (0.29)	0.50 (0.85)	0.60 (0.89)
Pre-Adopt Depression (0-1)	1		0.25 (0.44)	0.63 (0.49)	0.78 (0.44)	1.00 (0.00)
	2		0.23 (0.42)	0.63 (0.49)	0.78 (0.44)	1.00 (0.00)
	3		0.25 (0.43)	0.70 (0.47)	0.90 (0.32)	1.00 (0.00)
Pre-Adopt Anxiety (0-1)	1		0.69 (0.47)	0.89 (0.32)	0.89 (0.33)	1.00 (0.00)
	2		0.54 (0.50)	0.82 (0.39)	0.78 (0.44)	0.80 (0.45)
	3		1.77 (0.81)	2.15 (0.85)	2.78 (0.92)	3.63 (0.51)
Unplanned Adoption (0-2)	1		0.02 (0.13)	0.09 (0.28)	0.22 (0.44)	0.00 (0.00)
	2		0.02 (0.13)	0.13 (0.34)	0.11 (0.33)	0.00 (0.00)
	3		0.00 (0.00)	0.00 (0.00)	0.10 (0.32)	0.20 (0.45)
History of Depression (0-1)	1		0.19 (0.39)	0.54 (0.51)	0.89 (0.33)	0.83 (0.41)
	2		0.16 (0.37)	0.61 (0.50)	0.89 (0.33)	1.00 (0.00)

Subscale (Potential Range)	Time	Trajectory Class, Mean (SD)				
		Class 1 (n=70): Stably Low	Class 2 (n=41): Slight Increase-Decrease	Class 3 (n=10): Increase-Maintain	Class 4 (n=6): Increase-Increase	
		0.26 (0.44)	0.61 (0.50)	0.80 (0.42)	1.00 (0.00)	
Social Support (0-12)	3					1.00 (0.00)
	1	0.23 (0.56)	1.00 (1.31)	2.11 (2.09)		6.00 (2.10)
	2	0.27 (0.58)	1.47 (1.57)	2.75 (1.91)		6.00 (1.83)
	3	0.48 (1.02)	1.69 (1.82)	2.40 (2.00)		7.00 (3.32)
Marital Satisfaction (0-3)	1	0.00 (0.00)	0.09 (0.28)	0.00 (0.00)		0.83 (1.33)
	2	0.00 (0.00)	0.26 (0.60)	0.56 (0.88)		1.20 (1.64)
	3	0.04 (0.19)	0.06 (0.24)	0.40 (0.97)		1.60 (1.52)
Life Stress (0-7)	1	0.28 (0.52)	0.60 (0.91)	1.22 (0.83)		1.67 (1.21)
	2	0.28 (0.55)	0.79 (0.91)	1.33 (0.87)		1.40 (1.14)
	3	0.46 (0.66)	0.67 (0.96)	2.00 (1.41)		1.20 (1.79)
Child Care Stress (0-3)	2	0.23 (0.50)	0.82 (0.87)	1.44 (0.73)		2.20 (1.10)
	3	0.24 (0.47)	0.42 (0.61)	1.00 (1.05)		1.80 (1.30)
Child Temperament (0-3)	2	0.13 (0.43)	0.74 (0.95)	1.33 (1.41)		1.40 (1.52)
	3	0.22 (0.57)	0.55 (0.87)	0.70 (0.82)		1.20 (1.64)
Adoption Blues (0-1)	2	0.10 (0.30)	0.32 (0.47)	0.56 (0.53)		0.00 (0.00)
	3	0.09 (0.29)	0.33 (0.48)	0.50 (0.53)		0.40 (0.55)

Note. PDP1-R = Postpartum Depression Predictors Inventory-Revised. Higher score indicates higher risk for depression (e.g. higher self-esteem score indicates low self-esteem). Mean and SD are unadjusted mean and SD.

Table 5
Mixed Effects Modeling of Explanatory Variables as a Function of Time and Latent Class Membership

Variable	Possible Range	Time	Trajectory Class, Mean (SD)			Mixed Effects Model, p-value				
			Class 1 (n=70): Stably Low	Class 2 (n=41): Slight Increase- Decrease	Class 3 (n=10): Increase- Maintain	Class 4 (n=6): Increase- Increase	Class	Time	Class*Time	
<i>Expectations</i>										
Expectation: Parent	6-42	1	37.14 (2.73)	36.06 (4.16)	35.11 (2.62)	33.80 (2.49)	<0.001	1vs3; 1vs4; 2vs3	0.077	
		2	36.30 (3.15)	35.71 (3.53)	31.78 (2.86)	33.75 (8.02)				
		3	35.59 (2.83)	34.97 (3.64)	32.00 (3.40)	28.80 (9.15)				
Expectation: Child	5-35	1	26.05 (2.99)	25.06 (3.28)	25.11 (1.54)	23.67 (3.08)	0.001	1vs4; 2vs4	0.103	
		2	28.46 (3.43)	27.47 (3.65)	25.56 (2.92)	24.25 (10.87)				
		3	28.65 (3.51)	27.24 (4.62)	27.60 (2.41)	21.20 (11.67)				
Expectation: Family/Friends	5-35	1	28.75 (3.74)	26.85 (3.81)	23.67 (3.94)	22.80 (3.90)	0.002	1vs3	0.123	
		2	29.64 (3.73)	28.26 (4.07)	25.33 (4.80)	28.25 (5.56)				
		3	29.71 (3.98)	29.06 (4.46)	26.50 (4.03)	26.60 (6.02)				
Expectation: Society	4-28	1	20.27 (3.62)	18.85 (3.64)	18.11 (1.90)	19.60 (3.51)	0.137		0.969	
		2	22.22 (2.95)	20.76 (4.36)	20.88 (3.18)	20.60 (3.91)				
		3	22.54 (3.10)	21.00 (4.51)	21.20 (2.62)	20.80 (2.59)				
<i>Interpersonal Variables</i>										
PSS-Fa: Family Support	0-20	1	16.39 (3.97)	13.74 (6.21)	13.67 (6.26)	3.00 (3.35)	<0.001	1vs2; 1vs4; 2vs4; 3vs4	0.468	
		2	17.21 (3.59)	13.53 (6.28)	12.56 (6.78)	3.20 (3.96)				
		3	16.50 (4.42)	13.88 (6.72)	13.30 (6.13)	4.40 (3.85)				
PSS-Fr: Friend Support	0-20	1	16.20 (3.89)	14.40 (4.60)	13.33 (4.82)	6.67 (5.13)	<0.001	1vs3; 1vs4; 2vs4	0.963	
		2	16.44 (3.36)	14.74 (4.03)	11.89 (7.57)	8.00 (7.62)				
		3	15.72 (4.72)	14.00 (4.58)	11.00 (6.85)	8.00 (5.43)				
Partner's Enthusiasm Being Parent	1-7	1	6.53 (0.69)	6.63 (0.65)	6.56 (0.53)	6.00 (1.26)	β, γ	0.034	0.034	T1: NS T2: NS T3: 1vs4; 2vs4; 3vs4

		Mixed Effects Model, p-value										
		Trajectory Class, Mean (SD)										
Variable	Possible Range	Time	Class 1 (n=70): Stably Low	Class 2 (n=41): Slight Increase- Decrease	Class 3 (n=10): Increase- Maintain	Class 4 (n=6): Increase- Increase	Class	Time	Class*Time			
Partner's Enthusiasm Being Adoptive Parent	1-7	2	6.49 (0.65)	6.55 (0.72)	6.67 (0.71)	6.20 (1.30)			Foli et al.			
		3	6.37 (0.71)	6.36 (0.78)	6.20 (0.79)	5.00 (1.22)						
		1	6.48 (0.73)	6.57 (0.65)	6.56 (0.53)	6.00 (1.26) $\beta_1\gamma$	0.080	<0.001		1vs3; 2vs3	0.256	
		2	6.48 (0.62)	6.50 (0.89)	6.33 (0.87)	6.00 (1.41)						
		3	6.30 (0.72)	6.27 (0.80)	6.20 (0.79)	5.00 (1.22)						
IRQ: Love	10-90	1	84.85 (4.82)	83.33 (6.07)	80.33 (6.44)	72.83 (8.66) $\beta_1\gamma$	<0.001	1vs4; 2vs4; 3vs4	<0.001	1vs2; 1vs3	0.024	T1: 1vs4; 2vs4 T2: 1vs3; 1vs4; 2vs4 T3: 1vs3
		2	84.00 (5.03)	81.95 (6.79)	77.56 (7.92)	69.20 (14.45)						
			83.53 (5.32)	81.91 (7.23)	79.22 (6.67)	63.40 (15.01)						
IRQ: Maintenance	5-45	1	36.10 (5.43)	36.24 (5.48)	30.78 (8.09)	30.17 (7.03)	0.004	1vs4; 2vs4	0.012	1vs2; 1vs3	0.867	
		2	34.28 (5.76)	34.68 (4.73)	30.89 (8.52)	25.20 (12.62)						
		3	34.21 (6.21)	34.27 (7.06)	31.10 (6.97)	26.00 (9.33)						
IRQ: Ambivalence	5-45	1	6.22 (2.90)	6.62 (2.35)	8.78 (5.02) $\beta_1\gamma$	13.33 (9.58) $\beta_1\gamma$	<0.001	1vs3; 1vs4; 2vs4	<0.001	1vs3; 2vs3	<0.001	T1: 1vs4; 2vs4 T2: 1vs4; 2vs4 T3: 1vs3; 1vs4
		2	6.83 (4.94)	7.38 (3.55)	9.78 (6.70)	12.60 (10.14)						
		3	7.17 (5.21)	7.21 (2.75)	14.50 (8.97)	17.80 (10.18)						
IRQ: Conflict	5-45	1	13.30 (4.49)	15.32 (5.35)	16.11 (7.24) $\alpha\beta$	22.50 (7.58) $\beta_1\gamma$	<0.001	1vs4; 2vs4; 3vs4	<0.001	1vs2; 1vs3	0.016	T1: 1vs4; 2vs4 T2: 1vs3; 1vs4; 2vs4 T3: 1vs3
		2	14.25 (5.14)	16.30 (5.22)	19.89 (9.84)	22.40 (7.30)						
		3	14.56 (5.87)	17.00 (5.60)	19.00 (8.84)	29.00 (4.85)						
Sexual Relationship	1-7	1	5.49 (1.31)	5.03 (1.62)	4.11 (2.09)	5.17 (1.60)	0.016	1vs3	0.018	1vs3	0.633	
		2	5.25 (1.36)	4.82 (1.56)	3.89 (1.96)	4.20 (2.28)						
		3	5.41 (1.25)	4.88 (1.73)	3.90 (1.79)	3.80 (2.05)						
Psychological Symptoms												
IDAS: Ill Temper	5-25	1	6.43 (1.63)	7.18 (2.21)	8.89 (2.52)	9.60 (2.61)	<0.001	1vs2; 1vs3; 1vs4; 2vs4	0.035	1vs2	0.229	
		2	6.52 (1.62)	7.61 (2.60)	9.89 (3.18)	11.00 (4.18)						

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Variable	Possible Range	Time	Trajectory Class, Mean (SD)				Mixed Effects Model, p-value					
			Class 1 (n=70): Stably Low	Class 2 (n=41): Slight Increase- Decrease	Class 3 (n=10): Increase- Maintain	Class 4 (n=6): Increase- Increase	Class	Time	Class*Time			
		3	6.60 (1.89)	7.64 (2.73)	8.20 (1.99)	10.40 (2.41)				Foli et al.		
IDAS: Social Anxiety	5-25	1	6.22 (1.85)	6.29 (1.55)	7.22 (1.20)	9.00 (1.58)	<0.001	1vs3; 1vs4; 2vs3; 2vs4	0.540		0.069	
		2	5.87 (1.17)	6.84 (2.34)	8.22 (2.77)	8.00 (1.41)						
		3	6.04 (1.48)	6.27 (1.77)	8.20 (2.49)	9.60 (2.19)						
IDAS: Panic	8-40	1	8.68 (1.23)	9.18 (1.71)	9.33 (1.41)	10.40 (2.30)	0.002	1vs3	0.008		1vs3	0.311
		2	8.28 (0.72)	8.79 (1.30)	9.56 (1.81)	9.40 (2.61)						
		3	8.25 (0.72)	8.64 (1.27)	9.50 (1.90)	8.60 (0.55)						
IDAS: Traumatic Intrusion	4-16	1	4.43 (0.78)	4.82 (1.70)	5.88 (2.10)	5.80 (2.49)	<0.001	1vs3; 1vs4; 2vs3	0.784			0.071
		2	4.25 (0.86)	4.70 (1.39)	7.33 (3.08)	5.40 (1.67)						
		3	4.29 (0.85)	4.45 (0.90)	6.10 (2.64)	6.40 (2.88)						
Feeling Rested	1-5	1	3.63 (0.89)	3.26 (1.12)	3.00 (1.32)	2.17 (0.98)	<0.001	1vs2; 1vs3; 1vs4; 2vs4	0.012	1vs2	0.919	
		2	3.26 (0.91)	2.76 (1.10)	2.44 (0.73)	1.80 (1.30)						
		3	3.37 (0.81)	2.97 (1.02)	2.40 (1.07)	2.20 (0.84)						
Alcohol Drinking	1-4	1	1.63 (0.93)	1.54 (0.74)	1.63 (0.74)	1.67 (1.21)	0.998		0.299		0.514	
		2	1.58 (0.81)	1.61 (0.86)	1.67 (0.71)	1.60 (0.89)						
		3	1.69 (0.85)	1.63 (0.83)	1.33 (0.50)	1.60 (0.89)						
Life Orientation												
LOT-R	0-24	1	17.08 (3.87)	16.03 (3.04)	16.00 (3.70)	12.20 (4.76)	0.009	1vs4	0.901		0.110	
		2	17.26 (3.11)	16.21 (4.24)	14.25 (4.62)	13.80 (4.02)						
		3	17.19 (3.40)	16.41 (3.43)	14.20 (4.34)	12.80 (3.77)						
Life Satisfaction	0-10	1	8.73 (0.70)	8.29 (1.00)	7.89 (1.17)	6.17 (1.94)	<0.001	1vs2; 1vs3; 1vs4; 2vs4; 3vs4	0.188		0.543	
		2	8.62 (0.82)	8.42 (0.92)	7.78 (1.20)	5.80 (2.59)						
		3	8.62 (0.71)	8.09 (0.89)	7.60 (1.17)	6.20 (2.05)						

Note. LOT-R = Life Orientation Test-Revised. PSS-Fa = Perceived Social Support from Family. PSS-Fr = Perceived Social Support from Friends. IRQ = Intimate Relations Questionnaire. IDAS = Inventory of Depression and Anxiety Symptoms. DAS = Dyadic Adjustment Scale. Alcohol drinking was scored as: 1=no drink, 2=1-2 beverages, 3=3-4 beverages, and 4=more than 4 beverages per week. Higher score indicates a higher score in the direction of the way the variable is described in the table (e.g., higher scores on Life Satisfaction= more satisfaction). Mean and SD are unadjusted mean and SD. P-value was obtained from a mixed effects model. Tukey's post-hoc test was performed to adjust for multiple comparisons. Significant ($P<0.05$) class and time differences are noted below each p-value. Due to space, for significant interaction, the significant difference in time by each latent class is specified on the first cell of each group using this notation:

α = time 1 vs. 2;

β = time 1 vs. 3; and

γ = time 2 vs. 3. NS = no significant differences in any class (at the given time for interaction).

Table 6

Subject Characteristics by Trajectory Class

Variable	Trajectory Class, n (%)				p-value
	Class 1 (n=70): Stably Low	Class 2 (n=41): Slight Increase- Decrease	Class 3 (n=10): Increase-Maintain	Class 4 (n=6): Increase-Increase	
Parent					
Gender					0.007
Male	42 (60%)	12 (29%)	3 (30%)	2 (33%)	
Female	28 (40%)	29 (71%)	7 (70%)	4 (67%)	
Parent Age (yrs.), mean (SD)	37.5 (5.0)	38.0 (5.6)	38.7 (6.7)	40.8 (3.8)	0.498
Race/Ethnicity					0.848
White	65 (93%)	37 (90%)	10 (100%)	6 (100%)	
Other	5 (7%)	4 (10%)	0 (0%)	0 (0%)	
Income					0.505
Under \$75,000	21 (30%)	12 (31%)	5 (56%)	3 (50%)	
\$75,000 to under \$100,000	19 (28%)	14 (36%)	3 (33%)	1 (17%)	
More than \$100,000	29 (42%)	13 (33%)	1 (11%)	2 (33%)	
Education					0.074
Less than four year college graduate	9 (13%)	8 (20%)	4 (40%)	2 (33%)	
Four-year college graduate	34 (49%)	19 (46%)	0 (0%)	3 (50%)	
Post-graduate	27 (38%)	14 (34%)	6 (60%)	1 (17%)	
Job Status					0.076
Full time	52 (74%)	24 (58%)	5 (50%)	2 (33%)	
Part time	7 (10%)	6 (15%)	1 (10%)	0 (0%)	
Other	11 (16%)	11 (27%)	4 (40%)	4 (67%)	
Infertility					0.930
Yes	31 (47%)	18 (45%)	4 (40%)	2 (33%)	
No	35 (53%)	22 (55%)	6 (60%)	4 (67%)	

Variable	Trajectory Class, n (%)				p-value
	Class 1 (n=70): Stably Low	Class 2 (n=41): Slight Increase- Decrease	Class 3 (n=10): Increase-Maintain	Class 4 (n=6): Increase-Increase	
Bothered by infertility ^a , mean (SD)	2.4 (1.2)	2.7 (1.2)	2.8 (1.1)	1.8 (1.0)	0.314
Religion					0.923
Protestant	31 (44%)	17 (41%)	6 (60%)	2 (33%)	
Roman Catholic	9 (13%)	5 (12%)	0 (0%)	0 (0%)	
Non-denominational Christian	22 (31%)	16 (39%)	3 (30%)	3 (50%)	
Other	8 (11%)	3 (7%)	1 (10%)	1 (17%)	
Level of Religiosity ^b , mean (SD)	6.0 (1.2)	6.3 (1.0)	6.4 (0.8)	5.0 (2.8)	0.084
Motivation of Adoption					
Build family through adoption	56 (80%)	30 (73%)	6 (60%)	5 (83%)	0.491
God's calling	47 (67%)	31 (76%)	9 (90%)	3 (50%)	0.271
Want a child of specific gender	3 (4%)	4 (10%)	1 (10%)	1 (17%)	0.271
Other	11 (16%)	4 (10%)	0 (0%)	1 (17%)	0.504
Child					
Gender					0.437
Male	30 (50%)	23 (61%)	3 (33%)	2 (40%)	
Female	30 (50%)	15 (39%)	6 (67%)	3 (60%)	
<i>Father</i>					0.945
Male	19 (53%)	5 (50%)	1 (33%)	1 (50%)	
Female	17 (47%)	5 (50%)	2 (67%)	1 (50%)	
<i>Mother</i>					0.371
Male	11 (46%)	18 (64%)	2 (33%)	1 (33%)	
Female	13 (54%)	15 (36%)	4 (67%)	2 (67%)	
Age (mos.), mean (SD)	30.1 (42.9)	31.2 (37.9)	23.2 (32.2)	36.5 (32.2)	0.405
<i>Father</i>	32.8 (44.8)	19.1 (21.2)	33.5 (56.8)	61.5 (38.9)	0.333
<i>Mother</i>	26.0 (40.5)	35.6 (41.8)	18.0 (16.6)	19.8 (16.7)	0.490

Variable	Trajectory Class, n (%)				p-value
	Class 1 (n=70): Stably Low	Class 2 (n=41): Slight Increase- Decrease	Class 3 (n=10): Increase-Maintain	Class 4 (n=6): Increase-Increase	
Child's Race/Ethnicity					0.509
White	23 (38%)	7 (18%)	1 (11%)	1 (20%)	
Black or African	10 (17%)	9 (24%)	4 (45%)	0 (0%)	
Hispanic	2 (3%)	2 (5%)	0 (0%)	0 (0%)	
Asian or Pacific Islander	20 (33%)	13 (34%)	2 (22%)	3 (60%)	
Multiracial	4 (7%)	6 (16%)	2 (22%)	1 (20%)	
Other	1 (2%)	1 (3%)	0 (0%)	0 (0%)	
<i>Father</i>					0.400
White	13 (36%)	1 (10%)	0 (0%)	0 (0%)	
Black or African	7 (19%)	3 (40%)	2 (67%)	0 (0%)	
Hispanic	1 (3%)	1 (10%)	0 (0%)	0 (0%)	
Asian or Pacific Islander	12 (33%)	3 (30%)	0 (0%)	2 (100%)	
Multiracial	2 (6%)	2 (20%)	1 (33%)	0 (0%)	
Other	1 (3%)	0 (0%)	0 (0%)	0 (0%)	
<i>Mother</i>					0.955
White	10 (42%)	6 (21%)	1 (17%)	1 (33%)	
Black or African	3 (13%)	6 (21%)	2 (33%)	0 (0%)	
Hispanic	1 (4%)	1 (4%)	0 (0%)	0 (0%)	
Asian or Pacific Islander	8 (33%)	10 (36%)	2 (33%)	1 (33%)	
Multiracial	2 (8%)	4 (14%)	1 (17%)	1 (33%)	
Other	0 (0%)	1 (4%)	0 (0%)	0 (0%)	
Transracial Family					0.020
No (Same as at least one parent)	25 (42%)	7 (18%)	1 (11%)	0 (0%)	
Yes (Different from both parents)	35 (58%)	31 (82%)	8 (89%)	5 (100%)	
<i>Father</i>					0.191
No (Same as at least one parent)	14 (39%)	1 (10%)	0 (0%)	0 (0%)	
Yes (Different from both parents)	22 (61%)	9 (90%)	3 (100%)	2 (100%)	
<i>Mother</i>					0.143
No (Same as at least one parent)	11 (46%)	6 (21%)	1 (17%)	0 (0%)	

Variable	Trajectory Class, n (%)				p-value
	Class 1 (n=70): Stably Low	Class 2 (n=41): Slight Increase- Decrease	Class 3 (n=10): Increase-Maintain	Class 4 (n=6): Increase-Increase	
Yes (Different from both parents)	13 (54%)	22 (79%)	5 (83%)	3 (100%)	
# of Adopted children					0.221
1	55 (92%)	35 (92%)	8 (89%)	3 (60%)	
2	4 (7%)	2 (5%)	1 (11%)	2 (40%)	
3	1 (2%)	1 (3%)	0 (0%)	0 (0%)	
<i>Father</i>					0.196
1	32 (89%)	10 (100%)	2 (67%)	1 (50%)	
2	3 (8%)	0 (0%)	1 (33%)	1 (50%)	
3	1 (3%)	0 (0%)	0 (0%)	0 (0%)	
<i>Mother</i>					0.447
1	23 (96%)	25 (89%)	6 (100%)	2 (67%)	
2	1 (4%)	2 (7%)	0 (0%)	1 (33%)	
3	0 (0%)	1 (4%)	0 (0%)	0 (0%)	
Special Need					0.079
Yes	22 (37%)	20 (53%)	2 (22%)	4 (80%)	
No	38 (63%)	18 (47%)	7 (78%)	1 (20%)	
<i>Father</i>					0.158
Yes	13 (36%)	5 (50%)	0 (0%)	2 (100%)	
No	23 (64%)	5 (50%)	3 (100%)	0 (0%)	
<i>Mother</i>					0.565
Yes	9 (38%)	15 (54%)	2 (33%)	2 (67%)	
No	15 (62%)	13 (46%)	4 (67%)	1 (33%)	
Type of Special Need					0.689
Physical	8 (13%)	10 (26%)	2 (50%)	1 (20%)	
Emotional/Psychological	5 (8%)	3 (8%)	1 (11%)	0 (0%)	
Developmental/Cognitive	5 (8%)	4 (11%)	0 (0%)	1 (20%)	
Other	13 (21%)	10 (26%)	1 (11%)	2 (40%)	
Missing	30 (49%)	11 (29%)	5 (56%)	1 (20%)	

Variable	Trajectory Class, n (%)				p-value
	Class 1 (n=70): Stably Low	Class 2 (n=41): Slight Increase- Decrease	Class 3 (n=10): Increase-Maintain	Class 4 (n=6): Increase-Increase	
<i>Father</i>					0.195
Physical	5 (14%)	4 (40%)	0 (0%)	0 (0%)	
Emotional/Psychological	2 (5%)	1 (10%)	1 (33%)	0 (0%)	
Developmental/Cognitive	4 (11%)	0 (0%)	0 (0%)	1 (50%)	
Other	7 (19%)	3 (30%)	1 (33%)	1 (50%)	
Missing	19 (51%)	2 (20%)	1 (33%)	0 (0%)	
<i>Mother</i>					0.735
Physical	3 (13%)	6 (21%)	2 (33%)	1 (33%)	
Emotional/Psychological	3 (13%)	2 (7%)	0 (0%)	0 (0%)	
Developmental/Cognitive	1 (4%)	4 (14%)	0 (0%)	0 (0%)	
Other	6 (25%)	7 (25%)	0 (0%)	1 (33%)	
Missing	11 (46%)	9 (32%)	4 (67%)	1 (33%)	
<i>Type of Adoption</i>					0.955
Public (domestic)	11 (18%)	5 (13%)	1 (11%)	0 (0%)	
Private (domestic)	18 (30%)	12 (32%)	3 (33%)	1 (20%)	
Inter-country	25 (42%)	19 (50%)	5 (56%)	4 (80%)	
Other	6 (10%)	2 (5%)	0 (0%)	0 (0%)	
<i>Father</i>					0.975
Public (domestic)	6 (17%)	2 (20%)	1 (33%)	0 (0%)	
Private (domestic)	11 (31%)	3 (30%)	1 (33%)	0 (0%)	
Inter-country	17 (47%)	5 (50%)	1 (33%)	2 (100%)	
Other	2 (6%)	0 (0%)	0 (0%)	0 (0%)	
<i>Mother</i>					0.827
Public (domestic)	5 (21%)	3 (11%)	0 (0%)	0 (0%)	
Private (domestic)	7 (29%)	9 (32%)	2 (33%)	1 (33%)	
Inter-country	8 (33%)	14 (50%)	4 (67%)	2 (67%)	
Other	4 (17%)	2 (7%)	0 (0%)	0 (0%)	
Length of Waiting Time (mos.), mean (SD)	9.4 (10.4)	11.0 (11.7)	13.3 (18.2)	17.6 (11.8)	0.336

Variable	Trajectory Class, n (%)				p-value
	Class 1 (n=70): Stably Low	Class 2 (n=41): Slight Increase- Decrease	Class 3 (n=10): Increase-Maintain	Class 4 (n=6): Increase-Increase	
<i>Father</i>	9.4 (10.0)	15.1 (17.7)	7.8 (7.3)	8.0 (5.7)	0.854
<i>Mother</i>	9.5 (11.2)	9.5 (8.6)	16.0 (22.0)	24.0 (10.4)	0.174

Note

α_1 =strongly disagree-5=strongly agree.

β_1 =not at all-7=very strongly religious.

For continuous variables, one way analyses of variance were used except child's age for which Kruskal-Wallis nonparametric test was used. For categorical variables, Fisher's exact tests were used except parents' education, child's race, and type of special need for which chi-square tests were implemented.