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Predictors of attrition and attendance in a fatherhood education program

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ABSTRACT

This study examined risk-factors for attrition (drop out) and poor attendance of 1040 fathers enrolled in a five-session fatherhood education program with an emphasis on parenting. Demographic factors (including socio-economic status), fathers' relationship status, level of relationship conflict, social support, psychological distress, and parenting stress were evaluated for their impact on attrition and attendance. Furthermore, the impact of financial incentives was considered. Results indicated that education, income, age, and relationship conflict were associated with attrition and/or missed sessions. Attrition and attendance did not vary by incentive amount. Implications of these findings for policy and practice are discussed.

1. Introduction

The contributions of fathers' positive involvement to children's well-being has been well-documented (Lamb, 2010; Pleck, 2010). Furthermore, interventions targeting fathers individually or jointly with mothers have been found to be successful in improving parenting and child outcomes (Cowan, Cowan, & Barry, 2011; Fabiano et al., 2012; Fletcher, Freeman, & Matthey, 2011). Yet the benefits of these programs may be reduced or lost if parents fail to attend program sessions or drop out altogether.

Fatherhood education, parenting education, parenting training, and other prevention programs often suffer from attrition; although, estimates vary greatly. Some estimates from parenting education and parenting training programs place the attrition rate at one-third to one-half of participants, but other estimates specific to fathers are higher (Fletcher et al., 2011; Frey & Snow, 2005). High rates are reported even when parents are offered transportation, childcare, and financial incentives (Duppong-Hurley, Hoffman, Barnes, & Oats, 2016). Attendance issues are a concern for fatherhood education programs and similar attrition rates have been reported (e.g., Dion et al., 2015). The current study examined factors related to attendance and attrition in a fatherhood education program.

We note that fatherhood education programs (also called "responsible fatherhood programs") overlap with parenting education and parenting training programs. However, fatherhood education programs typically support fathers in additional areas beyond parenting and co-parenting. For programs funded by the Federal Responsible Fatherhood Initiative, programs must address parenting, economic stability, and relationship education. The fatherhood education program considered in the present study included all three areas with an emphasis on parenting. Consequently, our review of the literature on program participation draws heavily from studies of parenting education and parenting training programs (collectively referred to as "parenting programs").

Attrition and poor attendance are problematic for several reasons. Many programs use group formats. Small groups are less cost-effective than larger groups and an insufficient number of participants may render discussions and activities difficult or even impossible. Furthermore, high rates of attrition and absences compromise the effectiveness of program evaluations, threaten the external and internal validity of evaluation studies (e.g., Spoth & Molgaard, 1993) and reduce statistical power to detect significant program effects (Guyll, Spoth, & Redmond, 2003).

1.1. Defining participation and attrition

Studies investigating participation in parenting programs have examined barriers to *enrollment* and/or *attendance*, but do not always distinguish between the two. Furthermore, the terms *enrollment*, *engagement*, and *retention* are inconsistently used to refer to constructs related to participation in parenting programs (Axford, Lehtonen, Kaoukji, Tobin, & Berry, 2012; Baker et al., 2011; Ponzetti, 2016). For this study, we followed the practice of Baker and colleagues who defined *enrollment* as "attending at least one program session" and *attendance* as the "percentage [or count] of sessions attended for the subset of [participants] that enroll in a program" (Baker et al., 2011, p. 127).

A concept related to participation is that of *attrition*, or whether or

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not participants drop out of the program before the final session. Although *attendance* and *attrition* are related concepts and likely correlated, the two reflect different experiences and may be due to distinct mechanisms. For example, a participant who attended the first, sixth, and seventh sessions of a seven-session program did not drop out of the program. However, they received less program content than a participant who attended the first four sessions before dropping out. Consequently, a measure of attendance provides more information about the amount of content received whereas a measure of attrition provides more information regarding the inability or loss of interest in continuing in the program. Thus, measures of attendance and attrition provide distinct yet related information about participants' participation in a program. The present study examined factors related to both attendance and attrition.

1.2. A focus on fathers

Despite a growing body of research demonstrating the benefits of positive father involvement and parenting education/training (Lamb, 2010; Ponzetti, 2016; Pleck, 2010), few studies have specifically examined factors related to fathers' participation in parenting education or fatherhood education programs. Other studies including both fathers and mothers have been limited in that data have typically not been analyzed and reported separately by gender, resulting in unanswered questions regarding the experiences of fathers in these programs (Burgess, 2009). Studies specifically examining fathers address this limitation. The current study builds on previous research by identifying predictors of attendance and attrition in a sample of fathers enrolled in a fatherhood education program.

1.3. Theoretical framework

Theoretical guidance for this project was derived from the *risk-factor model* as outlined by Kazdin (1996). The risk-factor model is a general approach commonly used in public health and epidemiology for identifying antecedents, or risk-factors, that increase the likelihood of an event, such as missing a session or dropping out of the program. Key components of this approach include a recognition that risk is multiply determined and no single factor or group of factors is necessary or sufficient to affect the target event. Rather, risk factors are probabilistically related to the event. A benefit of this approach is that individuals at high-risk of attrition or attendance problems can be identified and supported.

1.4. Review of predictors of participation in parenting and fatherhood education programs

We reviewed the research literature to identify predictors of participation in fatherhood education programs and parenting programs. Consistent with the scope of this study, our review was restricted to those factors linked to attendance and attrition. Because studies do not always differentiate between enrollment and attendance, we also considered studies that examined factors associated with enrollment. We considered programs directed at both fathers and mothers or only fathers, including fatherhood education programs, parent training programs, parenting education programs, and programs for clinically-referred children and their parents. Only a few studies specifically examined factors related to fathers' participation. Consequently, factors linked to participation in parenting programs in general (i.e., not specific to fathers) were identified as possible predictors. We also reviewed large-scale evaluation reports and best-practice recommendations that documented the insights of project staff who directly recruited, taught, or otherwise interacted with fathers.

1.4.1. Demographic characteristics

Lower socioeconomic status (SES) has been linked to decreased enrollment and attendance in parent training and parenting education programs; conversely, several studies have failed to detect this association (Axford et al., 2012; Baker et al., 2011; Reyno & McGrath, 2006; Spoth & Redmond, 1995).

A meta-analysis of parent training programs indicated that maternal age was associated with attrition, with younger mothers at greater risk (Reyno & McGrath, 2006). Father's age may also be associated. The reason younger parents are more likely to drop out is not clear. Younger parents may be more likely to have younger children, be balancing school and work, and/or be early in their careers resulting in potentially more scheduling conflicts.

Individuals who are racial/ethnic minorities may be less likely to enroll and attend, and more likely to drop out of parenting programs (Baker et al., 2011; Hofferth, 2003; Reyno & McGrath, 2006). However, there is some evidence that some minority groups are relatively more interested on average in participating (Axford et al., 2012). Some researchers have suggested that racial/ethnic minorities may be less likely to enroll or attend because of language and/or cultural barriers, unfamiliarity or mistrust of services, and educators/practitioners who do not share their cultural backgrounds (e.g., Axford et al., 2012).

1.4.2. Financial incentives

The impact of financial incentives (e.g., cash or gift cards) on attendance is unclear and somewhat controversial for several reasons. First, although financial incentives are frequently cited as being important recruitment tools (e.g., Stahlschmidt, Threlfall, Seay, Lewis, & Kohl, 2013), some studies have failed to find an association (e.g., Dion et al., 2008). Yet a lack of association for some studies may be due to incentives that are too small (Snow, Frey, & Kern, 2002). Second, incentives increase costs, thereby reducing the cost effectiveness of the program. Third, agencies may prefer to target services to parents who are motivated primarily to obtain knowledge and training rather than incentives (Skogrand, Reck, Higginbotham, Adler-Baeder, & Dansie, 2010; Stahlschmidt et al., 2013). Yet there is some evidence that incentives may help parents initially enroll and attend who will then continue to attend because they find the program content beneficial (Skogrand et al., 2010; Stahlschmidt et al., 2013). Finally, financial incentives may act less as an incentive per se, but more as a support that helps remove barriers to attendance, such as the cost of traveling to the course (Skogrand et al., 2010). Related to this point, there is some evidence that incentives may have a greater impact on the participation of parents for whom the incentive is needed (i.e., lower SES) to support or enable participation (Guyll et al., 2003).

1.4.3. Parent's relationship status and conflict

The relationship status of parents may be related to enrollment and attendance, with single parents being at greatest risk of non-participation (Baker et al., 2011; Reyno & McGrath, 2006). The mechanism(s) linking relationship status to enrollment and attendance are unknown, but researchers have speculated that single parents may have more scheduling conflicts, less time, and more difficulty with childcare (e.g., Baker et al., 2011). The quality of the family environment, including the amount of conflict between parents, may also affect participation (Kazdin & Wassell, 2000). Parents with higher levels of relationship conflict may be at greater risk of missing sessions or dropping out.

1.4.4. Sources of stress and support

Parent personality and psychological adjustment have been linked to parents' participation (e.g., Reyno & McGrath, 2006; Snow, Kern, & Curlette, 2001). For example, Kazdin and Wassell (2000) found that parents with greater symptoms of psychopathology and stress perceived greater barriers to program participation. In contrast, support may promote participation. Parents who reported better social support and/or greater social engagement were more likely to enroll and attend and less likely to drop out; however, several studies have failed to detect this association (Baker et al., 2011; Eisner & Meidert, 2011; Kazdin &

Wassell, 2000).

Child behavior problems may be associated with parents' participation in parenting programs. Parents raising a child with severe behavior problems may be more motivated to seek out support and guidance to address the behavior (Heinrichs, Bertram, Kuschel, & Hahlweg, 2005; Salari & Filus, 2017; Spoth & Redmond, 1995). Baker and colleagues (Baker et al., 2011) suggest that the presence of behavior problems may lead parents to perceive a greater need for parenting education or training and motivate them to attend more sessions.

1.4.5. Additional predictors

There are also potential factors beyond the scope of this study that may uniquely affect fathers' experiences in parenting education/fatherhood programs. These factors include programs or curricula that are "mother-focused" (i.e., emphasize issues unique to mothers, use mothers primarily as examples, or portray mothers as exemplars for fathers to follow), practitioners/educators who do not recognize the contributions of fathers to their children's development, and the preference of some fathers for male practitioners/educators (Bayley, Wallace, & Choudry, 2009; Fabiano, 2007; McBride et al., 2017; National Fatherhood Initiative, 2006).

1.5. The current study

Given the importance of father involvement to child outcomes and the relative lack of studies examining predictors of fathers' attendance and attrition in fatherhood education and parenting programs, the aim of this study is to use the risk-factor model (Kazdin, 1996) to identify predictors of fathers' participation (attrition and attendance) in a fatherhood education program. Based on our review of the literature, the following hypotheses were formulated.

1.5.1. Hypothesis 1: effect of demographic variables

We hypothesized that demographic characteristics would be associated with attrition and attendance. Due to the mixed nature of past research, analyses related to indicators of socioeconomic status and race/ethnicity were largely exploratory. One exception was that we hypothesized that fathers aged 18–24 would experience elevated risk of attrition and poorer attendance. For the purposes of this study, we used the cut-off of age 25 because the average father's age at first birth in the United States in 2010 was 25.1 (Martinez et al., 2012). Thus fathers under the age of 25 were more likely to be new or relatively new fathers. Fathers in this age range would also be more likely to be attending school or be early in their careers. These characteristics may make this group more vulnerable to attrition or poor attendance.

1.5.2. Hypothesis 2: effect of financial incentives

Our investigation of the role of financial incentives is limited to their impact on attrition and attendance, not enrollment. We hypothesized that the use of financial incentives would be associated with decreased risk of attrition and increased number of sessions attended. However, we hypothesized that the impact of incentives would be greater for lower-SES individuals.

1.5.3. Hypothesis 3: effect of fathers' relationship status and conflict

We hypothesized that fathers who were married would experience lower risk of attrition and better attendance than fathers who were dating or single. Of those fathers in a relationship, we hypothesized that those who experienced greater relationship conflict with their spouse/partner would experience higher risk of attrition and poorer attendance.

1.5.4. Hypothesis 4: effect of sources of stress and support

We hypothesized that fathers with risk of serious mental illness and less social support would be at greater risk of attrition and attend fewer sessions. We also hypothesized that fathers who felt overwhelmed by parenting responsibilities would exhibit the same pattern.

2. Method

2.1. Participants and procedures

Data for this study were drawn from a federally funded Fatherhood Education project, which was administered by a land-grant university. Fathers were recruited to participate in the courses through mailings, billboards, radio ads, partnerships with community organizations, the extension system, etc. Courses were marketed specifically to men; however, consistent with federal guidelines, courses were open to parents of any sex/gender.

Fatherhood education courses were held weekly for two hours for a total of five weeks. Each course was led by one of 13 trained facilitators hired by the University to teach grant-funded courses throughout the state. Eleven of the facilitators were male. All courses were free. Meals were provided at each session. During the first and final sessions, participants completed surveys (available in English and Spanish) regarding their demographic characteristics, economic circumstances, relationships with children and spouse/partner, etc. Informed consent was obtained from all participants.

One of three grant-approved curricula was used for each course: Fathering with Love and Logic®, Home Run Dads®, and 24/7 Dads®. Sessions consisted of short lectures, videos, group discussions, and activities. All three curricula cover parenting skills and knowledge, discipline, relationship quality, and coparenting. The number of participants in a course varied from one to 26, with a median size of seven.

Over time, the financial incentive mechanism changed as enrollment goals were met. Initially, participants were offered one $25 gift card for completing the surveys at the first session and one $25 gift card for each session they attended thereafter. An additional gift card was offered at the final session for completing the post-program surveys. A total of six gift cards were offered. Later, participants were offered one gift card at the end of the first session and at the end of the last session for completing surveys. Eventually, gift cards were discontinued. Program advertisements included notice regarding the availability of incentives and participants were informed of how many gift cards they would receive by the time they enrolled (i.e., attended the first session).

There were 2,279 parents who participated in a community course offered in 10 counties in the state between July of 2016 and September of 2018. For the purposes of the current study, the sample was restricted to courses that were held for 5 sessions and participants who were male, over 18, had children under 21, and indicated their relationship status (to enable exploration of potential relational predictors). Some items were only collected if the participant lived with the youngest biological or adopted child. Consequently, the sample was further restricted to fathers living with their youngest child, which yielded a sample of 1092. The analytic sample was created by restricting the sample to participants with complete data on study measures. A flow chart illustrating the process of sample selection is available in the supplemental material. The number of participants in the analytic sample was 1040. There were no significant differences on study variables between the analytic sample and the 52 cases with missing data (see Table 1). Cross-tabulation tables of the analytic sample demographic characteristics are available in the supplemental material.

Most (84.5%) participants were white, non-Hispanic/Latino/a/x. Of the remaining participants, 8.9% identified as Hispanic/Latino/a/x, 1.9% identified as multiracial and/or reported two or more races, and 4.6% identified as American Indian/Alaskan Native, Black or African-American, Native Hawaiian/Pacific Islander, or Asian. Most of the sample was 25 or older (97.3%). Median personal income was between two and three thousand dollars per month, but a variety of incomes were represented in the sample: 11.7% earned less than $12, 000 per year, 23.3% earned less than $24, 000 per year, and 25.8% earned more than $60, 000 per year.

Table 1
Descriptive statistics: Analytic Sample vs. Participants excluded due to missing data.

	Excluded participants (n = 52)	Analytic sample (n = 1040)	p
Curriculum			0.194
24/7 Dads	1 (1.9%)	90 (8.7%)	
Home run dads	9 (17.3%)	206 (19.8%)	
Love and logic	42 (80.8%)	744 (71.5%)	
Financial incentive offered			0.393
No gift cards	5 (9.6%)	104 (10%)	
Two gift cards	24 (46.2%)	571 (54.9%)	
Six gift cards	23 (44.2%)	365 (35.1%)	
Race/Ethnicity			0.800
White	35 (85.4%)	879 (84.5%)	
Hispanic/Latino/a/x	5 (12.2%)	93 (8.9%)	
Another Race/Ethnicity	1 (2.4%)	48 (4.6%)	
Multiple races	0 (0.0%)	20 (1.9%)	
Age			0.651
18–24	1 (1.9%)	28 (2.7%)	
25–34	24 (46.2%)	400 (38.5%)	
35–44	17 (32.7%)	435 (41.8%)	
45–54	9 (17.3%)	143 (13.8%)	
55 or older	1 (1.9%)	34 (3.3%)	
Personal monthly income (Thousands)	2.7 (1.8)	2.9 (1.6)	0.400
Difficulty paying bills			0.723
Never	13 (28.3%)	328 (31.5%)	
Once in a while	24 (52.2%)	491 (47.2%)	
Somewhat often	7 (15.2%)	133 (12.8%)	
Very often	2 (4.3%)	88 (8.5%)	
Education			0.724
High school diploma/GED or less	7 (14.6%)	182 (17.5%)	
Voc. or Tech. Cert./Some college/Associates degree	16 (33.3%)	297 (28.6%)	
Bachelor's degree	14 (29.2%)	254 (24.4%)	
Advanced degree	8 (16.7%)	192 (18.5%)	
In school	3 (6.2%)	115 (11.1%)	
Relationship Status			0.394
Married to Current Partner	44 (84.6%)	882 (84.8%)	
Dating Current Partner	2 (3.8%)	78 (7.5%)	
No Current Partner	6 (11.5%)	80 (7.7%)	
Relationship Conflict	2.1 (0.7)	2.1 (0.7)	0.650
Emotional Social Support	3.2 (0.8)	3.2 (0.7)	0.899
Serious Mental Illness			0.999
No	44 (93.6%)	955 (91.8%)	
Yes	3 (6.4%)	85 (8.2%)	
Overwhelmed by Parenting (Parenting Stress)			0.145
Never	8 (16%)	82 (7.9%)	
Hardly ever	7 (14%)	240 (23.1%)	
Sometimes	26 (52%)	524 (50.4%)	
Often	9 (18%)	194 (18.7%)	

Note. Voc. or Tech. Cert. = Vocational or Technical Certification.

2.2. Measures

2.2.1. Attendance and attrition

Attendance and attrition from the program were calculated using attendance records maintained by facilitators. A participant was considered to have dropped out of the course if they stopped attending and did not return. Attendance was calculated by summing the number of sessions missed by a participant.

2.2.2. Course characteristics

Courses were taught by one of 13 trained facilitators. Twelve dummy variables were created with one facilitator serving as the reference. One of three grant-approved curricula was used for each course: Fathering with Love and Logic®, Home Run Dads®, and 24/7 Dads®. Two dummy-code indicators were created with 24/7 Dads® serving as the reference group.

2.2.3. Financial incentives

Dummy indicators were created to indicate whether participants were offered two or six gifts cards. The reference category was no gift cards.

2.2.4. Participant demographics

A dummy variable was created for age indicating whether (1) or not (0) the father was under 25 years of age. Dummy variables were also created to indicate race/ethnicity for the following groups: “Hispanic/Latino/a/x” and “Another Race or Multiple Races.” The reference group was “White, non-Hispanic/Latino/a/x.”

Measures of socioeconomic status included education, income, and difficulty paying bills. Dummy variables for education were created as follows: “High school diploma, GED or less,” “Vocational/technical certification, some college, or an associate's degree,” “Bachelor's degree,” and “Attending school.” The reference category was “Advanced degree.”

Participants reported their personal monthly income using the following scale: 0 = “Less than $500,” 0.5 = “$500 - $1000,” 1 = “$1001 - $2000,” 2 = “$2001 - $3000,” 3 = “$3001 - $4000,” 4 = “$4001 - $5000,” and 5 = “More than $5000.” Participants were instructed not to include earnings of others who lived with them. Participants also indicated how often they experienced difficulty paying their bills using the following response options: 1 = “Never,” 2 = “Once in a while,” 3 = “Somewhat often,” and 4 = “Very often.” Dummy variables were created to indicate level of difficulty with “Never” serving as the reference category.

2.2.5. Relationship status and conflict

Two dummy variables were created for relationship status indicating whether the father was single or dating. Married fathers served as the reference group. Marital/relationship conflict (hereafter “relationship conflict”) was assessed using seven items regarding conflict with a current spouse/partner. These items were previously used in the Supporting Healthy Marriage Evaluation (Hsueh & Knox, 2013). Participants were asked to indicate the frequency of conflictual interactions in the past month, such as “My partner/spouse was rude or mean to me when we disagreed” and “Our arguments became very heated.” Two items were adapted from the Psychological Maltreatment of Women Inventory (Tolman, 1999): “My partner/spouse blamed me for his/her problems” and “My partner/spouse yelled or screamed at me.” Response options ranged from 1 = “Never” to 4 = “Often.” Exploratory factor analyses, including parallel analysis, indicated the presence of a single factor. All items loaded highly (> 0.70) on the factor which had good reliability ($\alpha = 0.92$, $\omega = 0.86$).

2.2.6. Sources of stress and support

Risk of serious mental illness was assessed using Kessler's six-item Psychological Distress Scale (Kessler et al., 2002). This measure is a screening instrument for serious mental illness used in the U.S. National Health Interview Survey. Scores of 13 or higher indicate the presence of a serious mental health illness (see Kessler et al., 2003). The measure had good reliability in the present sample ($\alpha = 0.86$, $\omega = 0.77$). A dummy variable was created indicating whether (1) or not (0) a serious mental illness may be present.

The availability of emotional support was assessed using a subset of item from the Emotional Support subscale of the Protective Factors Survey (Counts et al., 2010). Participants were asked to indicate how strongly they agreed with statements such as: “When I am lonely, there are several people I can talk to” and “If there is a crisis, I have others I can talk to.” Response options differed from the original scale and ranged from 1 = “Strongly Agree” to 4 = “Strongly Disagree.” Exploratory factor analyses, including parallel analysis, indicated the presence of a single factor. All items loaded highly (> 0.80) on the factor which had good reliability ($\alpha = 0.92$, $\omega = 0.91$).

Parenting stress was assessed using a single item developed for the

larger federal evaluation of Fatherhood Education programs (Administration for Children and Families, 2015). Participants were asked: "In the past month, how often have you felt overwhelmed by your parenting responsibilities?" Response options included: "Never," "Hardly ever," "Sometimes," or "Often." Dummy variables were created with "Never" as the reference category.

2.3. Analytic plans

2.3.1. Predicting attrition

Discrete-time survival analysis (e.g. Singer & Willett, 2003) was used to predict attrition. The method provides several advantages over other types of analyses examining attrition, including the ability to examine how risk of attrition unfolds and changes over time.

Because participants were nested within facilitators, facilitator indicators were included as fixed effects. With only 13 facilitators, there was not a sufficient number to accurately test whether participants attending with one facilitator differed significantly from those attending with another in terms of risk of attrition. Consequently, the facilitator variable is included only to account for dependence in the data and not to estimate effects of different characteristics of facilitators on participant attrition (e.g., sex of the facilitator).

Several predictors were identified in the literature review. Testing multiple predictors increases the risk of type I error, or falsely concluding a predictor had an effect. However, the inclusion of multiple predictors and the multiple model parameters needed to parameterize time and account for nesting within facilitators (see next paragraph for details) reduces the power to detect significant effects. This increases the risk of type II error, or falsely concluding a predictor did not have an effect. Consequently, we devised a model-building strategy that would balance the risk of Type I and II errors.

Predictors were grouped conceptually into five sets (curricula, demographic indicators, financial incentive type and interaction(s) with incentives, relationship status and conflict, and sources of stress and support). Each set was added sequentially and change in model fit was tested. If model fit significantly improved, the set of predictors was retained. The significance of individual predictors in the model was not evaluated until the final model was identified. Testing predictors as sets, retaining only significant sets, and evaluating the significance of individual predictors only in the final model reduced the number of significance tests performed and, if not all predictor sets were retained, the number of predictors in the final model. This approach reduced Type I error. The potential reduction of the number of non-significant predictors in the final model reduced Type II error. In addition, we followed recommended practices (e.g., Wasserstein & Lazar, 2016) by including confidence intervals in addition to *p*-values when evaluating individual predictors.

The details of our model-building approach are as follows: first, a model was fit with no predictors other than the time indicators and facilitator dummy variables (i.e., parameterization of time and nesting). Four time indicators were included (without an intercept) representing sessions 2–5 to estimate the risk of attrition in each session. An indicator for session 1 was not included because no attrition occurred during the first session; that is, enrollment in the course occurred during the first session. Thus participants became at risk of attrition starting in session 2. Second, dummy indicators of curriculum were added. For this and the remaining steps, sets of predictors were retained if they significantly improved model fit. Third, demographic indicators (age, race/ethnicity, education, income, and difficulty paying bills) were added. Fourth, measures indicating type of financial incentive offered were added. As previously noted, we hypothesized that financial incentives may be more strongly associated with participation when there is greater need (i.e., financial difficulty). Furthermore, the effect of incentives may vary by time (e.g., potentially receiving two $25 gift cards at the fifth session may reduce risk of attrition for that session). Consequently, we tested separately for interactions between incentive type and difficulty paying bills and between incentive type and time (i.e., session number) as part of the fourth step. Fifth, relationship status was added. Finally, measures of sources of stress and support (presence of a serious mental illness, emotional support, and parenting stress) were added to the model.

Relationship conflict was also identified as a potential predictor of attrition but was only collected for fathers in a relationship. To examine the impact of this predictor on attrition, the previous steps were repeated for fathers in the analytic sample who were in a relationship ($n = 959$; relationship conflict was missing for one participant). Relationship conflict was added as a predictor in the fifth step and the indicator for single fathers was removed.

Discrete-time survival analysis is generally parameterized as a logistic regression model. An assumption of logistic regression is that continuous predictors are linearly related to the logit of the outcome (attrition vs. no attrition). This assumption was evaluated for each continuous predictor (income, relationship conflict, and emotional support) by testing the significance of an additional parameter: the interaction between the predictor and the log of the predictor (Field, Miles, & Field, 2012).

2.3.2. Predicting attendance (number of missed sessions)

Negative binomial regression was used to predict the number of missed sessions. Negative binomial regression was used instead of Poisson regression because the standard deviation of the number of sessions ("count") was greater than the mean. The same model-building strategy used for predicting attrition was used for predicting attendance with the exception that no indicators of time were added to the model. Analyses for this study were conducted in R version 3.5.1 (R Core Team, 2018) and RStudio version 1.1.456 (RStudio Team, 2018) using the *MASS* package version 7.3–50 (Venables & Ripley, 2002) and the *logistf* package version 1.23 (Heinze & Ploner, 2018).

3. Results

3.1. Predicting attrition

The initial discrete-time survival model was fit with only the time indicators and the facilitator indicators. One facilitator had perfect retention of participants in the sample (i.e., no attrition). He taught 42 participants across nine courses using the Love and Logic® curriculum. The indicator for this facilitator perfectly predicted the outcome, a situation known as complete separation. The recommended approach for analyzing data in this scenario is Firth's logistic regression (Heinze & Schemper, 2002). Given that discrete-time survival analysis can be estimated as a logistic regression, Firth's method was used.

As previously noted, analyses were conducted separately for the full analytic sample ($n = 1040$) and for the subsample of fathers who were dating or married ($n = 959$). This approach was used so that relationship status (married, dating, single) and relationship conflict could both be examined as predictors. Relationship status did not predict attrition (e.g., single vs. married fathers: $b = -0.152$, $p = .593$). Consequently, only results from analyses of the subsample of dating or married fathers are reported and interpreted here. Results for the full sample are available in the supplemental material.

Results indicated that the risk of attrition was significantly greater than zero for sessions 2–5. Again, no participant was at risk of attrition at session 1. The risk of attrition at each session (without controlling for covariates) was 4.63%, 4.62%, 3.48%, and 7.54% for sessions 2–5, respectively. The total attrition rate by the end of the program (session 5) was relatively low: 17.73%.

Attrition was not affected by curricula ($\chi^2 = 1.134$, $df = 2$, $p = .567$) and, consequently, indicators of curricula were not retained in the model. The addition of demographic predictors significantly improved model fit ($\chi^2 = 29.986$, $df = 11$, $p = .001$). Evaluation of the linearity assumption for personal income indicated that this assumption

was violated ($b = 0.425$, $p = .049$). However, the addition of a quadratic term to allow for a curvilinear relationship between income and attrition was not significant ($b = 0.026$, $p = .458$) and did not improve model fit ($\chi^2 = 0.550$, $df = 1$, $p = .458$). Consequently, the quadratic effect was not retained.

The addition of financial incentive type did not improve model fit ($\chi^2 = 2.621$, $df = 2$, $p = .270$). Furthermore, incentive type did not interact with difficulty paying bills ($\chi^2 = 4.597$, $df = 6$, $p = .596$). Although receiving six gifts cards versus none was associated with a decreased likelihood of attrition at the final session ($b = -1.024$, $p = .026$), the addition of the interaction between incentive type and time to the model did not significantly improve model fit ($\chi^2 = 6.877$, $df = 8$, $p = .550$). Consequently, incentive type was not retained in the model.

The addition of relationship status and relationship conflict did not improve model fit ($\chi^2 = 1.413$, $df = 2$, $p = .493$). However, evaluation of the linearity assumption for relationship conflict indicated that this assumption was violated ($b = 1.238$, $p = .025$). The addition of a quadratic term to allow for a curvilinear relationship between relationship conflict and attrition was significant ($b = 0.265$, $p = .029$) and improved model fit ($\chi^2 = 4.742$, $df = 1$, $p = .029$). Consequently, the quadratic effect was retained.

Attrition was not affected by sources of stress and support ($\chi^2 = 4.118$, $df = 5$, $p = .533$) and these predictors (presence of a serious mental illness, emotional support, and parenting stress) were not retained. The linearity assumption for emotional support was not violated.

The final model is reported in Table 2. Education was a significant predictor of attrition. Fathers with a high school education or less were 2.413 times (95% OR CI = 1.366–4.314) more likely to drop out than fathers with an advanced degree. Relationship conflict was also a significant predictor and had a curvilinear effect ($b = 0.265$, $p = .029$). Fig. 1 depicts the estimated hazards (probabilities) of attrition for participants with different levels of significant predictors. The curvilinear effect of relationship conflict can be seen in Fig. 1 by noting that participants with average levels of conflict had lower risk than participants with low levels. In contrast, participants with higher levels of conflict had higher risk. Thus, as the amount of conflict increases from low to high, the risk of attrition first decreases and then increases. Also depicted in Fig. 1 is the gradual decline in risk of attrition during sessions 2–4 and the increase in risk at session 5.

3.2. Predicting attendance (number of sessions missed)

Analyses predicting attrition were conducted separately for the full analytic sample ($n = 1040$) and for subsample of fathers who were dating or married ($n = 959$). Relationship status did not predict attendance (e.g., single vs. married fathers: $b = 0.028$, $p = .876$). Consequently, only results from analyses of the subsample of dating or married fathers are reported and interpreted here. Results for the full sample are available in the supplemental material.

In the initial negative binomial regression model, the number of sessions missed was predicted by the facilitator indicators. Adding curriculum as a predictor did not improve model fit ($\chi^2 = 0.742$, $df = 2$, $p = .690$) and, consequently, curriculum was not retained as a predictor. The addition of demographic predictors significantly improved model fit ($\chi^2 = 36.200$, $df = 11$, $p < .001$). The addition of financial incentive type did not improve model fit ($\chi^2 = 3.123$, $df = 2$, $p = .210$). Furthermore, incentive type did not interact with difficulty paying bills ($\chi^2 = 5.714$, $df = 6$, $p = .456$). Attendance was not affected by relationship status ($\chi^2 = 1.842$, $df = 2$, $p = .398$) or sources of stress and support ($\chi^2 = 7.963$, $df = 5$, $p = .158$) and these predictors were not retained. Tests of the linearity assumption for continuous predictors did not indicate any violations.

The final model is reported in Table 3. Education was a significant predictor of the number of missed sessions. Fathers with a high school education or less were estimated to miss 1.853 (95% IRR CI = 1.269–2.714) times as many sessions as fathers with an advanced degree. Fathers with an associate's degree, some college, or vocational/technical certification were estimated to miss 1.427 (95% IRR CI = 1.042–1.959) times as many sessions as fathers with an advanced degree. As hypothesized, fathers under the age of 25 missed more sessions on average. Fathers who were under the age of 25 were estimated to miss 1.969 (95% IRR CI = 1.160–3.369) times as many classes as fathers who were 25 or older. Finally, income was also associated with the number of session missed. For every $1000 increase in monthly income, fathers were estimated to miss 1.083 (95% IRR CI = 1.005–1.167) times as many classes. Fig. 2 depicts the estimated number of sessions missed for participants with different levels of significant predictors.

3.3. Distribution of financial incentive

The type of financial incentive (six, two, or no gift cards) was not randomly assigned. Although financial incentives were only one of

Table 2
Results of discrete-time survival analysis predicting attrition in a fatherhood education program.

Predictor	Estimate	S.E.	*p*	OR	OR 95 CI
Session 2	−3.838	0.445	< 0.001	0.022	[0.009, 0.051]
Session 3	−3.820	0.446	0.001	0.022	[0.009, 0.052]
Session 4	−4.073	0.454	0.001	0.017	[0.007, 0.041]
Session 5	−3.279	0.434	0.001	0.038	[0.015, 0.088]
Education: H.S. or Less	0.881	0.286	0.002	2.413	[1.366, 4.314]
Education: Associates/Some	0.465	0.255	0.070	1.593	[0.963, 2.688]
Education: Bachelor's	−0.003	0.261	0.990	0.997	[0.593, 1.695]
Education: In school	−0.158	0.361	0.667	0.854	[0.401, 1.733]
Personal income per month	0.084	0.060	0.168	1.088	[0.965, 1.228]
Diff. bills: Once in a while	0.050	0.194	0.801	1.052	[0.714, 1.562]
Diff. bills: Somewhat often	0.384	0.263	0.158	1.468	[0.858, 2.469]
Diff. bills: Very often	0.162	0.325	0.630	1.175	[0.597, 2.214]
Age: Under 25	0.796	0.398	0.065	2.217	[0.947, 4.662]
Latino/a/x or Hispanic	0.214	0.264	0.435	1.239	[0.712, 2.057]
Another/Multiple races	−0.405	0.384	0.280	0.667	[0.283, 1.354]
Relationship. Status: Dating	0.166	0.269	0.550	1.181	[0.672, 1.983]
Relationship conflict: Centered	−0.007	0.115	0.952	0.993	[0.790, 1.257]
Relationship conflict^2	0.265	0.116	0.029	1.303	[1.028, 1.637]

Note. Estimates for facilitators (i.e., dummy code indicators) are not shown but were included in analyses to account for dependence in the data. H.S. or Less = High school diploma/GED; Associates/Some = Associates degree, vocational certification or training, or some schooling; In school = Currently attending school; Diff. Bills = Difficulty paying bills; OR = Odds Ratio; 95 CI = 95% confidence interval.

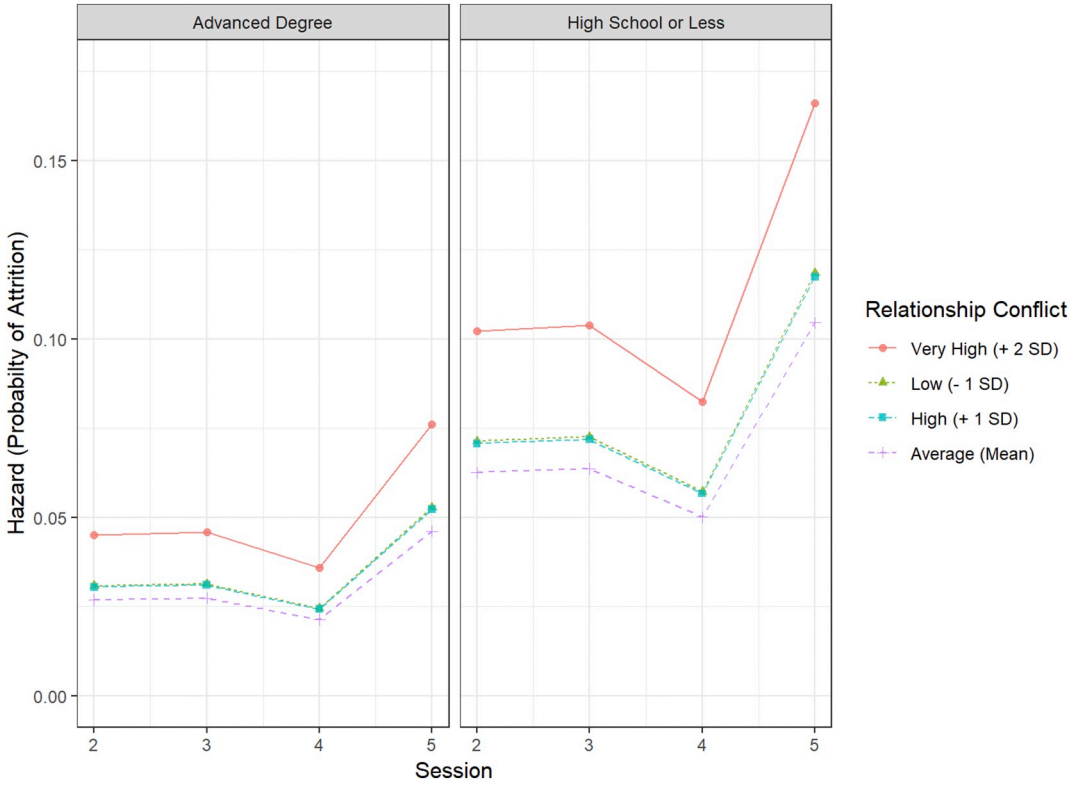

Fig. 1. Estimated risk of attrition (Dropout) in a fatherhood education course.
Note. Estimates of risk were calculated with non-significant continuous predictors held at their means and using the reference groups for non-significant categorical predictors.

Table 3
Results of negative binomial regression predicting attendance (Number of Missed Sessions) in a fatherhood education program.

Predictor	Estimate	S.E.	*p*	IRR	IRR 95 CI
(Intercept)	−0.908	0.266	0.001	0.403	[0.239, 0.677]
Education: H.S. or Less	0.617	0.187	0.001	1.853	[1.269, 2.714]
Education: Associates/Some	0.355	0.160	0.026	1.427	[1.042, 1.959]
Education: Bachelor's	−0.026	0.162	0.873	0.974	[0.708, 1.342]
Education: In school	−0.141	0.219	0.520	0.868	[0.562, 1.333]
Personal income per month	0.080	0.038	0.035	1.083	[1.005, 1.167]
Diff. bills: Once in a while	0.117	0.123	0.341	1.124	[0.882, 1.434]
Diff. bills: Somewhat often	0.204	0.176	0.246	1.227	[0.869, 1.729]
Diff. bills: Very often	0.195	0.207	0.347	1.215	[0.812, 1.813]
Age: Under 25	0.677	0.271	0.013	1.969	[1.160, 3.369]
Latino/a/x or Hispanic	0.113	0.179	0.527	1.120	[0.788, 1.587]
Another/Multiple races	−0.142	0.224	0.525	0.867	[0.557, 1.333]

Note. Estimates for facilitators (i.e., dummy code indicators) are not shown but were included in analyses to account for dependence in the data. H.S. or Less = High school diploma/GED; Associates/Some = Associates degree, vocational certification or training, or some schooling; In school = Currently attending school; Diff. Bills = Difficulty paying bills; IRR = Incidence rate ratios, 95 CI = 95% confidence interval.

many recruitment and enrollment tools used, it is possible that the different financial incentives attracted different populations. We tested for differences in race/ethnicity, age, personal income, difficulty paying bills, and education by incentive type (see Table 4). Personal income and education varied by incentive type. Income was higher for participants who received fewer gift cards. There was no clear overall pattern of the association between incentive type and education. Because the set of demographic indicators was retained in all models, analyses controlled for these two predictors.

4. Discussion

Children benefit from positively involved fathers (Lamb, 2010). A growing number of fatherhood education programs and parenting education programs serve fathers, aiming to promote positive father involvement (e.g., Panter-Brick et al., 2014). Yet few studies have examined factors associated with fathers' attrition and attendance in these programs despite difficulties in recruiting and retaining fathers (Stahlschmidt et al., 2013). The present study addressed this gap by using the *risk-factor model* (Kazdin, 1996) to examine predictors of attrition and attendance in a fatherhood education program.

Consistent with the *risk-factor model*, our findings indicated that multiple factors led to increased risk of attrition and/or poor attendance. For example, these findings indicated that fathers' socioeconomic status and age influence their attendance at and attrition from fatherhood education programs. Specifically, fathers who had lower levels of education were more likely to drop out. Fathers with lower levels of education also missed more sessions. These findings were consistent with studies of parenting programs indicating that lower socioeconomic status was a risk factor for poor attendance; however, there are other studies that did not find this association (Axford et al., 2012; Baker et al., 2011; Reyno & McGrath, 2006; Spoth & Redmond, 1995).

Some have suggested that social isolation, reading difficulties, and the need for an interpreter may be responsible for the link between lower SES and participation (Axford et al., 2012). However, it is unlikely that these factors were responsible for the association in this sample. We tested for the effect of social support, the curricula relied little on the reading of text materials, and 98.4% of the sample reported speaking English primarily in their home or speaking English "very well" (nearly all classes were offered in English). Scheduling conflicts were frequently identified in the literature as a barrier to participation in fatherhood education and parenting programs (Axford et al., 2012;

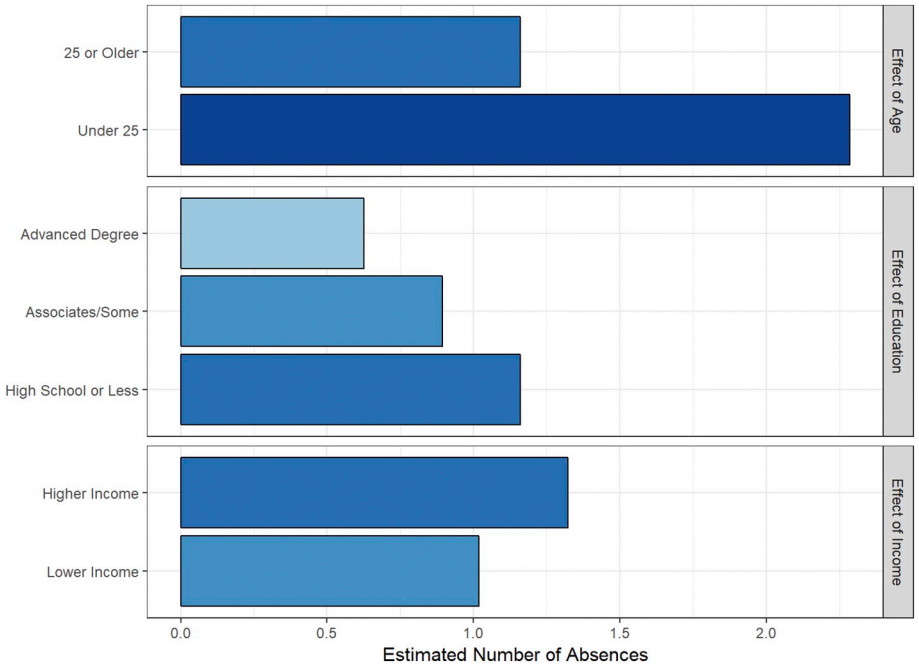

Fig. 2. Estimated number of missed sessions in a 5-session fatherhood course.
Note. Estimates were calculated using the following values: non-Hispanic/Latino/a/x White, 25 years of age or older, high school degree or less, average income, and difficulty paying bills "somewhat often." Different values were used as indicated in the figure (e.g., the estimate for "under 25" was obtained using these values with the exception that "25 or older" was used instead of "under 25"). Associates/Some = Vocational or Technical Certification/Some college/Associates Degree. Higher/lower income = one standard deviation above or below average.

Bronte-Tinkew et al., 2008; Duppong-Hurley et al., 2016). Perhaps fathers with lower levels of education were more commonly employed in jobs with less reliable schedules and thus experienced more scheduling conflicts with class sessions. Additional research is needed to understand the mechanism by which lower levels of education are associated with poorer participation.

Surprisingly, *higher* personal income was associated with elevated risk of poor attendance. In some ways, a higher income would help remove barriers to attendance that have been identified for lower SES individuals, such as the cost of transportation to the course (Axford et al., 2012). Yet, higher income was associated with poorer attendance in contrast to other indicators of socioeconomic status included in the model, such as education. Although the reason for this finding was unclear, it is worth noting that the effect of income is quite small: for every $1000 increase in monthly income, fathers were estimated to miss only 1.083 times as many sessions. Again, research is needed to understand how socioeconomic status may be linked to participation (e.g., through variables such as time spent working or perceived need for fatherhood education).

As hypothesized, relationship conflict was associated with risk of attrition; however, the association was non-linear. Risk of attrition was greater for fathers reporting higher levels of conflict than the sample average. Yet risk was also greater for fathers reporting lower levels of conflict relative to the sample average (see Fig. 1). Conflict with families

Table 4
Comparison of demographic indicators by incentive type.

	No gift cards n = 104	Two gift cards n = 571	Six gift cards n = 365	p
Race/Ethnicity				0.116
White	90 (86.5%)	481 (84.2%)	308 (84.4%)	
Hispanic/Latino/a/x	9 (8.7%)	60 (10.5%)	24 (6.6%)	
Another Race/Ethnicity	4 (3.8%)	18 (3.2%)	26 (7.1%)	
Multiple Races	1 (1.0%)	12 (2.1%)	7 (1.9%)	
Age				0.233
18–24	3 (2.9%)	16 (2.8%)	9 (2.5%)	
25–34	32 (30.8%)	217 (38.0%)	151 (41.4%)	
35–44	53 (51.0%)	230 (40.3%)	152 (41.6%)	
45–54	12 (11.5%)	84 (14.7%)	47 (12.9%)	
55 or Older	4 (3.8%)	24 (4.2%)	6 (1.0%)	
Personal monthly income (Thousands)	3.30 (1.62)	2.92 (1.63)	2.82 (1.67)	0.031
Difficulty paying bills				0.206
Never	36 (34.6%)	176 (30.8%)	116 (31.8%)	
Once in a while	43 (41.3%)	271 (47.5%)	177 (48.5%)	
Somewhat often	16 (15.4%)	78 (13.7%)	39 (10.7%)	
Very often	9 (8.7%)	46 (8.1%)	33 (9.0%)	
Education				0.006
High school diploma/GED or Less	14 (13.5%)	109 (19.1%)	59 (16.2%)	
Vocational or technical certification/Some college/Associates degree	38 (36.5%)	175 (30.6%)	84 (23.0%)	
Bachelor's degree	23 (22.1%)	124 (21.7%)	107 (29.3%)	
Advanced degree	17 (16.3%)	112 (19.6%)	63 (17.3%)	
In school	12 (11.5%)	51 (8.9%)	52 (14.2%)	
Relationship status				0.358
Married to current partner	87 (83.7%)	476 (83.4%)	319 (87.4%)	
Dating current partner	7 (6.7%)	45 (7.9%)	26 (7.1%)	
No current partner	10 (9.6%)	50 (8.8%)	20 (5.5%)	

has been identified as a barrier to participation in parenting programs (Kazdin & Wassell, 2000), but, to our knowledge, no study has indicated that low levels of conflict negatively impacts participation.

Constructive relational conflict has been linked to warm parenting (McCoy, George, Cummings, & Davies, 2013); thus, low levels of conflict may point to lower perceived need for parent education among participants. Conversely, low levels of conflict, even negative conflict, are not always ideal and may indicate that relationship challenges are not being resolved (see McNulty & Russell, 2010). Participants in this study who had lower levels of conflict generally reported that they "Never" or "Hardly Ever" engaged in the conflictual relationship behaviors assessed. It may be that the participants in this sample with low levels of conflict were not addressing their relationship challenges and that these challenges interfered with their participation. The findings of this study regarding marital conflict and participation in a fatherhood education program is consistent with extensive research indicating that father involvement with children is affected by marital and coparenting relationship quality (e.g., Hohmann-Marriott, 2011) and research indicating that couple-focused programs can be effective vehicles for providing parenting education to fathers (e.g., Cowan, Cowan, Pruett, Pruett, & Gillette, 2014).

A review of the existing literature on risk factors for attrition and attendance in parenting programs identified several predictors. Many of these factors were also identified in evaluation reports and "best practices" reports for involving fathers in parenting programs and fatherhood education programs. Yet few of these factors were significant predictors of attrition and/or attendance in the present study.

The relatively low number of significant predictors may not be surprising for two reasons. First, the effect of many of the identified predictors from past research had been mixed (race/ethnicity, socioeconomic status, financial incentive type, emotional support, children's behavior problems; e.g., Axford et al., 2012) and other predictors had rarely been studied (psychological adjustment, relationship conflict).

Second, the program examined in the present study had a relatively low rate of attrition (17.8%) and missed sessions (82.5% missed no more than one session and 59.8% missed no sessions). In administering this program, program staff and facilitators followed many of the published recommendations for promoting fathers' attendance, including providing food at each session, holding courses during the evening and weekends to avoid scheduling conflicts, keeping the length of courses short, and developing a positive view about fathers and their contributions to children's development (Bayley et al., 2009; Fabiano, 2007; National Fatherhood Initiative, 2006; McBride et al., 2017). Perhaps following these recommendations led to the program's success in retaining fathers. Doing so may have helped address some of the practical concerns frequently identified as barriers to parents' participation as well as fathers' concerns that programs are "mother-focused" (Axford et al., 2012; Bayley et al., 2009; Fabiano, 2007; McBride et al., 2017; National Fatherhood Initiative, 2006; Smokowski et al., 2018). The impact of these practices on attendance and attrition is an important area for future research.

Although many of the predictors identified in the literature review were weakly or inconsistently associated with participation in parenting programs, one predictor demonstrated greater consistency. Younger age of mothers was identified as a significant predictor of attrition in a meta-analysis of parent training programs (Reyno & McGrath, 2006). Younger age was a risk factor for fathers' poor participation in this study as well.

Although several studies linked younger parental age and attrition in parenting programs, the exact mechanism responsible for this association has not been determined. The authors of one of the first studies reporting this association speculated that younger mothers may experience higher levels of stress, which interferes with their participation (Kazdin, Mazurick, & Bass, 1993). The same may have been true for fathers in this study who may be more likely to be have very young children at home and be actively attending school or receiving vocational training, leading to more conflicts and barriers to attendance. Given that many fathers under 25 would be first-time or relatively new fathers (Martinez et al., 2012) who could particularly benefit from fatherhood education, additional research is needed to identify why these fathers were at greater risk of poor participation and how to support their attendance.

The present study examined the use of financial incentives. Financial incentive type did not have an impact on attendance and attrition. Offering two $25 gift cards or even six gift cards did not lead to less attrition or better attendance compared to no gift cards. Past research has been inconclusive regarding the utility of financial incentives. Some researchers have suggested that financial incentives may only matter if they are sufficiently large, but not too large (see Snow et al., 2002) or are provided to lower SES participants who use them primarily to support attendance (Guyll et al., 2003; Skogrand et al., 2010). Because random assignment was not used, the need for financial incentives cannot be settled conclusively by the findings of this study. However, our analyses controlled for demographic indicators that varied with incentive type (i.e., personal income and education). Furthermore, the findings of this study do suggest that providing large financial incentives ($150) is likely unnecessary. Focusing on factors other than large incentives may be as effective or more effective for retaining fathers as well as more cost-effective.

When considering the implications of this study for policy and practice, we emphasize that this study examined the impact of financial incentives on the attendance and attrition of *participants who had enrolled*. Consequently, the findings of this study regarding the use of incentives to promote participation may not apply to the use of incentives for recruitment purposes. The impact of incentives on recruitment is unclear, but the use of incentives may help remove barriers to attendance, such as the cost of traveling to the course (Skogrand et al., 2010). Furthermore, although our analyses indicated that the effect of incentives did not vary with financial difficulty (i.e., the interaction between incentive type and difficulty paying bills was not significant), it is possible that incentives may still impact attrition for more vulnerable fathers and/or fathers with a lower socioeconomic status.

An advantage of the use of discrete-time survival analysis was that the effect of time on risk can be modeled and studied. As depicted in Fig. 1, there was an increase in risk of attrition at the fifth and final session (i.e., proportionally more fathers dropped the course by missing the final session). It is somewhat surprising that more fathers would drop out after the fourth session, having already attended most of the course. However, during the final session, additional surveys were administered. It may be that fathers were more inclined to skip the final session knowing that some portion of the session would be spent completing surveys rather than on content.

Alternatively, the increase in risk of attrition may be due to fathers' declining interest in attending as the course continued. McCarthy and colleagues (McCarthy, Sundby, Merladet, & Luxenberg, 1997) examined predictors of attendance by 161 adolescents and young adults at a parenting skills program. They noted that attendance dropped after five sessions and again after 10 sessions. Although it is unlikely that there is an ideal number of sessions that applies to all fathers and all curricula, it is possible that interest in attending a program may tend to drop significantly at around four to five sessions. The effect of course length on fathers' participation warrants further investigation.

Theoretical guidance for this project was derived from the *risk-factor model* as outlined by Kazdin (1996). According to this model, risk is multiply determined, no single factor is necessary or sufficient to affect a target event, and risk factors are probabilistically related to the event. Although the risk factors identified in this study were significantly related to attrition and/or attendance, the presence of these factors did not *guarantee* that participants would encounter difficulties in participation. Illustrating this, of the 182 fathers with a high school education or less, 49 (26.9%) dropped out of their course, but 133 (73.1%) did not. This point is of particular importance when targeting populations

to receive fatherhood education or parenting education; fathers under the age of 25 with lower education may indeed be at greater risk of poor attendance, but, based on the results of this study, most will still attend. Consequently, these populations—who may have a greater need for these services—may still benefit from being targeted to receive parenting and fatherhood education despite the obstacles they face in participation.

5. Limitations

Findings from the present study should be generalized with caution due to additional limitations beyond those already discussed. First, data were collected from a convenience sample that was largely well-educated, middle-class, and White, non-Hispanic/Latino/a/x. Second, some constructs were assessed using single items (e.g. parenting stress) or short scales that may not fully measure the constructs. Consequently, non-significant findings may be due in part to limitations in measures rather than a true lack of association. Third, the sample was restricted to fathers who were residing with their youngest biological or adopted child. Therefore, findings may not apply to other fathers. Fourth, a common barrier to participation in parenting or fatherhood education courses is childcare (e.g., Duppong-Hurley et al., 2016); however, a reliable indicator for need for childcare was not available in the present study.

6. Conclusion

Despite these limitations, the present study provided unique insights into factors affecting fathers' participation in a fatherhood education program. It also highlighted the importance of socioeconomic status, age, and relationship conflict for fathers' attendance and retention in fatherhood education. Age, SES, and relationship conflict continued to influence fathers' participation beyond the provision of financial incentives. This study illustrated the use of discrete-time survival analysis and negative binomial regression as tools for predicting attrition and attendance over time. These approaches provided additional insights into the complementary but distinct constructs of attendance and attrition. Finally, the present study provided important insights into the need and effectiveness of financial incentives. The findings of this study may aid researchers, practitioners and policy makers as they seek to promote positive father involvement through fatherhood and parenting education.

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Declarations of interest

None.

Appendix A. Supplementary data

Supplementary material to this article can be found online at https://doi.org/10.1016/j.childyouth.2019.05.007.

References

Administration for Children and Families, Department of Health and Human Services (2015). *Proposed healthy marriage and responsible fatherhood performance measures and additional data collection.* Federal register no: 2015–06534Washington, DC: Office of Planning, Research, and Evaluation, Administration for Children and Families, U.S. Department of Health and Human Services.

Axford, N., Lehtonen, M., Kaoukji, D., Tobin, K., & Berry, V. (2012). Engaging parents in parenting programs: Lessons from research and practice. *Child Youth Serv. Rev. 34*(10), 2061–2071. https://doi.org/10.1016/j.childyouth.2012.06.011.

Baker, C. N., Arnold, D. H., & Meagher, S. (2011). Enrollment and attendance in a parent training prevention program for conduct problems. *Prev. Sci. 12*(2), 126–138. https://doi.org/10.1007/s11121-010-0187-0.

Bayley, J., Wallace, L. M., & Choudry, K. (2009). Fathers and parenting programmes: Barriers and best practice. *Community Practitioner, 82*(4), 28–31. https://www.ncbi.nlm.nih.gov/pubmed/19397081.

Bronte-Tinkew, J., Burkhauser, M., & Metz, A. (2008). *Elements of promising practice in teen fatherhood programs: Evidence-based and evidence-informed research findings on what works: (514692009–001).* American Psychological Association https://doi.org/10.1037/e514692009-001.

Burgess, A. (2009). *Fathers and parenting interventions: What works? Abergavenny.* UK: The Fatherhood Institute. Retrieved from www.fatherhoodinstitute.org/wp-content/uploads/2013/11/Fathers-and-Parenting-Interventions-What-Works.pdf.

Counts, J. M., Buffington, E. S., Chang-Rios, K., Rasmussen, H. N., & Preacher, K. J. (2010). The development and validation of the protective factors survey: A self-report measure of protective factors against child maltreatment. *Child Abuse Negl. 34*(10), 762–772. https://doi.org/10.1016/j.chiabu.2010.03.003.

Cowan, C. P., Cowan, P. A., & Barry, J. (2011). Couples' groups for parents of preschoolers: Ten-year outcomes of a randomized trial. *J. Fam. Psychol. 25*(2), 240–250. https://doi.org/10.1037/a0023003.

Cowan, P. A., Cowan, C. P., Pruett, M. K., Pruett, K., & Gillette, P. (2014). Evaluating a couples group to enhance father involvement in low-income families using a benchmark comparison: Evaluating a couples group to enhance father involvement. *Fam. Relat. 63*(3), 356–370. https://doi.org/10.1111/fare.12072.

Dion, M. R., Hershey, A. M., Zaveri, H. H., Avellar, S. A., Strong, D. A., Silman, T., & Moore, R. (2008). *Implementation of the building strong families program.* American Psychological Association https://doi.org/10.1037/e565612012-001.

Dion, M. R., Zaveri, H., & Holcomb, P. (2015). Responsible fatherhood programs in the Parents and Children Together (PACT) evaluation: Responsible fatherhood programs. *Fam. Court. Rev. 53*(2), 292–303. https://doi.org/10.1111/fcre.12140.

Duppong-Hurley, K., Hoffman, S., Barnes, B., & Oats, R. (2016). Perspectives on engagement barriers and alternative delivery formats from non-completers of a community-run parenting program. *J. Child Fam. Stud. 25*(2), 545–552. https://doi.org/10.1007/s10826-015-0253-0.

Eisner, M., & Meidert, U. (2011). Stages of parental engagement in a universal parent training program. *J. Prim. Prev. 32*(2), 83–93. https://doi.org/10.1007/s10935-011-0238-8.

Fabiano, G. A. (2007). Father participation in behavioral parent training for ADHD: Review and recommendations for increasing inclusion and engagement. *J. Fam. Psychol. 21*(4), 683–693. https://doi.org/10.1037/0893-3200.21.4.683.

Fabiano, G. A., Pelham, W. E., Cunningham, C. E., Yu, J., Gangloff, B., Buck, M., ... Gera, S. (2012). A waitlist-controlled trial of behavioral parent training for fathers of children with ADHD. *J. Clin. Child Adolesc. Psychol. 41*(3), 337–345. https://doi.org/10.1080/15374416.2012.654464.

Field, A., Miles, J., & Field, Z. (2012). *Discovering statistics using R* (1st ed.). London, England: SAGE Publications. https://us.sagepub.com/en-us/nam/discovering-statistics-using-r/book236067.

Fletcher, R., Freeman, E., & Matthey, S. (2011). The impact of behavioural parent training on fathers' parenting: A meta-analysis of the Triple P-Positive Parenting Program. *Fathering, 9*(3), 291–312. https://doi.org/10.3149/fth.0903.291.

Frey, M. R., & Snow, J. N. (2005). The personality construct of entitlement: An intervention for decreasing attrition in parent education groups. *J. Individ. Psychol. 61*(2), 161–173. https://utpress.utexas.edu/journals/05-summer-61-2.

Guyll, M., Spoth, R., & Redmond, C. (2003). The effects of incentives and research requirements on participation rates for a community-based preventive intervention research study. *J. Prim. Prev. 24*, 25–41. https://doi.org/10.1023/A:1025023600517.

Heinrichs, N., Bertram, H., Kuschel, A., & Hahlweg, K. (2005). Parent recruitment and retention in a universal prevention program for child behavior and emotional problems: Barriers to research and program participation. *Prev. Sci. 6*(4), 275–286. https://doi.org/10.1007/s11121-005-0006-1.

Heinze, G., & Ploner, M. (2018). Logistf: Firth's bias-reduced logistic regression: R package version 1.23. Retrieved from https://CRAN.R-project.org/package=logistf.

Heinze, G., & Schemper, M. (2002). A solution to the problem of separation in logistic regression. *Stat. Med. 21*(16), 2409–2419. https://doi.org/10.1002/sim.1047.

Hofferth, S. L. (2003). Race/ethnic differences in father involvement in two-parent families: Culture, context, or economy? *J. Fam. Issues, 24*(2), 185–216. https://doi.org/10.1177/0192513X02250087.

Hohmann-Marriott, B. (2011). Coparenting and father involvement in married and unmarried coresident couples. *J. Marriage Fam. 73*(1), 296–309. https://doi.org/10.1111/j.1741-3737.2010.00805.x.

Hsueh, J., & Knox, V. (2013). *Supporting healthy marriage evaluation: Eight sites within the United States, 2003–2013: Codebook for 30-month survey.* Ann Arbor, MI: Inter-university Consortium for Political and Social Research https://doi.org/10.3886/ICPSR34420.v2.

Kazdin, A. E. (1996). Dropping out of child psychotherapy: Issues for research and implications for practice. *Clinical Child Psychology and Psychiatry, 1*(1), 133–156. https://doi.org/10.1177/1359104596011012.

Kazdin, A. E., Mazurick, J. L., & Bass, D. (1993). Risk for attrition in treatment of antisocial children and families. *Journal of Clinical Child Psychology, 22*(1), 2–16. https://doi.org/10.1207/s15374424jccp2201_1.

Kazdin, A. E., & Wassell, G. (2000). Predictors of barriers to treatment and therapeutic change in outpatient therapy for antisocial children and their families. *Ment. Health Serv. Res. 2*(1), 27–40. https://doi.org/10.1023/A:1010191807861.

Kessler, R. C., Andrews, G., Colpe, L. J., Hiripi, E., Mroczek, D. K., Normand, S. L. T., &

Zaslavsky, A. M. (2002). Short screening scales to monitor population prevalences and trends in non-specific psychological distress. *Psychol. Med. 32*(6), 959–976. https://doi.org/10.1017/S0033291702006074.

Kessler, R. C., Barker, P. R., Colpe, L. J., Epstein, J. F., Gfroerer, J. C., Hiripi, E., ... Zaslavsky, A. M. (2003). Screening for serious mental illness in the general population. *Arch. Gen. Psychiatry, 60*(2), 184. https://doi.org/10.1001/archpsyc.60.2.184.

Lamb, M. E. (2010). *The role of the father in child development* (5th ed.). Hoboken, NJ: John Wiley & Sons, Inc. https://www.wiley.com/en-us/The+Role+of+the+Father+in+Child+Development%2C+5th+Edition-p-9780470405499.

Martinez, G., Daniels, K., & Chandra, A. (2012). *Fertility of men and women aged 15–44 years in the United States: National Survey of family growth, 2006–2010, (No. 51).* Hyattsville, MD: National Center for Health Statistics. Retrieved from https://www.cdc.gov/nchs/data/nhsr/nhsr051.pdf.

McBride, B. A., Curtiss, S. J., Uchima, K., Laxman, D. J., Santos, R. M., Weglarz-Ward, J., & Kern, J. (2017). Father involvement in early intervention: Exploring the gap between service providers' perceptions and practices. *J. Early Interv. 39*(2), 71–87. https://doi.org/10.1177/1053815116686118.

McCarthy, P., Sundby, M., Merladet, J., & Luxenberg, M. G. (1997). Identifying attendance correlates for a teen and young adult parenting program. *Fam. Relat. 46*(2), 107. https://doi.org/10.2307/585034.

McCoy, K. P., George, M. R. W., Cummings, E. M., & Davies, P. T. (2013). Constructive and destructive marital conflict, parenting, and children's school and social adjustment: Marital conflict and parenting. *Soc. Dev. 22*(4), 641–662. https://doi.org/10.1111/sode.12015.

McNulty, J. K., & Russell, V. M. (2010). When “negative” behaviors are positive: A contextual analysis of the long-term effects of problem-solving behaviors on changes in relationship satisfaction. *J. Pers. Soc. Psychol. 98*(4), 587–604. https://doi.org/10.1037/a0017479.

National Fatherhood Initiative (2006). *A guide to strengthening fatherhood in your community: Moving from inspiration to implementation.* National Fatherhood Initiative.

Panter-Brick, C., Burgess, A., Eggerman, M., McAllister, F., Pruett, K., & Leckman, J. F. (2014). Practitioner review: Engaging fathers - recommendations for a game change in parenting interventions based on a systematic review of the global evidence. *J. Child Psychol. Psychiatry, 55*(11), 1187–1212. https://doi.org/10.1111/jcpp.12280.

Pleck, J. H. (2010). Paternal involvement: Revised conceptualization and theoretical linkages with child outcomes. In M. E. Lamb (Ed.). *The role of the father in child development* (pp. 58–93). (5th ed.). Hoboken, NJ: John Wiley & Sons, Inc. https://www.wiley.com/en-us/The+Role+of+the+Father+in+Child+Development%2C+5th+Edition-p-9780470405499.

Ponzetti, J. J. (Ed.). (2016). *Evidenced-based parenting education: A global perspective*(1st ed.). New York, NY: Routledge.

R Core Team (2018). *R: A language and environment for statistical computing.* Vienna, Austria: R Foundation for Statistical Computing. (Retrieved from) http://www.R-project.org/.

Reyno, S. M., & McGrath, P. J. (2006). Predictors of parent training efficacy for child externalizing behavior problems - a meta-analytic review. *J. Child Psychol. Psychiatry, 47*(1), 99–111. https://doi.org/10.1111/j.1469-7610.2005.01544.x.

RStudio Team (2018). *RStudio: Integrated development for R.* Boston, MA: RStudio, Inc. Retrieved from http://www.rstudio.com/.

Salari, R., & Filus, A. (2017). Using the health belief model to explain mothers' and fathers' intention to participate in universal parenting programs. *Prev. Sci. 18*(1), 83–94. https://doi.org/10.1007/s11121-016-0696-6.

Singer, J. D., & Willett, J. B. (2003). *Applied longitudinal data analysis.* Oxford, UK: Oxford University Press https://doi.org/10.1093/acprof:oso/9780195152968.001.0001.

Skogrand, L., Reck, K. H., Higginbotham, B., Adler-Baeder, F., & Dansie, L. (2010). Recruitment and retention for stepfamily education. *Journal of Couple & Relationship Therapy, 9*(1), 48–65. https://doi.org/10.1080/15332690903473077.

Smokowski, P., Corona, R., Bacallao, M., Fortson, B. L., Marshall, K. J., & Yaros, A. (2018). Addressing barriers to recruitment and retention in the implementation of parenting programs: Lessons learned for effective program delivery in rural and urban areas. *J. Child Fam. Stud. 27*(9), 2925–2942. https://doi.org/10.1007/s10826-018-1139-8.

Snow, J. N., Frey, M. R., & Kern, R. M. (2002). Attrition, financial incentives, and parent education. *Fam. J. 10*(4), 373–378. https://doi.org/10.1177/106648002236755.

Snow, J. N., Kern, R. M., & Curlette, W. L. (2001). Identifying personality traits associated with attrition in systematic training for effective parenting groups. *Fam. J. 9*(2), 102–108. https://doi.org/10.1177/1066480701092003.

Spoth, R., & Molgaard, V. (1993). Consumer-focused data collection in prevention program evaluation: Rationale and illustrations. *Evaluation & the Health Professions, 16*(3), 278–294. https://doi.org/10.1177/016327879301600302.

Spoth, R., & Redmond, C. (1995). Parent motivation to enroll in parenting skills programs: A model of family context and health belief predictors. *J. Fam. Psychol. 9*(3), 294–310. https://doi.org/10.1037/0893-3200.9.3.294.

Stahlschmidt, M. J., Threlfall, J., Seay, K. D., Lewis, E. M., & Kohl, P. L. (2013). Recruiting fathers to parenting programs: Advice from dads and fatherhood program providers. *Child Youth Serv. Rev. 35*(10), 1734–1741. https://doi.org/10.1016/j.childyouth.2013.07.004.

Tolman, R. M. (1999). The validation of the psychological maltreatment of women inventory. *Violence Vict. 14*, 25–37. https://doi.org/10.1891/0886-6708.14.1.25.

Venables, W. N., & Ripley, B. D. (2002). *Modern applied statistics with S* (4th ed.). New York: Springer. https://www.springer.com/us/book/9780387954578.

Wasserstein, R. L., & Lazar, N. A. (2016). The ASA's statement on *p* -values: Context, process, and purpose. *Am. Stat. 70*(2), 129–133. https://doi.org/10.1080/00031305.2016.1154108.