

# The Unique Effects of Fathers' Warmth on Adolescents' Positive Beliefs and Behaviors: Pathways to Resilience in Low-Income Families

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Published online: 16 November 2016  
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**Abstract** The aim of the present study was to investigate the pathways through which fathers' warmth influences adolescents' grades. We investigated the positive beliefs of optimism and academic self-efficacy, and the motivational construct of determination, as possible mediators. Questionnaire data were collected from a sample of 183 sixth-graders (78 male, 105 female) from low-income families: 133 Mexican Americans, 36 African Americans, 11 European Americans, and 3 other ethnicity. Multigroup SEM path analysis was used to test two path models and investigate variations in these models by adolescents' gender. Results revealed that, controlling for mothers' warmth, fathers' warmth predicts adolescents' positive beliefs and that these relations vary by adolescents' gender. For male adolescents, relations between fathers' warmth and English language arts grades are mediated by academic self-efficacy and determination to persist on challenging schoolwork. For female adolescents, relations between fathers' warmth and math grades are mediated by optimism and determination. These results demonstrate the unique contributions of fathers' warmth to their sons' and daughters' emotional and academic development. Our study suggests that counselors and educators may positively influence

adolescents' well-being by encouraging fathers to communicate warmth and acceptance to their adolescents.

**Keywords** Academic achievement motivation · Academic self-concept · Adolescents · African Americans · Mexican Americans · Emotional well-being · Father-child relations · Human gender differences · Optimism · Parental involvement · Path analysis · Self-efficacy · Gender role attitudes

Adolescents in low-income families are much more likely than their middle-class peers to underachieve and eventually drop out of school (Snyder and Dillow 2012). They experience stressors associated with economic hardship, such as not having their basic needs met and living in unsafe neighborhoods, and they attend schools struggling to meet educational standards with fewer resources (Orfield et al. 2004). Two resilience factors that have been shown to help these at-risk adolescents overcome barriers and motivate them to complete their schooling are positive attitudes and parental support (Jeynes 2007; Swanson et al. 2011). When parents encourage children's efforts and offer them support to deal with difficult challenges, children show greater confidence in their abilities. Students with positive beliefs about their academic abilities are more motivated and determined to achieve and more persistent on schoolwork (Caraway et al. 2003). As a result, they are more likely to earn high grades (Juang and Silbereisen 2002; Voydanoff 2004).

Much of the evidence for the effects of parental involvement derives from research on mothers, yet when children begin middle school, fathers may have an even greater impact than mothers on their academic trajectories (Hossain and Shipman 2009). Further, recent research on low-income fathers has found that fathers' warmth and support are positively

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related to adolescents' academic outcomes (Plunkett et al. 2009). Yet, we know little about *how* adolescents experience their fathers' warmth and which beliefs and behaviors are most affected by those experiences. The first aim of our study was to examine the influence of fathers' warmth on adolescents' academic outcomes through the potential mediators of adolescents' positive beliefs and motivational behaviors. We investigated the effects of fathers' warmth, controlling for mothers' warmth, to learn how adolescents benefit differently and incrementally from their fathers. Because girls and boys respond differently to the warmth they receive from their mothers (Fulton and Turner 2008), our second aim was to explore whether fathers' warmth affects sons and daughters differently.

### Fathers' Involvement

Lamb et al. (1987) originally conceptualized fathers' involvement as comprising three dimensions: responsibility, accessibility, and engagement. Until recently, the majority of research on low-income fathers' involvement focused on the first two dimensions: responsibility and accessibility (Saracho and Spodek 2007). Most of this research has been limited to a focus on only the father's presence, examining for example the effects of time spent with fathers on children's well-being, as well as differences between children with non-resident fathers and those whose fathers live in the home (Lamb 2000). Because low-income fathers are less likely to reside with their children and to participate in research (Tamis-LeMonda and McFadden 2010), the effects of the third dimension of father involvement, engagement, are less well understood.

Engagement refers to the quality of the father-child relationship and is defined as fathers' positive interactions with their children (Lamb et al. 1987). Several scholars have urged researchers to focus more on these aspects of the quality of the father-child relationship, including warmth, supportiveness, sensitivity, affective climate, and relational synchrony (Cabrera et al. 2000; Palkovitz 2007). Accordingly, Pleck (2010) proposed an expanded theoretical framework that differentiates engagement into three dimensions: positive engagement activities, warmth and responsiveness, and control and monitoring. In our study, we were interested in whether the specific dimension of warmth and responsiveness positively contributes to adolescents' self-beliefs and attitudes toward school.

Most of the research on the effects of fathers' warmth on school-age children and adolescents has focused on child social-emotional outcomes such as self-esteem (Allgood et al. 2012; Behnke et al. 2011) and internalizing and externalizing behaviors (Day and Padilla-Walker 2009; Delgado et al. 2013). Only a few studies have measured the effects of fathers' warmth on academic outcomes. In their study of a

multi-ethnic sample of urban middle-school students, Lowe and Dotterer (2013) found that fathers' warmth moderates relations between parental monitoring and school behavioral engagement. Adolescents whose fathers express more warmth are even less likely than their peers to engage in school trouble, and this interaction effect is stronger for male than for female adolescents. A few studies of African American adolescent girls have also found positive effects of fathers' warmth on their academic outcomes (Cooper 2009; Hanson 2007).

### Self-Efficacy and Optimism

Fathers' warmth has a positive and unique influence on adolescents' achievement motivation, yet we know little about the psychological mechanisms that mediate this process. In other words, what are the specific beliefs and attitudes of adolescents that are affected by fathers' warmth and that also predict achievement motivation? According to Expectancy-Value (EV) theory (Eccles and Wigfield 2002), students are motivated and determined to complete academic tasks when they believe in the utility value of those tasks, have positive self-schema and goals, and have *high self-efficacy*, the belief that they are competent and can achieve in a particular subject. Caregivers shape these goals and beliefs through their behaviors and the messages they convey to their children, both implicitly and explicitly. EV theory proposes that children experience emotions in response to their parents' messages and behaviors, which then shape their formation of their own beliefs and behaviors. When parents encourage their children to work hard and overcome challenges, as well as communicate high expectations for their success, they are engaging in *social persuasion*, one of the four sources of self-efficacy proposed by Bandura (1989). Children interpret these messages as affirmations that their parents believe in their ability to perform and succeed, thus increasing their self-efficacy.

Although there is ample evidence to support this model, very little research focuses specifically on fathers' influence. A few recent studies have suggested that fathers' warmth may influence adolescents' achievement motivation through its effect on academic self-efficacy. For example, in the previously mentioned study by Lowe and Dotterer (2013), the authors found that adolescents whose fathers were warm and supportive experienced higher confidence in their abilities and effectiveness as students. Cooper (2009) found that African American adolescent girls' global and academic self-esteem was higher when their fathers were more warm and supportive, which then related to greater academic engagement. In our study, we investigated whether adolescents who experienced higher father warmth would report higher self-efficacy in language arts and math. Because academic self-efficacy positively predicts academic motivation and

engagement (Linnenbrink and Pintrich 2002), we further investigated whether academic self-efficacy mediated relations between fathers' warmth and adolescents' determination on schoolwork.

Another possible mediator of relations between fathers' warmth and academic motivation and achievement is positive expectations for one's future, operationalized as optimism. Optimism is defined as positive "generalized outcome expectancies" (Scheier and Carver 1985, p. 232) that may be due to one's own actions but may also be due to luck or to others' actions. Scheier and Carver (1992) propose that optimism exists in two forms: *dispositional optimism*, an individual personality trait, and *situational optimism*, a state of mind in response to a specific situation or context, such as one's family environment. Accordingly, parents may contribute to their children's situational optimism through their supportive interactions and messages about the future. Although research on parents' contributions to their adolescents' optimism has increased (Thomson et al. 2015), we have yet to uncover whether optimism serves as a mediator between parents' support and adolescents' outcomes.

Research on the predictors and benefits of optimism is important because of its potential role as a resiliency factor. A few studies have found that optimism protects adolescents against depression and delinquency and predicts life satisfaction (Carvajal 2012; Ey et al. 2005; Lagacé-Séguin and d'Entremont 2010). In a longitudinal study of mostly White high-school students, Jackson et al. (2005) found that adolescents' optimism mediated relations between an authoritative parenting style that blends high warmth with high expectations and young adults' self-esteem 6 years later. In their study, adolescents reported on their parents in general, rather than on each parent separately. Despite increasing research on the effects of parental support on adolescents' optimism, most of these studies have focused on middle-class White families, and only one is known to specifically investigate fathers. Yu and Ko (2013) investigated fathers' influence on adolescents' optimism in Korea and found that fathers' optimism predicted their emotional expressivity, which then predicted their adolescents' optimism. In our study, we extended this research by asking whether fathers' warmth contributes to adolescents' optimism in low-income ethnic minority families in the United States. We were also interested in investigating the mediating role of optimism between fathers' warmth and academic outcomes.

### Gender Differences in Father-Child Relationships

Because some research has suggested that fathers influence their daughters and sons in different ways, we further investigated gender differences in our study. Two gender socialization models have been proposed to explain how girls' and

boys' interactions with their fathers and mothers shape their beliefs and attitudes (Pomerantz et al. 2004). The *transactional* model states that children's characteristics, such as their gender, influence how their parents treat them. Accordingly, fathers demonstrate warmth and offer support in different ways or in different amounts depending on whether their child is a girl or a boy. The *interactional model* proposes that, regardless of parents' treatment, children's gender influences the *effects* of that treatment on them. Accordingly, even if they receive the same levels and types of warmth from their fathers, sons and daughters experience, and are affected by, that warmth differently.

Researchers have found mixed support for both of these theories when studying the impact of fathers (Leavell et al. 2012). Regarding the transactional theory, some researchers have found that father's involvement does not vary with child's gender (Costigan and Cox 2001; Hossain and Shipman 2009; Shumow and Miller 2001; Tamis-LeMonda et al. 2009). Yet, others have found that fathers prefer involvement with sons, possibly because they have more in common and feel a greater responsibility for guiding their sons (Raley and Bianchi 2006; Rouyer et al. 2007).

There has been less research on fathers testing the interactional theory that parents' equal treatment of boys and girls nonetheless affects sons and daughters differently. In a sample of Mexican-origin families, Plunkett et al. (2008) found that academic support from the other-gender parent affected girls' and boys' motivation more than did support from the same-gender parent, suggesting that daughters and sons experience their fathers' support differently. In a multi-ethnic study of adolescents from immigrant families, Plunkett et al. (2009) found that fathers' help with schoolwork had positive effects on female adolescents' academic engagement, but not on that of male adolescents. In their study of White middle-class elementary-school children, Tan and Goldberg (2009) found that daughters' anxiety decreased when their fathers were more interpersonally involved, but sons' anxiety was unaffected. Although it is impossible to ascertain whether the girls and boys in these studies were treated similarly by their fathers, the findings that sons and daughters are affected differently by their fathers provide support for distinguishing between girls and boys in research on fathering.

### Gendered Beliefs about Achievement

Gender differences in adolescents' academic beliefs and attitudes give us another reason to investigate whether fathers' warmth affects male and female adolescents differently. Gender stereotypes shape adolescents' perceptions of specific subjects, such as math and English, and interact with their beliefs about their abilities (Eccles et al. 1990). Adolescents absorb stereotypes that girls are less gifted and perform at

lower levels than boys do in math (Steele and Ambady 2006) and that boys are less verbally skilled and perform at lower levels than girls do in English (Kurtz-Costes et al. 2014). These general stereotypes affect students' beliefs about their own abilities. Studies of gender differences in adolescents' ability beliefs and self-concepts in math and English find that female adolescents' self-concepts in math are lower than those of male adolescents (Else-Quest et al. 2013; Marsh and Yeung 1998; Nagy et al. 2010) whereas their self-efficacy in English is higher than that of male adolescents (Huang 2013). Furthermore, these differences translate to differences in actual performance, with female adolescents lagging behind male adolescents in math (Reilly et al. 2015; Spinath et al. 2008) and male adolescents lagging behind female adolescents in language arts (Scheiber et al. 2015). However, research on this question remains equivocal as some meta-analyses have shown that female adolescents outperform male adolescents across domains (Hyde 2005; Voyer and Voyer 2014).

The limited research on gender differences in achievement beliefs in ethnic minority samples suggests similar trends, with boys reporting higher math self-concepts than girls (Else-Quest et al. 2013). For example, a recent study of African American adolescents found that male adolescents were more likely than female adolescents to attribute lower performance in English and higher performance in math to their ability (Swinton et al. 2011). In a study of Black middle-school students, Mickelson and Greene (2006) found that female adolescents outperformed male adolescents on reading tests. If boys view English as a more "feminine" subject, then those whose male role models express more warmth may be more inclined to put effort into their English classes.

## The Current Study

The purpose of the present study was to investigate whether and how fathers' warmth contributes to adolescents' academic outcomes, over and above the contributions of mothers' warmth, and to explore possible gender differences in these relations. The limited research on parental involvement that includes both fathers and mothers suggests fathers' warmth has an independent effect (Leidy et al. 2011; McBride et al. 2005; Videon 2005). In some studies, father-child relationship quality explains more variance in positive child outcomes than does mother-child relationship quality (Kramer 2012; Updegraff et al. 2001; Williams and Kelly 2005). Thus our first hypothesis was that adolescents who reported greater father warmth would have more optimism and academic self-efficacy, controlling for mothers' warmth (Hypothesis 1a), and that these relations would vary with adolescents' gender (Hypothesis 1b). Second, we hypothesized that adolescents' optimism and self-efficacy beliefs would predict their determination on school tasks (Hypothesis 2a) and would mediate

relations between fathers' warmth and adolescents' grades (Hypothesis 2b). Third, we expected gender differences in how fathers' warmth affects adolescents (Hypothesis 3), but due to limited research in this area, we did not formulate specific hypotheses as to the nature of these differences.

## Method

### Participants

The present study is part of a larger study of low-income, ethnic minority families (Suizzo et al. 2012; Suizzo et al. 2016). The study was conducted in four middle schools (6th through 8th grades) in a large urban district in the southwestern United States. The median household income in the schools' neighborhoods was approximately \$35,000 at the time of the study. Between 90 and 94 % of the students at these schools were classified as "economically disadvantaged," and between 75 and 78 % were classified as "at risk" by the school district. The families in our study are representative of families in these neighborhoods with regard to SES and ethnicity. The sample for our study comprised 183 sixth-graders (78 male, 105 female), ranging from 11 to 13 years-old and with a mean age of 11.86 years ( $SD = .56$ ). These students self-identified as members of the following ethnic groups: 133 (73 %) Mexican Americans, 36 (20 %) African Americans, 11 (6 %) European Americans, and 3 (2 %) other ethnicity. The relation between ethnicity and gender was not significant,  $\chi^2(4) = 5.12, p = .275$ , suggesting similar ethnic group proportions by gender.

Regarding household compositions, 11 (30 %) African Americans lived with both their mothers and fathers and 25 (69 %) lived with only one parent; 88 (66 %) Mexican Americans lived with both parents and 45 (34 %) lived with one; and 6 (54.5 %) European Americans lived with both and 5 (45.5 %) lived with only one parent. Breaking household composition down by gender, 51 (63 %) boys and 66 (64.7 %) girls reported that they lived with their fathers; and 71 (88 %) boys and 93 (91 %) girls reported living with their mothers. In their responses to the father warmth questions, 135 (74 %) students indicated that they were referring to their biological fathers, 32 (17 %) to their stepfathers, and 7 (4 %) to their grandfathers.

### Procedure and Measures

At the beginning of the Spring semester, the research team conducted multiple visits to 6th grade classrooms at all four schools to distribute envelopes to students. These envelopes contained a letter to their parent or guardian, an IRB-approved description of the study and its potential risks, and a parental consent form. We provided English and Spanish versions of

all documents. Once consent was obtained, we scheduled times to administer the questionnaires to the students either during lunch period or during a non-instructional first period. Questionnaires were available in Spanish and English, and bilingual research assistants were present to answer students' questions.

### Grades

To measure academic achievement, we obtained students' math and language arts grades from the school district for the final 6-week period of the academic year, which was the period during which we administered questionnaires. Grades were reported on a 0–100 point scale and submitted to the schools by teachers after we had collected data from the students.

### Parental Warmth

Students completed the parental warmth subscale of the Memories of Parents questionnaire (EMBU-C; Muris et al. 2003). The subscale consists of ten items measuring frequency of paternal supportive, accepting, and nurturing behaviors toward the child on a 4-point scale from 0 (*no, never*) to 3 (*yes, most of the time*). Sample items include: "My father is interested in my hobbies" (supportive), "My father shows me that he loves me" (nurturing), and "My father likes me just the way I am" (accepting). Students completed this subscale once for each parent with whom they lived (fathers:  $\alpha = .92$ , mothers:  $\alpha = .85$ ). We calculated means of all father items and of all mother items to create father and mother scale scores. Higher scores indicate greater perceived parental warmth.

### Optimism

The Youth Life Orientation Test (YLOT; Ey et al. 2005) is a 14-item questionnaire that measures children's expectations about their future. Sample items include: "When things are bad, I expect them to get better," and "I usually expect to have a good day." Responses range from 0 (*not true for me*) to 3 (*true for me*) on a 4-point Likert-type scale. Cronbach's alpha of the scale in the current study was .78. Scale scores were generated by calculating means of all items, with higher scores reflecting higher optimism.

### Academic Self-Efficacy in Language Arts and Math

These two scales were adapted from the Patterns of Adaptive Learning Questionnaire's (PALS; Midgley et al. 2000) general academic efficacy scale to make them specific to each subject area. Participants responded to five items for language arts and five for math, rating how true each statement was for them on a 5-point Likert-type scale that ranged from 1 (*not at all true*)

to 5 (*very true*). Items were "Even if the [math/language arts] work is hard, I can learn it"; "I can do almost all the work in [math/language arts] class if I don't give up"; "I'm certain I can master the skills taught in [math/language arts] class this year"; "I'm certain I can figure out how to do the most difficult class work in [math/language arts]"; and "I can do even the hardest work in this [math/language arts] class if I try." Internal consistency reliabilities of the scales in the current study were .82 for language arts and .86 for math. Scale scores were the means of all items on each scale, and higher scores reflect greater self-efficacy.

### Academic Determination

Students responded to five items from the Motivational Trait Questionnaire (MTQ; Heggstad and Kanfer 2000) indicating their level of determination and persistence when engaging in challenging school tasks: "I continue working on difficult tasks despite the frustrations I encounter"; "When something I'm working on is hard for me, I keep trying to figure it out"; "It bothers me to leave projects uncompleted"; "When I start a project, I make up my mind to see it through"; and "I often continue to work on a task after everyone else has given up." We obtained permission from the first author to adjust the wording of some items for early adolescents. Response choices ranged from 1 (*very untrue*) to 4 (*very true*) on a 4-point scale ( $\alpha = .83$ ). Means were calculated to generate scale scores, with higher scores indicating greater academic determination.

### Analytic Strategy

The aim of our study was to model the paths from fathers' warmth to adolescents' grades, controlling for mothers' warmth. We first examined the distributions of all variables and determined that they met criteria for normality (Kline 2005). To examine associations between fathers' warmth and adolescents' optimism and academic self-efficacy, controlling for mothers' warmth, we ran partial correlations controlling for mothers' warmth. Because we expected adolescent gender differences in the influence of fathers' warmth, we then ran partial correlation analyses by adolescents' gender. We further investigated these gender differences by running moderation models, with adolescent gender as a moderator of the relations between father warmth and each of the three adolescent positive beliefs: optimism, math self-efficacy, and language arts self-efficacy.

Based on our hypotheses and the results of our correlations and moderation models, we then tested two path models using Stata's SEM Builder to investigate the direct and indirect paths from fathers' warmth to adolescents' grades controlling for mothers' warmth. For each model, the antecedent was fathers' warmth, the first mediator was a positive belief (optimism or

self-efficacy), the second mediator was determination, and the outcome was grades. We then used multigroup path analysis to investigate whether these models differed by gender. Path analysis is a form of Structural Equation Modeling (SEM) in which relations between variables are estimated using observed (rather than latent) values of those variables (Kline 2005; Ullman 2013). Model fit was evaluated with the use of several fit indices:  $\chi^2$ , comparative fit index (CFI), root-mean-square error of approximation (RMSEA), and Akaike information criterion (AIC).

## Results

### Descriptive Findings

Table 1 lists all variable means, both overall and by gender. Paired sample *t*-tests showed that the overall mean for father warmth was significantly lower than the mean for mother warmth,  $t(182) = -5.71, p < .001$ , indicating that adolescents reported their mothers to be warmer, on average, than their fathers. We found significant gender differences in the means of language arts grades,  $t(164) = -3.99, p < .001$ , Cohen's  $d = .60$ , and math grades,  $t(160) = -3.68, p < .001$ , Cohen's  $d = .56$ ; both means were higher for female than for male adolescents. There were no other significant gender differences in the remaining study variables.

To address Hypothesis 1a, which predicted that fathers' warmth would be positively correlated with adolescents' optimism and with both math and language arts self-efficacy (controlling for mothers' warmth), we conducted a partial correlation analyses. We found no significant associations between fathers' warmth and adolescents' optimism nor between fathers' warmth and adolescents' self-efficacy (in math and language arts) in the full sample. To address Hypothesis 1b, that these relations would vary by gender, we conducted partial correlation analyses (controlling for mothers' warmth)

on male and female adolescents separately (see Table 1). Among male adolescents, fathers' warmth was associated with language arts self-efficacy, and among female adolescents, fathers' warmth was associated with optimism. Because fathers' warmth and math self-efficacy were not correlated in either group, math self-efficacy was not included in subsequent analyses.

### Moderation Models

To further address Hypothesis 1b, that there would be gender differences in relations between fathers' warmth and adolescents' optimism, as well as between fathers' warmth and language arts self-efficacy, we ran two moderation models. These models tested interactions between adolescents' gender and fathers' warmth—the first predicting optimism and the second predicting language arts self-efficacy. In the first model, fathers' warmth, adolescents' gender, and the interaction term (father warmth by adolescent gender) accounted for 21 % of the variance in optimism. The addition of the interaction term accounted for a change in  $R^2$  of .02,  $F(1178) = 4.32, p = .04$ . The conditional effect of fathers' warmth on optimism indicates that for male adolescents, higher father warmth is not related to changes in optimism; however, for female adolescents, higher warmth does predict greater optimism,  $F(4, 178) = 2.20, p = .03$ , 95 % CI [.014,.267], controlling for mother warmth.

In the second moderation model, fathers' warmth, adolescents' gender, and the interaction term accounted for 28 % of the variance in language arts self-efficacy. The addition of the interaction term accounted for a change in  $R^2$  of .03,  $F(1172) = 5.94, p = .02$ . The conditional effect of father warmth on language arts self-efficacy shows that for male adolescents, higher warmth predicts greater self-efficacy,  $F(4172) = 3.24, p = .001$ , 95 % CI = [.173,.713]; however, fathers' warmth is not related to changes in self-efficacy for female adolescents, controlling for mothers' warmth.

**Table 1** Means, standard deviations, and partial correlations, controlling for mother warmth, by adolescents' gender ( $N = 183$ )

	Female adolescents ( $n = 102$ ) <i>M</i> ( <i>SD</i> )	Male adolescents ( $n = 81$ ) <i>M</i> ( <i>SD</i> )	Overall ( $N = 183$ ) <i>M</i> ( <i>SD</i> )	Partial correlations						
				1	2	3	4	5	6	7
1. Father warmth	3.39 (.68)	3.44 (.63)	3.42 (.66)	--	.21*	.02	.07	-.01	.05	.02
2. Optimism	3.22 (.48)	3.10 (.46)	3.17 (.48)	-.10	--	.16	.22*	.27**	.11	.14
3. Language arts self-efficacy	4.34 (.71)	4.16 (.79)	4.27 (.75)	.34**	.11	--	.66**	.17	.09	.18
4. Math self-efficacy	4.34 (.83)	4.30 (.73)	4.32 (.78)	.19	.21	.48**	--	.08	.07	.24*
5. Determination	4.84 (.83)	4.77 (.86)	4.81 (.84)	.08	.36**	.27*	.17	--	.37**	.32**
6. Language arts grades	85.82 (6.76)	81.69 (6.94)	84.02 (7.12)	.14	-.12	.23*	.21	.26*	--	.79**
7. Math grades	84.62 (7.53)	80.23 (8.27)	82.69 (8.14)	.01	-.07	.16	.19	.40**	.64**	--

Partial correlations, controlling for mother's warmth, for female adolescents are above the diagonal; for male adolescents, below. Grades range from 0 to 100

\* $p < .05$ , \*\*  $p < .01$

## SEM Path Analysis Models

Our second hypothesis was that adolescents' optimism and self-efficacy would predict their determination (Hypothesis 2a) and that optimism, self-efficacy, and determination would mediate relations between fathers' warmth and adolescents' grades, controlling for mothers' warmth (Hypothesis 2b). To address these hypotheses, we tested two structural models, one for each outcome (math grades, language arts grades). Model 1 proposed an indirect path from fathers' warmth to math grades through the mediators of optimism and determination. Model 2 proposed an indirect path from fathers' warmth to language arts grades through the mediators of language arts self-efficacy and determination. To test whether our two hypothesized models were equivalent across gender (Hypothesis 3), we conducted multi-group SEM using a maximum likelihood method that accounts for missing values (Acock 2013).

### Model 1

Our first SEM analysis tested the following paths: fathers' warmth to optimism to determination to math grades, controlling for mothers' warmth. First we tested a baseline model with all paths unconstrained. This baseline model fit the data moderately well,  $\chi^2 = 5.97$ ,  $df = 4$ ,  $p = .20$ , RMSEA = .07, AIC = 2406.41, CFI = .98. We then ran this model with all paths constrained to be equal,  $\chi^2 = 14.70$ ,  $df = 11$ ,  $p = .20$ , RMSEA = .06, AIC = 2401.14, CFI = .95. We conducted a Chi-square difference test and found that this fully constrained model was not significantly different from the baseline, unconstrained model. An examination of modification indices suggested freeing the path between fathers' warmth and optimism to improve model fit.

We therefore ran the model again with only this first path unconstrained. This analysis produced a  $\chi^2 = 10.18$ ,  $df = 10$ ,  $p = .43$ , and the following model fit indices: RMSEA = .01, AIC = 2398.62, CFI = 1.00. When we compared the fully constrained model with this partially constrained model, we found a significant difference in  $\chi^2$  of 4.52,  $p = .03$ , suggesting that the model allowing for an unconstrained path between fathers' warmth and optimism by gender provides a better fit to the data (see Fig. 1). These results support Hypotheses 2a and

2b, that adolescents' optimism predicts their determination and that optimism and determination mediate relations between fathers' warmth and adolescents' math grades, and Hypothesis 3, that the overall model differs by gender. Specifically, the model fit female adolescents but not male adolescents.

### Model 2

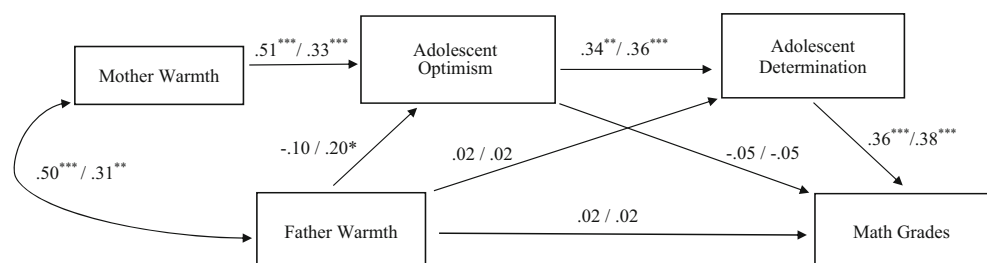
Our second SEM analysis tested the following paths: fathers' warmth to language arts self-efficacy to determination to language arts grades, controlling for mothers' warmth. We first ran a baseline model with all paths unconstrained and obtained a  $\chi^2$  of 3.72,  $df = 4$ ,  $p = .45$ , and the following model fit indices: RMSEA = .00, AIC = 2499.79, CFI = 1.00. We then ran this model with all paths constrained,  $\chi^2 = 14.58$ ,  $df = 11$ ,  $p = .20$ , RMSEA = .06, AIC = 2496.65, CFI = .96. Chi-square analysis indicated that the unconstrained model was not significantly different from the constrained model ( $\Delta\chi^2 = 10.86$ ,  $df = 1$ ,  $p = .15$ ). An examination of modification indices suggested freeing the path between fathers' warmth and self-efficacy to improve model fit, similar to Model 1.

We ran the model again with only this first path unconstrained, obtaining a  $\chi^2$  of 8.37,  $df = 10$ ,  $p = .59$ , and the following model fit indices: RMSEA = .00, AIC = 2492.44, CFI = 1.00. When we compared the fully constrained model with this partially constrained model, we found a significant difference in  $\chi^2$  of 6.21,  $p = .01$ , suggesting that the model allowing for an unconstrained path between fathers' warmth and language arts self-efficacy by gender provides a better fit to the data (see Fig. 2). These results support Hypotheses 2a and 2b, that adolescents' self-efficacy predicts their determination and that self-efficacy and determination mediate relations between fathers' warmth and adolescents' language arts grades, and Hypothesis 3, that the overall model differs by gender. This model fit male adolescents but not female adolescents.

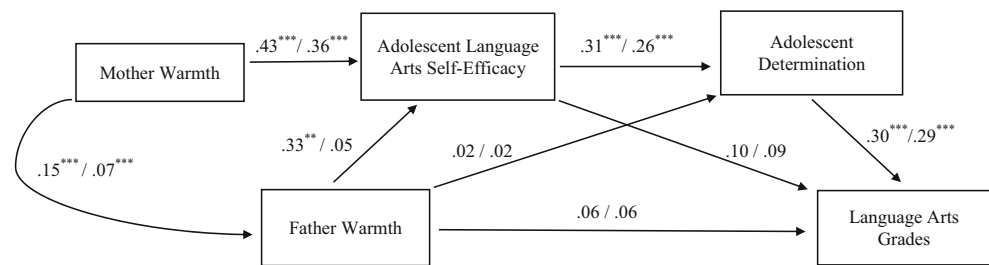
## Discussion

The present study provides new evidence of relations between fathers' warmth and adolescents' achievement through the mediators of adolescents' positive beliefs (optimism and academic self-efficacy) and determination. Our results suggest that low-

**Fig. 1** Standardized path coefficients of the hypothesized Model 1 for male adolescents/female adolescents. \*  $p < .05$ . \*\*  $p < .01$ . \*\*\*  $p < .001$



**Fig. 2** Standardized path coefficients of the hypothesized Model 2 for male adolescents/female adolescents. \*  $p < .05$ . \*\*  $p < .01$ . \*\*\*  $p < .001$



income fathers affect their adolescents' beliefs about themselves and their future, and these beliefs influence their achievement by increasing their determination to persist on school tasks. However, female and male adolescents benefit from their fathers' warmth in different ways. For female adolescents, fathers' warmth predicts optimism; for male adolescents, fathers' warmth predicts language arts self-efficacy. Furthermore, the path from fathers' warmth to math grades through the mediators of optimism and determination was significant only for female adolescents. The path from fathers' warmth to language arts grades through language arts self-efficacy and determination was significant only for male adolescents.

### Gender Differences in Effects of Fathers' Warmth

The findings of gender differences in the effects of fathers' warmth on adolescents' positive beliefs provide further support for the interactionist model of gender socialization (Pomerantz et al. 2004). Although female and male adolescents reported equal amounts of warmth from their fathers, correlations between fathers' warmth and adolescents' beliefs differed by gender. For female adolescents, fathers' warmth affected neither their academic self-efficacy nor their determination directly. The paths from fathers' warmth to those variables always passed through optimism. For male adolescents, the link between fathers' warmth and self-efficacy was direct. Fathers' warmth predicted language arts self-efficacy, which then predicted determination and grades. Thus, the direct effect of fathers' warmth on adolescents varies according to adolescents' gender. Even though in both genders, father warmth ultimately leads to stronger determination and grades.

Applying the interactionist model to these findings suggests that there is something about adolescents' gender that may cause male and female adolescents to experience their fathers' warmth differently, even if fathers are expressing equal amounts to sons and daughters. This finding suggests that gender differences in adolescents' emotions, self-beliefs, and academic behaviors may be attributed to the adolescent, regardless of their father's level of warmth toward him or her. Of course, by the time they reach adolescence, children have already begun constructing their gender schemas and these have been shaped in part by their parents' socialization. It is possible that fathers expressed gender-differential warmth to children when they were much younger and that this gender difference decreased or disappeared by

adolescence. The limited longitudinal research on parental warmth with adolescents shows a slow decline in fathers' warmth reported by both girls and boys across the adolescent years (Rodríguez et al. 2014; Shanahan et al. 2007). Despite this overall decline, however, adolescent boys and girls report similar levels of fathers' warmth during adolescence (Shanahan et al. 2007). Further, even if fathers are equally warm with sons and daughters, they may treat their sons and daughters differently in other ways not measured in our study. However, it is still worthwhile to note that despite not finding gender differences in the means of fathers' warmth and support reported by these adolescents, female and male adolescents responded differently to their fathers' warmth.

Why would fathers' warmth affect academic self-efficacy directly in male adolescents and not in female adolescents? According to gender role theory, children are aware of the roles they are expected to play in society based on their gender (Eagly et al. 2000). Further, gender intensification theory suggests that when children reach puberty, they begin to focus more intensely on their gender identity and on the unique aspects of their gender in contrast with the other gender (Hill and Lynch 1983). At this time, the same-gender parent serves as a role model for the adolescent, providing an example of what it means to be of that gender in his or her culture. It is possible that when boys receive warmth and support from their fathers, this may convey the message that expressing warmth is not incompatible with masculinity, countering the male cultural model of emotional restraint prevalent among Latino families (Fragoso and Kashubeck 2000). Consequently, experiences of fathers' warmth and support may specifically affect their self-concept rather than their overall psychological well-being. Interestingly, in a study of adolescents, Plunkett et al. (2007) found that fathers' support directly negatively predicted depressed mood in female adolescents but not in male adolescents. With male adolescents, the relation between fathers' support and depressed mood was mediated by sons' self-esteem. Our study extends this research into the academic domain, showing that fathers' effects on their sons' self-image may extend to their academic self-efficacy, which then fuels their determination and achievement.

Another interesting finding related to gender differences in the effects of fathers' warmth on academic outcomes is the specific academic domains affected. For female adolescents, fathers' warmth ultimately affects both language arts and math grades whereas for male adolescents, we found support only



for fathers' warmth on language arts grades. Researchers have found that boys tend to have lower self-efficacy in writing and English than girls do and perform less well in English than in math courses (Pajares and Valiante 2001; Wigfield et al. 1991). If fathers' warmth enhances male adolescents' self-efficacy in language arts, finding ways to support fathers' inclinations to express warmth and support to their sons may ultimately contribute to increasing their sons' success in English courses.

Why would fathers' warmth affect optimism in female but not male adolescents? Using gender role theory again, when fathers break from traditional role expectation and evidence high warmth, it is possible that daughters respond to this disruption of stereotype by feeling optimistic that they may also be capable of breaking free from the role they are expected to play as young women. In a recent study, Updegraff et al. (2014) found that fathers with less traditional gender attitudes had daughters with less traditional attitudes. Female adolescents whose fathers are less traditional and warmer may feel less constrained by gendered role expectations. This may heighten their feelings of agency and willingness to pursue male-dominated fields. For example, Leaper et al. (2012) found that adolescent girls with more egalitarian gender beliefs had greater interest in math and science.

The majority of participants in our study were classified as economically disadvantaged and lived in low-income, less safe neighborhoods, thereby increasing the potential for family stress. Thus, another possible explanation for the effects of fathers' warmth on female adolescents' optimism, but not on male adolescents' optimism, is that female adolescents may be more sensitive to family stress. For example, girls are more likely than boys are to report depression in response to marital conflict (Davies and Lindsay 2004). A recent study of ethnic minority urban high-school students found that paternal acceptance affected female adolescents more positively than male adolescents (García et al. 2014). In a study of Mexican origin adolescents, Updegraff et al. (2009) found that when father-adolescent conflict was high, female adolescents were more likely than were male adolescents to engage in risky behaviors. In such cases, experiencing high warmth and support from both their fathers and mothers may buffer the negative effects of conflict on girls. Father warmth may therefore enhance their security and trust, which translates into optimistic beliefs that things will turn out satisfactorily, even in less than favorable circumstances.

### Optimism as a Motivator

As shown in our literature review, very few studies have investigated adolescents' optimism as a predictor of achievement motivation or outcomes. A few researchers have investigated adolescents' hope, rather than optimism, as a mediator of the effects of parental support on academic outcomes. For

example, in a study of 9–14 year-old adolescents and their families (most of whom were White), Padilla-Walker et al. (2011) found that adolescent-reported parent-adolescent connectedness predicted adolescents' hope which then predicted their academic engagement. Our finding that optimism predicts academic motivation extends this research to another future-oriented emotion.

The finding that for female adolescents, optimism predicts academic motivation and achievement may be related to the nature of the population from which our sample was drawn. Adolescents growing up in low-income, ethnic minority families exposed to the stressors of poverty and discrimination may believe they have less power and control over their futures, even if they work hard to achieve. A general optimism that is not tied solely to one's abilities or actions may be a stronger protective factor for these youth, especially when their efforts do not lead to the outcomes for which they had planned. General optimism, especially if fueled by fathers, may enhance adolescents' resilience and determination to persist despite barriers of poverty and fewer role models of their ethnicity in positions of authority.

There is very little research on gender differences in adolescents' optimism, and the few known studies on this topic have yielded equivocal results. A study of bicultural and acculturative stress and optimism in low-income minority youths (median age = 14) found no gender differences in the mean levels of optimism reported (Romero et al. 2007). However, the authors did find gender differences in the *relations* between stress and optimism: Bicultural stress affected female adolescents' optimism but not that of male adolescents. In a study of rural at-risk adolescents, Puskar et al. (2010) found that adolescent girls reported lower optimism than did the boys in their sample of 14–18 year-old high-school students. A 3-year longitudinal study by Patton et al. (2011) offers a possible explanation for these differences. The authors found that whereas boys' optimism remained stable over the 3 years, girls' optimism steadily declined. More longitudinal research is needed to investigate whether fathers' warmth strengthens female adolescents' optimism, or at least prevents declines in their optimism throughout adolescence.

### Fathers' Warmth Is Unique

Among the extremely limited studies of fathers' warmth and adolescents' outcomes, studies that investigate the effects of fathers' warmth controlling for mothers' warmth are virtually non-existent. Ours is one of the first known studies to isolate the effects of fathers' warmth in a sample of low-income, multi-ethnic adolescents and to find that fathers' warmth predicts positive beliefs and academic motivation and achievement. This is an important finding because it confirms that these fathers play a unique and powerful role in adolescents' emotional and academic resilience. To date, only three known

studies have measured the effects of both fathers' and mothers' support on adolescents' academic outcomes in low-income, ethnic minority families (Lowe and Dotterer 2013; Plunkett et al. 2009; Plunkett et al. 2008), and only one of these measured fathers' warmth as a specific type of support.

Lowe and Dotterer (2013) studied 208 urban middle-school students who were predominantly African American as well as Latino and multiracial. They found that parental monitoring decreased incidences of school trouble for these adolescents and that fathers' warmth moderated this relation. Adolescents whose fathers expressed more warmth were even less likely than their peers were to engage in school trouble, and this interaction effect was stronger for male adolescents than for female adolescents. Although mothers' warmth moderated relations between parental monitoring and intrinsic motivation and cognitive engagement, fathers' warmth had no effect on these outcomes. Our study expands this small body of knowledge on the unique effects of fathers' warmth on adolescents' outcomes to the academic domain.

### Limitations and Future Research Directions

Despite the valuable contributions of our study, several limitations must be considered when conceptualizing further research. First, the samples we collected were relatively small and therefore limited the power of our analyses. Related to this limitation is the smaller number of African Americans, which precluded conducting comparisons based on racial/ethnic origin. African Americans and Mexican Americans hold different cultural models for the academic socialization and gender socialization of their children, and these models may vary further across socioeconomic levels. Future studies with larger, more diverse samples would enable us to deepen our understanding of intersections between ethnic and gender socialization and the distinct roles of fathers and mothers in these processes.

Second, because our measure of parents' warmth was based on adolescents' report, we did not have the direct perspectives of fathers on their expressions of warmth toward their children. However, adolescents' perceptions of their parents' warmth are arguably more relevant than are parents' perceptions of their own warmth. Nonetheless, in future research, we plan to collect data directly from fathers and mothers, as well as from adolescents, to gain a more nuanced and global understanding of this construct. This expansion will also shed light on whether fathers and their adolescents share similar perceptions of degrees of warmth, and whether degree of agreement reflects another aspect of the father-child relationship that may predict important child outcomes.

Third, because we collected data at only one point in time, we cannot draw any conclusions about causal relations or directions of relations among variables. It is possible that

adolescents who are more optimistic, efficacious, and high-achieving elicit more warmth from their fathers, or that high achievement engenders optimism in adolescents. In future studies, we intend to collect at least two waves of data to test longitudinal models and determine causality.

Although our study focuses only on fathers' relationships with adolescents, controlling for mothers' warmth, scholars are increasingly finding that relations between fathers' involvement and adolescents' outcomes are mediated or moderated by relations with other adults in adolescents' lives (Cabrera et al. 2007). Fathers' involvement is related to marital relationship quality as well as to mothers' involvement (Bonney et al. 1999), and mothers sometimes regulate and monitor fathers' access to children, especially for non-resident fathers (Fagan and Barnett 2003). Thus, future research on fathers' involvement should consider not only indirect and direct relations, but also interactions of fathers with other adults in their adolescents' lives.

### Practice Implications

Our study has implications for policies aimed at supporting parents and promoting adolescents' health and achievement. The present findings suggest that school counselors and teachers may be able to positively affect their students' self-views, motivation, and achievement by encouraging fathers to openly express warmth and support to their children. The vast majority of parental education and involvement programs are aimed at mothers, yet our study suggests that investing more resources into attracting and retaining fathers in such programs may have a significant impact on adolescents. These programs could include activities aimed at facilitating and encouraging father-adolescent conversations and providing new opportunities for fathers and adolescents to interact in meaningful ways. As children enter the adolescent phase, their fathers may question their role and feel increasing distant from their children. Knowing that, even during this time, their efforts to convey love and acceptance to their children are well worth the effort may give them more confidence to engage in those interactions.

### Conclusions

The evidence from our study demonstrates fathers' unique and meaningful influences on their adolescent children's emotional well-being and academic success. Further, these positive effects extend to both sons and daughters, albeit in different ways. Our findings show that fathers, even if they themselves have not benefitted from high levels of education or do not have sufficient English language skills to help their adolescents complete their homework, can still support their adolescents in ways that result in greater optimism, self-efficacy, and, ultimately, higher achievement.

**Acknowledgments** The present study was funded by a grant from The Spencer Foundation [Grant # 200800101]. Preliminary and partial results of this study were presented at the 2012 biennial meeting of the Society for Research on Adolescence, Vancouver, BC, Canada. We acknowledge the cooperation and generosity of the Austin Independent School District, and various middle school administrators, teachers, students, and their parents.

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