

Exploring Developmental Patterns and Predictors
of Gender-Based Relationship Efficacy

by

Ryan David Field

A Dissertation Presented in Partial Fulfillment
of the Requirements for the Degree
Doctor of Philosophy

Approved April 2017 by the
Graduate Supervisory Committee:

Carol Lynn Martin, Chair
Dawn DeLay
Cindy F. Miller
Kimberly A. Updegraff

ARIZONA STATE UNIVERSITY

May 2017

ABSTRACT

Segregation into own-gender peer groups, a common developmental pattern, has many potentially negative short- and long-term consequences. Understanding the social cognitive processes underlying intergroup processes may lead to a better understanding of, and a chance to improve, intergroup relations between boys and girls; however, until recently gender-typed cognitions have not received a lot of attention. Therefore, in two complementary studies, this dissertation examines developmental patterns and predictors of a particular type of social cognition, gender-based relationship efficacy (GBRE). The first study examines mean-level and interindividual stability patterns of GBRE longitudinally in two developmental periods: childhood and pre-adolescence. Specifically, the first study examined children's and pre-adolescents' GBRE toward own- (GBRE-Own) and other-gender (GBRE-Other) peers over a one-year period. Using a four factor repeated measures analysis of variance, the results indicated that GBRE-Own is significantly higher than GBRE-Other across both cohorts. GBRE-Other, however, increased from childhood to pre-adolescence. Stability and cross-lag effects were examined using a multi-group panel analysis and revealed that GBRE-Own and GBRE-Other were stable. Additionally, high levels of GBRE-Own led to lower levels of GBRE-Other one year later, but high levels of GBRE-Other led to higher levels of GBRE-Own. Implications for understanding segregation processes and suggestions for future research are discussed.

The second study examined potential affective/cognitive, behavioral, and contextual predictors of GBRE-Other in pre-adolescence. Several hypotheses were tested using panel models and regression analyses, but there was limited support. Results

indicated that GBRE-Other predicted more positive attitudes toward other-gender peers and higher preferences for other-gender peer interaction and that, for boys, anxious attitudes toward other-gender peers negatively predicted GBRE-Other and, for girls, parental attitudes toward their children's other-gender friendships negatively predicted GBRE-Other. The lack of significant findings in the second study should be interpreted cautiously. In general, GBRE is an important construct and more research is needed to fully understand the developmental progression and implications.

ACKNOWLEDGMENTS

I would like to acknowledge my advisor and chair, Dr. Carol Martin, for being as committed to my success as I was throughout my time at Arizona State University. I am grateful for the advice, mentorship, encouragement, and opportunities Carol provided which helped me to develop as a writer, critical thinker, and as a researcher. I would also like to thank the members who served on my committee, Drs. Dawn DeLay, Richard Fabes, Cindy Miller, and Kim Updegraff, for their advice and guidance over the past six years and especially during the comprehensive exam and dissertation processes. I am also extremely grateful to my parents, who have always supported and encouraged me to pursue my goals in education.

R.D.F.

TABLE OF CONTENTS

	Page
LIST OF TABLES.....	viii
LIST OF FIGURES.....	ix
GENERAL INTRODUCTION.....	1
STUDY 1: EXPLORING DEVELOPMENTAL DIFFERENCES AND INTERINDIVIDUAL STABILITY IN GENDER-BASED RELATIONSHIP EFFICACY	4
Gender as a Social Category.....	4
Peer Interactions in Childhood and Early Adolescence	6
Importance of Having Diverse Peer Interactions.....	8
Gender-Based Relationship Efficacy	9
Theoretical Perspectives on Gender Differentiated Cognitions.....	11
Behavioral-Cognitive Transactional Model.....	12
Intergroup Contact Theory.....	13
Social Exchange Theory	14
Present Study	17
Hypotheses	19
Method	22
Participants.....	22
Measures	23
Gender-Based Relationship Efficacy Questionnaire (GBRE)	23
Procedure	23

	Page
Analytic Plan.....	24
Results.....	25
Preliminary Results.....	25
Missing Data.....	26
Descriptive Statistics.....	27
Mean-Level GBRE Differences.....	28
GBRE Stability.....	30
Additional Panel Analyses.....	32
Discussion.....	32
Limitations.....	38
Conclusions and Implications.....	40
STUDY 2: PREDICTORS OF GENDER-BASED RELATIONSHIP EFFICACY	
TOWARD OTHER-GENDER INTERACTIONS: EXPLORING AFFECTIVE,	
BEHAVIORAL AND CONTEXTUAL VARIABLES.....	
Pre-Adolescence and the Emergence of Other-Gender Interactions.....	42
Importance of Promoting Other-Gender Interactions and Relationships.....	43
Gender-Based Relationship Efficacy.....	44
Potential Influences on GBRE-Other and Possible Transactional Patterns.....	48
Affective/Cognitive Influences.....	50
Behavioral Influences.....	52
Contextual Influences.....	53
Present Study and Hypotheses.....	55

	Page
Method	57
Participants.....	57
Measures	58
Gender-Based Relationship Efficacy Questionnaire (GBRE)	58
Positive, Negative, and Anxious Intergroup Attitudes	59
Peer Gender Preference.....	59
Other-Gender Friendships.....	60
Parental Values for Diversity in Child’s Friendships	60
Household Composition (Older Other-Gender Siblings)	61
Procedure	61
Analytic Plan.....	62
Results.....	63
Preliminary Analyses and Descriptive Statistics	63
Panel Analyses	64
Affective/Cognitive Predictors of GBRE-Other	64
Behavioral Predictors of GBRE-Other	66
Regression Analyses	66
Contextual Predictors of GBRE-Other	66
Discussion	67
Affective/Cognitive Predictors of GBRE-Other	68
Behavioral Predictors of GBRE-Other	71
Contextual Predictors of GBRE-Other	72

	Page
Limitations and Future Directions	75
GENERAL DISCUSSION	78
REFERENCES	80
APPENDIX	
A ITEMS USED IN THE PRESENT STUDY FROM THE GENDER-BASED RELATIONSHIPS EFFICACY SCALE	113
B SUMMARY OF MULTIPLY IMPUTED DATA SETS.....	115

LIST OF TABLES

Table	Page
1. Demographic Variables by Grade	95
2. Means and Standard Deviations for GBRE-Own and GBRE-Other by Cohort....	96
3. 2 nd /3 rd Grade Correlations between GBRE-Own and GBRE-Other by Gender....	97
4. 4 th /5 th Grade Correlations between GBRE-Own and GBRE-Other by Gender	98
5. Overall Means and Standard Deviations for All Study Variables.....	99
6. Correlations for All Study Variables.....	100

LIST OF FIGURES

Figure	Page
1. Bar Graph Illustrating the Significant Interaction between GBRE and Cohort ...	101
2. Bar Graph Illustrating the Marginally Significant Interaction between GBRE and Time	102
3. Bar Graph Illustrating the Non-significant Three-way Interaction between GBRE, Cohort, and Year	103
4. Fully Constrained Autoregressive, Cross-lagged Path Analysis Across Cohort and Gender.....	104
5. Autoregressive, Cross-lagged Path Analysis where Parameters Were Freed	105
6. Autoregressive, Cross-lagged Path Analysis Testing Hypothesis 1	106
7. Autoregressive, Cross-lagged Path Analysis Testing Hypothesis 2.....	107
8. Autoregressive, Cross-lagged Path Analysis Testing Hypothesis 3.....	108
9. Autoregressive, Cross-lagged Path Analysis Testing Hypothesis 4.....	109
10. Autoregressive, Cross-lagged Path Analysis Testing Hypothesis 5.....	110
11. Regression Analysis Testing Hypothesis 6	111
12. Regression Analysis Testing Hypothesis 7	112

General Introduction

Segregation into own-gender peer groups is a well-documented aspect of children's peer interactions, and preferences for own-gender peers persist throughout the life span (Maccoby, 1998; Mehta & Strough, 2009). In childhood, positive ingroup (i.e., own-gender) biases and negative outgroup (i.e., other-gender) biases can develop, magnifying perceptions (e.g., prejudices and stereotypes) of group differences (Tajfel & Turner, 1979). Group interactional styles and actual behaviors may also become more pronounced (e.g., Martin & Fabes, 2001). In fact, these gender-typed attitudes and behaviors can become so pronounced that it has been suggested that boys and girls grow up in separate cultures, which can be problematic (Maccoby, 1998). However, research has shown that segregation in childhood is not ubiquitous – the amount of time children spend with own- and other-gender peers varies and the degree to which children segregate has important longitudinal implications (Martin & Fabes, 2001) by potentially influencing the success and quality of future other-gender interactions (Field & Martin, 2016).

Moreover, interactions with other-gender peers become increasingly more prevalent and desired as boys and girls enter pre-adolescence – a process referred to as gender integration (Connolly, Craig, Goldberg, & Pepler, 2004; Dunphy, 1963; Feiring, 1999; Montgomery & Sorell, 1998). Although the gendered-nature of developmental *behavioral* patterns (e.g., segregation in childhood and integration during pre-adolescence and adolescence) have been well documented, less is known about the gender-differentiated social cognitions that may relate to or motivate these developmental changes (Martin, 2000; Miller, Martin, Fabes, & Hanish, 2013). Recent research suggests

that not all boys and girls feel as comfortable interacting with other-gender peers as with own-gender peers in pre-adolescence (4th grade) and adolescence (7th and 8th grade), but there is variability in these cognitions – particularly toward other-gender interactions (Zosuls, Field, Martin, Andrews, & England, 2014). One's perceived comfort with and ability to understand and interact with own- and other-gender peers, referred to as gender-based relationship efficacy (GBRE; Zosuls et al., 2014), is an important construct to consider when examining boys and girls peer relationships. For instance, relationship efficacy beliefs about own- (GBRE-Own) and other-gender (GBRE-Other) peer interactions have been shown to be positively associated with social, emotional, and academic outcomes in pre-adolescence and adolescence (Field, Martin, Andrews, England, & Zosuls, *in press*; Zosuls et al., 2014). Therefore, it is important to understand and promote both GBRE-Own and GBRE-Other.

GBRE is a relatively new construct and for that reason, several questions surrounding the developmental patterns and predictors of GBRE have yet to be examined. Therefore, the following studies were conducted with the intention of further exploring: 1) mean-level developmental patterns and stability of GBRE-Own and GBRE-Other; and 2) predictors of GBRE-Other. In the first study, I examined two separate cohorts followed across a one-year period (childhood [i.e., 2nd to 3rd grade] and pre-adolescence [i.e., 4th to 5th grade]). This developmental study was designed to examine: 1) the mean-level developmental patterns of GBRE-Own and GBRE-Other within each cohort (i.e., from 2nd to 3rd grade and from 4th to 5th grade) and between each cohort (i.e., childhood versus pre-adolescence); 2) the stability of GBRE-Own and GBRE-Other

within and between each cohort; and 3) the influence of GBRE-Own and GBRE-Other on each other.

In the second study, I examined predictors of GBRE-Other in pre-adolescence. To date, GBRE has only been examined concurrently with other variables or as a predictor variable (Field et al., *in press*; Zosuls et al., 2014), but because GBRE-Other has been shown to be related to social, emotional, and academic outcomes in pre-adolescence, it is crucial to understand factors that could increase GBRE-Other during a developmental period when other-gender interactions become more desired and prominent. Therefore, the second paper examined cognitive/affective (e.g., attitudes and expectations towards other-gender peers), behavioral (e.g., friendships with other-gender peers), and contextual factors (e.g., presence of older other-gender siblings in the home and parental attitudes toward their children's other-gender friendships) related to experiences with other-gender peers to predict GBRE-Other.

Together, the results from these studies provide a better understanding of the cognitive processes involved in gender-segregation and gender-integration as well as offer further insights into gender-specific social cognitions (i.e., GBRE-Own and GBRE-Other), which, until recently, have received little attention (Andrews, Martin, Field, Cook, & Lee, 2016; Field et al., *in press*; Zosuls et al., 2014). Furthermore, results from these studies may be useful for promoting gender-integration by offering insights into factors that promote positive cognitions toward other-gender peer interactions.

Study 1: Exploring Developmental Differences and Interindividual Stability in Gender-Based Relationship Efficacy

The ability to create cognitive schemas (i.e., categorized mental representations) helps us to more efficiently organize the complex world (Meadows, 2006; Smith & Medin, 1981). Cognitions (i.e., schemas, beliefs) about *social* categories play an important role in everyday life by influencing thoughts and perceptions about others (Bodenhausen, Kang, & Peery, 2012). One of the major ways that cognitions involving social categories influence thoughts and perceptions about others is due to using the self as a reference, which leads to the development of ingroups (i.e., those who share the trait being categorized) and outgroups (i.e., those who differ from the individual on the trait being categorized; Bodenhausen et al., 2012; Tajfel & Turner, 1979). Gender is a salient social category and as such, cognitions about gender are commonly used by individuals to organize the social world (Powlishta, 2004). One recently identified gender-typed belief is called gender-based relationship efficacy (GBRE), which refers to an individual's perceived comfort and confidence in understanding and interacting with own- (GBRE-Own) and other-gender (GBRE-Other) peers (Zosuls et al., 2014). The overall goal in the present study is to expand upon the initial work on this topic by exploring mean differences in both types of GBRE and to examine stability patterns of both types of GBRE over the important developmental periods of childhood and pre-adolescence.

Gender as a Social Category

Although beliefs about social categories can be formed on a variety of characteristics, children typically use the characteristics that are most salient to

themselves (Bigler & Liben, 2006; Turner, 1982). Thus, gender is one of the earliest, and most pervasive, characteristics that children use to create social categories (Maccoby, 1998; Martin & Ruble, 2010). Children are able to distinguish between male and female faces as young as 3 to 4 months of age (Quinn, Yahr, Kuhn, Slater, & Pascalis, 2002) and research shows that as early as 17 months of age, children begin to correctly apply gender labels (Zosuls et al., 2009). According to gender schema theory (Martin & Halverson, 1981; Martin, 1994), once children recognize their own and other individuals' gender category, their behavior and thinking begin to be influenced by the representations they form about males and females, called gender schemas. Creating these gender schemas has several behavioral consequences (Martin & Ruble, 2010). For example, gender schemas and using gender categories leads children to spend more time with gender-typed toys, develop gender-typed interaction and communication styles, and self-segregate into own-gender peer groups (Leaper, 1994; Martin, Ruble, & Szkrybalo, 2002; Zosuls et al., 2009). Furthermore, the more time children spend in gender-segregated groups, the more gender-typed their behaviors become (Martin & Fabes, 2001).

The development of gender schemas also has consequences on thinking and on affective beliefs – gender schema theorists posit that the development of gendered social categories influences the information that boys and girls adhere to and how they interpret that information (e.g., Martin, 2000). For example, children develop knowledge of gender stereotypes at a young age (e.g., boys play rough; Blakemore, Berenbaum, & Liben, 2009) and use these stereotypes to inform their attitudes and expectations towards interactions with own- and other-gender peers (Martin, 2000). In fact, recent research has demonstrated that boys and girls develop differentiated attitudes and expectations toward

own- and other-gender peers (Andrews et al., 2016; Zosuls et al., 2014; Zosuls et al., 2011). For example, children generally have more positive attitudes and expectations towards interactions with own-gender peers compared to other-gender peers (e.g., Andrews et al., 2016; Bukowski, Gauze, Hoza, & Newcomb, 1993; Zosuls et al., 2011). Moreover, own-gender friendships are preferred over other-gender friendships across the lifespan (Mehta & Strough, 2009). Thus, the behavioral and affective consequences of creating gender schemas in early childhood has implications on children's future peer interactions.

Peer Interactions in Childhood and Early Adolescence

Understanding the developmental patterns of children's and pre-adolescent's peer experiences and behaviors could offer insights into how gender-based social cognitions (e.g., GBRE) develop over time. Even before preschool, boys and girls demonstrate a preference for own-gender peers over other-gender peers (e.g., Serbin, Moller, Gulko, Powlishta, & Colburne, 1994); a preference which leads boys and girls to self-segregate into own-gender peer groups (e.g., Maccoby 1998; Ruble, Martin, & Berenbaum, 2006), develop gender-typed play and behaviors (e.g., Goble, Hanish, Martin, & Fabes, 2012; Serbin et al., 1994), and form friendships almost exclusively with own-gender peers (e.g., Feiring, 1999; Kovacs, Parker, & Hoffman, 1996). Within these own-gender peer groups, children are socialized by own-gender peers to follow own-gender norms thereby leading to an avoidance of cross-gender behaviors and interactions with other-gender peers (Maccoby, 1998; McGuire, Martin, Fabes, & Hanish, 2007), which further strengthens own-gender peer preferences. These own-gender peer preferences strengthen throughout childhood (e.g., LaFreniere, Strayer, & Gauthier, 1984; Maccoby, 1998; Maccoby &

Jacklin, 1987; Martin & Fabes, 2001), creating what has been described as a gender-segregation cycle (Martin et al., 2012). Children's propensity to interact with own-gender peers results in boys and girls developing distinct interests, behaviors, and interactions styles (Leaper, 1994; Maccoby, 1998), which has led to the suggestion that boys and girls develop in separate cultures (Maccoby, 1998).

Whereas childhood is characterized as a period of strong gender-typed behaviors and segregation into own-gender groups, pre-adolescence marks a shift in boys' and girls' peer group structure (Feiring, 1999; Poulin & Pedersen, 2007). Although, preferences for own-gender friendships persists throughout adulthood (Bukowski et al., 1993; Mehta & Strough, 2009), pre-adolescence marks an increased interest in other-gender peers, which is then followed by a gradual increase in actual interactions and friendships with other-gender peers in adolescence, often taking place in mixed-gender groups (Dunphy, 1963). For example, research suggests that beginning in pre-adolescence (as early as 10 years old; Herdt & McClintock, 2000), girls and boys begin to think about other-gender peers more often (Bowker, Spence, Thomas, & Gyoerkoe, 2012; Richards, Crowe, Larson, & Swarr, 1998; Tuval-Mashiach, Walsh, Harel, & Shulman, 2008) and then begin to talk about other-gender peers more often (McDonald, Putallaz, Grimes, Kupersmidt, & Coie, 2007). Eventually, this increased interest in other-gender peers leads to more frequent interactions and friendships with other-gender peers (Connolly, Furman, & Konarski, 2000; Feiring, 1999; Lam, McHale, & Crouter, 2014; Poulin & Pedersen, 2007).

Thus, there are considerable differences in terms of interactions and experience with other-gender peers when comparing children and adolescents. For these reasons, we

would expect that social cognitions that concern peer relationships, such as efficacy beliefs, may mirror these patterns of gender segregation to integration with both children and pre-adolescents having high levels of efficacy when interacting with own-gender peers, but pre-adolescents having higher levels of efficacy when interacting with other-gender peers compared to children. Moreover, understanding the stability of social cognitions such as efficacy could offer insight into individual differences in the development of these social cognitions. Again, we would expect that stability patterns of efficacy beliefs to mirror peer experiences in childhood and pre-adolescence such that efficacy beliefs towards own-gender interactions would remain relatively stable throughout development, but efficacy beliefs towards other-gender interactions would be less stable and more prone to fluctuation, particularly in pre-adolescence, based on individual differences in experiences and exposure to other-gender peers (Field & Martin, 2016).

Importance of Having Diverse Peer Interactions

As a result of gender segregation in childhood, boys and girls have little experience or understanding of other-gender interaction styles (e.g., Maccoby, 1998). Given that not all children experience the same level of own-gender socialization, examining variations in this and in the balance of own- and other-gender socialization are illuminating. Children who have both own- and other-gender friends tend to be better adjusted socially (Kovacs et al., 1996). In other words, having both own- and other-gender friends may provide children with more exposure to the intricacies and nuances of both own- and other-gender interaction styles and expectations. For example, other-gender interactions provide insight into, and experience with, the interests, behaviors, and

interaction styles of other-gender peers – an important lesson that may impact the success children and adolescents have in an increasingly diverse world (Connolly & McIsaacs, 2011; Grant, Fried, Parker, & Frese, 2010; Underwood & Rosen, 2009) and in future heterosexual romantic relationships (Collins, 2003; Collins & Sroufe, 1999; LaGreca & Macky, 2007). Other-gender interactions can also serve as a protective factor for children and adolescents who are prone to victimization (e.g., gender atypical youth) or who do not get along with own-gender peers (Bukowski, Sippola, & Hoza, 1999; Pauletti, Cooper, & Perry, 2014; Zosuls, Andrews, Martin, England, & Field, 2016). Therefore, better understanding the social cognitive processes underlying intergroup biases (e.g., gender segregation and own-gender preferences) may lead to a better understanding of, and a chance to improve, intergroup relations between boys and girls.

Gender-Based Relationship Efficacy

One type of social cognition, gender-based relationship efficacy (GBRE), may be particularly important to understanding and improving intergroup processes. Although research on gender-specific social cognitions has only recently emerged, boys and girls report differentiated cognitions toward own- and other-gender peers (e.g., Andrews et al., 2016; Zosuls et al., 2014; Zosuls et al., 2011). For example, Zosuls and colleagues found that pre-adolescents (4th graders) and adolescents (7th and 8th graders) had significantly higher levels of GBRE-Own compared to GBRE-Other (Zosuls et al., 2014).

Interestingly, adolescent girls reported higher GBRE-Own than boys, but no other gender differences emerged (Zosuls et al., 2014). Furthermore, GBRE-Own and GBRE-Other were differentially associated with own- and other-gender friendships and outcome expectancies (Zosuls et al., 2014). That is, for example, GBRE-Own predicted own-

gender friendships, but not other-gender friendships whereas GBRE-Other predicted other-gender friendships, but not own gender friendships.

When considering gendered social cognitions such as GBRE, it is also important to consider the developmental period (Abrams & Rutland, 2008). For example, in childhood, there is a dominant pattern in children's peer interactions and preferences toward own-gender versus other-gender peers (Maccoby, 1998; Mehta & Strough, 2009). However, although own-gender friendship preferences remain consistently high throughout adulthood (Mehta & Strough, 2009), the social dynamics of the peer group begin to shift in early adolescence from gender-segregated peer groups to more gender-integrated peer groups (Dunphy, 1963; Perry & Pauletti, 2011). There are many potential factors that could influence the transition to gender-integrated groups including gendered social cognitions such as GBRE (Field & Martin, 2016). For example, although the study was cross-sectional and not longitudinal, Zosuls and colleagues found that GBRE beliefs appear to follow the behavioral pattern of gender-integration in adolescence – eighth grade participants reported significantly higher GBRE-Other compared to seventh graders (Zosuls et al., 2014), suggesting that older adolescents begin to feel more comfortable and confident in their interactions with other-gender peers. This increased comfort around other-gender peers may have far reaching implications. For example, Field and colleagues found that GBRE-Own was positively related to affective academic outcomes (e.g., classroom community, school liking) in fourth grade; however, GBRE-Other was positively related to affective academic outcomes in fifth grade, but not fourth grade (Field et al., *in press*). Field and colleagues (*in press*) speculated that the increased interest in other-gender peers that emerges around the age of ten (see Herdt &

McClintock, 2000) may explain these developmental patterns, further highlighting the importance of developing positive social cognitions toward both own- *and* other-gender peers (e.g., GBRE-Own and GBRE-Other) and the importance of understanding developmental patterns in GBRE. GBRE offers exciting potential for understanding peer relationships and intergroup processes; however, it is a relatively new construct and several important questions remain about GBRE.

Theoretical Perspectives on Gender Differentiated Cognitions

There is limited information about the development of gender-based social cognitions in general and specifically, GBRE. Therefore, the present study utilizes a perspective that takes into account the developmental differences in children's and pre-adolescent's gendered peer experiences described above to examine gender-specific social cognitions. There is theoretical justification for drawing these parallels between behaviors (i.e., peer interactions) and cognitions (i.e., GBRE). Early explanations of gender segregation focused on behavioral similarities (e.g., Maccoby, 1998; Moller & Serbin, 1996) and perceived cognitive similarities (Barbu, LeManer-Idrissi, & Jouanjean, 2000; Martin, 2000; see Martin, Fabes, & Hanish, 2011 for an overview of explanations), separately. However, more recent gender development theorists have begun to examine the transactional effect of behaviors and cognitions (e.g., Miller et al., 2013); that is, the assumption that behavior change can lead to cognitive changes as well as shifts in cognitions leading to behavioral changes.

In terms of furthering investigation into the development of social cognitions about peers, more research has been conducted about peer interactions (see Ladd, 2005 for a review) than about related and relevant gender-differentiated cognitions (Martin,

2000; Miller et al., 2013). Despite the limited research on gender differentiated cognitions – several theories may offer insight into what to expect regarding the development and stability of GBRE beliefs. In this section, a behavioral-cognitive transactional model (Miller et al., 2013), intergroup contact theory (Pettigrew, 1998), and social exchange theory (Emerson, 1976) are used in conjunction with the established research on gender-based behavioral patterns (i.e., segregation in childhood and integration in pre-adolescence) to hypothesize mean-level and interindividual stability patterns in GBRE-Own and GBRE-Other and developmental differences among children and pre-adolescents.

Behavioral-cognitive transactional model. Some scholars (e.g., Martin et al., 2002; Miller et al., 2013) have proposed a transactional model between behavioral and cognitive processes. They suggest that, on one hand, peer experiences (e.g., gender segregation) play an important role in shaping children’s social cognitions (e.g., stereotypes, expectations, efficacy beliefs) (e.g., Berndt, 1981; Coleman, 2003; Martin et al., 2013). For example, Coleman (2003) found that children who had a stronger attachment to peers also had higher levels of efficacy toward social interactions (e.g., more confidence in, and understanding how to, enact appropriate social behaviors; Bandura, 1997). On the other hand, in line with gender schema theory, scholars suggest that children’s social cognitions influence their behaviors (e.g., Martin, 2000; Martin et al., 2013; Zosuls et al., 2014). For example, Zosuls and colleagues (2014) found that GBRE-Own and GBRE-Other were positively related to own- and other-gender friendships, respectively. In other words, this theory suggests a transactional model in which behaviors influence cognitions and cognitions influence behaviors.

Recently, a study using longitudinal network analyses and intensive observation methods suggested both directions of influence (Martin et al., 2013). In this study, children initially selected playmates who had similar levels of gender-typed play behaviors. In turn, Martin and colleagues (2013) found that socialization by playmates led to increased similarity in levels of gender-typed activities. Although behavioral compatibility contributes to gender segregation in childhood, results from these studies suggest other cognitive and social factors also likely influence segregation into own-gender peer groups (Barbu et al., 2000; Martin, 1994; Martin et al., 2013). If the influence of behaviors on cognitions are bidirectional, own-gender cognitions would likely be higher and more stable than other-gender cognitions, mirroring the increased frequency and stability of own-gender interactions across the lifespan.

Intergroup contact theory. Intergroup contact theory highlights the social-cognitive consequences of segregation between groups (e.g., increased stereotypes and prejudices towards outgroup members) and conversely, the potential benefits of interactions and experience with outgroup members (Pettigrew, 1998). Broadly, intergroup contact theory posits that segregation leads to the development of stereotypes and prejudices towards individuals who are perceived as different (i.e., outgroup members) from the individual's reference group (i.e., ingroup members), but that increased exposure to, and positive experiences with, members of the outgroup reduces the negative effects of segregation and even increases feelings of liking of outgroup members (Pettigrew, Tropp, Wagner, & Christ, 2011; Turner, Hewstone, Voci, Paolini, & Christ, 2007). In an attempt to determine the underlying mechanisms of positive contact effects, Pettigrew and Tropp (2008) conducted a meta-analysis examining mediators of

contact and prejudice reduction. They found three primary mediators – increased knowledge of the outgroup, anxiety reduction, and enhanced empathy. Given these underlying processes, it is likely that children’s perceived comfort and confidence in interacting with own- and other-gender peers (i.e., their GBRE) also mirrors how much experience they have with own- and other-gender peers. Although research based on intergroup contact theory has predominantly focused on the effects of positive contact with racial and ethnic outgroup members, similar findings have also been found with other groups (e.g., sexual orientations; see Pettigrew et al., 2011, for a review). Recently, Halim and colleagues demonstrated the positive effects of contact (i.e., having other-gender friendships) on attitudes toward other-gender peers (i.e., more positive attitudes and fewer stereotypes) in children (Halim, Martin, Andrews, Zosuls, & Ruble, *in progress*).

Social exchange theory. In addition to the transactional model and intergroup contact theory, social exchange theory may help explain potential developmental differences in cognitions between children and pre-adolescents. Social exchange theory posits that all human relationships are formed and maintained by the use of a subjective cost-benefit analysis in which rewards are maximized and costs are minimized (Emerson, 1976). In childhood, the potential costs of interacting with other-gender peers (e.g., getting teased by peers; Thorne, 1992) likely outweigh any perceived benefits. For example, Zosuls et al. (2011) found that both girls and boys expected higher costs of interacting with other-gender peers compared to own-gender peers. Moreover, Andrews et al. (2016) found that overall, children expected to be excluded by their peers if they interacted with other-gender peers.

Early adolescence, however, is a period associated with an increase in social pressure and opportunities for contact with other-gender peers (Feiring, 1999), which might result in a rebalancing of the costs-benefits analysis. Recent research supports this notion. For example, Hand and Furman (2009) examined the costs and benefits that older adolescents associated with non-romantic other-gender friendships, own-gender friendships, and romantic other-gender relationships and found that older adolescents do actively consider benefits (e.g., opportunity to meet other-gender peers) and costs (e.g., confusion over the nature of the relationship) when it comes to other-gender interactions. Even younger adolescents appear to demonstrate a shift in benefit-cost analysis of other-gender interactions. For example, Andrews et al. (2016) found that second graders had higher levels of exclusion expectancies (i.e., expecting to be excluded by peers if they interacted with other-gender peers) compared to fourth graders. These findings suggest that as children move into adolescence there is a rebalancing of costs and benefits of social interactions with own- and other-gender peers, and also that gender-typed beliefs that develop from gender segregation may not carry over into adolescence.

Based on these theories, children's and adolescent's gendered behavioral patterns (e.g., gender segregation and gender integration) may serve as useful guides for understanding their gender-based social cognitions. Given the pattern of gender segregation in early childhood, followed by gender integration in pre-adolescence, it is important to consider the consequences and developmental patterns of segregation on gender-based social cognitions such as GBRE. How then do these theories relate to developmental patterns and stability of GBRE? From a behavioral-cognitive transactional perspective, GBRE beliefs should mirror the behavioral patterns present in childhood and

early adolescence. That is, in childhood when own-gender interactions dominate children's social experiences, boys and girls are likely more confident and comfortable with own-gender peers. Thus, GBRE-Own is likely high relative to GBRE-Other. Intergroup contact theory and social exchange theory also support this notion: Children have more contact with own-gender peers (Maccoby, 1998) and thus should have more positive feelings and expect fewer costs associated with own-gender interactions.

With the increased interest in, and exposure to other-gender peers in pre-adolescence, the behavioral-cognitive transactional model would suggest that gender-based social cognitions should, again, mirror the behavioral patterns of integration. Therefore, as pre-adolescents gain more experience with other-gender peers, their efficacy toward other-gender peers (i.e., GBRE-Other) should also increase. Again, intergroup contact theory and social exchange theory support this notion – more positive contact with other-gender peers in the form of mixed-gender interactions and increasing benefits associated with other-gender interactions should increase cognitions such as GBRE-Other. Because of the potential individual variation in the amount of time spent with other-gender peers prior to pre-adolescence, interindividual differences in GBRE-Other are likely to be less stable compared to both GBRE-Own in pre-adolescence and GBRE-Own and GBRE-Other in childhood.

Interesting insights might also be gained about how one type of social cognition influences the development of another. In other-words, does GBRE-Own influence GBRE-Other and vice versa? Ideally, boys and girls would feel efficacious or have positive expectations in both own- and other-gender peer interactions given these beliefs can influence important outcomes such as attitudes toward school in mixed-gender

contexts (e.g., Andrews et al., 2016; Field et al., *in press*). On one hand, it is plausible that gender-differentiated social cognition such as GBRE (i.e., GBRE-Own and GBRE-Other) positively influence each other in a way that having high-efficacy on one domain is associated with high efficacy on the other domain. For example, Kovacs and colleagues (1996) found that children with both own- and other-gender friends were better adjusted socially which might suggest that some children are generally more competent regardless of the interaction partner. On the other hand, it is plausible that efficacy in one domain could negatively influence efficacy in another domain. For example, boys and girls who are high on GBRE-Own presumably spend more time with own-gender peers (e.g., Zosuls et al., 2014). Based on the gender-segregation cycle and intergroup contact theory, more time with own-gender peers could exacerbate real and perceived differences between own- and other-gender peers resulting in fewer other-gender interactions and lower GBRE-Other. Moreover, boys and girls who are higher on GBRE-Other might be more efficacious overall and more comfortable in mixed-gender settings which could further increase GBRE-Own over time.

Present Study

The present study addressed three questions regarding the development of GBRE by utilizing a short-term longitudinal study that examined GBRE beliefs in two cohorts – children and pre-adolescents. The first question pertained to mean-level patterns of GBRE-Own and GBRE-Other in childhood and pre-adolescence. Are there mean-level differences between GBRE-Own and GBRE-Other, and are the differences between GBRE-Own and GBRE-Other consistent in childhood and pre-adolescence? Prior research on mean-level developmental patterns of GBRE (i.e., Zosuls et al., 2014)

examined between-cohort differences in levels of GBRE-Own and GBRE-Other, but not within-cohort patterns (i.e., not longitudinally). Furthermore, Zosuls and colleagues (2014) examined boys and girls who were in the same developmental period (i.e., 7th and 8th grade adolescents), whereas the present study compares boys and girls from two separate developmental periods (i.e., childhood and pre-adolescence).

Although the present study does not directly assess own- and other-gender friendships or the amount of time spent with own- and other-gender peers, answering these questions gives insights into whether or not the developmental patterns of GBRE-Own and GBRE-Other reflect the developmental patterns of other social cognitions (e.g., expectancies of inclusion/enjoyment; Andrews et al., 2016) and the developmental patterns of gendered peer interactions (e.g., gender-segregated interactions in childhood to gender-integrated interactions in early adolescence; Dunphy, 1963).

The second question this study addressed pertains to stability patterns of GBRE-Own and GBRE-Other. Do GBRE-Own and GBRE-Other show similar types of stability over time, and are stability patterns of GBRE-Own and GBRE-Other similar in childhood and pre-adolescence? Answering these questions provides information about the influence of individual differences in the development of social cognitions. High levels of stability would suggest that GBRE follows a uniform, or normative, pattern for all boys and girls; however, low levels of stability in GBRE beliefs could suggest that individual differences (e.g., prior experience with own- or other-gender peers, contextual influences, and/or biological differences; see Field & Martin, 2016) influence GBRE beliefs.

Although there is limited research on gender-based social cognitions, particularly on GBRE, to guide these investigations, this study utilized several theoretical approaches in

conjunction with prior research on the behavioral (i.e., peer interactions) patterns of children (i.e., gender segregation) and adolescents (i.e., gender integration) to answer the questions outlined above.

The third question pertains to cross-lag relations between the two types of GBRE; in particular, how earlier high levels of GBRE-Own may minimize development of GBRE-Other a year later, and how earlier high levels of GBRE-Other may enhance development of later GBRE-Own. These patterns would lend support to the gender-segregation cycle by demonstrating the negative consequences of developing strong ingroup biases and how early other-gender efficacy may promote positive outcomes and represent a general sense of efficacy. To clarify, having high GBRE-Own in itself is not detrimental (in fact, there are many positive associations of having high GBRE-Own; Field et al., *in press*; Zosuls et al., 2014), but if it leads to less time spent and comfort with other-gender peers it could become detrimental over time.

Finally, boys and girls differ in many ways in terms of their peer relationships processes (e.g., behavioral/play styles, social cognitive styles, closeness/self-disclosure with peers) (Rose & Rudolph, 2006). Interestingly however, Zosuls and colleagues (2014) found limited evidence for gender differences in GBRE-Own and GBRE-Other in their cross-sectional study of pre-adolescent and adolescent participants. However, because GBRE has not been explored in younger cohorts or longitudinally, the present study further explored potential gender differences in mean-level and stability patterns of GBRE-Own and GBRE-Other.

Hypotheses

The first goal of the present study was to examine mean-level developmental differences between children's and pre-adolescent's GBRE-Own and GBRE-Other. In childhood, children's peer relationships are predominantly segregated by gender (Maccoby, 1998; Mehta & Strough, 2009), but as children enter adolescence the dynamics of the peer group begin to change such that other-gender interactions become more desired and prevalent (Dunphy, 1963; Herdt & McClintock, 2000) (although own-gender interactions remain high into and throughout adulthood; Mehta & Strough, 2009). Therefore, using a repeated-measures analysis of variance (RM-ANOVA), the first hypothesis (H1) was that GBRE-Own would be higher than GBRE-Other, regardless of cohort or year. However, it was also expected that a developmental change would occur and the discrepancy between GBRE-Own and GBRE-Other would be contingent upon cohort and time. Specifically, for the GBRE by Cohort effect, I expected that (H2) the pattern would be less pronounced for the pre-adolescent cohort compared to the younger cohort because of having higher GBRE-other, thereby the difference between the two would be smaller for the pre-adolescent cohort. Moreover, I expected a 3-way interaction of GBRE by Cohort by Time, in which, it was expected that (H3) the pre-adolescent cohort would demonstrate an increase in GBRE-Other from Year 1 to Year 2 of the study due to increasing interests in other-gender peers (e.g., Dunphy, 1963; Herdt & McClintock, 2000), but that younger cohort would not demonstrate a change in GBRE-Other as they remain in predominantly gender-segregated groups. Finally, although not specifically hypothesized, gender was included as an additional factor in the RM-ANOVA in order to explore potential gender differences in GBRE-Own and GBRE-Other.

The next set of hypotheses pertained to the interindividual stability of GBRE-Own and GBRE-Other and the cross-lag relations, and were tested using multi-group autoregressive and cross lag panel analyses within a structural equation modeling (SEM) framework. Based on the theoretical perspectives described above in conjunction with evidence that gender segregation is stable in childhood (Martin & Fabes, 2001), the fourth hypothesis (H4) was that, overall, in both cohorts, GBRE-Own would exhibit interindividual stability, but GBRE-Other would not be stable. As with the first set questions on mean-level differences, developmental differences were expected. Specifically, I expected that the stability of GBRE-Other would be dependent on cohort. That is, (H5) GBRE-Other was expected to be more stable in childhood when segregation is still strong (mirroring the stable behavioral patterns of gender segregation; Martin & Fabes, 2001), compared to pre-adolescence when other-gender interactions begin to emerge and are influenced many individual differences (e.g., prior experience, contextual factors, and biological factors) (Field & Martin, 2016).

Additionally, the cross lag paths in the panel analyses (i.e., the path from GBRE-Own to GBRE-Other and the path from GBRE-Other to GBRE-Own) were explored. Because higher levels of GBRE are associated with friendships (e.g., GBRE-Own is positively correlated with own-gender friendships; Zosuls et al., 2014), from a gender-segregation cycle and intergroup contact perspective, it was hypothesized that (H6) higher levels of GBRE-Own would predict lower levels of GBRE-Other one year later. Finally, (H7) higher levels of GBRE-Other were expected to predict higher levels GBRE-Own given children who are comfortable and confident with other-gender peers may be more efficacious and social skilled in general. Although not specifically hypothesized,

multi-group analyses were conducted to test for gender differences in parameter estimates in the proposed model.

Method

Participants

Data were collected as part of two-year longitudinal study designed to investigate children's gendered attitudes and beliefs. Participants were recruited from 19 2nd grade classrooms and 18 4th grade classrooms within eight elementary schools in a large city in the Southwestern United States. All students from these classrooms were invited to participate (2nd grade: $N = 394$; 4th grade: $N = 422$). All students who received parental consent (50%) also provided assent and were included in the study. The Year 1 sample included 206 2nd grade students ($M_{age} = 7.15$ years, $SD = .51$, 50.5% girls) and 206 4th grade students ($M_{age} = 9.13$ years, $SD = .51$, 44.2% girls). Participants were contacted and tested one year later (Year 2) in 3rd and 5th grade (3rd graders: 77% retention, $M_{age} = 8.38$, $SD = .59$, 52% girls; 5th graders: 74% retention, $M_{age} = 10.30$, $SD = .46$, 46% girls), respectively.

Overall, participants were from relatively diverse ethnic backgrounds (55% White, 18% Latino/Hispanic, 5% Asian, 5% Black, 3% Native American, 1% Pacific Islander, 13% other [including bi- or multi-ethnic]). Overall, the sample represented middle-class families with 83% of mothers and 74% of fathers reporting at least some college education, and an average household income range of \$51-75,000. Additional demographic information listed by grade is presented in Table 1. Attrition analyses (nonparametric chi-square tests and t-tests) indicated that participants who left the study

after Year 1 did not differ from participants who remained in the study on demographic variables or study variables (all p 's > .05).

Measures

Gender-Based Relationship Efficacy Questionnaire (GBRE). Participant's gender-based relationship efficacy was assessed using an adapted version of the GBRE (Zosuls et al., 2014). The GBRE consists of seven items, repeated such that children are separately asked about their efficacy for interacting with girls and with boys. Because of developmental differences, the 2nd/3rd grade cohort completed a shortened version of the GBRE, which consisted of four of the original seven items (i.e., items 2, 3, 5, and 7 reported in Zosuls et al., 2014 and in Appendix A). In order to more accurately compare cohorts, only those four items were used for the 4th/5th grade cohort (the 4-item own- and other-gender scales were very highly correlated with the full own- and other-gender 7-item scales in Year 1 and Year 2, r 's > .96, p 's < .001). For both cohorts, responses were averaged into girl/boy scales and recoded to own-gender/other-gender scales to create separate scores for GBRE-Own and GBRE-Other. Reliabilities for the 4-item GBRE-Own scale were $\alpha = .75, .78, .91,$ and $.87$ for 2nd, 3rd, 4th, and 5th grade, respectively. Reliabilities for the 4-item GBRE-Other scale were $\alpha = .83, .86, .90,$ and $.86$ for 2nd, 3rd, 4th, and 5th grade, respectively.

Procedure

Approval for the study was first received at the school district level and then school principals were contacted and informed about the study. If the school principals agreed to participate, teachers within their school were contacted and asked to help recruit children by sending information home to parents. To compensate schools for their

involvement in the study and their time, monetary compensation was provided (\$100 per school). Parents who provided consent were also asked to fill out a parent questionnaire which included child demographic information. Both a Spanish and English consent and questionnaire packet were provided. Parents received a small monetary compensation for participating (\$20). Teachers of participating students were also asked to complete questionnaires on each participating students' behaviors and academic ability (teacher variables were not used in the present study). Teacher's received monetary compensation for each questionnaire that they completed (\$20 per questionnaire completed). In Year 2, participants were contacted and then their new 3rd/5th grade teachers were contacted and informed about the study. If participants had switched schools and could be contacted, the new school principals and teachers were contacted and informed about the study.

In both Year 1 (2nd grade and 4th grade) and Year 2 (3rd grade and 5th grade), students' who received parental consent and provided assent completed questionnaires at school in small, mixed-gender, groups of three to five students, supervised by a trained research assistant. Pre-training of the scales and checks were built in throughout the questionnaire to ensure understanding of all measures. Questionnaires were completed in the Fall semester of each year and took approximately 45 minutes to complete. To account for order effects, four versions of the survey were used with the order of the measures and items within the measures varied in each version. Participants were given a small gift (e.g., a school logo pencil).

Analytic Plan

First, preliminary analyses were conducted in SPSS v. 23 to test normality assumptions and to examine potential missing data issues. Next, I computed descriptive

statistics and correlations for all study variables overall and by gender. Finally, after accounting for missing data, I tested the first main research question (Hypotheses 1-3) by conducting a four-factor RM-ANOVA in SPSS v. 23. All significant interactions were further examined using simple-effects analyses. For all significant main effects, interactions, and simple effects tests, effect size was examined using partial eta-squared (η_p^2) where .01 indicates small effects, .06 indicates medium effects, and .14 indicates large effects (Cohen, 1988). I tested the second and third main research questions (Hypotheses 4-7) using a multi-group autoregressive, cross lagged panel analysis in *Mplus* 7.11 (Muthén & Muthén, 1998-2014). Several full and constrained models were compared using log-likelihood ratio tests in order to test for cohort and gender differences.

Results

Preliminary Results

Before conducting analyses, skew and kurtosis for GBRE-Own and GBRE-Other were examined. For GBRE-Own, the skew was more than three and the kurtosis was more than eight for both cohorts at both time points (i.e., Year 1 and Year 2), which exceeds the range for a normal distribution (Tabachnick & Fidell, 2001). An examination of histograms and frequency charts suggest that GBRE-Own is negatively skewed. GBRE-Other was normally distributed. Although GBRE-Own was not normally distributed, ANOVAs are not as sensitive to non-normal data compared to other analyses and several simulation studies have shown that Type 1 error rate (i.e., false positives) are rarely affected by the violation of the normality assumption (e.g., Clinch & Keselman, 1982; Harwell, Rubinstein, Hayes, & Olds, 1992; Keppel & Wickens, 2004; Lix,

Keselman, & Keselman, 1996; Sawilowsky & Blair, 1992). Non-parametric tests can be used in the presence of non-normal data for one-way designs; however, they are much less useful for more complex designs (e.g., repeated measures ANOVAs; Keppel & Wickens, 2004). In more complex designs, homogeneity of variance is a more serious problem (Keppel & Wickens, 2004). Fortunately, the homogeneity of variance assumption was met for both GBRE-Own and GBRE-Other at both time points. Levene's test indicated equal variances, $F(3, 307)$ ranged from .59 to 1.95, p s were not significant. Furthermore, Hypotheses 3 and 4 were conducted in *Mplus* using a full information maximum likelihood estimator with robust standard errors, MLR (Muthén & Muthén, 1998-2014), which is used to handle missing and non-normal data.

Missing Data

There was very little item-level missing data. However, 23% of the 2nd grade cohort and 26% of the 4th grade cohort were missing all data from Year 2 of the study (3rd and 5th grade, respectively) due to attrition. As mentioned, participants who attrited from the study did not differ from those who participated in both data collections on demographic or study variables (see Method section). If data are missing completely at random (MCAR), missing data will not introduce bias (although standard errors of the sample estimates will be inflated due to reduced sample size) (Dong & Peng, 2013; van Ginkel & Kroonenberg, 2014). The most common test for MCAR is Little's MCAR Test. In the case of a non-significant p -value for Little's MCAR test, data can be assumed to be MCAR and missingness will not affect the results (Garson, 2015). In the present dataset, Little's MCAR test was conducted and was not significant, $\chi^2(2) = .76, p = .69$.

Although data passed the MCAR test, precautionary multiple imputation (MI) analyses were conducted in SPSS (v. 23) to compare the results of the original dataset which had missingness with five datasets with imputed values and thus, no missingness. A comparison of the RM-ANOVA results and means for GBRE-Own and GBRE-Other from the original dataset and each of the imputed datasets revealed very few differences (see Tables B1 and B2 in Appendix B). One drawback of MI in SPSS is that imputed datasets and results are not pooled for RM-ANOVAs. Therefore, the data file with the imputed data sets was restructured so that each individual participant was listed on a row and each variable (original and imputed) was listed as a column. For each participant, an average score was calculated for GBRE-Own and for GBRE-Other by averaging each of the five imputed GBRE-Own and GBRE-Other variables, respectively. The RM-ANOVA which tested Hypotheses 1 and 2 was then conducted in SPSS using the averaged variables, resulting in no missing data. Hypotheses 3 and 4 were conducted in *Mplus* using MLR estimation. Under the assumption of MCAR (and Missing at Random, MAR), MLR estimation uses all available data for each participant and protects against Type 1 error rate and nonnormality (Little & Rubin, 2002; Rhemtulla, Brosseau-Liard, & Savalei, 2012; Savalei, 2010).

Descriptive Statistics

Means and standard deviations for study variables (overall and split by gender) are presented in Table 2, separately by cohort. Zero-order, bivariate correlations were also conducted separately for girls and boys by cohort to assess the relations between GBRE-Own and GBRE-Other (See Table 3 and 4). Results indicated different patterns by gender and cohort. In the 2nd grade cohort, girls' GBRE-Own in Year 1 was positively

correlated with GBRE-Other in Year 1 and GBRE-Other in Year 1 was positively correlated with GBRE-Other in Year 2. For boys, GBRE-Own in Year 1 was positively correlated with GBRE-Own in Year 2 and GBRE-Other in Year 1 was positively correlated with GBRE-Own and GBRE-Other in Year 2.

In the 4th grade cohort, girls' GBRE-Own in Year1 was positively correlated with GBRE-Own in Year 2, GBRE-Other in Year 1 was positively correlated with GBRE-Other in Year 2, and GBRE-Own in Year 2 was positively correlated with GBRE-Other in Year 2. For boys, GBRE-Own in Year 1 was positively correlated with GBRE-Other in Year 1 and GBRE-Own in Year 2, GBRE-Other in Year 1 was positively correlated with GBRE-Other in Year 2, and GBRE-Own in Year 2 was positively correlated with GBRE-Other in Year 2.

Mean-Level GBRE Differences

A 2 (GBRE: own vs. other) x 2 (Cohort: 2nd/3rd grade vs. 4th/5th grade) x 2 (Time: Year 1 vs. Year 2) x 2 (Gender: girl vs. boy) RM-ANOVA was conducted in SPSS (v. 23) to test Hypotheses 1-3. As hypothesized (H1), results revealed a main effect of GBRE with participants reporting significantly higher GBRE-Own ($M = 3.47, SE = .03$) than GBRE-Other ($M = 2.28, SE = .05$), with a large effect size, $F(1, 405) = 567.40, p < .001, \eta_p^2 = .58$. This indicates that, on average across all grades, participants reported higher GBRE-Own compared to GBRE-Other. However, this effect was dependent upon Cohort and Time (described below). There was also a significant main effect for Cohort with the 4th grade cohort ($M = 2.93, SE = .04$) reporting higher GBRE (collapsed across GBRE-Own and GBRE-Other) than the 2nd grade cohort ($M = 2.81, SE = .04$), $F(1, 405) = 5.71,$

$p < .05$, $\eta_p^2 = .01$. The main effects of Time ($F [1, 405] = .36$, $p = .55$) and Gender ($F [1, 405] = .24$, $p = .63$) were not significant.

The interaction between GBRE and Cohort, ($F [1, 405] = 11.27$, $p = .001$, $\eta_p^2 = .03$) was significant. Simple effects tests were conducted to assess whether the effect for GBRE was significant in each cohort. Supporting the first hypothesis (H1), within-cohort comparisons revealed that both the 4th/5th grade cohort ($F [1, 405] = 209.47$, $p < .001$, $\eta_p^2 = .34$) and 2nd/3rd grade cohort ($F [1, 405] = 369.11$, $p < .001$, $\eta_p^2 = .48$) had higher GBRE-Own than GBRE-Other. Further simple effects tests were conducted to assess how cohorts differed. Consistent with the second hypothesis (H2), GBRE-Other was found to be significantly higher for the 4th/5th grade cohort ($M = 2.42$, $SE = .07$) compared to the 2nd/3rd grade cohort ($M = 2.14$, $SE = .07$), $F (1, 405) = 9.07$, $p = .003$, $\eta_p^2 = .02$, while the 4th/5th grade cohort ($M = 3.43$, $SE = .04$) and 2nd/3rd grade cohort ($M = 3.48$, $SE = .04$) did not differ on GBRE-Own, $F (1, 405) = .73$, $p = .39$. Therefore, GBRE-Own was higher than GBRE-Other at each time point and GBRE-Other was higher in the 4th/5th grade cohort compared to the 2nd/3rd grade cohort. See Figure 1.

There was also a significant interaction between GBRE and Time, $F (1, 405) = 5.23$, $p < .05$, $\eta_p^2 = .01$. Simple effects tests indicated that there was not a significant difference between GBRE-Own in Year 1 ($M = 3.48$, $SE = .04$) and Year 2 ($M = 3.43$, $SE = .03$), $F (1, 405) = 1.43$, $p = .23$ (collapsed across cohorts). However, GBRE-Other was marginally significantly higher in Year 2 ($M = 2.33$, $SE = .05$) compared to Year 1 ($M = 2.23$, $SE = .06$), $F (1, 405) = 2.91$, $p = .09$, $\eta_p^2 = .01$. Additional follow-up tests indicated that GBRE-Own was higher than GBRE-Other in Year 1 ($F [1, 405] = 358.23$, $p < .001$,

$\eta_p^2 = .47$) and Year 2 ($F [1, 405] = 459.26, < .001, \eta_p^2 = .53$). See Figure 2. There were not any other significant 2-way interactions.

The GBRE x Cohort x Time interaction, which specifically tested the third hypothesis (H3) by examining differences in GBRE-Own and GBRE-Other by Cohort and Time, was not significant, $F (1, 405) = .01, p = .94$ (see Figure 3). Although there was a significant interaction between GBRE and Cohort (collapsed across Time) as well as GBRE and Time (collapsed across Cohort) (both interactions are described above), the hypothesized increase of GBRE-Other from 4th to 5th grade (but not 2nd to 3rd grade) was not significant. Interestingly however, an examination of GBRE-Other means (overall means column in Table 2) indicate that GBRE-Other means increase during the year for both 2nd and 4th grade cohorts. There were not any other 3-way interactions between any combination of GBRE, Cohort, Time, and Gender, $F_s (1, 405) = .01$ to $2.42, p_s = .12$ to $.94$. Finally, there was not a 4-way interaction between GBRE, Cohort, Time, and Gender, $F (1, 405) = .24, p = .63$.

GBRE Stability

In order to test Hypotheses 4-7, structural equation modeling in *Mplus 7* (Muthén & Muthén, 2014) was used to assess the stability of GBRE-Own and GBRE-Other from Year 1 to Year 2 and the cross lag effects. Multi-group autoregressive, cross-lagged analyses were conducted and parameters were estimated using MLR. In each model, GBRE-Own from Year 2 was regressed on GBRE-Own from Year 1 and GBRE-Other from Year 2 was regressed on GBRE-Other from Year 1 (autoregressive paths) and GBRE-Other from Year 2 was regressed on GBRE-Own from Year 1 and GBRE-Own

from Year 2 was regressed on GBRE-Other from year 1 (cross-lagged paths). At each time-point, GBRE-Own and GBRE-Other were allowed to correlate.

To compare stability of GBRE-Own and GBRE-Other between cohorts, a multi-group analysis was conducted in which a model where all parameters were allowed to be free (unconstrained) was compared to a model where parameters were constrained to be equal across cohorts. In the unconstrained model, the model was fully saturated; thus, chi-square and fit indices (e.g., SRMR, CFI, RMSEA) were not available, but nested models were compared using -2 times the log likelihood difference, which is interpreted as a chi-square test (Little & Rubin, 2002). In the unconstrained model, the log likelihood value was -1857.20 with 28 degrees of freedom. In the fully constrained model the log likelihood value was -1861.03 with 22 degrees of freedom. The log likelihood ratio test revealed that the constrained model was not a significantly worse fit than the unconstrained model, $\chi^2(6) = 7.66, p = .26$. Therefore, the more parsimonious model was used to interpret path coefficients.

In the model, the autoregressive paths for both GBRE-Own ($b = .21, p < .01$) and GBRE-Other ($b = .41, p < .001$) were significant. Partially supporting the fourth hypothesis (H4) which stated that GBRE-Own would be stable, but GBRE-Other would not be stable, this finding suggests interindividual stability among participants (Total N = 409; 2nd grade cohort N = 203 and 4th grade cohort N = 206) on both GBRE-Own and GBRE-Other from Year 1 to Year 2. Moreover, because the parsimonious model was used, the fifth hypothesis (H5), which stated that GBRE-Other would be more stable among the younger cohort compared to the older cohort, was not supported.

The cross-lagged paths were also significant. Supporting the sixth hypothesis (H6), the path from GBRE-Own to GBRE-Other was significant and negative ($b = -.12, p < .05$) suggesting that a one-unit increase in GBRE-Own in Year 1 predicted a .12 decrease in GBRE-Other in Year 2. Finally, supporting the seventh hypothesis (H7), the path from GBRE-Other to GBRE-Own was significant and positive ($b = .08 p < .05$) suggesting that a one-unit increase in GBRE-Other in Year 1 predicts a .08 increase in GBRE-Own in Year 2. See Figure 4.

Finally, multi-group analyses were also conducted to examine gender differences separately by cohort and overall; however, path coefficients did not differ for girls and boys. In all models testing gender differences, the models with free parameters did not fit the data better than models where parameters were constrained to be equal between boys and girls.

Additional panel analyses. Although the more parsimonious (fully constrained) model combining all participants fit the data well, additional multi-group analyses revealed interesting developmental patterns. For example, when comparing cohorts, contrary to the fourth hypothesis GBRE-Other was stable for both the 2nd grade cohort ($b = .38 p < .001$) and 4th grade cohort ($b = .43 p < .001$), but GBRE-Own was only stable for the 4th grade cohort ($b = .30 p < .01$) and not the 2nd grade cohort ($b = .10 p = ns$). See Figure 5.

Discussion

Studies that differentiate cognitions toward own- and other-gender peers are limited. However, recent findings suggest that it is important to differentiate between how children and adolescents perceive own- versus other-gender peers and peer

interactions (e.g., Andrews et al., 2016; Zosuls et al., 2014) and there are important implications for school and friendship outcomes associated with these differentiated cognitions (Andrews et al., 2016; Field & Martin, 2016; Field et al., *in press*). In this study, focus was on gender-based relationship efficacy (GBRE). GBRE is an important construct to explore because it may offer insight into the gender-segregated nature of children's interactions and friendship group preferences.

There are also limited developmental studies focusing on gender-based social cognitions. Zosuls and colleagues (2014) examined GBRE in different pre-adolescent and adolescent cohorts (i.e., 4th, 7th, and 8th grade), but did not assess GBRE longitudinally or in younger cohorts. Understanding developmental patterns of social cognitive processes starting earlier in childhood may help explain why the transition to mixed-gender groups and other-gender interactions can be uncomfortable or more difficult for some boys and girls. Therefore, in the present study, I looked to further advance our understanding of GBRE by examining two important developmental aspects of GBRE-Own and GBRE-Other in childhood and pre-adolescence: 1) mean-level patterns of GBRE-Own and GBRE-Other, and 2) stability and cross-lag patterns of GBRE-Own and GBRE-Other. Examining both mean-level group patterns and interindividual stability of GBRE offers informative and complimentary insight into the developmental patterns of GBRE (see Bornstein, Putnick, & Esposito, 2017). Moreover, answering these questions provides insight into factors that might facilitate – or hinder – both own- and other-gender interactions and expectations.

In the first set of hypotheses, mean-level differences in GBRE-Own and GBRE-Other were explored. The results indicated both between-cohort and within-cohort

differences. Overall GBRE-Own was significantly higher than GBRE-Other; however, as expected this effect was dependent upon cohort and time. In both of the significant two-way interactions, GBRE-Own was higher than GBRE-Other regardless of cohort or time. In other words, GBRE-Own was higher than GBRE-Other at each time point. These findings, and findings from previous research on GBRE (Zosuls et al., 2014), demonstrate a consistent pattern from childhood through adolescence – GBRE-Own is consistently higher than GBRE-Other. This is not surprising given the gendered nature of peer interactions and preferences. In fact, this mirrors the patterns of peer gender preference for friendships, which is consistently in favor of own-gender friendships (Mehta & Strough, 2009). From an intergroup contact theory (Pettigrew, 1998) and behavioral-cognitive transactional approach (e.g., Miller et al. 2013), it is not surprising that children and pre-adolescents are more comfortable around own-gender peers because most children spend more time with own-gender peers compared to other-gender peers (Maccoby, 1998).

Moreover, the older cohort had higher GBRE-Other than the younger cohort, but this effect was not dependent upon time. In other words, overall, pre-adolescents reported higher GBRE-Other than children, but the expected increase in GBRE-Other from 4th to 5th grade in the pre-adolescent cohort was not found to be significant. In their study, Zosuls and colleagues (2014) found that even a one-year difference between 7th and 8th grader cohorts led to higher reported GBRE-Other in the 8th grade cohort. Perhaps the time between 4th and 5th grade was not long enough to detect a significant increase in GBRE-Other in the pre-adolescent sample, as that is likely the earliest boys and girls would start to demonstrate an interest in other-gender peers (Herdt & McClintock, 2000).

That said, it is interesting to note that the means for GBRE-Other from 2nd through 5th grade did increase over the course of a year for each cohort.

Based on the findings from the present study, it appears that social cognitions such as GBRE follow similar gender-differentiated developmental patterns as actual peer interactions and friendships. However, research on intergroup contact theory would suggest that children's early patterns of gender-segregation should perpetuate into adulthood. That is, own-gender peer preferences and beliefs about the outgroup (i.e., other-gender peers) should become more engrained over time unless positive intergroup contact is occurring (Pettigrew, 1998). Therefore, although not specifically measured or examined in the present study, increased exposure to other-gender peers may lead to more positive attitudes and expectancies and lower anxiety toward other-gender peers and peer interactions (Pettigrew, 1998). Our sample was selected from mixed-gender classrooms – even if children and pre-adolescents were not seeking other-gender interactions, simply being exposed to other-gender peers in a classroom setting over time could increase their comfort and understanding of other-gender peers (Field et al., *in press*). Moreover, what is interesting and different about applying intergroup contact theory to gender-based ingroups and outgroups compared to more commonly researched race/ethnicity ingroups/outgroups is that there is a biological factor that may encourage heterosexual boys and girls to initiate other-gender interactions (Herdt & McClintock, 2000). It is possible that increased interest in other-gender peers could lead to increased contact with other-gender peers – research shows that interest in pre-adolescence precedes actual interactions (Bowker et al., 2012; Richards et al., 1998). However, it is

also possible that the increased interest may act similarly to contact by improving the view of the outgroup.

It is also possible that the gradual increase in GBRE-Other over time could be due to normal developmental increases in cognitive flexibility and older children and adolescent's ability to better evaluate individual situations rather than relying on broad categories (Augoustinos & Rosewarne, 2001; Devine, 1989). Research on gender-typed attitudes and cognitions (e.g., gender stereotyping) appear to follow this curvilinear pattern of increased rigidity in early childhood followed by increased flexibility in late childhood and early adolescence (see Halim, 2016 for a review). Clearly there is a need to disentangle all of the potential biological, affective, behavioral, and contextual factors that could influence and interact with social cognitive beliefs regarding gender such as GBRE (Field & Martin, 2016).

Although no specific hypotheses were tested, potential gender differences were explored. Zosuls and colleagues (2014) found that in their adolescent cohorts (7th and 8th graders combined), girls reported higher GBRE-Own than boys, but there were no other significant gender differences. Zosuls et al (2014) speculated that because girls may experience more intimacy and self-disclosure in their friendships when they reach adolescence than boys (e.g., Furman & Rose, 2015) they may also experience more comfort and understanding with own-gender peers (i.e., GBRE-Own). It is interesting then that, in the present study, gender differences were not significant in the child and pre-adolescent cohorts. It is possibly that there were potential ceiling effects with relation to GBRE-Own in the present study, but it is also possible that gender differences in

relation to closeness with peers that emerge in adolescence (Furman & Rose, 2015) has not yet emerged in the child and pre-adolescent cohorts that were examined in this study.

In addition to consistent mean-level differences between GBRE-Own and GBRE-Other, the results of the present study also suggest that cognitions toward both own- and other-gender peers are stable. As expected, GBRE-Own was stable; however, contrary to expectations, GBRE-Other was also stable and the cohorts did not significantly differ as evidenced by the non-significant multi-group model results. Although there were only two time points, these analyses indicate interindividual stability over a one-year period for both GBRE-Own and GBRE-Other. In other words, children and pre-adolescents who were higher relative to their cohort on GBRE-Own and GBRE-Other in Year 1 of the study, remained higher on GBRE-Own and GBRE-Other, respectively, in Year 2 of the study relative to their cohort. That said, this type of measure of stability (homotypic – stability between the same measure) is considered a more liberal, upper bound, estimate of stability due to methodological issues such as practice effects and shared method variance (see Bornstein et al., 2017). Additionally, with only two time points it is only known that rank order was stable, but it was unknown if the magnitude in individual differences changed (i.e., differences between individuals could have increased from Year 1 to Year 2 or the differences between individuals could have become narrower among participants, but the rank order remained the same). That said, with only knowing the rank order it is difficult to speculate further. Finally, although it was expected that the cohorts examined in the present study would reveal developmental shifts in gender-based cognitions (which they did for GBRE-Other), it is possible that the one-year interval between assessments was too short to reveal changes in interindividual stability.

Cross lag paths in the panel analyses were also explored and revealed an interesting pattern. First, higher GBRE-Other in Year 1 of the study predicted higher GBRE-Own in Year 2 of the study, which may suggest that there is an overall social efficacy factor. That is, some children and pre-adolescents may be more comfortable in social situations in general (or regardless of their peer's gender). This interesting pattern may also indicate a breakdown of the segregation cycle, perhaps to a gender integration cycle where increasing integration leads to better overall social competencies. Second, higher GBRE-Own in Year 1 predicted lower GBRE-Other in Year 2. Perhaps this finding is indicative of own-gender socialization and the gender-segregation cycle (Maccoby, 1998; Martin et al., 2012). Although this study showed that at the group-level, mean-levels of GBRE-Other increased from childhood to pre-adolescence, there may be important individual characteristics that influence GBRE-Other. As boys and girls spend more time with own-gender peers and become more entrenched in own-gender behaviors and attitudes, they become less comfortable with other-gender peers. Perhaps children who are more rigid in their gender-typed beliefs (e.g., gender enforcers; Miller et al., 2013) are unable to overcome their early gender-typed beliefs. It would be interesting to explore this relation further in future research to see if these gender enforcers are able to overcome this pattern.

Limitations

The present study had several strengths; specifically, this study offers further insight into gender-differentiated social cognitions which could help explain gender segregation processes by examining two distinct cohorts longitudinally across a one-year period. Examining both mean-level changes and stability patterns offers a more complete

and nuanced understanding of the development of GBRE-Own and GBRE-Other. Despite these strengths, this study is not without limitations. Although we further demonstrated the importance of distinguishing between own- and other-gender social cognitions, a more fine-tuned measure of GBRE might offer a more accurate understanding of the complex nature of children's and adolescent's social cognitive processes. For example, in the present study, there was a potential ceiling effect for GBRE-Own – nearly all participants in both cohorts rated GBRE-Own extremely high. Although ubiquitous high GBRE-Own scores is not unreasonable given the amount of time boys and girls spend with own-gender peers, a more detailed measure that assesses context (e.g., playground, classroom, or neighborhood), whether the interaction is in a group or one-on-one setting, whether the interaction is face-to-face or online (e.g., texting or social networking), and whether the interaction is self-initiated or teacher/parent/peer facilitated (e.g., a teacher assigns the child to work with an own- or other-gender peer) may increase the variability in both own- and other-gender interactions. A latent variable may provide the most accurate estimates of GBRE-Own and GBRE-Other by accounting for these different contexts and settings.

Although we were able to follow participants over a one-year period and were able to collect data on two cohorts in 2nd and 5th grade, it would have been helpful to track the same participants for a longer period or to have had a wider gap between cohorts (e.g., childhood and later adolescence). The cohorts in the present study (i.e., childhood and pre-adolescence) were selected because it was thought that this would be a pivotal period when gender-typed cognitions would be in process of shifting from more rigid, gender-typed cognitions to flexible cognitions (Halim, 2016; Herdt & McClintock,

2000). That said, it is difficult to know exactly when changes might occur so following the same participants for longer periods would increase the accuracy of detecting when cognitions begin to shift. Moreover, in and of itself, having two time points is not a limitation, but additional questions and individual-level information can be assessed using growth curve models, which typically require at least three assessments. Finally, given the fact that data was collected from several classrooms and schools, multilevel modeling may have been able to account for school and classroom level variance. However, the data in the present study did not meet the suggested requirements for conducting multilevel analyses regarding participants per cluster or number of clusters (e.g., Bryk & Raudenbush, 1992; Kreft, 1996; Kwok et al, 2008).

Conclusions and Implications

The goal of the present study was to better understand the construct of gender-based relationship efficacy by examining mean-level development, interindividual stability, and cross-lag patterns longitudinally in two cohorts. Better understanding of social cognitions such as GBRE could offer insight into factors that lead to segregation and help researchers and educators promote gender integration at an early age. Reducing gender-based intergroup biases and increasing efficacy at an early age may help facilitate other-gender interactions later on, which could be beneficial not only for more harmonious romantic relationships, but also for other facets of everyday life when other-gender encounters may happen (Connolly & McIsaac, 2011; LaGreca & Macky, 2007). Although both GBRE-Own and GBRE-Other were stable in the present study, GBRE-Other does appear to increase from childhood to pre-adolescence (GBRE-Own remains high and stable from childhood to pre-adolescence). Moreover, stability does not mean

that there is a lack of unexplained variance (Bornstein et al., 2017) so given the potential benefits associated with higher levels of GBRE-Other and the increasing interest in other-gender interactions in pre-adolescence there is a need to examine potential predictors of GBRE-Other.

Study 2: Predictors of Gender-Based Relationship Efficacy Toward Other-Gender Interactions: Exploring Affective, Behavioral and Contextual Variables

The benefits of friendships throughout the lifespan are well documented (see Furman & Rose, 2015 for a review); this is especially true during pre-adolescence and adolescence when peers begin to take on a more predominant and complex role in adolescents' lives (Brown, 2004). Often, adolescents select friends who are similar to themselves in terms of race, gender, age, socioeconomic status, and other demographic characteristics, a process referred to as homophily (McPherson, Smith-Lovin, & Cook, 2001). However, adolescents who have diverse friendships are exposed to unique beliefs, attitudes and behaviors, which provide them with opportunities to broaden their social perspectives and understanding of the world (Kovacs et al., 1996; Graham, Munniksmma, Juvonen, 2014; Park, Denson, & Bowman, 2013). One facet of friendship diversity, gender (i.e., having friendships with both own- and other-gender peers), has not received much attention outside of romantic relationships (e.g., Sippola, 1999) or concerning the negative aspects related to having other-gender friendships (e.g., increased substance abuse and risky sexual behaviors) (e.g., Poulin, Denault, & Pedersen, 2011). However, other-gender friendships can also be beneficial, particularly during pre-adolescence and adolescence when they become more frequent and desired (DeLay, Field, Sechler, Martin, & Hanish, 2017; Field & Martin, 2016; Monsour, 2002).

Despite the increased interest in other-gender peers in pre-adolescence, many girls and boys have had limited interactions with the other gender in childhood and thus, may not feel as confident and comfortable when interacting with other-gender peers (Field & Martin, 2016; Zosuls et al., 2014). If pre-adolescents do not feel comfortable with or do

not know how to interact with other-gender peers, it could limit their success with, or ability to initiate and maintain friendships with other-gender peers (Field & Martin, 2016; Zosuls et al., 2014). Therefore, it is important to increase pre-adolescents' comfort and ability to relate to and understand other-gender peers, which is referred to as gender-based relationship efficacy toward other-gender peers (GBRE-Other) (Zosuls et al., 2014). GBRE is a relatively new construct and has only been examined concurrently or as a predictor of other variables (e.g., Field et al., *in press*; Zosuls et al., 2014). Therefore, the major goal of the present study is to examine potential affective/cognitive, behavioral, and contextual predictors of GBRE-Other during the critical developmental period of pre-adolescence as well as to explore a potential transactional relationship between GBRE-Other and these variables. Additionally, because peer relationship experiences and processes differ between genders (e.g., girls are more prosocial and boys are more competitive), which can lead to behavioral and emotional consequences for both boys and girls (see Rose & Rudolph, 2006), potential gender differences are explored.

Pre-Adolescence and the Emergence of Other-Gender Interactions

Adolescence is a transitional period known for significant physical, cognitive, social, and emotional changes (Lerner & Steinberg, 2009). In terms of social changes, adolescents begin to place more emphasis and importance on peer relationships than they did in childhood (Brown, 2004; Rubin, Bukowski, & Parker, 2006). One of the hallmarks of adolescents' peer relationships is the development of other-gender friendships and romantic interests and thus, a transition occurs from predominantly own-gender peer groups in childhood to mixed-gender peer groups (e.g., Connolly & McIsaac, 2011; Dunphy, 1963). However, some scholars suggest this transition begins earlier, in pre-

adolescence, which is a separate developmental period that precedes adolescence and begins with the physical and psychological changes that typically start prior to the teenage years (around ages 9 – 12) (e.g., Corsaro, 2005). For example, adrenarche, or the maturation of the adrenal glands, which occurs around the age of 10 in boys and girls has been hypothesized to lead to increased romantic interest and attraction (see Herdt & McClintock, 2000 and McClintock & Herdt, 1996). Moreover, certain psychological changes may also contribute to this peer group shift. For instance, Halim (2016) suggested that social-cognitive development, including the development of gender-typed social cognitions, follows a curvilinear pattern in which infants' and preschool aged children's cognitions (e.g., gender typing and stronger own-gender preferences) become increasingly rigid, followed by a period of decreasing rigidity around ages 6-10. This decreased rigidity (and thus, increased flexibility) in children's gender-typed cognitions may allow boys and girls the opportunity to engage in behaviors they would have previously deemed socially unacceptable (e.g., interacting with an other-gender peer). In fact, several studies have supported this notion. For example, boys and girls begin to think about and talk about other-gender peers (Bowker et al., 2012; McDonald et al., 2007; Richards et al., 1998; Tuval-Mashiach et al., 2008) prior to actually interacting with other-gender peers in adolescence. Therefore, actual interactions with other-gender peers that generally begin in, and increase throughout, adolescence, are preceded by thoughts and interests in other-gender peers in pre-adolescence.

Importance of Promoting Other-Gender Interactions and Relationships

When boys and girls begin initiating cross-gender interactions, they may not be well-equipped to handle interactions with other-gender peers despite their increased

interest in them (Field & Martin, 2016; Maccoby, 1998). In childhood and pre-adolescence, many boys and girls spend a significant portion of their play time in own-gender dyads or groups (e.g., Martin & Fabes, 2001; Mehta & Strough, 2009; Richards et al., 1998). Within these own-gender interactions, boys and girls are socialized and develop gender-typed behaviors, interests, and interaction styles, which results in them developing in what has been described as separate cultures (Leaper, 1994; Maccoby, 1998). Developing in separate cultures can be problematic for males and females in terms of social functioning in mixed-gender societies in childhood (e.g., schools) and in adulthood (e.g., workplaces) (e.g., Fabes, Martin, Hanish, Galligan, & Pahlke, 2015; Fabes, Pahlke, Martin, & Hanish, 2013; Halim, 2016; Lee, Lawson, & McHale, 2015; Maccoby, 1998; Underwood & Rosen, 2009). In the short-term, for example, Underwood and Rosen (2009) suggest that interactions with other-gender peers can be frustrating when boys and girls expect the other-gender peer to behave in ways they are used to from their own-gender interactions. This may be especially frustrating for girls, who typically tend to be more accommodating to boys' interests and activities in mixed-gender groups (McDougall & Hymel, 2007), potentially putting them at a disadvantage in other-gender friendships (Furman & Rose, 2015; Rose, 2007). Likewise, boys might benefit more than girls from other-gender friendships because boys are more likely to seek and receive help from other-gender friends compared to girls (Sears, Graham, & Campbell, 2009). Moreover, Fabes and colleagues (2013) found that adolescents who spent more time in gender-segregated classrooms had stronger negative gender stereotypes at the end of the school year. These problems continue into the future: in a long-term longitudinal study, gender-typed interests in early adolescence were linked to gender-stereotypical

occupation selection in adulthood, which contributed to gender-based occupational segregation (Lee et al., 2015). Therefore, it appears that gender-segregation and the gender-differentiated attitudes and beliefs that develop within these own-gender peer groups in early childhood have both short- and long-term consequences across several domains.

Many of the studies of other-gender interactions and friendships have focused on negative consequences associated with spending time with other-gender peers (e.g., higher substance abuse, risky sexual behavior, internalizing problems, lower grades), especially for girls with older other-gender friends (e.g. Mrug, Borch, & Cillessen, 2011; Poulin et al., 2011; Stattin, Kerr, Mahoney, Persson, & Magnusson, 2005). However, other-gender interactions and friendships, particularly with same-age/grade other-gender peers, may serve many important concurrent and long-term benefits for pre-adolescents (DeLay et al., 2017; Field & Martin, 2016; Monsour, 2002).

The benefits of own-gender friendships including companionship, higher self-esteem, and higher social competence are well documented (e.g., Furman & Rose, 2015). Similar to own-gender friendships, other-gender friendships also help reduce loneliness and increase companionship in adolescence (Furman & Shaffer, 1999; Grover, Nangle, Serwik, & Zeff, 2007; Hand & Furman, 2009). Moreover, pre-adolescent and adolescent boys and girls with same-aged other-gender friends reported higher levels of self-esteem (Darling, Dowdy, Van Horn, & Caldwell, 1999; Kuttler, La Greca, & Prinstein, 1999; Thomas & Daubman, 2001) and had higher levels of peer acceptance and social competence (Bukowski, Panarello, & Santo, 2016; Delay et al., 2017). Additionally, similar to own-gender friendships, other-gender friendships may also serve as a

protective factor for some youth (Smith & Leaper, 2006), especially for adolescents who do not get along with own-gender peers (Bukowski et al., 1999). For example, for young adolescents prone to victimization and exclusion (e.g., gender atypical youth; Pauletti et al., 2014), having an other-gender friend can serve as a protective factor by attenuating the negative consequences often associated with feeling atypical by increasing a sense of belongingness in social situations (Master & Walton, 2013; Smith & Leaper, 2006).

There are also many benefits unique to having other-gender friendships and interactions. Increased other-gender interactions offer the potential to broaden boys' and girls' perspectives (Field & Martin, 2016). For example, other-gender interactions provide experiences and perspectives that may be new to adolescents (Grover et al., 2007). These experiences may be new because, for many children, they will have spent so much of their early years in segregated own-gender groups where they formed gender-specific interests, behaviors, and interaction styles (Bukowski et al., 1993, Maccoby, 1998). As such, having a more diverse group of friends (e.g., a mixed-gender group) in childhood and pre-adolescence and learning how to relate and adapt to different interaction expectations based on the gender of the peer are important developmental tasks that likely have implications for success in a variety of contexts and situations (e.g., mixed-gender schools or romantic relationships) (Connolly & McIsaac, 2011; Grant et al., 2010; Underwood & Rosen, 2009). For example, middle schools in which other-gender interactions were more frequent also had lower levels of aggression compared to middle schools with less gender integration (Faris & Felmlee, 2011). Moreover, adolescent girls with other-gender friends also reported more interest in STEM careers (Robnett & Leaper, 2013) and both boys and girls with other-gender friends had higher

perceived academic ability beliefs and higher grades compared to boys and girls with only own-gender friends (Delay et al., 2017).

Finally, other-gender interactions play an important role in the immediate and long term success of romantic relationships for heterosexual youth (e.g., Leaper & Anderson, 1997). For example, adolescents who have more other-gender friends reported lower dating anxiety than adolescents without other-gender friends (LaGreca & Macky, 2007) and anxiety related to other-gender interactions and romantic relationships can have negative long-term consequences in adulthood (e.g., romantic dysfunction) (Collins, 2003; Collins & Sroufe, 1999).

Gender-Based Relationship Efficacy

To help minimize the potential obstacles that adolescents face when initiating other-gender interactions and developing other-gender friendships in adolescence, it may be helpful to promote and facilitate other-gender interactions in pre-adolescence (Miller et al., 2017). Research and theory (e.g., Allport, 1954; Bandura, 1986; Martin, 2000; Zosuls et al., 2014) suggest that, due to own-gender biases and lack of experience with other-gender peers, children and pre-adolescents may have lower levels of confidence and more concerns when interacting with other-gender peers compared to own-gender peers. Thus, one factor that might be particularly influential in facilitating the transition to other-gender interactions and mixed-gender groups is gender-based relationship efficacy beliefs toward other-gender peers (GBRE-Other). In fact, research shows that in pre-adolescence, GBRE-Other is positively related to other-gender friendships (Zosuls et al., 2014) and to holding stronger feelings of classroom community in mixed-gender classrooms (Field et al., *in press*). However, GBRE is a relatively new construct and thus

far has only been examined concurrently with other variables or as a predictor variable (e.g., Field et al., *in press*; Zosuls et al., 2014), meaning little is known about what influences the development of GBRE.

Gender-based relationship efficacy is conceptually related to Bandura's (1982) concept of self-efficacy and expands upon the domain of social self-efficacy, which refers to the ability to initiate and maintain relationships (Smith & Betz, 2000). Social self-efficacy has been shown to be an important predictor of behaviors related to positive social relationships (e.g., shyness and conflict resolution skills) (Field, Tobin, & Reese-Weber, 2014; Smith & Betz, 2000). However, research on social self-efficacy is limited because it fails to distinguish between intergroup interactional contexts (e.g., own-gender and other-gender peer interactions) (Zosuls et al., 2014). Because of children's differential experience with own- and other-gender peers (see above), it is important to distinguish between their efficacy toward own-gender interactions (GBRE-Own) and their efficacy with other-gender interactions (GBRE-Other) (Zosuls et al., 2014).

The importance of separately assessing efficacy toward own- and other-gender peers has been empirically demonstrated: Zosuls and colleagues (2014) and Field (Study 1) found that, overall, GBRE-Own beliefs were significantly higher than GBRE-Other beliefs in childhood through adolescence. Despite this overall difference, there is individual variability on these measures. For example, children and adolescents who were more comfortable and confident in their other-gender interactions (i.e., higher GBRE-Other) had more other-gender friends and were more comfortable and successful in mixed-gender school settings (Field et al., *in press*; Gest & Rodkin, 2011; Jennings & Greenberg, 2009; Zins & Elias, 2007; Zosuls et al., 2014). Given the benefits of having

higher efficacy toward other-gender interactions and thus, more frequent interactions with other gender peers, it is important to understand factors that might increase efficacy beliefs, particularly toward other-gender interactions, in pre-adolescence when other-gender interactions become more desired and prevalent (e.g. Dunphy, 1963).

Potential Influences on GBRE-Other and Possible Transactional Patterns

Self-efficacy is influenced by various personal, social, and contextual variables (Bandura, 1997). Because more general self-efficacy is predicted by a variety of variables, it is possible that this is also the case for GBRE. For that reason, in the present study, affective/cognitive (e.g., positive, negative, and anxious attitudes and expectations toward other-gender peers and other-gender peer preferences), behavioral (e.g., friendships with other-gender peers), and contextual (e.g., parental beliefs about friendship diversity and presence of older other-gender siblings in the home) variables will be examined as potential influences of GBRE-Other in pre-adolescence. Importantly, the relation between GBRE-Other and many of the variables examined (specifically, the affective/cognitive and behavioral variables) may be transactional. That is, pre-adolescents' GBRE-Other may influence their attitudes and behaviors towards other-gender peers and these attitudes and behaviors may in turn influence their GBRE-Other beliefs.

Affective/cognitive influences. Cognitive theories of gender development (Martin & Halverson, 1981; Martin, 2001) explain how cognitive beliefs and expectations influence children's social judgments and peer experiences (Martin, 1994; Martin, Fabes, Hanish, Leonard, & Dinella, 2011). Therefore, it is plausible that the affective attitudes, expectancies, and preferences pre-adolescents hold towards other-

gender peers influences their efficacy towards other-gender interactions (GBRE-Other). Likewise, since GBRE is a cognitive belief, this may relate to other beliefs such that pre-adolescents' GBRE-Other may also influence their attitudes and expectations about and preferences for other-gender interactions. For example, from an intergroup contact theory perspective (Pettigrew, 1998), negative expectations (e.g., fear of getting teased by peers or feeling anxious) about other-gender interactions are likely to diminish confidence and comfort in interactions with other-gender peers whereas positive other-gender expectations (e.g., being included by other-gender peers) are likely to increase confidence and comfort with other-gender peers (e.g., Barlow, Louis, Hewstone, 2009; Davies, Tropp, Aron, Pettigrew, & Wright, 2011; Leaper, 1994; Zosuls et al., 2014). In turn, lower confidence and comfort with other-gender peers is likely to perpetuate negative expectations and decrease preferences towards other-gender peers whereas higher confidence and comfort with other-gender peers is likely to increase positive perceptions towards other-gender peers (Miller et al., 2013). In fact, although not directly tested, correlational studies support this idea. For example, Zosuls and colleagues (2014) found that for both girls and boys, GBRE-Other was negatively correlated with expectancies of being teased for interacting with other-gender peers and feelings of discomfort about other-gender interactions and positively correlated with positive expectations about other-gender interactions (i.e., being included by other-gender peers). Examining these beliefs and the potential transactional relations among them extends earlier research on gender beliefs and also may give insights into how different types of beliefs are organized as representations, thereby informing gender theory development. In the present study, the transactional relations between pre-adolescents' GBRE-Other and their positive,

negative, and anxious expectations toward other-gender interactions and their preferences for other-gender peer interactions will be examined.

Behavioral influences. Social information processing theory (Crick & Dodge, 1994) suggests and provides empirical evidence that children's prior social experiences influence how they interpret their peer encounters, the expectancies they form about peer interactions, and the degree of confidence they have in enacting particular behaviors with peers. Furthermore, intergroup contact theory (Pettigrew, 1998) illustrates how interactions with members outside one's own group improves attitudes. Based on these principles, exposure to peers should influence adolescents' beliefs about peers. Considering the limited experiences most pre-adolescents have with other-gender peers, it is not surprising that they have significantly lower GBRE-Other beliefs compared to GBRE-Own beliefs (Zosuls et al., 2014). Avoiding situations or activities (e.g., other-gender interactions) perpetuates low self-efficacy beliefs, which can create self-fulfilling prophecies of failure, whereas positive experiences and practice can gradually increase efficacy beliefs (Bandura, 1994). For example, and consistent with intergroup contact theory, in a meta-analysis examining interactions with cross-group friends (they did not specifically examine gender as a grouping variable) and cognitions toward outgroup members, Davies and colleagues (Davies et al., 2011) found that time spent with outgroup peers was a strong predictor of positive attitudes toward outgroup peers. More specifically, Zosuls and colleagues (Zosuls et al., 2014) found a strong, positive correlation between GBRE-Other and other-gender friendships. Therefore, it appears that increased positive exposure to other-gender peers may increase pre-adolescents' expectancies of comfort with other-gender peers.

Likewise, based on cognitive theories of gender development (Martin, 1994), it is also plausible that having higher GBRE-Other would also increase the frequency of other-gender interactions resulting in a bidirectional, or transactional, process. For example, Halim and colleagues (2017) found a bidirectional link between young adolescents' other-gender friendships and attitudes and stereotypes toward other-gender peers. Specifically, having other-gender friendships predicted more positive and less negative attitudes toward other-gender peers and, the reverse pattern was also found; young adolescents with more positive and less negative attitudes toward other-gender peers had more other-gender friendships (Halim et al, 2017). In the present study, the transactional relationship between pre-adolescents' GBRE-Other and their other-gender friendships were examined.

Contextual influences. The family is considered to be an important context for gender development and socialization (Leaper & Bornstein, 2002; McHale, Updegraff, Helms-Erikson, & Crouter, 2001; McHale, Updegraff, & Whiteman, 2012). In the present study, two aspects that tap into family context will be assessed: the influence of having older other-gender siblings and parental attitudes toward diversity in children's friendships on GBRE-Other will be examined. Much of the research on familial influences on gender socialization has been rooted in social learning theories, which posits that siblings and parents serve as role models from which children adopt masculine or feminine qualities (McHale et al., 2012). However, it is also plausible from an intergroup contact perspective (Pettigrew, 1998), that regardless of whether or not boys and girls adopt masculine or feminine qualities from their parents or siblings, the mere exposure to these other-gender behaviors and interaction styles may influence their

GBRE-Other – similar to the expected influence of exposure to other-gender peers on GBRE-Other described above.

For example, although children and pre-adolescents predominantly select own-gender friends (Martin & Fabes, 2001; Mehta & Strough, 2009; Richards et al., 1998), having other-gender siblings, particularly older other-gender siblings, could provide insights and experience with other-gender interaction styles (Field & Martin, 2016; McHale et al., 2001; Updegraff, McHale, & Crouter, 2000) and reduce traditional gender-typed behaviors and characteristics (e.g., Perez-Brena, Wheeler, Updegraff, & Schaefer, 2015). For example, Ickes and Turner (1983) found that college-aged men who had older sisters exhibited behaviors more typical of female-typical conversational styles. Moreover, McHale and colleagues found that siblings, particularly younger siblings, adopted the gender-typed attitudes and behaviors of their older, opposite-gender siblings (McHale et al., 2001). Therefore, if children are exposed to older other-gender siblings and peers (e.g., when the sibling's friends come over to the house), they may have higher comfort with the other gender (i.e., higher GBRE-Other). However, the research on the influence of siblings on peer interactions is limited (Furman & Rose, 2015).

Parents and in particular, their attitudes, may also influence GBRE-Other beliefs. Much of the literature on parent-child relationships related to gender development has focused on parents' behaviors (e.g., how they act around sons or daughters), but it is also important to consider parents' attitudes (e.g., stereotypes, beliefs) toward gender (Axinn & Thorton, 1993; Tenenbaum & Leaper, 2002). Although the amount of time spent with parents begins to decrease in adolescence (e.g., Larson & Richards, 1991), parent's attitudes toward gender in general, and specifically, their attitudes about the value of

other-gender friends, may also influence pre-adolescents' GBRE-Other beliefs. For example, when children are younger, parents typically set up play dates with own-gender peers as opposed to other-gender peers (Maccoby, 1998) suggesting that they value own-gender interactions for their children more than other-gender interactions. Surprisingly little is known about the relation of parental attitudes to children's attitudes and cognitions. Overall, however, Tenenbaum and colleagues (Leman & Tenenbaum, 2011; Tenenbaum & Leaper, 2002) have found a positive relationship between parents' gender schemas and their children's gender cognitions such that parents with more traditional gender schemas were more likely to have children with more gender-typed cognitions. It is possible then, that parents who place less value on other-gender interactions (i.e., have more traditional gender-schemas) will have-children with lower GBRE-Other. Moreover, there may be gender differences regarding parents' attitudes toward other-gender friendships such that parents are more encouraging and accepting of their sons' interactions with other-gender peers compared to their daughters (Axinn, Young-DeMarco, & Ro, 2011). Based on this gender double standard, parental attitudes are expected to be a stronger predictor of boys' GBRE-Other compared to those of girls. Therefore, the present study examines the influence of two important relationships within the family context (i.e., siblings and parents) on pre-adolescent's GBRE-Other beliefs.

Present Study and Hypotheses

Although other-gender interactions are limited in childhood and pre-adolescence, having other-gender friendships has many benefits, and GBRE-Other is related to other-gender friendships (Zosuls et al., 2014). Therefore, it is important to better understand factors that relate to higher levels of GBRE-Other. In the present study,

affective/cognitive (e.g., positive, negative, and anxious attitudes about other-gender peers; other-gender peer preferences), behavioral (e.g., friendships with other-gender peers), and contextual (e.g., presence of older other-gender siblings in the home and parental attitudes about their children having other-gender friends) factors were examined as predictors of GBRE-Other. In order to test these predictors of GBRE-Other, several panel analyses (in cases in which the effect could be transactional) and regression analyses (in cases in which the effect could only be unidirectional) were conducted using the pre-adolescent cohort from Study 1.

Analyses were conducted separately for each variable; therefore, several hypotheses were tested in the present study. For the affective/cognitive variables, a transactional effect was hypothesized, therefore both cross-lag effects were expected to be significant. In other words: (H1) more positive attitudes about other-gender peers in 4th grade would predict higher GBRE-Other in 5th grade and higher GBRE-Other in 4th grade would predict more positive attitudes about other-gender peers in 5th grade; (H2) negative attitudes about other-gender peers in 4th grade would predict lower GBRE-Other in 5th grade and lower GBRE-Other in 4th grade would predict more negative attitudes about other-gender peers in 5th grade; (H3) anxiety about other-gender peers in 4th grade would predict lower GBRE-Other in 5th grade and lower GBRE-Other in 4th grade would predict more anxiety about other-gender peers in 5th grade; and (H4) higher other-gender peer preferences in 4th grade would predict higher GBRE-Other in 5th grade and higher GBRE-Other in 4th grade would predict higher other-gender peer preferences in 5th grade.

A transactional effect was also hypothesized for the behavioral predictor, other-gender friendships. Specifically, (H5) pre-adolescents with more other-gender friendships

in 4th grade were expected to have higher GBRE-Other in 5th grade and pre-adolescents with higher GBRE-Other in 4th grade were expected to have more other-gender friendships in 5th grade.

Regression analyses were used to test the contextual predictors. Specifically, it was hypothesized that (H6) the presence of older other-gender siblings in the home (yes/no categorical predictor) would predict higher GBRE-Other and (H7) pre-adolescents with parents who place more value on other-gender friendships would have higher GBRE-Other compared to pre-adolescents with parents who do not place value on other-gender friendships, and this relation was expected to be stronger for boys compared to girls. Additionally, although not specifically hypothesized in H1-H6, because boys and girls peer experiences and social processes differ in important ways (Rose & Rudolph, 2006), potential gender differences were explored by comparing multi-group models in which gender was constrained to be equal on parameters and models where parameters were allowed to vary by gender.

Method

Participants

This study used data from a two-year longitudinal study designed to investigate children's gendered attitudes and beliefs. Participants were recruited from 18 fourth grade classrooms within eight elementary schools in a large city in the southwestern United States. All students from these classrooms were invited to participate ($N = 422$); parental consent was given for all participants and each participant also provided assent to participate. Participants completed questionnaires in fourth grade and were assessed again one year later in fifth grade. In year 1, participants included 206 fourth grade

students (M age = 9.13 years, SD = .51, 44.2% girls) from diverse ethnic backgrounds (55% White, 18% Latino/Hispanic, 5% Asian American, 5% African American, 3% Native American, 1% Pacific Islander, 14% other [including bi- or multi-ethnic]). Overall, the sample represented middle-class families with 83% of mothers and 74% of fathers reporting at least some college education, and an average household income range of \$51-75,000. In year 2 (fifth grade), 74% of the original students participated. The fifth grade sample included 152 participants (M age = 10.30, SD = .46, 46% girls). Attrition analyses revealed that groups did not differ on demographic variables (gender, ethnicity, income) or study variables (all p 's > .05). Parents or guardians (83.5% mothers, 13.6% fathers, 2.9% other) completed measures on their household composition, their child's demographics, and their own gender related attitudes and beliefs. Parents (M age = 38.64 years, SD = 7.22, range 25- 66), similar to their children, were relatively ethnically diverse (62.4% White, 23.8% Latino/Hispanic, 5% Asian American, 2% African American, 3.5% Native American, 1% Pacific Islander, 2.5% other) and a majority of parents were married and living together (64.5%), while the rest were not married and not living together (25.1%), not married but living together (7.4%), and married but not living together (3%).

Measures

Gender-Based Relationship Efficacy Questionnaire (GBRE). Participants' gender-based relationship efficacy toward own- and other-gender peers was assessed using the GBRE (Zosuls et al., 2014). This measure consisted of seven items, repeated such that participants were separately asked about their efficacy for interacting with girls and with boys. Participants rated their relationship efficacy using a 5-point scale from 0

(*Not at All*) to 4 (*A Lot*). Example items include: “How much do you understand [girls/boys]?” and “How much do you know how to act around [girls/boys]?” Responses were averaged into girl/boy scales and recoded to own-gender/other-gender scales, to create separate scores for GBRE-Own and GBRE-Other. The present study only used the GBRE-Other scale ($\alpha = .92$ in 4th grade and $.90$ in 5th grade).

Positive, negative, and anxious intergroup attitudes. Participants’ positive and negative attitudes toward other-gender peers were assessed using a 15-item scale adapted from Zosuls et al. (2011) (see Halim et al., 2017). Each question was repeated such that participants were separately asked about their attitudes toward girls and their attitudes toward boys. Each item was prefaced with, “How many [girls/boys] make you feel...” Participants indicated their attitudes toward boys and girls using a 4-point scale from 0 (*None*) to 3 (*All*). The measure consisted of a seven-item positive attitudes subscale (e.g., “happy” and “excited to play”), a five-item negative attitudes subscale (e.g., “angry” and “like you want to get away from them”), and a three-item anxious attitudes subscale (e.g., “nervous” and “scared”). Responses were averaged into girl/boy scales and recoded into positive own-gender/other-gender, negative own-gender/other-gender, and anxious own-gender/other-gender scales. In the present study, only the other-gender positive ($\alpha = .92$ in 4th grade and $.90$ in 5th grade), other-gender negative ($\alpha = .82$ in 4th grade and $.86$ in 5th grade), and other-gender anxious ($\alpha = .61$ in 4th grade and $.70$ in 5th grade) attitudes scales were used.

Peer gender preference. Participants’ preference for own- and other-gender peer interactions was assessed using two sociometric nomination questions. The first question asked participants to “Name three kids from your class that you would most like to hang

out/play with” and the second question asked participants to “Name three kids from your class that you would most like to sit next to”. The gender of each nomination was recorded (names were omitted from the dataset) and the proportion of female friends was calculated and recoded to proportion of other-gender friends for each question (higher proportion scores indicate the participant nominated more other-gender peers and lower proportion scores indicate the participant nominated more own-gender peers). A total other-gender proportion score was calculated for each participant by combining the proportion scores of each question.

Other-gender friendships. Participants’ friendships with boys and girls were assessed using a three-item measure (Zosuls et al., 2014). Participants used a 5-point scale, ranging from 0 (*none/almost none*) to 4 (*almost all/all*) to answer how many of their friends were girls and boys (separately) in three separate domains (school, home/neighborhood, and extracurricular activities). Responses were recoded into own- and other-gender friends. Only the other-gender friendship scale was used in the present study. Although other-gender friendships can be context dependent (e.g., Bukowski et al., 1993), the three other-gender items were strongly correlated at both time points (r_s ranged from .21 to .43, $ps < .001$). Thus, following Zosuls and colleagues (2014), items were averaged to create composite scores for other-gender friendships.

Parental values for diversity in child’s friendships. Parents’ values about diversity in their children’s friendships (ethnic/racial and gender) were assessed using a 7-item questionnaire in Year 1 of the study. Only 4-items pertaining to gender diversity were used in the present study. Parents used a 4-point scale, ranging from 0 (*strongly disagree*) to 3 (*strongly agree*) to indicate their beliefs about their children’s other-gender

friendships (e.g., ‘I think it benefits my child to have friends of the other sex.’). The items were averaged to create a composite score ($\alpha = .71$)

Household composition (older other-gender siblings). Parents reported on the age and gender composition of participant’s siblings. From these reports, dummy coded sibling variables were created. To test the influence of having an older other-gender sibling, a dummy variable was created in which 0 = no older other-gender sibling (n = 138) (i.e., only child, own-gender only sibling, younger other-gender sibling only) and 1 = has an older other-gender sibling (n = 50).

Procedure

Approval for the study was first received at the school district level and then school principals were contacted and informed about the study. If the school principals agreed to participate, teachers within their school were contacted and asked to help recruit children by sending information home to parents. To compensate schools for their involvement in the study and their time, monetary compensation was provided (\$100 per school). Parents who provided consent were also asked to fill out a parent questionnaire which include demographic information. Both a Spanish and English consent and questionnaire packet were provided. Parents received a small monetary compensation for participating (\$20). Teachers of participating students were also asked to complete questionnaires on each participating students’ behaviors and academic ability (teacher variables were not used in the present study). Teacher’s received monetary compensation for each questionnaire that they completed (\$20 per questionnaire completed). In Year 2, participants were contacted and then their new 5th grade teachers were contacted and

informed about the study. If participants had switched schools and could be contacted, the new school principals and teachers were contacted and informed about the study.

In both Year 1 (4th grade) and Year 2 (5th grade), students' who received parental consent and provided assent completed questionnaires at school in small, mixed-gender, groups of three to five students, supervised by a trained research assistant. Pre-training on the scales and checks were built in throughout the questionnaire to ensure understanding of all measures, and research assistants answered any questions students had about measures. Questionnaires were completed in the Fall semester of each year and took approximately 45 minutes to complete. To account for order effects, four versions of the survey were used with the order of the measures and items within the measures varied in each version. Participants were given a small gift (e.g., a school logo pencil).

Analytic Plan

Preliminary analyses were conducted using SPSS v. 23 to examine means, standard deviations and correlations between all study variables. Means and standard deviations were computed for the entire sample and separately by gender. A one-way ANOVA was conducted to test for mean differences between girls and boys on all study variables.

To test the transactional effect of the affective/cognitive and behavioral predictors on GBRE-Other (hypotheses H1-H5), a series of two-wave, two-variable panel analyses were conducted using structural equation modeling in *Mplus* Version 7 (Muthén & Muthén, 1998-2014). In each of the five analyses, the autoregressive and cross-lagged effects were entered, but to test the hypotheses, only the cross-lagged effects were

interpreted. Full information maximum likelihood estimation was used to account for missing data in Year 2 of the study.

Regression analyses were also conducted in *Mplus* Version 7 (Muthén & Muthén, 1998-2014) to test the effects of the contextual predictors on GBRE-Other for H6 and H7. In separate analyses, the categorical sibling variable (yes/no presence of older other-gender siblings in the home) and parental values toward other-gender friendships were entered as predictor variables, with the pre-adolescent's gender and GBRE-Other beliefs in 4th grade were entered as covariates. GBRE-Other beliefs in 5th grade were entered as the criterion variable in the regression analyses. Multi-group analyses were conducted to test for gender differences in parameter estimates in the proposed models.

Results

Preliminary Analyses and Descriptive Statistics

Before conducting analyses, skew and kurtosis for all study variables were examined. The skew was less than three and the kurtosis was less than eight for all variables, which falls within the range for normal distribution (Tabachnick & Fidell, 2001). Means, standard deviations, and correlations are presented in Tables 5 and 6. A one-way ANOVA was conducted for each study variable in order to examine gender differences. Results indicated that girls had significantly higher negative attitudes toward other-gender peers than boys in 4th grade ($F [1, 204] = 16.35, p < .001$) and 5th grade ($F [1, 150] = 16.39, p < .001$), although overall, means were low for girls and boys. Girls also reported feeling more anxious about other-gender peers compared to boys in 5th grade, $F (1, 150) = 8.43, p < .01$. Additionally, GBRE-Other in 4th grade was strongly and positively correlated with GBRE-Other in 5th grade. GBRE-Other in both 4th and 5th

grade were significantly correlated with most of the predictor variables, especially concurrent variables.

Panel Analyses

In order to test Hypotheses 1 through 5, five separate panel analyses were conducted using structural equation modeling in *Mplus 7* (Muthén & Muthén, 1998-2014). Full Information Maximum Likelihood (FIML) estimation was used, which allows for unbiased parameter estimates when there is missing data (Enders & Bandalos, 2001). In order to test the hypothesized transactional effects, GBRE-Other in Year 2 (5th grade) was regressed on GBRE-Other in Year 1 (4th grade) and the Year 1 predictor (e.g., positive attitudes towards other-gender peers) and in the same model, the Year 2 predictor was regressed on the Year 1 predictor and GBRE-Other in Year 1 in each of the five models (see Figures 1-5). For each analysis, gender differences were examined by conducting log likelihood ratio tests to compare full and constrained models. With the exception of the anxious attitudes model (H3) described below, the log likelihood ratio tests revealed that the constrained models were not a significantly worse fit than the unconstrained models, χ^2 's (6) = 3.78 to 8.31, $ps > .05$, indicating that there were not gender differences. Therefore, the more parsimonious models with constrained paths were used to interpret path coefficients for these hypotheses.

Affective/cognitive predictors of GBRE-Other. The first hypotheses, which concerned positive transactional relations between GBRE-Other and positive attitudes toward other-gender peers, was not supported. However, GBRE-Other did significantly predict positive attitudes toward other-gender peers, $b = .17, p < .01$. Thus, controlling for positive attitudes towards other-gender peers in 4th grade, a one-unit increase in

GBRE-Other in 4th grade was associated with a .17-unit increase in positive attitudes towards other-gender peers in 5th grade. Positive attitudes toward other-gender peers did not predict GBRE-Other, $b = -.05$, $p = ns$. Additionally, the model explains 22% of the variance in GBRE-Other, $R^2 = .22$, $p < .001$, and 24% of the variance in positive attitudes, $R^2 = .24$, $p < .001$ (Figure 6).

In the second model, negative attitudes toward other-gender peers did not predict GBRE-Other ($b = .001$, $p = ns$) and GBRE-Other did not predict negative attitudes toward other-gender peers ($b = -.02$, $p = ns$), failing to support the second hypothesis that there was a negative transactional relation between GBRE-Other and negative attitudes toward other-gender peers (Figure 7).

The third hypothesis, which concerned the relation between GBRE-Other and anxious attitudes toward other-gender peers, was not supported. However, log likelihood comparisons revealed that paths should be free suggesting that there were gender differences, $\chi^2(6) = 15.11$, $p < .05$. Anxious attitudes toward other-gender peers in 4th grade predicted GBRE-Other in 5th grade for boys ($b = -.32$, $p < .05$), but not girls ($b = .08$, $p = ns$). However, GBRE-Other in 4th grade did not predict anxious attitudes toward other-gender peers for boys ($b = .07$, $p = ns$) or girls ($b = -.02$, $p = ns$) in 5th grade (Figure 8).

The fourth hypothesis, which examined the transactional relation between GBRE-Other and other-gender peer preferences, was not supported. However, GBRE-Other in 4th grade did significantly predict other-gender peer preference in 5th grade, $b = .04$, $p < .01$. Thus, controlling for other-gender peer preference in 4th grade, a one-unit increase in GBRE-Other in 4th grade was associated with a .04-unit increase in other-gender peer

preferences in 5th grade. Other-gender peer preferences in 4th grade did not predict GBRE-Other in 5th grade, $b = .01$, $p = ns$ (Figure 9).

Behavioral predictors of GBRE-Other. The fifth hypothesis, which concerned a transactional relation between GBRE-Other and other-gender friendships, was not supported. However, GBRE-Other in 4th grade did marginally predict other-gender friendships in 5th grade, $b = .13$, $p < .10$. Thus, controlling for other-gender friendships in 4th grade, a one-unit increase in GBRE-Other in 4th grade was associated with a .13-unit increase in other-gender friendships in 5th grade. Other-gender friendships in 4th grade did not predict GBRE-Other in 5th grade, $b = .11$, $p = ns$. Additionally, the model explains 22% of the variance in GBRE-Other, $R^2 = .22$, $p < .001$, and 18% of the variance in other-gender friendships, $R^2 = .18$, $p < .01$ (Figure 10).

Regression Analyses

In order to test Hypotheses 5 and 6 which examined the effects of the contextual predictors (e.g., older other-gender siblings and parental attitudes about gender-diversity) on GBRE-Other, two separate regression analyses were conducted in *Mplus 7* using FIML (Muthén & Muthén, 1998-2014). In both analyses, GBRE-Other in 5th grade was regressed on the predictor variable and GBRE-Other in 4th grade.

Contextual predictors of GBRE-Other. In the first regression analysis, GBRE-Other in 5th grade was regressed on the sibling predictor (i.e., older other-gender sibling [dichotomous variable: 0 = does not have an older other-gender sibling, 1 = has an older other-gender sibling]) and GBRE-Other in 4th grade. Results indicated that having an older, other-gender sibling did not predict GBRE-Other in 5th grade when controlling for GBRE-Other in 4th grade ($b = .22$, $p = ns$), failing to support the sixth hypothesis.

However, the model did explain 23% of the variance in GBRE-Other in 5th grade, $R^2 = .23$, $p < .01$ (Figure 11). Although the estimate for older other-gender siblings was in the expected direction, controlling for GBRE-Other in 4th grade accounted for a large portion of the variance. Finally, gender differences were explored, but the model did not differ for boys and girls, $\chi^2(2) = 2.90$, $p > .05$.

In the second regression analysis, GBRE-Other in 5th grade was regressed on parental attitudes about gender-diversity in their children's friendships and GBRE-Other in 4th grade. Parental attitudes about gender-diversity in their children's friendships was a significant predictor of GBRE-Other in 5th grade for girls ($b = -.55$, $p < .05$), but not for boys ($b = .13$, $p = ns$). Interestingly for girls, a one-unit increase in parental attitudes about gender-diversity led to a .55-unit decrease in GBRE-Other in 5th grade (Figure 12).

Discussion

In general, boys and girls are less comfortable interacting with other-gender peers relative to own-gender peers (Zosuls et al., 2014; Study 1), which may limit the frequency and quality of interactions with other-gender peers in childhood through adolescence. Although other-gender interactions and friendships have been linked to negative outcomes such as depression and delinquent behaviors (e.g., Poulin et al., 2011), recent evidence suggests that same-aged other-gender friendships in pre-adolescence can have a positive impact on pre-adolescents' mental, social, and academic functioning (e.g., Darling et al., 1999; DeLay et al., 2017; Field & Martin, 2016; Pauletti et al., 2014). Other-gender friendships also offer new perspectives and insights for girls and boys who may have had limited other-gender interactions in childhood (Grover et al., 2007) and may even reduce initial dating anxiety in adolescence (LaGreca & Macky, 2007).

Because of these benefits, understanding and finding ways to increase comfort and confidence in peer interactions, especially interactions with other-gender peers, is important. To that end, the goal of the present study was to examine factors that might be related to GBRE-Other in a sample of pre-adolescents. Several hypotheses were tested in order to examine the transactional relations between GBRE-Other and affective/cognitive (i.e., positive, negative, and anxious attitudes toward other gender peers and other-gender peer preferences) and behavioral (i.e., other-gender friendships) factors. Additional hypotheses examined the linear relation between contextual factors (i.e., older other-gender siblings and parental attitudes toward their children's other-gender friendships) and GBRE-Other. Results offered limited support for the hypotheses. Overall, few predictors of GBRE-Other were identified; nonetheless, GBRE-Other predicted changes in other variables over time, particularly positive attitudes/expectations toward other-gender peers and other-gender peer preferences. Some gender differences were found with girls reporting higher mean-levels of negative and anxious attitudes/expectations toward other-gender peers.

Affective/Cognitive Predictors of GBRE-Other

Prior to hypothesis testing, the relations between the predictor variables and GBRE-Other were examined. Based on correlations, the results indicated that GBRE-Other is related to affective/cognitive variables in the expected directions. For example, at both time points GBRE-Other was positively associated with positive attitudes towards other-gender peers and other-gender peer preferences and negatively associated with negative and anxious attitudes toward other-gender peers. Although not formally hypothesized, gender-differences on each study variable were explored. Interestingly,

there were mean-level gender differences on negative and anxious attitudes with girls reporting higher scores compared to boys. This pattern may be due to girls being more accommodating to boys' gender-typed behaviors and interaction styles, which tend to be rougher than girls' styles (Rose, 2007).

Despite the significant associations between GBRE-Other and the affective/cognitive predictors, there was not support for the transactional hypotheses regarding these variables. Instead, GBRE-Other positively, significantly predicted positive attitudes toward other-gender peers and other-gender peer preferences one year later. Understandably, if children are more comfortable and confident with other-gender peers it makes sense that they would have more positive attitudes toward, and a stronger preference for other-gender peers. Interestingly, however, and failing to support the hypotheses, the transactional effect was not significant – that is, positive attitudes towards other-gender peers and other-gender peer preferences did not predict GBRE-Other one year later. In hindsight, this may make sense. Cognitive theories of gender development (e.g., Martin, 2001) demonstrate that gender-typed cognitive beliefs and expectations influence peer experiences (e.g., Martin et al., 2011); however, one of the primary predictors of efficacy is actual positive experiences (i.e., positive experiences increase efficacy) (Bandura, 1982), thus, simply having positive attitudes or a stronger preference for other-gender peers may not actually increase comfort and confidence in other-gender interactions. This finding could reflect the developmental pattern that shows that boys and girls begin thinking about and talking about other-gender peers before actually interacting with and befriending other-gender peers (e.g., Bowker et al., 2012; McDonald et al., 2007; Richards et al., 1998). In other words, gender-based cognitive rigidity (e.g.,

‘boys cannot play with girls because they have cooties’) and the negative impacts of the gender-segregation cycle (e.g., increasing perceived and real differences between boys and girls; Martin et al., 2012) may be decreasing by pre-adolescence (Halim, 2016), but confidence and comfort has not yet increased. This pattern suggests that testing done after a longer duration (e.g., from pre-adolescence to late adolescence) might be more likely to show transactional effects.

The only affective/cognitive variable that predicted GBRE-Other one year later was anxious attitudes towards other-gender peers. As expected, more anxious attitudes led to significantly lower GBRE-Other; however, this finding was only significant for boys. Although girls report higher levels of anxious attitudes toward other-gender peers, perhaps boys face more pressures for initiating other-gender interactions (e.g., Rudman & Glick, 2008) than do girls, which could decrease their confidence and comfort with other-gender peers. Moreover, the transactional effect was not significant for boys or girls (i.e., GBRE-Other did not predict anxious attitudes one year later). Perhaps there was a floor effect for anxious attitudes toward other-gender peers, which would result in little variability to predict.

Aside from anxiety (for boys only), negative attitudes toward other-gender peers and GBRE-Other did not demonstrate a predictive relation in either direction, contrary to hypotheses. One reason for this may be due to the low levels of negative attitudes towards other-gender peers. Both boys and girls had very low mean-levels of negative attitudes toward other-gender peers, which supports previous research (e.g., Zosuls et al., 2011). Perhaps there was a floor effect and/or not enough variation in negative attitudes to find significant effects. It is hopeful for future other-gender interactions and

friendships that negative attitudes toward other-gender peers were so low. Gender is an important category in which children use to make ingroup (i.e., own-gender) and outgroup (i.e., other-gender) judgments (e.g., Martin & Ruble, 2010). Interestingly, however, research from this study and Zosuls et al. (2011) demonstrate a different pattern compared to research on racial and ethnic ingroup/outgroup attitudes in which there are strong negative prejudices and negative biases directed towards outgroup members (e.g., Pettigrew, 1998). The findings from the present study might suggest that future research and programs should focus on finding ways to increase positive attitudes and beliefs toward other-gender interactions, rather than ways to decrease potentially negative biases (see Miller et al., 2017 for a review of a program designed to promote positive peer interactions).

Behavioral Predictors of GBRE-Other

In the present study, other-gender friendships were positively and significantly related to GBRE-Other. Although concurrent relations (e.g., GBRE-Other and other-gender friendships both measured in Year 1) were stronger, the longitudinal correlations (e.g., GBRE-Other in Year 1 and other-gender friendships in Year 2) were also positive and significant. However, the fifth hypothesis which concerned the positive transactional effect between GBRE-Other and other-gender friendships was not supported. Despite what might be suggested by intergroup contact theory (Pettigrew, 1998), having more other-gender friendships did not lead to an increase in GBRE-Other and GBRE-Other did not lead to an increase in other-gender friendships (although the effect for the latter was marginally significant in the expected direction). In the present study, other-gender friendships were examined using a self-report measure where participants indicated how

many of their friends were other-gender peers across three settings using a Likert scale. Perhaps a more nuanced or behavioral measure of other-gender friendships (e.g., reciprocated peer nominations) would have revealed a stronger pattern. Additionally, *quality* of these reported other-gender friendships was not assessed. In order for interactions or friendships to lead to an increase in GBRE-Other as hypothesized, the interactions need to be positive, high quality interactions (e.g., Bandura, 1982). It is possible, and even likely, that boys' and girls' initial interactions and friendships with other-gender peers in pre-adolescence are awkward, uncomfortable, and sometimes associated with teasing (e.g., Dunphy, 1963; Giordano, Longmore, & Manning, 2006; Thorne, 1993), which would not increase comfort and confidence in other-gender relationships (i.e., GBRE-Other). In future studies it would be beneficial to examine reciprocated friendships and quality of those friendships.

Contextual Predictors of GBRE-Other

The presence of older other-gender siblings in the home and parent's attitudes towards their children having other-gender friendships was examined as potential contextual predictors of GBRE-Other. Based on previous research which demonstrated that older, other-gender siblings are influential on younger siblings' behaviors and attitudes (e.g., McHale et al., 2001; Perez-Brena et al., 2015), the sixth hypothesis was that having older, other-gender siblings would predict higher levels of GBRE-Other. However, that hypothesis was not supported. Unlike previous studies which have found that having an older other-gender sibling can influence gender-typed attitudes and behaviors, possibly through social learning mechanisms (e.g., Updegraff et al., 2000), having an older other-gender sibling does not appear to influence GBRE-Other.

However, these results should be interpreted cautiously. There are many characteristics (e.g., birth order, age differences between siblings, number of other siblings present, parents' marital status, etc.) that could impact the effect of siblings and in previous studies (e.g., McHale et al., 2001; Updegraff et al., 2000; Perez-Brena et al., 2015) a considerable amount of effort was expended to control for these variations. For example, Updegraff et al. (2000) used a stringent recruitment method to ensure that all participants in their study were from married, intact families, and had a sibling within one to three years younger. The goals of the larger study from which the data for the present study came from were not specifically focused on siblings and as such, the amount of information and control available with regards to siblings was limited. Of those who provided sibling information, 50 participants in the present study had an older other-gender sibling living in the household and 138 participants did not have an older other-gender sibling.

Although there is limited research on the relation between parents' attitudes and their children's cognitions, based on findings that parents who had more traditional gender schemas had children with more gender-typed cognitions (e.g., Leman & Tenenbaum, 2011; Tenenbaum & Leaper, 2002), the seventh hypothesis was that parental attitudes toward their children's other-gender friendships would predict GBRE-Other and that based on gender double standard (e.g., Axinn et al., 2011), this effect would be stronger for boys compared to girls. Based on correlations, the concurrent relation in Year 1 between GBRE-Other and parental attitudes toward their children's other-gender friendships was significant. However, the hypothesis was not supported, which is

interesting given that most parents (84% of respondents were mothers) had fairly high values for diversity in their children's friendships with regard to other-gender friendships.

Additionally, there was a significant predictive effect for girls and it was in the opposite direction than I would have expected. Specifically, girls whose parents reported valuing their children having other-gender friendships had daughters with lower GBRE-Other. The negative coefficient for girls was surprising considering that previous research has found that parents with more traditional gender schemas have children with more gender-typed cognitions (Leman & Tenenbaum, 2011). The opposite effect occurred in the present study – parents who had higher values for gender-diverse friendships predicted lower GBRE-Other for girls one year later. Perhaps parents with higher values for gender-diverse friendships facilitate other-gender interactions before their child is ready or wants to interact with other-gender peers, which could be more detrimental or uncomfortable for girls since they may be at a disadvantage in mixed-gender contexts (Rose, 2007). Additionally, father-child relationships play an important role in adolescent social and cognitive development, especially for sons (Bronte-Tinkew, Moore, & Carrano, 2006). Thus, for boys, perhaps the hypothesized effect of parents' attitudes on GBRE-Other would have been significant if more fathers completed the parent report measure (only 14% of respondents were fathers). It is also possible that the effect is in the opposite direction than what was hypothesized and tested. In other words, children's gender-typed cognitions may influence parents' values for diversity. For example, if a child is uncomfortable around other-gender peers, their parents might be more encouraging of them to interact with other-gender peers. Future research is needed to

further explore the relation between parental values and children's beliefs and patterns of peer relationships.

Limitations and Future Directions

Based on the correlation matrix, the variables examined in the present study were related to GBRE-Other, however, there is limited support for hypotheses that the variables investigated here were predictive of GBRE-Other. Instead, as has been found previously (e.g., Field et al., *in press*; Zosuls et al., 2014), GBRE-Other did predict a variety of variables, with the present study showing longitudinal patterns in these relationships for positive attitudes toward other-gender peers and other-gender peer preferences. However, few variables predicted GBRE-Other except anxious attitudes toward other-gender peers, which negatively predicted GBRE-Other for boys, and for girls, parental attitudes toward their children's other-gender friendships negatively predicted GBRE-Other. Controlling for GBRE-Other in Year 1 in the analyses appears to be accounting for much of the variance. Also, the results from Study 1 indicate that, although there is discontinuity in GBRE-Other (i.e., mean-levels increase over time), GBRE-Other has high levels of interindividual stability (i.e., rank order remains the same). The fact that GBRE-Other was stable might suggest that other stable individual characteristics (e.g., genetic or biological factors, personality traits) are related to the mean-level changes in GBRE-Other (see Bornstein et al., 2017). Further research is needed to test these ideas.

Although the findings were limited, the present study had several strengths. Namely, I examined other-gender variables related to GBRE-Other longitudinally across three important domains (i.e., affective/cognitive, behavioral, and contextual) and I

examined these relations during pre-adolescence when interest in other-gender peers is first beginning to emerge (e.g., Dunphy, 1963). However, the present study is not without limitations that may have influenced the findings; thus, the results from the present study should be interpreted with caution and the variables examined should not necessarily be discarded as unimportant to increasing GBRE-Other. As mentioned above, some of the measures themselves may have had limitations. For example, the negative affective/cognitive variables had very low means potentially resulting in floor effects. Perhaps a more nuanced measure of pre-adolescent's negative or anxious feelings would better assess pre-adolescents' attitudes. Moreover, quality of friendships was not assessed or controlled for in the present study, but quality, and not necessarily quantity of other-gender friendships, may be an important predictor of GBRE-Other. Finally, the present study did not have the level of control or a large enough sample compared to other studies that were designed to specifically examine contextual issues such as sibling influence (e.g., McHale et al., 2001). Additionally, the present study did not have any information about the participants' siblings other than their age and gender.

Ultimately, the goal of this study was to examine potential predictors of GBRE-Other during pre-adolescence because that is the time when other-gender interactions and friendships gain significance (e.g., Dunphy, 1963; Herdt & McClintock, 2000) and when changes in GBRE-Other were expected to emerge. However, some research suggests that boys and girls only start thinking about other-gender peers during pre-adolescence (e.g., Bowker et al., 2012), which might mean that it would be too early to detect changes in GBRE-Other. Future studies should examine the relation of GBRE-Other and the affective/cognitive, behavioral, and contextual variables in an older sample.

GBRE-Other is a construct that has potential to play an important role in promoting positive other-gender friendships, which offer adolescents many benefits. By examining GBRE-Other and several potential predictors of GBRE-Other, this study provided an important first step in testing a larger theoretical developmental model of other-gender friendship development (Field & Martin, 2016). Early life experiences can have a large, long-term impact developmentally and on the trajectory of the construct in question (Bornstein, 2014); thus, increasing GBRE-Other, and ultimately positive other-gender friendships, is a process that may best start early in life.

General Discussion

Research on gender-differentiated cognitions is limited. However, recent findings suggest that it is important to differentiate between how children and pre-adolescents perceive own- versus other-gender peers and peer interactions (e.g., Andrews et al., 2016; Zosuls et al., 2014). In childhood, boys and girls spend a majority of their time in gender-segregated peer groups (Maccoby, 1998), but in pre-adolescence and adolescence interest in, and actual interactions with other-gender peers begin to emerge (Dunphy, 1963). However, when boys and girls begin initiating other-gender interactions, they may not be well-equipped to handle interactions with other-gender peers despite their increased interest in them (Field & Martin, 2016; Maccoby, 1998). Therefore, the overall goal of this dissertation was to further examine developmental patterns and predictors of a particular type of social cognition, gender-based relationship efficacy (GBRE), which is defined as one's perceived comfort with and ability to understand and interact with own- (GBRE-Own) and other-gender (GBRE-Other) peers.

The first study examined developmental patterns of both GBRE-Own and GBRE-Other over a one-year period in childhood and adolescence. Previous research has examined mean-level patterns of GBRE-Own and GBRE-Other cross-sectionally in an older sample (e.g., Zosuls et al., 2014), but this was the first study to examine longitudinal mean-level patterns of GBRE-Own and GBRE-Other in childhood and pre-adolescence. Moreover, this study examined stability patterns of GBRE-Own and GBRE-Other and the transactional relation between GBRE-Own and GBRE-Other. Consistent with previous research (Zosuls et al., 2014), GBRE-Own was higher than GBRE-Other. Importantly, results from Study 1 demonstrated a developmental shift in GBRE-Other

that mirrored behavioral patterns of gender-integration that begin to emerge in pre-adolescence (Dunphy, 1963) – that is, GBRE-Other was higher in the pre-adolescent cohort compared to the childhood cohort. The first study also found initial support for the previously hypothesized negative consequences of the gender-segregation cycle (Martin et al., 2012) by demonstrating that higher levels of GBRE-Own predicted lower levels of GBRE-Other one year later.

The second study examined potential predictors of GBRE-Other in the same pre-adolescent sample as used in the first study. Because GBRE is a relatively new construct, this study relied on theoretical perspectives to guide the development of hypotheses. Based on several theories, the study examined predictors across three broad domains (affective/cognitive, behavioral, and contextual). The results in this study were limited, but it appears as though controlling for earlier levels of GBRE-Other may have accounted for much of the variance in outcomes. Overall, few factors were found to predict GBRE-Other although GBRE-Other continued to have the expected predictive value longitudinally. Furthermore, it was encouraging that correlations between the GBRE-Other and the predictor variables were significant and in the expected directions.

In conclusion, both GBRE-Own and GBRE-Other have important implications for social, emotional, and academic outcomes (Field et al., *in press*; Zosuls et al., 2014); thus, developing a better understanding of social cognitive processes such as GBRE may lead to a better understanding of, and a chance to improve, intergroup relations between boys and girls.

REFERENCES

- Abrams D., Rutland A. (2008). The development of subjective group dynamics. In S. Levy & M. Killen (Eds.), *Intergroup attitudes and relations in childhood through adulthood* (pp. 47–65). Oxford, United Kingdom: Oxford University Press.
- Allport, G. W. (1954). *The nature of prejudice*. Reading, MA: Addison-Wesley.
- Andrews, N. C. Z., Martin, C. L., Field, R. D., Cook, R. E., Lee, J. (2016). Development of expectancies of gender-based social exclusion and inclusion and their school-related consequences. *Child Development, 87*, 1423-1435. doi: 10.1111/cdev.12596
- Augoustinos, M., & Rosewarne, D. L. (2001). Stereotype knowledge and prejudice in children. *British Journal of Developmental Psychology, 19*, 143-156. doi: 10.1007/978-3-319-24841-7_2
- Axinn, W. G., & Thorton, A. (1993). Mothers, children, and cohabitation: The intergenerational effects of attitudes and behavior. *American Sociological Review, 58*, 233-246. doi: 10.2307/2095968
- Axinn, W. G., Young-DeMarco, L., & Ro, M. C. (2011). Gender double standards in parenting attitudes. *Social Science Research, 40*, 417-432. doi: 10.1016/j.ssresearch.2010.08.010
- Bandura, A. (1982). Self-efficacy mechanism in human agency. *American Psychologist, 37*, 122-147. doi: 10.1037/0003-066X.37.2.122
- Bandura, A. (1986). *Social foundations of thought and action: A social cognitive theory*. Englewood Cliffs, NJ: Prentice-Hall.
- Bandura, A. (1994). Self-efficacy. In V. S. Ramachaudran (Ed.), *Encyclopedia of human behavior* (Vol. 4, pp. 71-81). New York: Academic Press.
- Bandura A. (1997). *Self-efficacy: The exercise of control*. New York: W. H. Freeman.
- Barbu, S., LeManer-Idrissi, G., & Jouanjean, A. (2000). The emergence of gender segregation: Towards an integrative perspective. *Current Psychology Letters: Behavior, Brain, and Cognition, 3*, 7–18.
- Barlow, F. K., Louis, W. R., & Hewstone, M. (2009). Rejected! Cognitions of rejection and intergroup anxiety as mediators of the impact of cross-group friendships on prejudice. *British Journal of Social Psychology, 48*, 389-405. doi: 10.1348/014466608X387089

- Berndt, T. J. (1981). Relations between social cognition, nonsocial cognition, and social behavior: The case of friendship. In J. H. Flavell & L. Ross (Eds.), *Social cognitive development: Frontiers and possible futures* (pp. 176-199). New York, NY: Cambridge University Press.
- Bigler, R. S., & Liben, L. S. (2006). A developmental intergroup theory of social stereotypes and prejudice. In R.V. Kail (Ed.), *Advances in child development and behavior* (Vol. 34, pp. 39–89). San Diego: Elsevier. doi: 10.1016/s0065-2407(06)80004-2
- Blakemore, J. E., Berenbaum, S. A., & Liben, L. S. (2009). *Gender development*. New York: Psychology Press.
- Bodenhausen, G. V., Kang, S. K., & Peery, D. (2012). Social categorization and the perception of social groups. In S. T. Fiske & C. N. Macrae (Eds.), *SAGE handbook of social cognition* (pp. 311-329). Los Angeles, CA: Sage. doi: 10.4135/9781446247631.n16
- Bornstein, M. H. (2014). Human infancy . . . and the rest of the lifespan. *Annual Review of Psychology*, 65, 121–158. doi:10.1146/annurev-psych-120710-100359
- Bornstein, M. H., Putnick, D. L., & Esposito, G. (2017). Continuity and stability in development. *Child Development Perspectives*. doi:10.1111/cdep.12221
- Bowker, J. C., Spencer, S. V., Thomas, K. K., & Gyoerko, E. A. (2012). Having and being an other-sex crush during early adolescence. *Journal of Experimental Child Psychology*, 111, 629-643. doi: 10.1016/j.jecp.2011.11.008
- Bronte-Tinkew, J., Moore, K. A., & Carrano, J. (2006). The father-child relationship, parenting styles, and adolescent risk behaviors in intact families. *Journal of Family Issues*, 27, 850-881. doi: 10.1177/0192513X05285296
- Brown, B. B. (2004). Adolescents' relationships with peers. In R. M. Lerner & L. Steinberg (Eds.), *Handbook of adolescent psychology, 2nd edition* (pp. 363-394). New York: Wiley.
- Bryk, A. S., & Raudenbush, S. W. (1992). *Hierarchical linear models: Applications and data analysis methods*. Newbury Park, CA: Sage.
- Bukowski, W. M., Gauze, C., Hoza, B., & Newcomb, A. F. (1993). Differences and consistency between same-sex and other-sex peer relationships during early adolescence. *Developmental Psychology*, 29, 255-263. doi: 10.1037/0012-1649.29.2.255

- Bukowski, W. M., Panarello, B. & Santo, J. B. (2016). Androgyny in liking and in being liked are antecedent to well-being in pre-adolescent boys and girls. *Sex Roles*. doi:10.1007/s11199-016-0638-6
- Bukowski, W.M., Sippola, L.K., & Hoza, B. (1999). Same and other: Interdependency between participation in same- and other-sex friendships. *Journal of Youth and Adolescence*, 28, 439-460. doi: 10.1023/A:1021664923911
- Clinch, J. J., & Keselman, H. J. (1982). Parametric alternatives to the analysis of variance. *Journal of Educational Statistics*, 7, 207-214. doi: 10.2307/1164645
- Cohen, J. (1988). *Statistical power analysis for the behavioral sciences* (2nd ed.). Hillsdale, NJ: Erlbaum.
- Coleman, P. K. (2003). Perceptions of parent-child attachment, social self-efficacy, and peer relationships in middle childhood. *Infant and Child Development*, 12, 351-368. doi: 10.1002/icd.316
- Collins, W. A. (2003). More than myth: The developmental significance of romantic relationships during adolescence. *Journal of Research on Adolescence*, 13, 1-24. doi: 10.1111/1532-7795.1301001
- Collins, W. A., & Sroufe, L. A. (1999). Capacity for intimate relationships: A developmental construction. In W. Furman, C. Feiring, & B. B. Brown (Eds.), *Contemporary Perspectives on Adolescent Romantic Relationships* (pp. 123–147). New York: Cambridge University Press. doi: 10.1017/CBO9781316182185.007
- Connolly, J., Craig, W., Goldberg, A., & Pepler, D. (2004). Mixed-gender groups, dating, and romantic relationships in early adolescence. *Journal of Research on Adolescence*, 14, 185-207. doi: 10.1111/j.1532-7795.2004.01402003.x
- Connolly, J., Furman, W., & Konarski, R. (2000). The role of peers in the emergence of heterosexual romantic relationships in adolescence. *Child Development*, 71, 1395-1408. doi: 10.1111/1467-8624.00235
- Connolly, J., & McIsaac, C. (2011). Romantic relationships in adolescence. In M. K. Underwood, & L. H. Rosen (Eds.), *Social development: Relationships in infancy, childhood, and adolescence* (pp. 180-203). New York, NY: Guilford Press.
- Corsaro, W. (2005). *The Sociology of Childhood* (2nd ed.), Thousand Oaks, CA: Pine Forge Press.
- Crick, N. R., & Dodge, K. A. (1994). A review and reformulation of social information-processing mechanisms in children's social adjustment. *Psychological Bulletin*, 115, 74-101. doi: 10.1037/0033-2909.115.1.74

- Darling, N., Dowdy, B. B., Van Horn, M. L., & Caldwell, L. L. (1999). Mixed-sex settings and the perception of competence. *Journal of Youth and Adolescence*, 28, 461–480. doi:10.1023/A:1021617007981
- Davies, K., Tropp, L. R., Aron, A., Pettigrew, T. F., & Wright, S. C. (2011). Cross-group friendships and intergroup attitudes a meta-analytic review. *Personality and Social Psychology Review*, 15, 332-351. doi: 10.1177/1088868311411103
- Delay, D., Field, R. D., Sechler, C. M., Martin, C. L., & Hanish, L. D. (2017). The impact of mixed-gender peer groups on early adolescent adjustment outcomes after the middle school transition. Poster submitted to the Biannual Society for Research in Child Development, Austin, TX.
- Devine, P. G. (1989). Stereotypes and prejudice. Their automatic and controlled components. *Journal of Personality and Social Psychology*, 56, 5-18. doi: 10.1037/0022-3514.56.1.5
- Dong, Y., & Peng, C. Y. J. (2013). Principled missing data methods for researchers. *SpringPlus*, 2, 222. doi: 10.1186/2193-1801-2-222
- Dunphy, D. C. (1963). The social structure of urban adolescent peer groups. *Sociometry*, 26, 230-246. doi: 10.2307/2785909
- Emerson, R. M. (1976). Social exchange theory. *Annual Review of Sociology*, 2, 335-362. doi: 10.1146/annurev.so.02.080176.002003
- Enders, C. K., & Bandalos, D. L. (2001). The relative performance of full information maximum likelihood estimation for missing data in structural equation models. *Structural Equation Modeling*, 8, 430-457. doi: 10.1207/S15328007SEM0803_5
- Fabes, R. A., Martin, C. L., Hanish, L. D., Galligan, K., & Pahlke, E. (2015). Gender-segregated schooling: A problem disguised as a solution. *Educational Policy*, 29, 431-447. doi: 10.1177/0895904813492382
- Fabes, R. A., Pahlke, E., Martin, C. L., & Hanish, L. D. (2013). Gender-segregated schooling and gender stereotyping. *Educational Studies*, 39, 315-319. doi: 10.1080/03055698.2012.760442
- Faris, R., & Felmlee, D. (2011). Status struggles network centrality and gender segregation in same-and cross-gender aggression. *American Sociological Review*, 76, 48-73. doi: 10.1177/0003122410396196

- Feiring, C. (1999). Other-sex friendship networks and the development of romantic relationships in adolescence. *Journal of Youth and Adolescence*, 28, 495-512. doi: 10.1023/A:1021621108890
- Field, R. D., & Martin, C. L. (2016). The development of own- and other-gender friendships: The interaction of biological, behavioral, and social influences. In T. A. Roberts, N. Curtin, L. Cortina, & L. E. Duncan (Eds.), *Best Practices in Feminist Psychological Science: Gender Beyond Difference* (pp. 121-139). New York: Springer.
- Field, R. D., Martin, C. L., Andrews, N. C. Z., England, D. E., & Zosuls, K. M. (*in press*) The influence of gender-based relationship efficacy on attitudes toward school. *Merrill Palmer Quarterly*.
- Field, R. D., Tobin, R. M., & Reese-Weber, M. (2014). Agreeableness, social self-efficacy, and conflict resolution strategies. *Journal of Individual Differences*, 35, 95-102. doi: 10.1027/1614-0001/a000131
- Furman, W., & Rose, A. J. (2015). Friendships, romantic relationships, and peer relationships. *Handbook of child psychology and developmental science*. doi: 10.1002/9781118963418.childpsy322
- Furman, W., & Shaffer, L. A. (1999). A story of adolescence: The emergence of other-sex relationships. *Journal of Youth and Adolescence*, 28, 513-522. doi: 10.1023/A:1021673125728
- Garson, G. D. (2015). *Missing values analysis and data imputation*. Asheboro, USA: Statistical Associates Publishers.
- Gest, S. D., & Rodkin, P. C. (2011). Teaching practices and elementary classroom peer ecologies. *Journal of Applied Developmental Psychology*, 32, 288-296. doi: 10.1016/j.appdev.2011.02.004
- Giordano, P. C., Longmore, M. A., & Manning, W. D. (2006). Gender and the meanings of adolescent romantic relationships: A focus on boys. *American Sociological Review*, 71, 260-287. doi: 10.1177/000312240607100205
- Goble, P., Martin, C. L., Hanish, L. D., Fabes, R. A. (2012). Children's gender-typed activity choices across preschool social contexts. *Sex Roles*, 67, 435-451. doi: 10.1007/s11199-012-0176-9
- Graham, S., Munniksma, A., & Juvonen, J. (2014). Psychosocial benefits of cross-ethnic friendships in urban middle schools. *Child Development*, 85, 469-483. doi: 10.1111/cdev.12159

- Grant, A. M., Fried, Y., Parker, S. K., & Frese, M. (2010). Putting job design in context: Introduction to the special issue. *Journal of Organizational Behavior*, *31*, 145-157. doi: 10.1002/job.679
- Grover, R. L., Nangle, D. W., Serwik, A., & Zeff, K. R. (2007). Girl friend, boy friend, girlfriend, boyfriend: Broadening our understanding of heterosocial competence. *Journal of Clinical Child and Adolescent Psychology*, *36*, 491-502. doi: 10.1080/15374410701651637
- Halim, M. L. D. (2016). Princesses and superheroes: Social cognitive influences on early gender rigidity. *Child Development Perspectives*, *10*, 155-160. doi: 10.1111/cdep.12176
- Halim, M. L., Martin, C. L., Andrews, N. C. Z., Zosuls, K. M., & Ruble, D. N. (2017). Enjoying each other's company: Children's Other-Gender Friendships Promotes Positive Other-Gender Attitudes and Vice Versa. Manuscript in progress.
- Hand, L. S., & Furman, W. (2009). Rewards and costs in adolescent other-sex friendships: Comparisons to same-sex friendships and romantic relationships. *Social Development*, *18*, 270-287. doi: 10.1111/j.1467-9507.2008.00499.x
- Harwell, M. R., Rubinstein, E. N., Hayes, W. S., & Olds, C. C. (1992). Summarizing Monte Carlo results in methodological research: The one-and two-factor fixed effects ANOVA cases. *Journal of Educational Statistics*, *17*, 315-339.
- Herd, G., & McClintock, M. (2000). The magical age of 10. *Archives of Sexual Behavior*, *29*, 587-606. doi: 10.1023/A:1002006521067
- Ickes, W., & Turner, M. (1983). On the social advantages of having an older, opposite-sex sibling: Birth order influences in mixed-sex dyads. *Journal of Personality and Social Psychology*, *45*, 210-222. doi: 10.1037/0022-3514.45.1.210
- Jennings, P. A., & Greenberg, M. T. (2009). The prosocial classroom: Teacher social and emotional competence in relation to student and classroom outcomes. *Review of Educational Research*, *79*, 491-525. doi: 10.3102/0034654308325693
- Kovacs, D. M., Parker, J. G., & Hoffman, L. W. (1996). Behavioral, affective, and social correlates of involvement in cross-sex friendship in elementary school. *Child Development*, *67*, 2269-2286. doi: 10.2307/1131622
- Keppel, G., & Wickens, T. D. (2004). *Design and analysis. A researcher's handbook* (4th ed.). Pearson: Upper Saddle River, NJ.

- Kreft, I. G. G. (1996). Are multilevel techniques necessary? An overview, including simulation studies. Unpublished manuscript. Retrieved from <http://www.stat.ucla.edu/~kreft/quarterly/quarterly.html>
- Kuttler, A. F., La Greca, A. M., & Prinstein, M. J. (1999). Friendship qualities and social-emotional functioning of adolescents with close, cross-sex friendships. *Journal of Research on Adolescence, 9*, 339-366. doi: 10.1207/s15327795jra0903_5
- Kwok, O., Underhill, A. T., Berry, J. W., Luo, W., Elliott, T. R., & Yoon, M. (2008). Analyzing longitudinal data with multilevel models: An example with individuals living with lower extremity intra-articular fractures. *Rehabilitation Psychology, 53*, 370-386. doi: 10.1037/a0012765
- Ladd, G. W. (2005). *Children's peer relationships and social competence: A century of progress*. New Haven, CT: Yale University Press.
- LaFreniere, P., Strayer, F. F., & Gauthier, R. (1984). The emergence of same-sex affiliative preferences among preschool peers: A developmental/ethological perspective. *Child Development, 55*, 1958-1965. doi: 10.2307/1129942
- La Greca, A. M., & Mackey, E. R. (2007). Adolescents' anxiety in dating situations: The potential role of friends and romantic partners. *Journal of Clinical Child and Adolescent Psychology, 36*, 522-533. doi: 10.1080/15374410701662097
- Lam, C. B., McHale, S. M., & Crouter, A. C. (2014). Time with peers from middle childhood to late adolescence: Developmental course and adjustment correlates. *Child Development, 85*, 1677-1693. doi: 10.1111/cdev.12235
- Larson, R., & Richards, M. H. (1991). Daily companionship in late childhood and early adolescence: Changing developmental contexts. *Child Development, 62*, 284-300. doi: 10.2307/1131003
- Leaper, C. (Ed.). (1994). *New directions for child development: Vol. 65. Childhood gender segregation: Causes and consequences*. San Francisco: Jossey-Bass.
- Leaper, C., & Anderson, K. J. (1997). Gender development and heterosexual romantic relationships during adolescence. *New Directions for Child and Adolescent Development, 78*, 85-103. doi: 10.1002/cd.23219977808
- Leaper, C., & Bornstein, M. H. (Ed.) (2002). *Children and parenting*. Mahwah, NJ: Erlbaum.
- Lee, B., Lawson, K. M., & McHale, S. M. (2015). Longitudinal associations between gender-typed skills and interests and their links to occupational outcomes. *Journal of Vocational Behavior, 88*, 121-130. doi: 10.1016/j.jvb.2015.02.011

- Leman, P. J., & Tenenbaum, H. R. (2011). Practicing gender: Children's relationships and the development of gendered behaviour and beliefs. *British Journal of Developmental Psychology*, 29, 153-157. doi: 10.1111/j.2044-835X.2011.02032.x
- Lerner, R. M., & Steinberg, L. (2009). *Handbook of Adolescent Psychology, Volume 1: Individual Bases of Adolescent Development* (Vol. 1). John Wiley & Sons.
- Little, R. J., & Rubin, D. B. (2002). *Statistical analysis with missing data*. Wiley and Sons: Hoboken, NJ. doi: 10.1002/9781119013563
- Lix, L. M., Keselman, J. C., & Keselman, H. J. (1996). Consequences of assumption violations revisited: A quantitative review of alternatives to the one-way analysis of variance F test. *Review of Educational Research*, 66, 579-619. doi: 10.2307/1170654
- Maccoby, E.E. (1998). *The two sexes: Growing up apart, coming together*. Cambridge, MA: Belknap Press.
- Maccoby, E. E., & Jacklin, C. N. (1987). Gender segregation in childhood. In H. W. Reese (Ed.), *Advances in child development and behavior* (pp. 239-288). New York: Academic Press. doi: 10.1016/s0065-2407(08)60404-8
- Martin, C. L. (1994). Cognitive influences on the development and maintenance of gender segregation. In C. Leaper (Ed.), *Childhood Gender Segregation: Causes and Consequences* (pp. 35-51). San Francisco: Jossey-Bass. doi: 10.1002/cd.23219946505
- Martin, C. L. (2000). Cognitive theories of gender development. In T. Eckes & H. M Trautner (Eds.), *The developmental social psychology of gender*. (pp. 91-121). Mahwah, NJ: Lawrence Erlbaum.
- Martin, C. L., & Fabes, R. A. (2001). The stability and consequences of young children's same-sex peer interactions. *Developmental Psychology*, 37, 431-446. doi: 10.1037/0012-1649.37.3.431
- Martin, C. L., Fabes, R. A., & Hanish, L. D. (2011). Gender and temperament in young children's social interactions. In A. D. Pellegrini (Ed.), *Oxford Handbook of the Development of Play* (pp. 214-230). Oxford: Oxford University Press.
- Martin, C. L., Fabes, R. A., Hanish, L., Leonard, S., & Dinella, L. M. (2011). Experienced and expected similarity to same-gender peers: Moving toward a comprehensive model of gender segregation. *Sex Roles*, 65, 421-434. doi: 10.1007/s11199-011-0029-y

- Martin, C. L., Fabes, R. A., Hanish, L., Updegraff, K., Miller, C., Gaertner, B., Kochel, K., & Foster, S. (April, 2012). *The Sanford Harmony Program: Program description and preliminary findings*. Invited address presented at the Gender Development Research Conference, San Francisco, CA.
- Martin, C. L., Kornienko, O., Schaefer, D. R., Hanish, L. D., Fabes, R. A., & Goble, P. (2013). The role of sex of peers and gender-typed activities in young children's peer affiliative networks: A longitudinal analysis of selection and influence. *Child Development, 84*, 921-937. doi: 10.1111/cdev.12032
- Martin, C. L., & Halverson, C. F. (1981). A schematic processing model of sex typing and stereotyping in children. *Child Development, 52*, 1119-1134. doi: 10.2307/1129498
- Martin, C. L., & Ruble, D. N. (2010). Patterns of gender development. *Annual Review of Psychology, 61*, 353-381. doi: 10.1146/annurev.psych.093008.100511
- Martin, C. L., Ruble, D. N., & Szkrybalo, J. (2002). Cognitive theories of early gender development. *Psychological Bulletin, 128*, 903-933. doi: 10.1037/0033-2909.128.6.903
- Master, A., & Walton, G. M. (2013). Minimal groups increase young children's motivation and learning on group-relevant tasks. *Child Development, 84*, 737-751. doi: 10.1111/j.1467-8624.2012.01867.x
- McClintock, M. K., & Herdt, G. (1996). Rethinking puberty: The development of sexual attraction. *Current Directions in Psychological Science, 5*, 178-183. doi: 10.1111/1467-8721.ep11512422
- McDonald, K. L., Putallaz, M., Grimes, C. L., Kupersmidt, J. B., & Coie, J. D. (2007). Girl talk: Gossip, friendship, and sociometric status. *Merrill-Palmer Quarterly, 53*, 381-411. doi: 10.1353/mpq.2007.0017
- McDougall, P., & Hymel, S. (2007). Same-gender versus cross-gender friendship conceptions: Similar or different? *Merrill-Palmer Quarterly, 53*, 347-380.
- McGuire, J., Martin, C. L., Fabes, R. A., Hanish, L. D. (2007). *The role of "gender enforcers" in young children's peer interactions*. Poster presented at the Biennial Meeting of Social Research on Child Development. Boston, MA.
- McHale, S. M., Updegraff, K. A., Helms-Erikson, H., & Crouter, A. C. (2001). Sibling influences on gender development in middle childhood and early adolescence: A longitudinal study. *Developmental Psychology, 37*, 115-125. doi: 10.1037/0012-1649.37.1.115

- McHale, S. M., Updegraff, K. A., & Whiteman, S. D. (2012). Sibling relationships and influences in childhood and adolescence. *Journal of Marriage and the Family*, *74*, 913–930. doi: 10.1111/j.1741-3737.2012.01011.x
- McPherson, M., Smith-Lovin, L., & Cook, J. M. (2001). Birds of a feather: Homophily in social networks. *Annual Review of Sociology*, *27*, 415-444. doi: 10.1146/annurev.soc.27.1.415
- Meadows, S. (2006). *The child as thinker: The development and acquisition of cognition in childhood* (2nd ed.) New York: Routledge.
- Mehta, C. M., & Strough, J. (2009). Sex segregation in friendships and normative contexts across the life span. *Developmental Review*, *29*, 201-220. doi: 10.1016/j.dr.2009.06.001
- Miller, C. F., Kochel, K. P., Wheeler, L. A., Updegraff, K. A., Fabes, R. A., Martin, C. L., & Hanish, L. D. (2017). The efficacy of a relationship building intervention in 5th grade. *Journal of School Psychology*, *61*, 75-88. doi: 10.1016/j.jsp.2017.01.002
- Miller, C. F., Martin, C. L., Fabes, R. A. & Hanish, L. (2013). Bringing the cognitive and the social together: How gender detectives and gender enforcers shape children's gender development. In M. R. Banaji & S. A. Gelman (Eds.), *Navigating the social world: What infants, children, and other species can teach us* (pp. 306-313). Oxford: Oxford University Press. doi: 10.1093/acprof:oso/9780199890712.003.0056
- Moller, L. C., & Serbin, L. A. (1996). Antecedents of toddler gender segregation: Cognitive consonance, gender-typed toy preferences and behavioral compatibility. *Sex Roles*, *35*, 445–460. doi:10.1007/BF01544131
- Monsour, M. (2002). *Women and men as friends: Relationships across the life span in the 21st century*. Mahwah, NJ: Lawrence Erlbaum Associates.
- Montgomery, M. J., & Sorell, G. T. (1998). Love and dating experience in early and middle adolescence: Grade and gender comparisons. *Journal of Adolescence*, *21*, 677-689. doi: 10.1006/jado.1998.0188
- Mrug, S., Borch, C., & Cillessen, A. H. N. (2011). Other-sex friendships in late adolescence: Risky associations for substance use and sexual debut? *Journal of Youth and Adolescence*, *40*, 875–888. doi: 10.1007/s10964-010-9605-7
- Muthén, L.K. and Muthén, B.O. (1998-2014). *Mplus User's Guide*. Seventh Edition. Los Angeles, CA: Muthén & Muthén

- Park, J. J., Denson, N., & Bowman, N. A. (2013). Does socioeconomic diversity make a difference? Examining the effects of racial and socioeconomic diversity on the campus climate for diversity. *American Educational Research Journal*, *50*, 466–496. doi: 10.3102/0002831212468290
- Pauletti, R. E., Cooper, P. J., & Perry, D. G. (2014). Influences of gender identity on children's maltreatment of gender-nonconforming peers: A person x target analysis of aggression. *Journal of Personality and Social Psychology*, *106*, 843–866. doi: 10.1037/a0036037
- Perez-Brena, N. J., Wheeler, L. A., Updegraff, K. A., & Schaefer, D. R. (2015). Mexican-American adolescents' gender-typed characteristics: The role of sibling and friend characteristics. *Archives of Sexual Behavior*, *44*, 1255–1268. <http://doi.org/10.1007/s10508-014-0447-3>
- Perry, D. G., & Pauletti, R. E. (2011). Gender and adolescent development. *Journal of Research on Adolescence*, *21*, 61–74. doi:10.1111/j.1532-7795.2010.00715.x
- Pettigrew, T. F. (1998). Intergroup contact theory. *Annual Review of Psychology*, *49*, 65–85. doi: 10.1146/annurev.psych.49.1.65
- Pettigrew, T. F., & Tropp, L. R. (2008). How does intergroup contact reduce prejudice? Meta-analytic tests of three mediators. *European Journal of Social Psychology*, *38*, 922–934. doi: 10.1002/ejsp.504
- Pettigrew, T. F., Tropp, L. R., Wagner, U., & Christ, O. (2011). Recent advances in intergroup contact theory. *International Journal of Intercultural Relations*, *35*, 271–280. doi: 10.1016/j.ijintrel.2011.03.001
- Poulin, F., Denault, A-S., & Pedersen, S. (2011). Longitudinal associations between other-sex friendships and substance use in adolescence. *Journal of Research on Adolescence*, *21*, 776–788. doi: 10.1111/j.1532-7795.2011.00736.x
- Poulin, F., & Pedersen, S. (2007). Developmental changes in gender composition of friendship networks in adolescent girls and boys. *Developmental Psychology*, *43*, 1484–1496. doi: 10.1037/0012-1649.43.6.1484
- Powlishta, K.K. (2004). Gender as a social category: Intergroup processes and gender-role development. In M. Bennett & F. Sani (Eds.), *The Development of the Social Self* (pp. 103–133). East Sussex, England: Psychology Press. doi: 10.4324/9780203391099_chapter_4
- Quinn, P. C., Yahr, J., Kuhn, A., Slater, A. M., & Pascalis, O. (2002). Representation of the gender of human faces by infants: A preference for female. *Perception*, *31*, 1109–1121. doi: 10.1068/p3331

- Rhemtulla, M., Brosseau-Liard, P. É., & Savalei, V. (2012). When can categorical variables be treated as continuous? A comparison of robust continuous and categorical SEM estimation methods under suboptimal conditions. *Psychological Methods, 17*, 354-373. doi: 10.1037/a0029315
- Richards, M. H., Crowe, P. A., Larson, R., & Swarr, A. (1998). Developmental patterns and gender differences in the experience of peer companionship during adolescence. *Child Development, 69*, 154-163. doi: 10.1111/j.1467-8624.1998.tb06140.x
- Robnett, R. D., & Leaper, C. (2013). Friendship groups, personal motivation, and gender in relation to high school students' STEM career interest. *Journal of Research on Adolescence, 23*, 652-664. doi: 10.1111/jora.12013
- Rose, A. J. (2007). Structure, content, and socioemotional correlates of girls' and boys' friendships: Recent advances and future directions. *Merrill-Palmer Quarterly, 53*, 489-506. doi: 10.1353/mpq.2007.0019
- Rose, A. J., & Rudolph, K. D. (2006). A review of sex differences in peer relationship processes: Potential trade-offs for the emotional and behavioral development of girls and boys. *Psychological Bulletin, 132*, 98-131. doi: 10.1037/0033-2909.132.1.98
- Rubin, K. H., Bukowski, W. M., & Parker, J. G. (2006). Peer interactions, relationships, and groups. In N. Eisenberg, W. Damon, R. M. Lerner (Eds.), *Handbook of child psychology: Vol. 3, Social, emotional, and personality development (6th ed.)* (pp. 571-645). Hoboken, NJ US: John Wiley & Sons Inc.
- Ruble, D. N., Martin, C. L., & Berenbaum, S. A. (2006). Gender development. In W. Damon (Series Ed.) & N. Eisenberg (Vol. Ed.), *Handbook of Child Psychology (6th ed., Vol. 3, pp. 858-932)*. New York: Wiley.
- Rudman, L. A., & Glick, P. (2008). *The social psychology of gender: How power and intimacy shape gender relations*. New York: Guilford Press.
- Savalei V. (2010). Small sample statistics for incomplete nonnormal data: Extensions of complete data formulae and a Monte Carlo comparison. *Structural Equation Modeling: A Multidisciplinary Journal, 17*, 241-264. doi: 10.1080/10705511003659375
- Sawilowsky, S. S., & Blair, R. C. (1992). A more realistic look at the robustness and Type II error properties of the t test to departures from population normality. *Psychological Bulletin, 111*, 352-360. doi: 10.1037/0033-2909.111.2.352

- Sears, H. A., Graham, J., & Campbell, A. (2009). Adolescent boys' intentions of seeking help from male friends and female friends. *Journal of Applied Developmental Psychology, 30*, 738-748. doi: 10.1016/j.appdev.2009.02.004
- Serbin, L. A., Moller, L. C., Gulko, J., Powlishta, K. K., & Colburne, K. A. (1994). The emergence of gender segregation in toddler playgroups. In C. Leaper (Ed.) *Childhood gender segregation: Causes and consequences* (pp. 7–18). San Francisco: Jossey-Bass. doi: 10.1002/cd.23219946503
- Sippola, L. K. (1999). Getting to know the “other”: The characteristics and developmental significance of other-sex relationships in adolescence. *Journal of Youth and Adolescence, 28*, 407-418. doi: 10.1023/A:1021660823003
- Smith, H. M., & Betz, N. E. (2000). Development and validation of a scale of perceived social self-efficacy. *Journal of Career Assessment, 8*, 283-301. doi: 10.1177/106907270000800306
- Smith, T. E., & Leaper, C. (2006). Self-perceived gender typicality and the peer context during adolescence. *Journal of Research on Adolescence, 16*, 91-104. doi: 10.1111/j.1532-7795.2006.00123.x
- Smith, E. E., & Medin, D. L. (1981). *Categories and concepts*. Cambridge, MA: Harvard University Press. doi: 10.4159/harvard.9780674866270
- Stattin, H., Kerr, M., Mahoney, J. L., Persson, A., & Magnusson, D. (2005). Explaining why a leisure context is bad for some girls and not for others. In J. L. Mahoney, R. W. Larson, & J. Eccles (Eds.), *Organized activities as contexts of development: Extracurricular activities, afterschool and community programs* (pp. 211 – 234). Mahwah, NJ: Erlbaum
- Tabachnick, B.G., Fidell, L.S., (2001). *Using multivariate statistics* (4th ed.). Allyn and Bacon: Boston, MA.
- Tajfel, H., & Turner, J. C. (1979). An integrative theory of intergroup conflict. In W. G. Austin & S. Worchel (Eds.), *The social psychology of intergroup relations*. Monterey, CA: Brooks/Cole.
- Tenenbaum, H. R., & Leaper, C. (2002). Are parents' gender schemas related to their children's gender-related cognitions? A meta-analysis. *Developmental Psychology, 38*, 615-630. doi: 10.1037/0012-1649.38.4.615
- Thomas, J. J., & Daubman, K. A. (2001). The relationship between friendship quality and self-esteem in adolescent girls and boys. *Sex Roles, 45*, 53-65. doi: 10.1023/A:1013060317766

- Thorne, B. (1992). Girls and boys together... but mostly apart: Gender arrangements in elementary schools. In J. Wrigley (Ed.), *Education and Gender Equality* (pp. 115-130). Routledge Falmer.
- Thorne, B. (1993). *Gender play: Girls and boys in school*. Rutgers University Press.
- Turner, J. C. (1982). Towards a cognitive redefinition of the social group. In H. Tajfel (Ed.), *Social identity and intergroup relations* (pp. 15-40). Cambridge, England: Cambridge University Press.
- Turner, R. N., Hewstone, M., Voci, A., Paolini, S., & Christ, O. (2007). Reducing prejudice via direct and extended cross-group friendship. In W. Strobe, & M. Hewstone (Eds.), *European review of social psychology* (pp. 212–255). Hove, U.K.: Psychology Press. doi: 10.1080/10463280701680297
- Tuval-Mashiach, R., Walsh, S., Harel, S., & Shulman, S. (2008). Romantic fantasies, cross- gender friendships, and romantic experiences in adolescence. *Journal of Adolescent Research*, 23, 471-487. doi: 10.1177/0743558407311332
- Underwood, M. K., & Rosen, L. H. (2009). Gender, peer relations, and challenges for girlfriends and boyfriends coming together in adolescence. *Psychology of Women Quarterly*, 33, 16-20. doi: 10.1111/j.1471-6402.2008.01468.x
- Updegraff, K. A., McHale, S. M., & Crouter, A. C. (2000). Adolescents' sex-typed friendship experiences: Does having a sister versus a brother matter? *Child Development*, 71, 1597-1610. doi: 10.1111/1467-8624.00251
- van Ginkel, J. R., & Kroonenberg, P. M. (2014). Analysis of variance of multiply imputed data. *Multivariate Behavioral Research*, 49, 78-91. doi: 10.1080/00273171.2013.855890
- Zins, J. E., & Elias, M. J. (2007). Social and emotional learning: Promoting the development of all students. *Journal of Educational and Psychological Consultation*, 17, 233-255. doi: 10.1080/10474410701413152
- Zosuls, K. M., Andrews, N. C. Z., Martin, C. L., England, D. E., & Field, R. D. (2016). Developmental changes in the link between gender typicality and peer victimization and exclusion. *Sex Roles*. doi: 10.1007/s11199-016-0608-z
- Zosuls, K. M., Field, R. D., Martin, C. L., Andrews, N. C. Z., & England, D. E. (2014). Gender-based relationship efficacy: Children's self-perceptions in intergroup contexts. *Child Development*, 85, 1663-1676. doi: 10.1111/cdev.12209
- Zosuls, K. M., Martin, C. L., Ruble, D. N., Miller, C. F., Gaertner, B. M., England, D. E., & Hill, A. P. (2011). It's not that we hate you: Understanding children's gender

attitudes and expectancies about peer relationships. *British Journal of Developmental Psychology*, 29, 288-304. doi: 10.1111/j.2044-835X.2010.02023.x

Zosuls, K. M., Ruble, D. N., Tamis-LeMonda, C. S., Shrout, P. E., Bornstein, M. H., & Greulich, F. K. (2009). The acquisition of gender labels in infancy: Implications for gender-typed play. *Developmental Psychology*, 45, 688-701. doi: 10.1037/a0014053

Table 1
Demographic Variables by Grade

Variable	Grade							
	Cohort 1				Cohort 2			
	2 nd Grade (N = 206)		3 rd Grade (N = 159)		4 th Grade (N = 206)		5 th Grade (N = 152)	
	N	%	N	%	N	%	N	%
Gender								
Girls	104	50.5%	83	52.2%	91	44.2%	70	46.1%
Boys	102	49.5%	76	47.8%	115	55.8%	82	53.9%
Missing	0	0%	0	0%	0	0%	0	0%
Ethnicity								
White	116	56.3%	94	59.1%	109	52.9%	81	53.3%
Latino/Hispanic	33	16%	22	13.8%	38	18.4%	33	21.7%
Asian	11	5.3%	8	5.0%	11	5.4%	7	4.6%
Black	12	5.8%	9	5.7%	6	2.9%	3	2.0%
Native American	5	2.4%	2	1.3%	7	3.4%	5	3.3%
Pacific Islander	1	0.5%	0	0%	2	1.0%	1	0.7%
Other _a	25	12.1%	21	13.2%	29	14.1%	20	13.2%
Missing	3	1.5%	3	1.9%	4	1.9%	2	1.3%
Household Income								
\$25,000 or less	29	14.1%	19	11.9%	38	18.4%	31	20.4%
\$26-50,000	47	22.8%	34	21.4%	43	20.9%	34	22.4%
\$51-75,000	30	14.6%	23	14.5%	30	14.6%	19	12.5%
\$76-100,000	41	19.9%	32	20.1%	42	20.4%	29	19.1%
\$101-150,000	24	11.7%	18	11.3%	22	10.7%	15	9.9%
Over \$150,000	28	13.6%	26	16.4%	24	12.1%	21	13.8%
Missing	7	3.4%	7	4.4%	7	3.4%	3	2.0%
IEP Plan_b								
No	185	89.8%	145	91.2%	191	92.7%	143	94.1%
Yes	16	7.8%	9	5.7%	14	6.8%	9	5.9%
Missing	5	2.4%	5	3.1%	1	0.5%	0	0%
Household Type								
Single Parent	53	25.7%	39	24.5%	46	22.3%	33	21.7%
Two-parent	150	72.8%	117	73.6%	158	76.7%	119	78.3%
Missing	3	1.5%	3	1.9%	2	1.0%	0	0%

_a = including bi- or multi-racial

_b = Individualized Education Plan (e.g., after school tutoring, behavior difficulties, speech therapy)

Table 2

Means and Standard Deviations for GBRE-Own and GBRE-Other by Cohort

Variables	Cohort					
	2 nd /3 rd Grade			4 th /5 th Grade		
	Girls	Boys	Overall	Girls	Boys	Overall
GBRE-Own (Year 1)	3.52 (.74)	3.45 (.69)	3.49 (.71)	3.43 (.90)	3.52 (.73)	3.48 (.81)
GBRE-Other (Year 1)	2.09 (1.18)	2.06 (1.26)	2.08 (1.22)	2.51 (1.16)	2.27 (1.26)	2.38 (1.22)
GBRE-Own (Year 2)	3.46 (.63)	3.48 (.61)	3.47 (.62)	3.34 (.70)	3.44 (.60)	3.39 (.65)
GBRE-Other (Year 2)	2.19 (1.05)	2.22 (1.08)	2.21 (1.06)	2.53 (.91)	2.39 (.95)	2.45 (.93)

Table 3
2nd/3rd Grade Correlations between GBRE-Own and GBRE-Other by Gender

Variables	1.	2.	3.	4.
1. GBRE-Own (Year 1)	--	.31**	.05	.09
2. GBRE-Other (Year 1)	.06	--	.13	.46***
3. GBRE-Own (Year 2)	.25*	.21*	--	.28**
4. GBRE-Other (Year 2)	-.00	.40***	.11	--

Note. Girls' correlations are presented on the top half of the diagonal; boys' correlations are presented on the bottom half.

* $p < .05$, ** $p < .01$, *** $p < .001$

Table 4
4th/5th Grade Correlations between GBRE-Own and GBRE-Other by Gender

Variables	1.	2.	3.	4.
1. GBRE-Own (Year 1)	--	.06	.38 ^{**}	-.07
2. GBRE-Other (Year 1)	.21 [*]	--	.11	.41 ^{***}
3. GBRE-Own (Year 2)	.29 ^{**}	.18 ⁺	--	.28 ^{**}
4. GBRE-Other (Year 2)	.02	.57 ^{***}	.39 ^{***}	--

Note. Girls' correlations are presented on the top half of the diagonal; boys' correlations are presented on the bottom half.

⁺ $p < .10$, ^{*} $p < .05$, ^{**} $p < .01$, ^{***} $p < .001$

Table 5
Overall Means and Standard Deviations for All Study Variables

Variables	Mean (<i>SD</i>)	
	Girl	Boy
GBRE-Other - Year 1	2.44 (1.04)	2.25 (1.17)
GBRE-Other - Year 2	2.50 (.91)	2.40 (1.03)
Positive expectancies toward OG _a peers - Year 1	1.20 (.69)	1.26 (.87)
Negative expectancies toward OG peers - Year 1	1.04 (.73) ¹	.67 (.59)
Anxious expectancies toward OG peers - Year 1	.68 (.63)	.55 (.63)
Positive expectancies toward OG peers - Year 2	1.22 (.61)	1.32 (.79)
Negative expectancies toward OG peers - Year 2	1.05 (.72) ²	.61 (.61)
Anxious expectancies toward OG peers - Year 2	.80 (.65) ³	.50 (.61)
OG peer preference - Year 1 _b	.22 (.25) ⁴	.16 (.21)
OG peer preference - Year 2 _b	.19 (.22)	.17 (.22)
OG friends - Year 1	1.28 (.81)	1.11 (.82)
OG friends - Year 2	1.33 (.85)	1.18 (.80)
Parental attitudes _c - Year 1	2.24 (.47) ⁵	2.37 (.46)
Older OG siblings _d - Year 1	.27 (.45)	.26 (.44)

Note. _aOG = other-gender; _bOther-gender peer preference was created using a proportion score of participants' other-gender nominees. _cParental attitudes refers to parent reported attitudes about gender diversity in their children's peer relationships. _dOlder other-gender siblings is a dichotomous variable (138 participants did not have an older other-gender sibling living in the same house, 50 participants did have an older other-gender sibling living in the same house, 18 participants did not provide sibling information). Girl and boy means for each study variable were compared using a One-way ANOVA. ¹⁻³Girls had significantly higher negative expectancies toward OG peers compared to boys in Year 1 and Year 2 ($ps < .001$) and were more anxious expectancies toward OG peers in Year 2 ($p < .01$). ⁴Girls nominated more OG peers than boys ($p < .10$). ⁵Parents of boys reported more positive attitudes toward their child having OG friendships compared to parents of girls ($p < .10$).

Table 6
Correlations for All Study Variables

Variables	1.	2.	3.	4.	5.	6.	7.	8.	9.	10.	11.	12.	13.	14.
1. GBRE-Other - Year 1	--	.47***	.58***	-.24***	-.26***	.43***	-.11	.04	.24**	.28***	.53***	.34***	.16*	.08
2. GBRE-Other - Year 2		--	.25**	-.10	-.22**	.53***	-.36***	-.20*	.15 ⁺	.34***	.32***	.49***	-.00	.11
3. Positive expectancies toward OG _a peers - Year 1			--	-.26***	.04	.44***	-.07	.17*	.31***	.27**	.63***	.32***	.14*	.03
4. Negative expectancies toward OG peers - Year 1				--	.41***	-.19*	.41***	.19*	-.01	.08	-.12 ⁺	.01	.02	-.07
5. Anxious expectancies toward OG peers - Year 1					--	-.04	.20*	.22**	.03	-.02	-.04	-.01	-.08	-.01
6. Positive expectancies toward OG peers - Year 2						--	-.24**	.09	.20*	.38***	.31***	.53***	-.07	.10
7. Negative expectancies toward OG peers - Year 2							--	.55***	.12	-.07	-.05	-.14 ⁺	.16*	-.11
8. Anxious expectancies toward OG peers - Year 2								--	.27**	.07	.13	.05	.09	-.14 ⁺
9. OG peer preference - Year 1 _b									--	.39***	.42***	.15 ⁺	-.00	-.17*
10. OG peer preference - Year 2 _b										--	.30***	.30***	.13	-.05
11. OG friends - Year 1											--	.40***	.08	-.10
12. OG friends - Year 2												--	.05	-.00
13. Parental attitudes _c - Year 1													--	-.18*
14. Older OG siblings _d - Year 1														--

Note. _aOG = other-gender; _bOther-gender peer preference was created using a proportion score of participants' other-gender nominees. Parental attitudes refers to parent reported attitudes about gender diversity in their children's peer relationships. _dOlder other-gender siblings is a dichotomous variable (138 participants did not have an older other-gender sibling living in the same house, 50 participants did have an older other-gender sibling living in the same house, 18 participants did not provide sibling information).
+ $p < .10$, * $p < .05$, ** $p < .01$, *** $p < .001$

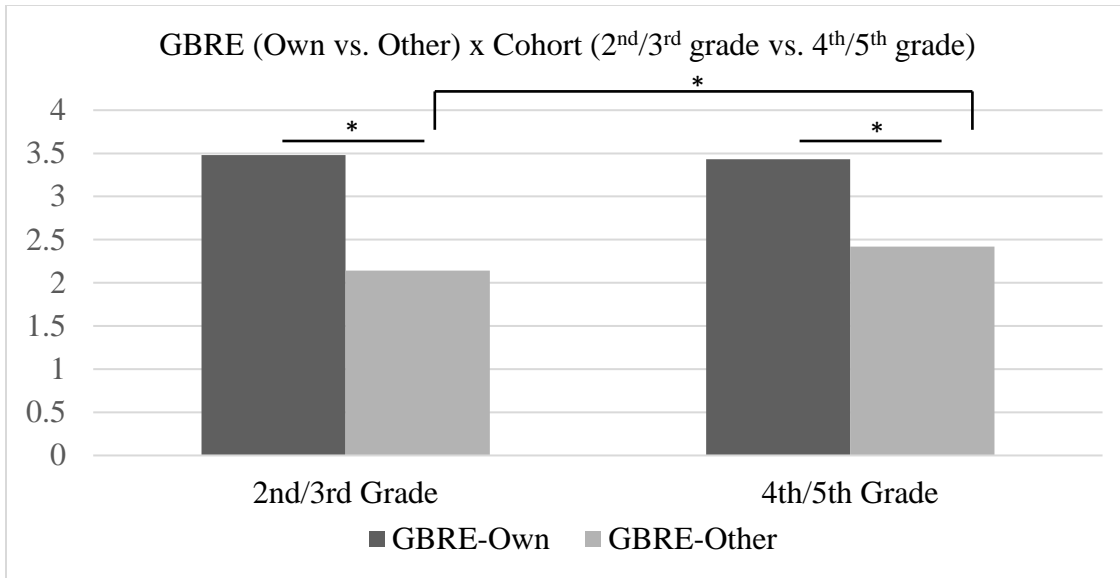


Figure 1. Bar graph illustrating the significant interaction between GBRE and Cohort. Simple effects revealed that both cohorts reported higher GBRE-Own compared to GBRE-Other and the 4th/5th grade cohort reported higher GBRE-Other compared to the 2nd/3rd grade cohort.

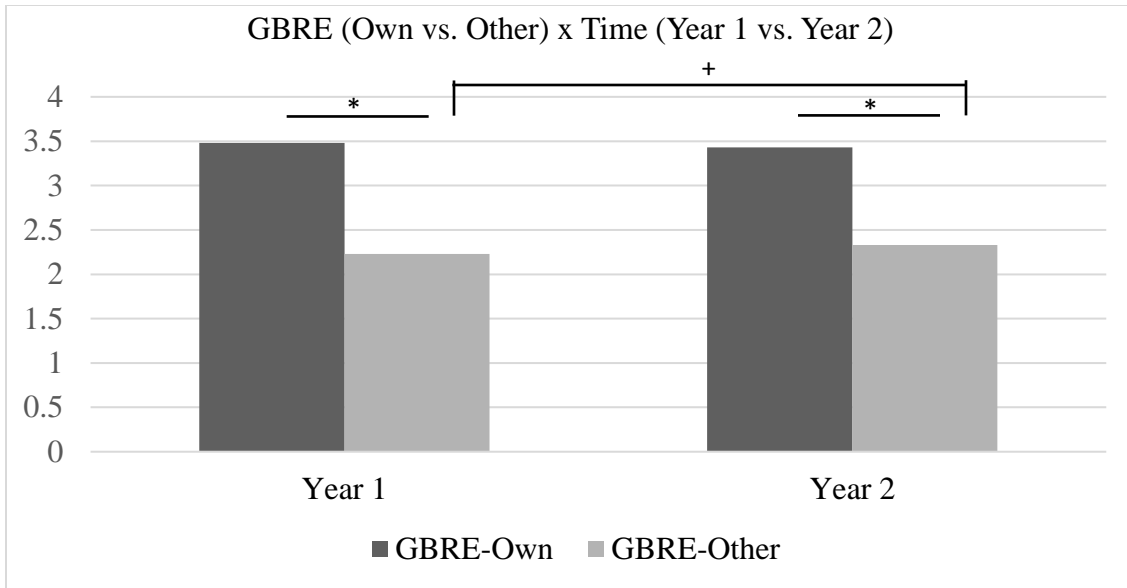


Figure 2. Bar graph illustrating the marginally significant interaction between GBRE and Time. GBRE-Own was higher than GBRE-Other in Year 1 and Year 2. GBRE-Other was marginally significantly higher in Year 2 compared to Year 1.

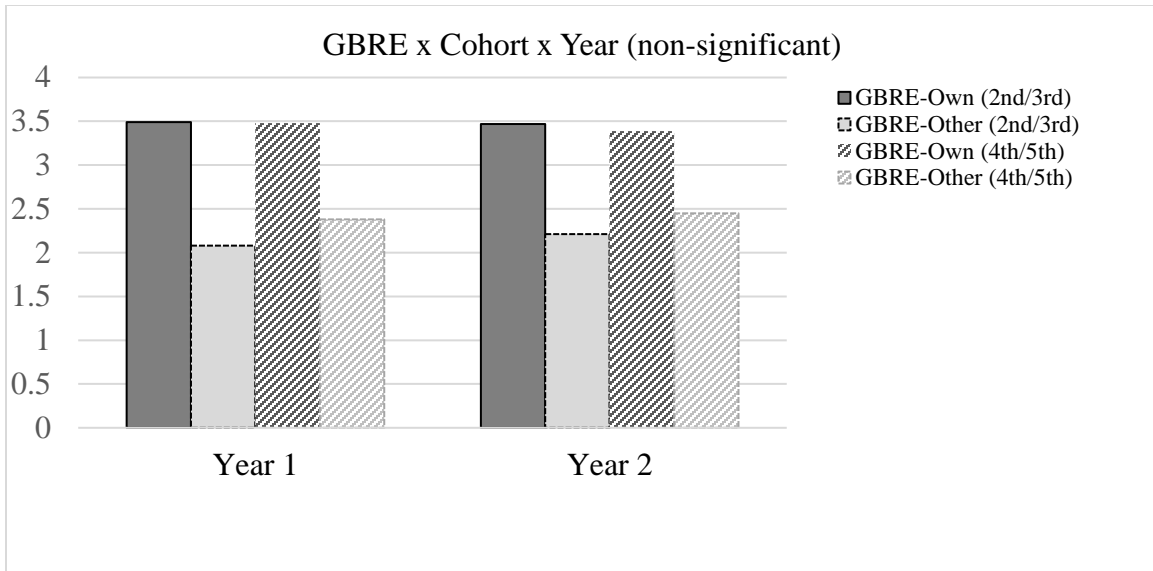


Figure 3. Bar graph illustrating the non-significant three-way interaction between GBRE, Cohort, and Year.

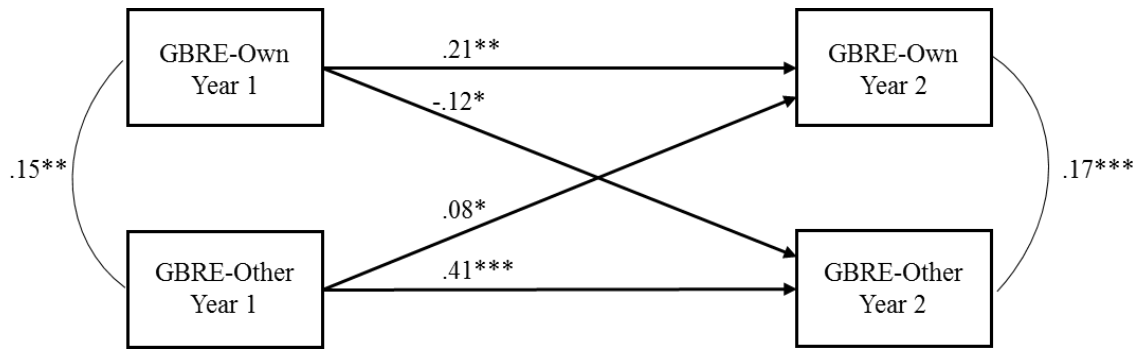


Figure 4. Fully constrained autoregressive, cross-lagged path analysis across cohort and gender. Gender differences were tested using multi-group analyses, but log likelihood comparisons suggested that the more parsimonious (constrained) model fit the data as well as the model with freed parameters.

* $p < .05$, ** $p < .01$, *** $p < .001$

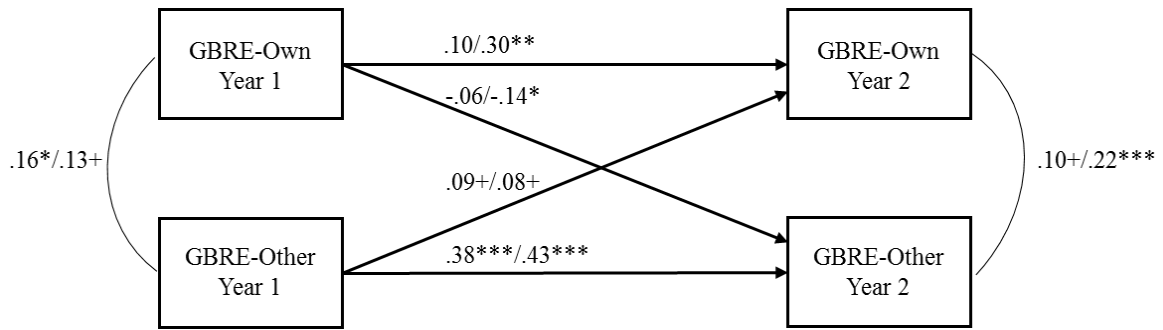


Figure 5. Autoregressive, cross-lagged path analysis where parameters were freed. 2nd grade cohort parameter estimates are listed first, followed by 4th grade cohort parameter estimates.

* $p < .05$, ** $p < .01$, *** $p < .001$

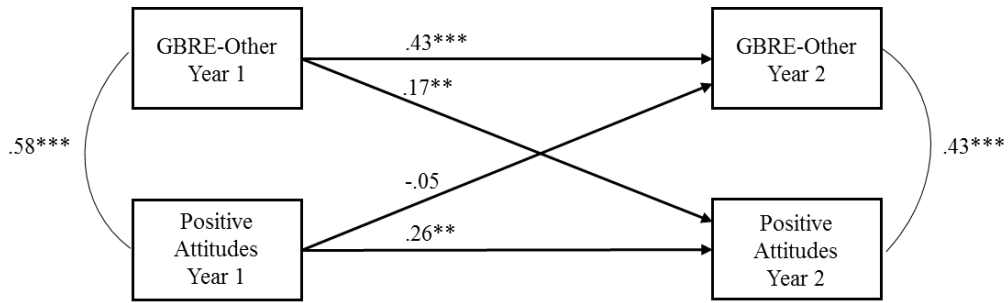


Figure 6. Autoregressive, cross-lagged path analysis testing Hypothesis 1 ($N = 204$). GBRE-Other: $R^2 = .22$, $p < .001$; Positive Attitudes: $R^2 = .24$, $p < .001$. Positive Attitudes = Positive attitudes toward other-gender peers.
 * $p < .05$, ** $p < .01$, *** $p < .001$

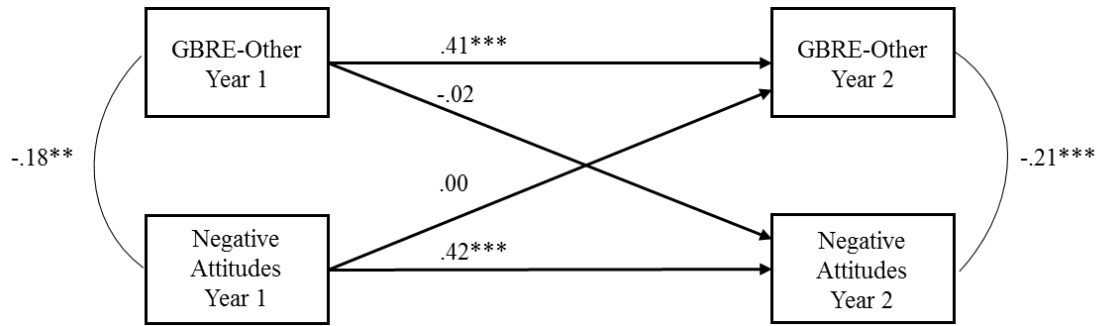


Figure 7. Autoregressive, cross-lagged path analysis testing Hypothesis 2 ($N = 204$). GBRE-Other: $R^2 = .22, p < .001$; Negative Attitudes: $R^2 = .17, p < .001$. Negative Attitudes = Negative attitudes toward other-gender peers.
 $* p < .05, ** p < .01, *** p < .001$

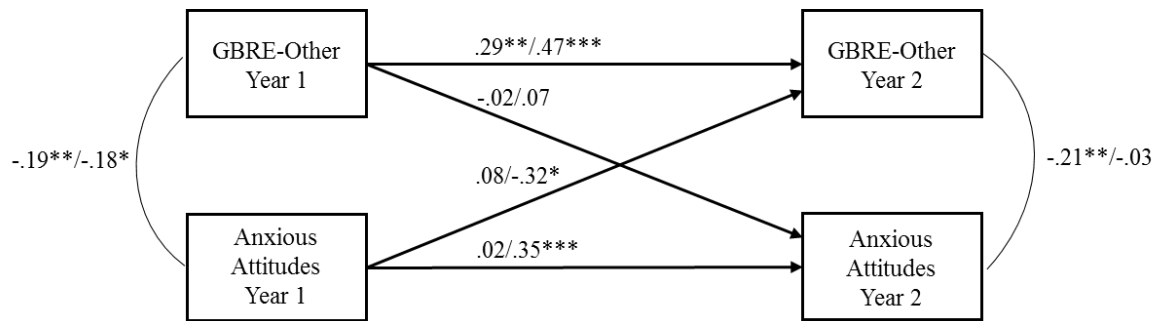


Figure 8. Autoregressive, cross-lagged path analysis testing Hypothesis 3 ($N = 90$ girls, 114 boys). Parameter estimates for girls are listed first, followed by boys. For girls, GBRE-Other: $R^2 = .10$, $p = \text{ns}$; Anxious Attitudes: $R^2 = .00$, $p = \text{ns}$. For boys, GBRE-Other: $R^2 = .37$, $p < .001$; Anxious Attitudes: $R^2 = .13$, $p < .05$. Anxious Attitudes = Anxious attitudes toward other-gender peers.
 $* p < .05$, $** p < .01$, $*** p < .001$

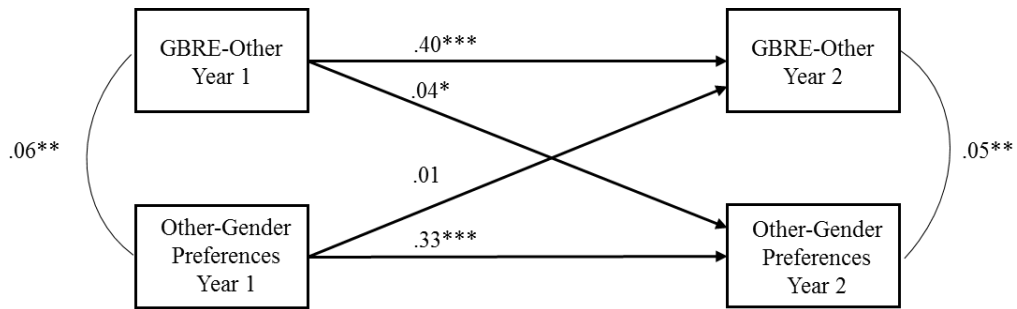


Figure 9. Autoregressive, cross-lagged path analysis testing Hypothesis 4 ($N = 204$).
 GBRE-Other: $R^2 = .22, p < .001$; Other-Gender Preference: $R^2 = .18, p < .01$.
 $^+p < .10, *p < .05, **p < .01, ***p < .001$

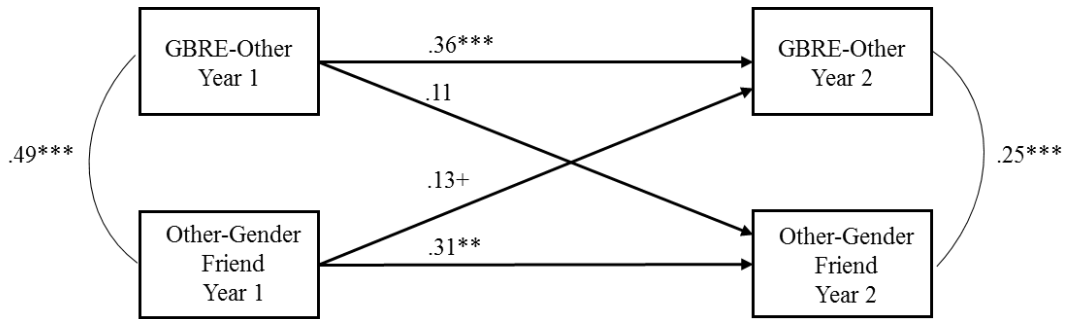


Figure 10. Autoregressive, cross-lagged path analysis testing Hypothesis 5 ($N = 204$).
 GBRE-Other: $R^2 = .22$, $p < .001$; Other-Gender Friend: $R^2 = .18$, $p < .01$.
 $^+p < .10$, $^*p < .05$, $^{**}p < .01$, $^{***}p < .001$

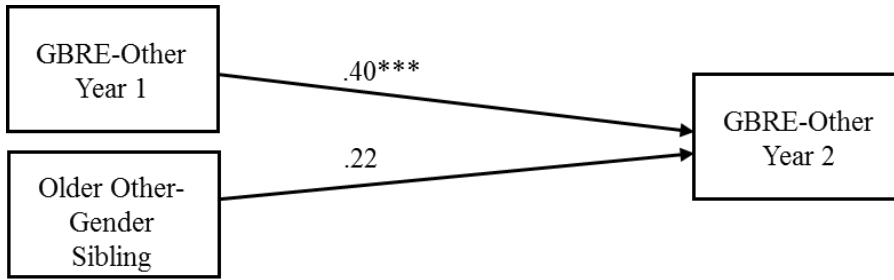


Figure 11. Regression analysis testing Hypothesis 6 ($N = 135$; 69 missing all but x-variable or missing x-variables). GBRE-Other: $R^2 = .23$, $p < .001$.

*** $p < .001$

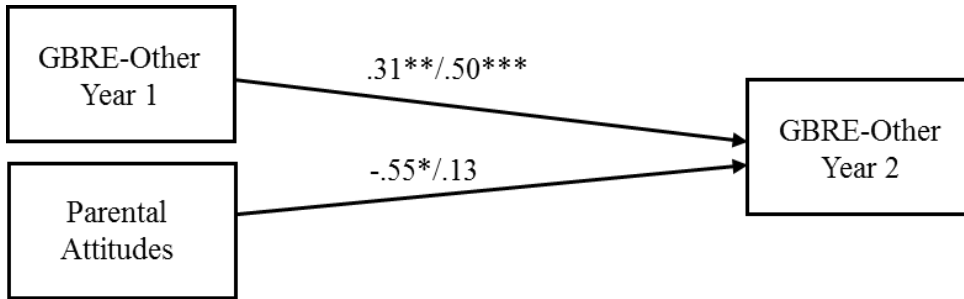


Figure 12. Regression analysis testing Hypothesis 7 ($N = 150$, 68 girls, 82 boys; 54 missing all but x-variable or missing x-variables). Coefficients are presented girl/boy. * $p < .05$, ** $p < .01$, *** $p < .001$

APPENDIX A
ITEMS USED IN THE PRESENT STUDY FROM THE GENDER-BASED
RELATIONSHIPS EFFICACY SCALE

Gender Based Relationship Efficacy Scale (adapted from Zosuls et al., 2014)

Response Scale: 0 = not at all, 1 = not really, 2 = a little bit, 3 = pretty much, 4 = a lot

2. How much do you know how to talk to [girls/boys]?
4. How much do you know how to be accepted by [girls/boys]?
5. How much do you know how to have fun with [girls/boys]?
7. How much do you know how to play with [girls/boys]?

APPENDIX B

SUMMARY OF MULTIPLY IMPUTATION DATA SETS

Table B1

Summary of Repeated Measures ANOVAs on Original Data and Imputed Data Sets

Effects	Data Sets					
	Original	MI 1	MI 2	MI 3	MI 4	MI 5
Main Effects						
Gender	X	X	X	X	X	X
Grade (Cohort)	+	+	+	+	*	*
Time (Year)	+	X	X	X	X	X
GBRE	*	*	*	*	*	*
Two-Way Interactions						
GBRE x Grade	*	*	*	*	*	*
GBRE x Gender	+	X	X	X	X	X
Year x Gender	X	X	X	X	X	X
Year x Grade	X	X	X	X	X	X
GBRE x Year	X	*	+	*	*	*
Gender x Grade	X	X	X	X	X	X
Three-Way Interactions						
GBRE x Gender x Grade	X	+	X	X	X	X
Year x Gender x Grade	X	X	X	X	X	X
GBRE x Year x Gender	X	X	X	X	X	X
GBRE x Year x Grade	X	X	X	X	X	X
4-Way Interaction						
GBRE x Year x Grade x Gender	X	X	X	X	X	X

Note. In the GBRE x Year interaction, simple effects comparing GBRE showed that GBRE-Own was higher than GBRE-Other at both time points in the imputed data sets. Additionally, simple effects comparing Year for this interaction were not significant for most imputation data sets or showed that GBRE-Other was marginally higher at Year 2. Original = original dataset with missing data; MI1-5 = multiple imputation data sets 1 through 5.

x= main effect or interaction was not significant; + = main effect or interaction was marginally significant; * = main effect or interaction was significant

Table B2

Summary of Means and Standard Deviations for Original Data and Imputed Data Sets

Variables	Data Set Means (SD)					
	Original	MI 1	MI 2	MI 3	MI 4	MI 5
GBRE-Own Year 1	3.47 (.77)	3.48 (.76)	3.48 (.76)	3.48 (.76)	3.48 (.76)	3.48 (.76)
GBRE-Other Year 1	2.21 (1.23)	2.23 (1.23)	2.23 (1.23)	2.23 (1.23)	2.23 (1.23)	2.23 (1.23)
GBRE-Own Year 2	3.50 (.70)	3.46 (.65)	3.43 (.69)	3.42 (.68)	3.42 (.68)	3.44 (.67)
GBRE-Other Year 2	2.35 (1.11)	2.33 (1.06)	2.31 (1.06)	2.32 (1.06)	2.32 (1.07)	2.37 (1.06)

Note. Original = original dataset with missing data; MI1-5 = multiple imputation data sets 1 through 5.