

“To Be, or Not to Be, That Is the Question”: Modeling and Differentiation Among Siblings Participating in Organized Youth Sport

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Organized youth sport is a relatively common family context in which sibling dynamics are not well understood. The present study was designed to address two contrasting mechanisms of socialization—*modeling* and *differentiation*—in examining older siblings’ influence on younger siblings’ sport participation. American youth ($N = 221$) age 10–15 years ($M = 12.38$, $SD = 1.01$) who were active sport participants completed an online survey measuring individual and family demographics, sibling relationship qualities, and parent–child relationship dimensions. The participants reported on their most proximal older siblings, all of whom were within 4 years of age. The analyses suggest that sibling differentiation dynamics decreased the likelihood of playing the same primary sport as an older sibling for (a) the same biological sex, close in age to siblings; (b) the same biological sex, further in age from siblings; and (c) mixed biological sex, wide in age from siblings. The “Discussion” section highlights the practical value of understanding the impact of sibling influence processes on the individual, sibling dyad, and family system.

Keywords: birth order, sibling influence, sibling sex composition, sport choice

Sibling relationships are recognized as the longest lasting relationship in the family unit (Cicirelli, 1995; Whiteman, McHale, & Soli, 2011). Importantly, sibling relationships exist without regard for personal preference and without any explicit contract of acknowledgment—rather, these relationships may be considered fait accompli based simply on sharing a mother and father. Although sibling relationships are not made by choice, they serve as formative instruments of socialization, having the potential to greatly impact the trajectory of both individuals’ lives (Feinberg, McHale, Crouter, & Cumsille, 2003; Slomkowski, Rende, Novak, Lloyd-Richardson, & Niaura, 2005). Indeed, across the life span, siblings may serve as both rivals and role models (McHale, Updegraff, & Whiteman, 2012; Volkman, 2006), while exhibiting tones of both warmth and conflict in daily interactions (Campione-Barr & Smetana, 2010; Stoneman, 2001). These interactions can take place in a variety of contexts, one of which is organized youth sport (Fraser-Thomas, Côté, & Deakin, 2008).

In organized youth sport, siblings have the potential to impact each other in terms of perception of achievement, amount of participation, and level of enjoyment (Blazo et al., 2014; Côté, 1999; Osai & Whiteman, 2017). In fact, as younger siblings report more warmth in relationships with older siblings, younger siblings report more interest and skill in sport-related activities (Osai & Whiteman, 2017). These authors also noted that in same-sex sibling dyads, as older siblings report more time spent in sport-related activities, younger siblings report similar behavior. Interestingly, this finding did not hold for mixed-sex siblings. Given the potential dyadic and family level implications of siblings’ sport-related decisions, it is important that scholars look to theoretically based

constructs and processes that provide a framework for understanding and predicting sport-related behavior.

Two influence processes that can help explain siblings’ developmental trajectories are modeling and differentiation (Whiteman, Becerra, & Killoren, 2009). When engaged in modeling processes, younger siblings often pursue a similar life course to their older siblings, using them as temporal reference points over the life span (Solmeyer, McHale, & Crouter, 2014). In other cases, younger siblings may choose to differentiate (Whiteman et al., 2009), pursuing distinct interests and pathways to reduce competition and comparison within the family. For example, Whiteman, McHale, and Crouter (2007) examined how older siblings influenced younger brothers’ and sisters’ behavior in four domains. Survey data from 382 youth suggested that siblings experience similar outcomes when younger siblings reported higher levels of trying to be like their older brother/sister (i.e., modeling), including interests in extracurricular activities, such as athletics. Within this study, the younger siblings also reported not wanting to be like or compete with an older sibling (i.e., differentiation) in the same achievement domains. When taking both modeling and differentiation behaviors into account within the context of youth sport, a child may engage in modeling by choosing to participate in the same sport, wear the same number, or play the same position as an older sibling, whereas another may differentiate by participating in a different sport or playing a different position than an older sibling, or by choosing not to play sport altogether. Importantly, the family level implications of modeling and differentiation can be seen not only in the sibling dyad (e.g., via sibling warmth and conflict), but also in the parent–child relationship (e.g., via differential treatment).

Previous research suggests that modeling and differentiation have the potential to foster both positive and negative experiences for youth engaged in sport and physical activity (for a review, see Blazo & Smith, 2017). The majority of research in this area, however, lacks guiding theory and/or applies theory in a post hoc

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fashion. In light of this, the present research used theory to frame the empirical understanding of younger siblings' socialization experiences in organized youth sport. Specifically, the present study has been designed as an explicit test of social learning theory and differentiation theory processes (i.e., modeling, differentiation).

Social Learning, Sibling Modeling, and Imitation

Social learning processes, such as modeling and imitation, have been cited as a primary social mechanism driving similarities in domains such as aggression and delinquency (e.g., [Rowe & Gulley, 1992](#); [Slomkowski, Rende, Conger, Simons, & Conger, 2001](#)), health risk behaviors ([D'Amico & Fromme, 1997](#)), and substance use behaviors (e.g., [Slomkowski et al., 2005](#); [Whiteman, Jensen, & Maggs, 2013](#)). As a means of social learning, modeling is defined as acquiring knowledge through the observation of other individuals ([Bandura, 1977](#)). For example, it is thought that younger children may observe the actions of an older sibling and utilize them as a guide for their own future behavior. This process encompasses paying attention to the potential model, retaining the behavior cognitively, understanding that you do or do not have the physical capability to reproduce the behavior, and feeling motivated to actually attempt the modeled behavior. As individuals follow these steps, they may then try to imitate the behavior modeled. Through imitation, practicing the behavior, and receiving feedback regarding the behavior, individuals have a better chance of modeling the behavior. In youth sport, a younger sibling may see an older sibling participate in a sport that looks appealing. Once they have captured the behavior cognitively, they then replay this memory until they try to attempt the behavior. Once the younger sibling feels like they can perform the behavior, they then feel a sense of motivation to perform the behavior and try to imitate the behavior. Importantly, however, other factors play a key role in determining whether or not a younger sibling will want to model an older sibling's behavior.

One key aspect of social learning is that observers are more likely to model the behaviors of another individual when the two individuals are more similar ([Bandura, 1977](#); [Sutton-Smith & Rosenberg, 1970](#)). Scholars note that younger siblings are more likely to imitate siblings who are more similar in age and share biological sex (e.g., [Boyle, Sanford, Szatmari, Merikangas, & Offord, 2001](#); [Rowe & Gulley, 1992](#); [Trim, Leuthe, & Chassin, 2006](#)). Additionally, sibling dyads who share warmer relationships are more likely to exhibit modeling behaviors and demonstrate similarities in behavior (e.g., [McHale, Bissell, & Kim, 2009](#); [Slomkowski et al., 2005](#)). In general, most research on sibling influence suggests that the sibling modeling process is largely unidirectional, with younger siblings modeling the behavior of older siblings in multiple domains (e.g., drug and alcohol use, sexual activity, interests, extracurricular activities; e.g., [Boyle et al., 2001](#); [McHale et al., 2009](#); [Slomkowski et al., 2005](#)). In the sport literature, emerging qualitative research suggests that modeling can be a key process engaged in by younger siblings during childhood and adolescence as they pursue developmental milestones similar to their older siblings (see [Blazo et al., 2014](#); [Taylor, Carson, & Collins, 2018](#)). Building on this emerging body of work, the present study specifically examined whether modeling an older sibling's sports activities predicted greater behavioral similarity (i.e., playing the same primary sport) among younger siblings.

Sibling Differentiation

Although youth sport provides a context for sibling modeling, it is also important to consider the impact of sibling differentiation among siblings in sport. Differentiation theory, rooted largely in Adler's psychoanalytic theory, posits that younger siblings will choose different pathways from an older sibling in an effort to create a unique identity ([Ansbacher & Ansbacher, 1956](#); [Whiteman et al., 2007](#)). For example, younger children may observe the actions of an older sibling and subsequently choose to pursue a different or unique path. This process of differentiation or "niche picking" is thought to protect siblings from rivalry and competition by reducing competition for parental resources, ultimately promoting greater relational harmony (i.e., more warmth, less conflict) between siblings ([Schachter, Gilutz, Shore, & Adler, 1978](#); [Whiteman et al., 2007](#)). Recent research, however, challenges this premise, as studies by Whiteman et al. generally note lower levels of intimacy and higher rates of conflict among siblings who differentiate ([Whiteman, Bernard, & McHale, 2010](#); [Whiteman et al., 2007](#)). Even though this finding contradicts a core tenet of differentiation theory, it may be that siblings' relationship quality reports are linked to differentiation, as opposed to psychodynamic drives (i.e., the reduction of competition). In sport, differentiation typically occurs when a younger sibling wants to chart their own course in an effort to secure more parent and family resources (e.g., time, money, affection; see [Blazo et al., 2014](#); [Taylor et al., 2018](#)). In direct contradiction to social learning processes, differentiation theory posits that younger siblings who are more similar to an older sibling in terms of biological sex and age are more likely to differentiate, resulting in less competition for resources and a more harmonious sibling relationship.

The Present Study

Notably, there appears to be an incompatibility between the contexts that promote modeling and differentiation processes in the sibling relationship. In light of this, there is a critical need to explore the impact of these opposing processes on younger siblings' sport participation decisions. Indeed, testing the contrasting processes of modeling and differentiation within the context of youth sport has the potential to help researchers better understand sibling influence within the broader context of the family, while also offering researchers and practitioners a more nuanced understanding of sibling influence in organized youth sport.

To understand more clearly the older siblings' influence in organized youth sport, research must consider the many factors that may moderate modeling and differentiation processes. At a minimum, two potential moderators should be included when considering younger siblings' sport participation decisions: biological sex composition of the sibling dyad and the age spacing (or difference) between the siblings. These factors are important, as theory and research suggest that older siblings who are more like younger siblings in these ascribed characteristics (i.e., biological sex, age) are more likely to model (e.g., [Rowe & Gulley, 1992](#); [Slomkowski et al., 2001, 2005](#)) and differentiate (e.g., [Feinberg & Hetherington, 2000](#); [Feinberg et al., 2003](#); [Schachter et al., 1978](#); [Schachter, Shore, Feldman-Rotman, Marquis, & Campbell, 1976](#)).

In addition to the constructs listed above, it is important to consider other factors to control for. When recognizing the many potential covariates on younger siblings' sport participation decisions, one should recognize global factors, such as sibling and parent relationship quality (i.e., warmth and conflict). Indeed,

sibling relationship quality has been recognized as an influence mechanism of sibling decision making (Slomkowski et al., 2005; Trim et al., 2006), and parent–child relationship quality has been recognized as a context for socialization (Darling & Steinberg, 1993). In sport, Côté (1999) described the parent–child relationship as salient to athletes' decision making. Controlling for sibling and parent variables will allow for greater discernment regarding whether common factors of sibling modeling and/or differentiation (i.e., biological sex, age) predict youth sport participation outcomes, above and beyond relationship qualities with various members of the family unit.

An overarching goal of the present study was to achieve a more holistic understanding of the family system in youth sport by examining the impact of sibling modeling and differentiation on young athletes' sport participation decisions. To date, the overwhelming majority of research on significant others in youth sport has targeted relationships and interactions among athletes and their coaches, parents, and peers (e.g., Keegan, Spray, Harwood, & Lavalley, 2010; Smoll, Cumming, & Smith, 2011; Ullrich-French & Smith, 2006). While it is important to assess the unique and combined impacts of these individuals on athletes' experiences and outcomes, it remains important to also examine siblings as a salient developmental contributor in youth sport (for a review, see Blazo & Smith, 2017).

Examining sibling processes in organized youth sport has the potential to enhance practical and theoretical knowledge of the youth sport experience. As such, the present study was designed to examine how younger siblings' reports of modeling and differentiation in reference to older siblings predicted similarities and/or differences in siblings' sport participation decisions. Because the present study was exploratory, in that theoretical concepts have not been explicitly examined regarding sibling behavior in youth sport (Blazo & Smith, 2017), and in line with our overarching purpose, two explicit aims directed the present work: (a) to examine the extent to which reports of modeling and differentiation behaviors predicted younger siblings' sport participation decisions and (b) to determine the potential moderating influence of ascribed factors (i.e., biological sex composition of the dyad and age gap between siblings) on these processes.

Given the contrasting theoretical perspectives (i.e., modeling and differentiation) supported in past developmental theory, five specific hypotheses were forwarded in the present study. First, we expected that (H1) younger siblings who report higher levels of modeling behavior would be more likely to report their primary sport as being the same as that of their older sibling who is the closest in age. Second, we expected that (H2) younger siblings who report higher levels of differentiating behavior would be more likely to report a different primary sport from that of their older sibling who is the closest in age. Third, in line with past sibling research (e.g., Feinberg & Hetherington, 2000; Feinberg et al., 2003; Rowe & Gulley, 1992; Schachter et al., 1976, 1978; Slomkowski et al., 2001, 2005), we expected that (H3) biological sex composition (e.g., same sex or mixed sex) would moderate the relationship between each independent variable (i.e., modeling, differentiation) and siblings' sport participation decisions. Fourth, we expected that (H4) age difference would moderate the relationship between each independent variable (i.e., modeling, differentiation) and siblings' sport participation decisions. Last, we expected that (H5) modeling and differentiation processes would be most pronounced when siblings were closer in age and same-sex dyads. In providing evidence for or against these hypotheses, the present work has the potential to extend past empirical efforts that document

modeling and differentiation processes with regard to time spent in sport (e.g., Whiteman et al., 2007), as well as youth's skills, interest, and participation in sport (e.g., Osai & Whiteman, 2017).

Method

Participants

The participants included a sample of 221 American children (117 males and 104 females), representing 22 states. Of those who participated, 111 reported on a same-sex sibling, and 110 reported on a mixed-sex sibling. Within the sample, 1.4% ($n = 3$) identified as American Indian/Alaskan native, 2.7% ($n = 6$) as Asian, 13.6% ($n = 30$) as Black, 57% ($n = 126$) as White, 19.5% ($n = 43$) as "More than one race," and 5.9% ($n = 13$) as "Unknown/Other." Of those who participated, 111 reported on a same-sex sibling, and 110 reported on a mixed-sex sibling. Despite the inherent limitations of recruiting a nonrandomized convenience sample, utilizing this strategy allowed us to target a specific population of youth who were active participants in sport and had a close-in-age older sibling also participating. At the time of the data collection, the participants ranged in age from 10 to 15 years ($M = 12.38$, $SD = 1.01$) and participated across 11 individual and 13 team sports at the recreational or competitive level.

Because modeling and differentiation processes engaged in by younger siblings were examined, younger siblings were asked to report on themselves and a proximal older sibling who also participated in sport, all of whom were within 4 years of age of the participating sibling (range = 0.92–3.92 years; $M = 2.43$ years; $SD = 0.76$ years). A primary tenet of the modeling hypothesis is that siblings who are closer in age will engage in more similar behavior. Conversely, the differentiation hypothesis suggests that siblings who are closer in age will be more likely to choose different paths (Schachter et al., 1976, 1978). Therefore, in the present study, we recruited participants within 4 years of age to maximize the likelihood of attributing sport participation decisions to one of these two mechanisms.

Procedures

Upon human ethics approval, we sought permission to recruit children via electronic communication and personal contact from a variety of key youth sport gatekeepers (e.g., recreation managers, sport administrators, club coaches, parents) across the United States. Subsequent to obtaining gatekeeper permissions, parents and their children who qualified for the study were provided access to an anonymous online survey. Additionally, individuals who expressed interest in the survey and wanted to share it with adults who had children who qualified were sent an e-mail template with the survey link. As noted by Gall, Gall, and Borg (2007), this type of snowball sampling approach allowed individuals to seek and refer families who met the stated research criteria.

Each anonymous online survey consisted of (a) a letter of information explaining the study, (b) consent and assent forms to be signed by the parent/guardian and child, respectively, and (c) the survey instrument to be filled out by the child. The participants had the ability to complete the survey at a time and location of their choosing; however, the entire survey protocol needed to be completed in one sitting. In Part I of the survey, parents read a brief letter of information, and subsequent consent and assent forms were filled out electronically. In Part II, the participating child completed the 68-item survey protocol.

Measures

The individual and family demographics were collected by asking children to respond to a series of questions about themselves and their families. Specifically, the participants were asked to report their age, biological sex, ethnicity, race, grade level, number of sports participated in, primary sport, current sport, and goals for sport participation. Additionally, the participants reported the birth date, biological sex, primary sport, and other sports participated in for their most proximal older sibling.

Sibling modeling and differentiation were examined using a scale developed to examine sibling influence processes (Whiteman et al., 2010). The original 18-item measure consisted of eight items measuring social learning (i.e., modeling) and 10 items indexing differentiation. The answers were scored on a scale ranging from 1 (*never*) to 5 (*very often*). In the present study, the items were contextualized to the youth sport domain. Example sport-adapted items are “My older sibling provides a model for how I should play sports” (modeling) and “I play different sports so I won’t be like my older sister/brother” (differentiation). Mean scores were calculated for each subscale, with higher scores indicating higher levels of modeling or differentiation. The original subscales showed an internal consistency of scores of 0.90 and 0.85 for modeling and differentiation, respectively (Whiteman et al., 2010). These constructs have also been found to be orthogonal ($r = -.05$, *ns*) and valid in past research (Whiteman et al., 2007, 2010; Whiteman, Jensen, & Maggs, 2014) and were therefore examined independently in the present study.

Given that we adapted this measure to the sport context, to assess the factor structures of the sport-adapted sibling modeling and differentiation scales, we performed confirmatory factor analyses using the original factor structures from Whiteman et al.’s (2010) Sibling Influence Scale. Results of the confirmatory factor analyses indicated strong fit for both sibling modeling and sibling differentiation in sport (see Table 1 for the standardized factor

loadings of both constructs). Specifically, for sibling modeling in sport, all eight items loaded significantly onto the latent factor, with standardized weights greater than 0.34. Furthermore, allowing for select residual terms to covary, model fit was strong, $\chi^2 = 11.92$, $p = .53$, comparative-fit index = 1.00, normed fit index = .98, root mean square error of approximation = .01. For sibling differentiation in sport, all 10 items loaded significantly onto the latent factor, and nine of the 10 items had standardized weights greater than 0.35. Allowing for select residual terms to covary, model fit was strong, $\chi^2 = 24.74$, $p = .36$, comparative-fit index = .99, normed fit index = .96, root mean square error of approximation = .02.

Following previous work (Whiteman et al., 2010, 2014), we created overall modeling and differentiation in sport scores by averaging across the items for each scale separately. Although the item “I’ve learned from my sibling’s mistakes when playing sports” loaded weakly and negatively onto the differentiation factor in the confirmatory factor analyses, the item was included in the final differentiation in sport scale given previous work and that the internal consistency for this scale ($\alpha = .81$) was strong despite its inclusion. The modeling in sport scale also demonstrated strong internal consistency ($\alpha = .83$). Finally, the modeling and differentiation in sports scales were more modestly negatively correlated ($r = -.21$).

Age difference was calculated by subtracting the younger sibling’s birth date from the older sibling’s birth date. Age differences were rounded to two decimal places (i.e., an age difference of 1 year, 3 months, 9 days would be denoted as 1.27).

Biological sex composition was categorized as same-sex (male–male and female–female) or mixed-sex (male–female and female–male) dyads. The same-sex category was utilized as the reference group (0 = *same-sex dyad*, 1 = *mixed-sex dyad*).

Primary sport was categorized as whether or not younger siblings indicated that they participated in the same primary sport as their older sibling who was closest in age (0 = *different sport*, 1 = *same sport*).

Table 1 Standardized Factor Loadings From Confirmatory Factor Analyses for Modeling and Differentiation in Sports Subscales

Item	Standardized factor loadings	
	Modeling	Differentiation
My sibling includes me in sports activities with her/his friends.	.38	
My sibling sets an example for how to play sports.	.73	
My sibling tells me how I should play in a particular sport.	.41	
My sibling provides a model for how I should play sports.	.74	
My sibling includes me in her/his activities outside of sports.	.34	
My sibling encourages me to get involved in certain sports.	.46	
From watching my sibling, I have learned how to do things in sports.	.75	
My sibling gives me advice on how to play sports.	.60	
I play different sports so I won’t be like my sibling.		.51
My sibling sets a bad example for me in sports.		.40
I try to choose different sports to play than my sibling.		.74
I have learned from my sibling’s mistakes when playing sports.		–.18
After watching how my sibling is turning out, I plan to do things differently in sports.		.35
I want to play different sports than my sibling.		.75
I want people to know that I am not the same as my sibling.		.44
I try to play different sports than my sibling.		.86
I try to be good at sports that my sibling is not good at.		.55
It is hard to live up to my sibling’s example in sports so I try to be different.		.52

Sibling relationship qualities were indexed using the Sibling Relationship Inventory (Stocker & McHale, 1992). This scale measures global levels of warmth (six items) and conflict (six items) in the sibling relationship. An example item for warmth is “How much do you teach your sibling things or help her/him figure something out?” And an example item for conflict is “Some kids are mean to their sibling sometimes, even if they really care about them. How often would you say your sibling does things to you like tease you, bug you, or call you names?” The responses were measured using a Likert scale, ranging from 1 (*never or hardly at all*) to 5 (*always*). The average scores were calculated for each subscale, with higher scores indicating higher perceived levels of warmth or conflict. The Sibling Relationship Inventory has demonstrated validity in past research across child and early adolescent populations, as well as internal consistency reliability of scores ranging from 0.74 to 0.84 for older siblings and 0.71 to 0.88 for younger siblings (e.g., Stocker & McHale, 1992). In the youth sport domain, Blazo (2015) determined that sibling warmth and conflict showed acceptable internal consistency, with alpha levels of .72 for both subscales. In the present study, internal consistency of scores were 0.82 for sibling conflict and 0.77 for sibling warmth.

Parent–child warmth was assessed using an eight-item sport-adapted version of the Child’s Report of Parental Behavior Inventory (Schwarz, Barton-Henry, & Pruzinsky, 1985). The Child’s Report of Parental Behavior Inventory has demonstrated validity in past research across youth sport participants (e.g., Dorsch, Smith, & Dotterer, 2016). Dorsch et al. also provided evidence of good internal consistency of scores for the sport-adapted measure ($\alpha = .80$). Example sport-adapted items are “My father speaks to me in a warm and friendly voice during my sport” and “My mother is able to make me feel better when I am upset about my sport.” Items were measured on a Likert scale from 1 (*really unlike us*) to 4 (*really like us*). In the present study, parent–child warmth demonstrated high internal consistency ($\alpha = .89$ and $.86$ for father–child and mother–child warmth, respectively).

Parent–child conflict was measured using a three-item modified subscale from the Sport Friendship Quality Scale (Weiss & Smith, 1999). The original items were first contextualized to the youth sport context by Ullrich-French and Smith (2006) and have since been validated on independent youth sport samples by Dorsch et al. (Dorsch et al., 2016; Dorsch, King, Dunn, Osai, & Tulane, 2017). These studies have shown internal consistency of scores ranging from 0.78 to 0.92. Sample sport-adapted items include “My father and I fight about sports” and “My mother and I have arguments about sports.” The participants were asked to rate each item on a Likert scale from 1 (*not at all true*) to 5 (*really true*). In the present study, the internal consistency of scores were 0.76 for father–child conflict and 0.78 for mother–child conflict.

Data Analysis

Descriptive statistics were calculated based on the recommendations of Tabachnick and Fidell (2013) to assess the means, *SD*, and distributions of all study variables. The primary data were then analyzed using logistic regression models in SPSS (version 24.0; IBM Corp., Armonk, NY). In the present study, the main predictors were younger siblings’ levels of modeling and differentiation, and the binary outcome variable was whether both siblings participated in the same primary sport (0 = *different sport*, 1 = *same sport*). Because previous research suggests that the sex composition (0 = *same-sex dyad*, 1 = *mixed-sex dyad*) and age difference of sibling

dyads have the potential to shape modeling and differentiation processes, these two variables were included as potential moderators in the model. All independent and control variables, with the exception of biological sex composition, were mean centered.

A total of three models were analyzed. Model 1 tested the main effects of the predictor variables (i.e., modeling and differentiation) on siblings’ primary sport participation (i.e., same or different), controlling for biological sex composition, age difference, sibling warmth, sibling conflict, father–child warmth, father–child conflict, mother–child warmth, and mother–child conflict. Model 2 tested for interaction effects among the predictor and moderating variables. Two-way interactions were examined for the following five variable sets: (a) Modeling $\times$ Biological sex composition, (b) Differentiation $\times$ Biological sex composition, (c) Modeling $\times$ Age difference, (d) Differentiation $\times$ Age difference, and (e) Biological sex composition $\times$ Age difference. Finally, Model 3 tested for potential three-way interactions. The following three-way interactions were examined: (a) Modeling $\times$ Biological sex composition $\times$ Age difference and (b) Differentiation $\times$ Biological sex composition $\times$ Age difference.

Results

Of the 274 individuals who initiated the survey and had parents provide informed consent, 221 responses ultimately comprised the final data set. Of the 53 individuals who were removed from the final data set, 11 did not respond to any items, 35 did not progress farther than the demographic portion of the questionnaire, and the remaining seven did not respond to one or more full scales within the survey. Data missingness in the remaining sample was minimal (less than 1% of items overall and no more than 5% for any one participant). In these instances, mean imputation was used to account for the missing data. In four cases, the participants provided an irregular response (e.g., “a sport that I love to play”) to the open-ended item requesting they identify their primary sport. In these cases, we coded the participant as *not* participating in the same primary sport as their older sibling.

Descriptive and Inferential Statistics

Correlations, means, *SD*s, ranges of study variables, and Cronbach’s alpha (Cronbach, 1975) levels are found in Table 2. Inspection of these values indicates that a number of variables were significantly correlated. For example, modeling was significantly negatively correlated with differentiation ($r = -.21, p < .01$), father–child conflict ($r = -.21, p < .01$), and biological sex composition ($r = -.17, p < .05$), and significantly positively correlated with both father–child ($r = .24, p < .001$) and mother–child warmth ($r = .24, p < .001$). Sibling differentiation was significantly negatively correlated with father–child warmth ($r = -.16, p < .05$), as well as mother–child warmth ($r = -.27, p < .001$), and positively correlated with father–child conflict ($r = .13, p < .05$) and mother–child conflict ($r = .15, p < .05$).

Skewness and kurtosis values fell within acceptable ranges (sibling conflict skewness = 0.262 and kurtosis = -0.582 ; sibling warmth skewness = -0.087 and kurtosis = -0.606 ; sibling modeling skewness = -0.263 and kurtosis = -0.592 ; sibling differentiation skewness = 0.368 and kurtosis = -0.055). The mean scale scores were calculated for each construct by averaging the items used to measure the construct. No scale scores approached the top or bottom of the response range, providing additional evidence that the participant data were normally distributed.

Table 2 Correlations and Descriptive Statistics for Primary Study Variables ($N = 221$)

	1	2	3	4	5	6	7	8	9
1. Sibling modeling	—								
2. Sibling differentiation	-.21**	—							
3. Sibling conflict	-.18**	.21**	—						
4. Sibling warmth	.42***	-.25***	-.26***	—					
5. Father warmth	.24***	-.16*	-.25***	.18**	—				
6. Father conflict	-.21**	.13*	.20**	-.10	-.46***	—			
7. Mother warmth	.24***	-.27***	-.24***	.23**	.58***	-.21**	—		
8. Mother conflict	-.09	.15*	.25***	-.04	-.30***	.55***	-.33***	—	
9. Age difference	.13	-.04	-.13	.04	-.07	-.01	.07	-.01	—
<i>M</i>	3.37	2.40	2.61	2.93	3.34	1.48	3.51	1.24	2.43
<i>SD</i>	0.72	0.62	0.86	0.63	0.56	0.83	0.56	0.62	0.76
Range	1–5	1–5	1–5	1–5	1–4	1–5	1–4	1–5	0.92–3.92
α	.83	.81	.82	.77	.89	.76	.86	.78	—

Note. Biological sex composition of the sibling dyad is not included because it was measured as a dichotomous variable (0 = same sex; 1 = mixed sex).

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

Logistic Regression Analysis

Within the first model (see Table 3), a statistically significant relationship was found between sibling differentiation and primary sport participation ($B = -0.566$, $SE = 0.266$, $OR = 0.568$, $p = .033$). This effect suggests that, when holding all other variables constant, with each one-unit increase in the younger siblings' reports of differentiation, the likelihood of the younger siblings reporting the same primary sport as their older sibling decreased by 43.2%. Modeling behaviors were unrelated to the dyads' primary sport participation. Model 1 also revealed that biological sex composition was inversely associated with younger siblings' reports of choosing the same sport as an older sibling ($B = -1.101$, $SE = 0.313$, $OR = 0.332$, $p < .001$). This effect indicates that youth from mixed-sex sibling dyads were 66.8% less likely to choose the same sport as youth from same-sex sibling dyads.

Model 2 did not reveal any significant two-way interactions. Model 3, however, revealed a significant three-way interaction between differentiation, biological sex composition, and age difference ($B = -1.787$, $SE = 0.813$, $OR = 0.168$, $p = .028$). In order to further investigate this interaction, following the procedures outlined by Aiken and West (1991) for interpreting interactions, eight probabilities were calculated and graphed (see Figure 1, respectively). As seen in Figure 1, differentiation was linked to a decreased likelihood of playing the same primary sport among (a) siblings who shared the same biological sex and had a narrow age difference, (b) siblings who shared the same biological sex and had a wide age difference, and (c) mixed-biological sex siblings who had a wide age difference. Interestingly, differentiation was generally unrelated to the probability of sport similarity among mixed-sex dyads that had narrow age spacing.

Discussion

The aim of the present study was to achieve a more holistic understanding of the family system in youth sport by examining the impact of sibling modeling and differentiation on young athletes' sport participation decisions. Logistic regression models were conducted to determine whether younger siblings' reports of modeling and differentiation predicted the same or different

primary sport participation decisions relative to their most proximal older sibling. Overall, the findings highlighted the importance of sibling differentiation behaviors and their influence on shaping siblings' sport participation decisions.

Within the youth sport literature, modeling and differentiation behaviors have been reported by young athletes and their family members (see Blazo & Smith, 2017 for review). These mixed findings are not surprising, as modeling and differentiation have been shown to be orthogonal constructs in previous literature (Whiteman et al., 2007, 2010, 2014). In light of this, much of the sport sibling research has addressed these two influence processes qualitatively and retrospectively (Blazo et al., 2014; Davis & Meyer, 2008; Fraser-Thomas et al., 2008; Taylor et al., 2018; Trussell, 2014). The present study extends these efforts, providing the first explicit test of modeling and differentiation.

Consistent with our theory-derived hypotheses, as well as past empirical work on differentiation processes (e.g., Whiteman et al., 2007, 2010), with the exception of mixed-sex, narrowly spaced dyads, younger siblings who reported higher levels of differentiation were more likely to participate in a different primary sport than their older sibling closest in age. One reason for the exception may be that, for mixed-sex siblings, having a narrow age difference dictates sport behavior more than actual reports of differentiation behavior. Additionally, it could be that mixed-sex siblings who are closer in age do not overtly try to distinguish themselves in youth sport because a clear biological difference already exists. Coupled with narrow age spacing, mixed-sex siblings may not mind or may even welcome the opportunity to participate in the same sport or on the same team (Osai, Dorsch, & Bradford, 2019).

Interestingly, associations between differentiation and sport participation decisions were most pronounced for mixed-sex dyads with greater age spacing. One reason for this finding may be that being from a mixed-sex sibling dyad may push siblings toward different types of sport or activities (Fredricks & Eccles, 2005). In some cases, it may be that parents' perceptions of sport involvement by gender influences sport participation. Another explanation could be that females may tend to gravitate toward certain sports (or have certain options available to them, e.g., gymnastics), while males may gravitate toward sports that are different from females (or have different/more sport options available to them, e.g., football).

Table 3 Summary of Logistic Regression Analysis Examining the Association Between Younger Siblings' Reports of Modeling and Differentiation in Addition to Ascribed Factors and the Predicted Probability of Being in the Same Main Sport, While Controlling for Relational Factors (N = 221)

Variable	Model 1			Model 2			Model 3		
	B	OR	95% CI	B	OR	95% CI	B	OR	95% CI
Intercept	0.151	1.163		0.161	1.175		0.214	1.239	
Modeling	0.247	1.280	[0.798, 2.053]	0.182	1.200	[0.644, 2.236]	0.138	1.148	[0.612, 2.153]
Differentiation	-0.566*	0.568	[0.337, 0.955]	-0.634 [#]	0.531	[0.267, 1.053]	-0.684 [#]	0.505	[0.252, 1.010]
Biological sex composition	-1.101***	0.332	[0.180, 0.614]	-1.079***	0.340	[0.181, 0.637]	-1.156***	0.315	[0.164, 0.604]
Age difference	0.042	1.043	[0.701, 1.551]	-0.227	0.797	[0.462, 1.373]	-0.341	0.711	[0.409, 1.234]
Sibling warmth	0.425	1.530	[0.891, 2.626]	0.351	1.420	[0.820, 2.457]	0.412	1.510	[0.866, 2.633]
Sibling conflict	0.363 [#]	1.437	[0.980, 2.109]	0.344 [#]	1.411	[0.953, 2.088]	0.380 [#]	1.463	[0.976, 2.191]
Father warmth	-0.213	0.808	[0.391, 1.672]	-0.174	0.840	[0.394, 1.792]	-0.175	0.840	[0.386, 1.826]
Father conflict	0.013	1.013	[0.619, 1.657]	0.034	1.035	[0.628, 1.705]	0.084	1.088	[0.657, 1.800]
Mother warmth	0.250	1.285	[0.639, 2.581]	0.291	1.337	[0.648, 2.759]	0.307	1.359	[0.651, 2.835]
Mother conflict	0.046	1.047	[0.572, 1.916]	0.130	1.139	[0.612, 2.117]	0.071	1.074	[0.571, 2.021]
Modeling × Biological sex composition				0.125	1.133	[0.468, 2.742]	0.027	1.027	[0.402, 2.625]
Differentiation × Biological sex composition				0.004	1.004	[0.343, 2.941]	-0.141	0.868	[0.262, 2.879]
Modeling × Age difference									
Differentiation × Age difference				-0.115	0.891	[0.502, 1.581]	0.384	1.468	[0.687, 3.134]
Biological sex composition × Age difference				-0.629	0.586	[0.283, 1.213]	0.384	1.400	[0.494, 3.969]
Age difference				0.659	1.933	[0.835, 4.475]	0.749 [#]	2.114	[0.875, 5.110]
Modeling × Biological sex composition × Age difference							-1.191 [#]	0.304	[0.086, 1.068]
Differentiation × Biological sex composition × Age difference							-1.787*	0.168	[0.034, 0.824]
χ^2		34.592***			40.427***			47.487***	
df		10			15			17	

Note. OR = odds ratio; CI = confidence interval.

* $p < .05$. *** $p < .001$. [#] $p < .10$.

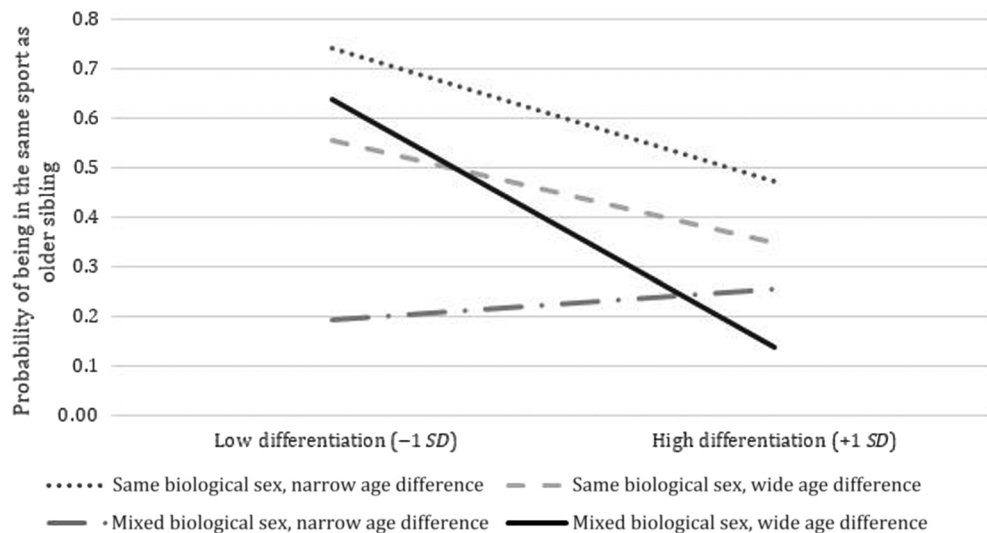


Figure 1 — Probability of younger sibling being in the same main sport as the older sibling as a function of sibling differentiation, biological sex composition, and age difference.

Indeed, sports like gymnastics, dance, and ice-skating seem to be sports that are more female-centric, whereas sports like football, wrestling, and hockey are more male-centric. Additionally, it may be that having a wide age difference may present fewer opportunities for siblings to participate at the same time or even on the same teams, a potential bonus for parents of siblings who are close in age.

An additional aim of this study was to explore the processes of modeling. Specifically, we wanted to explore how reported levels of modeling behaviors and ascribed characteristics (i.e., age, biological sex) influenced the likelihood of siblings identifying and playing the same primary sport. Despite the fact that the present study did not find significant support (at the $p < .05$ level) for sibling modeling processes in youth sport, it may be beneficial to think of why this might be. One reason for the nonsignificant findings may be that, while younger siblings report that they are trying to be like an older sibling in youth sport, they may decide to choose a different primary sport, despite how similar their ascribed characteristics may be in comparison with their older sibling and their actual level of reported modeling behavior. In addition, youth sport may be a context in which siblings can easily differentiate from one another (Sulloway & Zweigenhaft, 2010). With the wide range of youth sport options available to siblings and families, it may be that youth are taking the opportunity to carve out their own niche in youth sport, rather than participating in the same primary sport (Sulloway & Zweigenhaft, 2010). Furthermore, if parents have the resources and are willing to support a child's differentiation behavior in youth sport, either sibling may be more willing to try something different or "chart their own course." Alternatively, as noted in emerging work, parents may also encourage their children to choose their own unique path in organized youth sport, a process described as "parent-initiated differentiation" (Osai et al., 2019).

Pursuing a sharper understanding of modeling and differentiation has important implications at the family level because these processes are proposed to be related to different relational outcomes. For example, participating in the same main sport (i.e., modeling) may increase rivalry and competition, whereas participating in a different main sport (i.e., differentiation) has the potential to mitigate these outcomes because siblings are not directly competing against one another (Blazo et al., 2014). At

an experiential level, having an older sibling in the same sport gives a younger sibling someone to learn from and compete with, and someone against whom they can mark developmental milestones and achievements. Because youth sport is a dynamic, comparison-laden environment with substantial expectations from the self, parents, coaches, and others, it provides a unique context for the examination of these constructs. We, therefore, call on sport scholars to extend our research and research on family influences on youth sport participation in general, to include siblings in their designs, and to test theory-driven work hypotheses on the influence of siblings on youth's sport participation.

In reflecting upon our findings, it is important to acknowledge alternative relational pathways that may also influence young athletes' sport participation decisions. An obvious relationship that is salient to athletes' decision making is with parents (Côté, 1999). One potential way parents might impact sibling modeling and differentiation is through the differential treatment of multiple athletes in a household (Blazo et al., 2014; Feinberg & Hetherington, 2001; Jensen & Whiteman, 2014; Meunier et al., 2012). Importantly, global parent-child relationship factors, such as warmth and conflict, may, in fact, moderate the way differential treatment is interpreted by an athlete. In line with Darling and Steinberg (1993), we argue that parenting style in sport may be best conceptualized as a context of regular interaction that attenuates the influence of more specific parenting practices on the child (e.g., differential treatment). If accurate, parents may play a large role in sibling processes such as modeling and/or differentiation.

Limitations and Future Directions

While the present study contributes to the literature in many ways, a number of limitations should be considered. First, research on siblings in the broader context of organized youth sport is not amenable to simple or completely straightforward procedures or analyses. Indeed, there are a myriad of influences within the family, the team, and the broader sport context that shape young athletes' decision-making processes (see García Bengochea, 2002). It will, therefore, be imperative that future researchers design studies that

account for the additive or interactive influences of parents, coaches, peers, *and* siblings, among other factors. In line with Grimm, Dorrance Hall, Dunn, and Dorsch's (2017) call to frame youth sport research through a systems and/or ecological perspective, future work could consider the reciprocal nature of sibling socialization processes (for an example, see Whiteman, Jensen, & McHale, 2017), as well as the potential moderating effects of shared friendships among sibling dyads (Smith, 2003; Whiteman et al., 2013). Such extensions of the present work hold the potential to help create a more nuanced understanding of what affects younger and older siblings' youth sport participation decisions. In pursuing this goal, researchers should also consider whether target youth have more than one sibling in the household.

Related to the above limitation, it is important to acknowledge that sport selection decisions do not belong wholly to the child. Indeed, other individuals in the sport context (e.g., coaches and teammates) have the potential to influence athletes' sport participation decisions. In the home, parents are also salient contributors to athletes' sport participation decisions. They make numerous logistical decisions, and these decisions would seem to be complicated further when there is more than one sport-participating child in the family. Factors such as transportability (e.g., it is likely easier to have two kids in the same sport program than in two separate programs), cost (i.e., resource dilution among multiple children), and exposure (e.g., a parent's consumption of, or past participation in, sport) have the potential to impact young athletes' sport selection decisions. It is becoming more evident that young athletes' participation decisions are influenced by multiple actors within the family and team; therefore, future work targeting the effects of sibling influence as a component of the larger family, team, organizational, community, and societal systems is warranted.

A second limitation is that the study data were based solely on reports from younger siblings and were grouped by biological sex, without consideration for gendered sport experiences. Obtaining data from both older *and* younger siblings would help create a more holistic and accurate report of the sibling relationship and potential patterns of sibling influence. Future work could be conducted to examine the perspectives of both members of a sibling dyad, in which one was not involved in sport. This sampling approach could provide valuable insights for researchers or practitioners conducting sport retention studies and/or public health initiatives. Future work could also be bolstered by considering gender norms, identity, and conformity (e.g., to ideals of femininity and masculinity). We acknowledge that female-centric and male-centric sports have the potential to impact sport selection processes based on the "fit" of one's identity to a specific sport or set of sports. Therefore, a more deliberate approach may be necessary to flesh out the separate and combined impacts of biological sex and gendered identity (Chalabaev, Sarrazin, Fontayne, Boiché, & Clément-Guilottin, 2013).

Last, the present study utilized a cross-sectional design, which only afforded a snapshot of the participants' perspectives on modeling and differentiation, as well as their primary sport participation. Adopting a longitudinal approach would account for how younger siblings' thoughts and behaviors might change over time, which aligns with previous developmental research regarding differentiation (Feinberg & Hetherington, 2000). This also adheres to a developmental perspective of youth sport participation, as advocated for in seminal sport and exercise psychology readings, such as Côté (1999) and Weiss and Raedeke (2004). Moreover, the sample largely represents middle- to upper-socioeconomic-status families, in which children have the means to explore organized sport participation more than children from less affluent families. It

is possible that lower-socioeconomic-status families (and even many middle-class families) are highly cognizant of cost, both financially and in terms of time and other tangible resources. As such, the way sport "decision making" is viewed in these families may vary across certain socioeconomic variables. In the future, researchers should strive to sample a broader range of youth sport participants and families to provide a more comprehensive picture of siblings' youth sport selection experiences.

Conclusion

The present study extends the understanding of sibling sport participation in multiple ways. First, by explicitly testing sibling influence processes, this study provides evidence supporting differentiation hypotheses. Importantly, rather than applying theory post hoc, we demonstrated that sibling sport participation decisions can be predicted by using theory from other family contexts a priori. Additionally, the present study identified patterns associated with ascribed characteristics of siblings, namely, biological sex composition and age differences. Such knowledge provides a foundation for the continued development of explicit tests of theory related to familial relationships in sport.

From a practical standpoint, this study enhances the understanding of how and why younger siblings may engage in differentiation behaviors in organized youth sport. Through the lens of social comparison theory (Festinger, 1954), a younger sibling who initially participates in the same sport(s) as their older sibling may engage in adaptive (e.g., "If she can do it, I can too!") or maladaptive (e.g., "He was all-conference and there's no way I can live up to that") comparisons. These comparisons may manifest as sport participation decisions, specifically, a sibling's choice to model (i.e., participate in the same sport) or differentiate (i.e., seek a novel sport or activity in which to participate). As a first step in understanding these contrasting processes in youth sport, this study highlights the potential moderating influence of ascribed factors, such as biological sex composition and age difference. This represents an important extension of the literature, as sibling sport participation decisions impact other members of the family through the shared experiences in which parents and children engage together in organized youth sport. In line with the concept of "linked lives" (Elder, 1998, p. 4) and the broader tenets of feedback loops from family systems theory (Broderick, 1993), our work sets the table for future scholars to assess whether and how a younger sibling's sport participation decision (to play the same sport as an older sibling or not) may impact their individual experience, the sibling relationship, parent-child relationships within the family, and the family system as a whole.

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