



## Articles

# The Moderating Role of Gender in Siblings of Adults With Intellectual Disabilities

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## Abstract

Siblings play an important role in psychological and relational development in the lifecycle, especially if the family includes brothers or sisters with intellectual disability. The main objective of this study was to examine whether the relationships experienced by siblings of people with intellectual disability (ID-sibs) and siblings of people with typical development (TD-sibs) influence their ways of coping with stress and anxiety level, with particular emphasis on gender differences. The participants were 187 adults, of whom 104 (55.6%) were females aged 18 to 76 years ( $M = 29.42$ ;  $SD = 11.93$ ). Of our sample, 51.9% ( $N = 97$ ) had a sibling with an intellectual disability and 48.1% ( $N = 90$ ) had a sibling with typical development. The participants completed a self-report questionnaire that assessed demographics, sibling-relationship quality, anxiety, and coping orientations to problems experienced. The results show that women report a higher quality of relationship with ID-sibs compared to men and to women who have TD-sibs. The results further indicate that women with ID-sibs had higher levels of anxiety and used Transcendent-Oriented coping strategies more frequently. Lastly, gender moderated the relation between relationship quality and coping strategies in diverse ways in the two groups considered. The implications of the overall results are that sibling-focused interventions should focus on improving negative sibling relationships in order to reduce the impact of difficulties on TD siblings of both genders and that the content and delivery framework of interventions should be shaped accordingly.

**Keywords:** sibling relationship, intellectual disabilities, anxiety, coping strategies, gender, moderation

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## Siblings of Adults With Intellectual Disabilities: The Moderating Role of Gender in Coping Strategy, Anxiety, and Relationship Quality

Approximately 90% of individuals have a sibling, and various research studies have highlighted the fundamental role of the sibling relationship and support during childhood and adulthood (Milevsky, 2011). Researchers have also shown that the quality of the relationship with a sibling influences a child's adaptation, especially in the period of childhood and adolescence, when identity and autonomy are cardinal points around which development revolves. It has also been seen that siblings' positive and negative behaviors during childhood correlate significantly with relationship quality during the persons' lifetimes (Cicirelli, 1989; Hendrick & Hendrick, 2000).

Siblings therefore play a major role in children's psychological and relational development, especially if the family contains a brother or sister with intellectual disability (ID). Children who grow up with siblings with intellectual

or developmental disability may assume responsibilities and roles that actually belong to adult caregivers. Assuming such roles and responsibilities can have negative effects on the child's development that may last into adult life (Hooper, Decoster, White, & Voltz, 2011; Tomeny, Barry, Fair, & Riley, 2017), especially anxiety and stress (Tomeny et al., 2017) in adult siblings with typical development (TD). Sisters tend to take more care of their siblings with ID (Orsmond & Seltzer, 2007), in line with the cultural stereotype that sees women as the persons who are most involved in providing care in the family setting (Orsmond & Seltzer, 2000).

The gender of the ID sibling could influence involvement with TD-sibs and the quality of their relationship, although there is discordance in the data (Orsmond, Kuo, & Seltzer, 2009; Orsmond & Seltzer, 2007; Wilson, McGillivray, & Zetlin, 1992). Living close or not far from the home of the sibling with ID can promote more contact and closer sibling relationships (Greenberg, Seltzer, Orsmond, & Krauss, 1999; Orsmond & Seltzer, 2007; Zetlin, 1986), but when the sibling with developmental disability is moved from home to a community, the TD-sibs may appear less concerned about their sibling's welfare and decrease contact with him/her (Seltzer, Krauss, Hong, & Orsmond, 2001).

Several factors can affect the quality of the relationship with an ID sibling, such as the type of disability, the degree of independence of ID-sibs (Orsmond & Seltzer, 2007; Prino, Pasta, Gastaldi, & Longobardi, 2016; Wilson et al., 1992), and the presence of behavioral disorders (Orsmond et al., 2009). Relationship quality with ID-sibs may also vary according to the developmental stage of the TD-sibs. It is possible that the relationship with the ID sibling is experienced as negative during adolescence, with feelings of shame, fear of being isolated from peers, and less satisfaction than may be felt in adulthood (Begun, 1989; Wilson et al., 1992). However, a positive relationship between ID- and TD-sibs during adolescence tends to remain constant during adulthood. Some studies have examined relationship quality between adult siblings, comparing brothers and sisters with and without intellectual disability. While adults may have close relationships and regular contact with their siblings with developmental disability (Hodapp, Urbano, & Burke, 2010), the frequency and quality of such contacts may be lower than of those with typically developing siblings (TD-sibs) (Doody, Hastings, O'Neill, & Grey, 2010). However, not all studies are in agreement (Burbidge & Minnes, 2014).

The relationship with an ID-sib could constitute a source of distress, in particular if the care and protection of the sibling fall back on the adult TD-sib. Consequently, the strategies put into place by TD-sibs to manage distress could influence the quality of the relationship between ID and TD siblings. Therefore, another factor that may affect the quality of the relationship between siblings is coping strategies. Coping strategies are a person's active or passive strategies and behaviors for dealing with stressful events (Carver, Scheier, & Weintraub, 1989). Problem-focused coping is considered more effective than emotion-focused coping. Problem-focused coping is related to behaviors that act directly on the problem, while emotion-focused coping strategies, characterized by avoidance or heightening of the emotional aspects of the situation, are considered maladaptive (Carver et al., 1989). Gender tends to influence individuals' coping strategies. Males tend to resort more to problem-focused strategies, while females tend to rely on emotion-focused coping strategies (Ptacek, Smith, & Zanas, 1992). Greater use of problem-focused coping strategies and lower use of emotion-focused coping strategies are associated with closer sibling relationships (TD- and ID-sibling relationships) among both minors (McHale, Sloan, & Simeonsson, 1986) and adults (Orsmond & Seltzer, 2007). However, the coping strategies identified in the literature are varied, and the fact that they are described and classified in different manners testifies as to the complexity of the construct (Sica et al., 2008; Sica, Novara, Dorz, & Sanavio, 1997). One of the most used tools, the Coping Orientation to Problems – Experienced (COPE; Carver et al., 1989; Sica et al.,

1997), examines 15 coping strategies and, in the Italian Version, identifies 5 factors: Social Support (characterized by emotional venting, information research and understanding), Avoidance Strategies (characterized by behavioral and mental detachment, also through the use of drugs, and denial) Positive Attitudes (characterized by a positive reinterpretation of events and an attitude of acceptance), Problem Oriented Strategies (characterized by active strategies and planning), and Transcendent Orientation (which refers to the use of religion and a scarce sense of humor). Social Support and Transcendent Orientation are considered coping strategies that, when used alone in moments of distress, might be dysfunctional because they might reinforce a certain passiveness of the individual when confronted with difficulties and not promote active coping strategies (Chiri & Sica, 2007; Sica et al., 2008). Since being the brother/sister of a sibling with ID can be a stressful experience, it is important to consider coping strategies that, in development, can be associated with the relationship with the ID sibling. Later, these coping strategies may be maintained in adulthood as a way of dealing with stressful events. Adaptive coping strategies can act as buffering against anxiety and stress and can therefore have an impact on the quality of the relationship with ID-sibs.

Females tend to be more vulnerable to anxiety and the resulting anxiety disorders (Panayiotou, Karekla, & Leonidou, 2017). Having a sibling with ID can also increase the risk of anxiety symptoms. However, the literature does not identify female gender as a mediating factor (O'Neill & Murray, 2016). A study on adolescent TD-sibs of children with DS and ASD reveals that the quality of the relationship with the disabled sibling plays a mediating role in anxiety symptoms (Pollard, Barry, Freedman, & Kotchick, 2013). The better the relationship quality, the lower the anxiety symptoms experienced by adolescents (Pollard et al., 2013). It should, however, be pointed out that there is scant literature on this issue, especially in populations of adults with ID-sibs, and that no studies have taken gender into account in considering the relationship between anxiety and relationship quality.

Since the experience of having a sibling with ID is a potentially stressful one, anxiety and coping strategies are important constructs needing further examination, but they are little analyzed in the literature.

### **The Present Study**

The aim of the study was to examine whether the relationships experienced by siblings of people with intellectual disability (ID-sibs) and siblings of people with typical development (TD-sibs) influence their ways of coping with stress and anxiety level. In particular, we considered the following research questions: 1) whether ID-siblings exhibit higher anxiety and a better relationship quality compared to TD-siblings; 2) whether the quality of the sibling relationship correlates with coping strategies and anxiety; 3) and whether gender influences the levels of anxiety and coping strategies that are put into place.

## **Method**

### **Participants**

The participants were 187 adults, of whom 104 (55.6%) were females aged 18 to 76 years ( $M = 29.42$ ;  $SD = 11.93$ ). Of our sample, 51.9% ( $N = 97$ ) had a sibling with an intellectual disability (ID-sib) and 48.1% ( $N = 90$ ) had a sibling with typical development (TD-sib). The two groups were similar as regards the distribution of gender and age.

The University of Turin IRB approved the study (Protocol no. 47504). All participants were contacted through associations that deal with intellectual disability and that showed interest in our study. Informed consent was obtained from all individual participants included in the study.

## Measures

### Coping Orientations to Problems Experienced (COPE)

The Coping Orientations to Problems Experienced (COPE; Carver et al., 1989; Sica, Novara, Dorz, & Sanavio, 1997) instrument is used to assess coping strategies that determine individual capacity in reacting to stressful or traumatic events. COPE is made up of 60 items requiring respondents to state how often, in difficult situations, they use certain behaviors that reflect the 15 aspects investigated by the test. The options range from “I usually don’t do it” to “I nearly always do it.”

The questionnaire considers 15 coping mechanisms (e.g., Planning: reflect, plan, work out strategies to deal with the problem; Containing: hold back from acting impulsively, wait for the right moment to deal with stress; Emotional Outlet: letting out one’s feelings and emotions) and five dimensions: Social Support, Avoidance Strategy, Positive Attitudes, Problem-Oriented Strategy, Transcendent-Oriented Strategy. The Italian version of this instrument, used in this study, showed good reliability (Sica et al., 1997).

### State-Trait Anxiety Inventory

The Spielberger State-Trait Anxiety Inventory (STAI; Spielberger, 1989; Spielberger, Gorsuch, Lushene, Vagg, & Jacobs, 1983) is one of the more frequently used measures of anxiety in psychological research. It is a reliable and sensitive measure of anxiety. The STAI consists of two 20-item scales. One scale measures how one feels in general (trait anxiety), while the other measures how one feels at the present moment (state anxiety). Sum scores for both scales are calculated by adding the scores of all of the items, ranging from 20 to 80.

### Lifespan Sibling Relationship Scale (LSRS)

The Lifespan Sibling Relationship Scale (LSRS; Riggio, 2000) assesses attitudes towards the sibling relationship throughout the lifespan, in particular in childhood and adulthood. The questionnaire consists of 48 items in six subscales (eight items each) that assess: the quality of the relationship with the sibling and the sibling relationship as a child (Child Affect) and as an adult (Adult Affect); behavioral interactions with the sibling as a child (Child Behavior) and as an adult (Adult Behavior); belief about the sibling and sibling relationship as a child (Child Cognitions) and as an adult (Adult Cognitions). The total score of the LSRS may be considered an indicator of the current overall attitude toward the sibling relationship.

## Analytic Strategy

First, the correlation between demographic and study variables was analyzed.

The next step was analyzing the differences between the two groups with regard to the relationship between the siblings, the coping strategies, and the level of anxiety.

In connection with obtaining results showing the similar functioning of women and men, it was decided to perform a moderation analysis using a non-standard macro for SPSS PROCESS (Hayes, 2017) Model 1, the aim of which was to analyze separately for men and women the impact of the relationships between siblings on

styles of coping with stress and anxiety. The moderation analysis was divided into two parts. The first part addressed analysis of the influence of the relationships between siblings on styles of coping with stress, depending on gender, and the second part concerned the influence of sibling relationships on anxiety.

## Results

### Correlation Between Demographic and Study Variables

As shown in Table 1 and Table 2, the relationship between age and variables used in the study was analyzed. In both compared groups, there was a positive relationship with transcendental coping strategies (COPE Transcendent-Oriented). In addition, ID-sibs showed a positive correlation with anxiety as a State, while in the TD-sibs group there was a positive correlation with problem-oriented coping strategies and those oriented towards transcendental and spiritual aspects.

Table 1

*Correlation Between Study Variables in the ID-Sibs Group*

Variable	2	3	4	5	6	7	8	9	10	11	12	13	14
1. Age	-.016	-.187	-.204*	-.149	-.060	.086	-.024	.205	-.011	-.014	.225*	.231*	.046
2. LSRS Child affect	–	.511**	.690**	.339**	.532**	.454**	.072	-.182	.014	-.049	-.027	-.202	-.179
3. LSRS Adult affect		–	.505**	.770**	.331**	.598**	-.045	-.277**	.114	-.192	.053	-.119	-.107
4. LSRS Child cognitions			–	.465**	.756**	.490**	.007	-.089	-.038	-.052	-.022	-.177	-.171
5. LSRS Adult cognitions				–	.358**	.577**	-.040	-.135	.084	-.179	.110	-.124	-.074
6. LSRS Child behavior					–	.482**	.049	.048	-.105	-.127	.012	.037	-.077
7. LSRS Adult behavior						–	-.089	.030	-.159	-.274**	.134	-.062	-.137
8. COPE Social support							–	.178	.208*	.448**	.134	.053	.197
9. COPE Avoidance strategy								–	.003	.042	.384**	.539**	.418**
10. COPE Positive attitude									–	.548**	.394**	-.132	-.125
11. COPE Problem-oriented										–	.173	-.149	-.115
12. COPE Transcendent-oriented											–	.128	.012
13. STAI - state												–	.683**
14. STAI - trait													–

*Note.* LSRS: Lifespan Sibling Relationship Scale (Riggio, 2000); COPE: Coping Orientations to Problems Experienced (Carver, Scheier, & Weintraub, 1989); STAI: State-Trait Anxiety Inventory (Spielberger, 1989).

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

Referring to the relationship between the quality of the sibling relationship (LSRS) and coping strategies (COPE), the ID-sibs group showed a negative relationship between Adult Affect and Avoidance Strategy and between Adult Behavior and Problem-Oriented Strategy.

In the TD-sibs group, there were definitely more significant relationships between measures of coping strategies and the quality of sibling relationships. Specifically, the results on the Transcendent-Oriented scale are positively related to quality of sibling relationships (LSRS Child, Adult Affect and Child, Adult Cognitions).

When examining the relationship between anxiety, quality of sibling relationships and coping strategies in the ID-sibs group, there was no significant correlation between sibling relationship (LSRS) and anxiety, but there was a significant relationship of anxiety with avoidance coping strategies (COPE Avoidance Strategy).

Table 2

Correlation Between Study Variables in the TD-Sibs Group

Variable	2	3	4	5	6	7	8	9	10	11	12	13	14
1. Age	.084	-.032	-.098	.078	-.073	-.168	.062	.204	.171	.218*	.391**	.077	-.099
2. LSRS Child affect	–	.258*	.615**	.269*	.520**	.108	.084	-.109	.165	.147	.236*	-.198	-.239*
3. LSRS Adult affect		–	.290**	.833**	.222*	.721**	.072	.169	.070	.070	.261*	-.152	-.047
4. LSRS Child cognitions			–	.351**	.796**	.264*	-.021	.002	.170	.117	.253*	-.280*	-.309**
5. LSRS Adult cognitions				–	.266*	.719**	.044	.243*	.117	.032	.373**	-.220	-.115
6. LSRS Child behavior					–	.261*	-.018	-.024	.058	.083	.157	-.274*	-.369**
7. LSRS Adult behavior						–	-.008	.170	-.037	-.180	.200	-.198	-.049
8. COPE Social support							–	.116	.177	.312**	.002	-.162	.089
9. COPE Avoidance strategy								–	.251*	.100	.492**	.360**	.318**
10. COPE Positive attitude									–	.514**	.362**	-.237*	-.344**
11. COPE Problem-oriented										–	.270*	-.260*	-.223*
12. COPE Transcendent-oriented											–	-.039	-.137
13. STAI - state												–	.653**
14. STAI - trait													–

Note. LSRS: Lifespan Sibling Relationship Scale (Riggio, 2000); COPE: Coping Orientations to Problems Experienced (Carver, Scheier, & Weintraub, 1989); STAI: State-Trait Anxiety Inventory (Spielberger, 1989).

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

In the TD-sibs group, there were significant negative correlations between anxiety and quality of sibling relationships (LSRS Child Affect, Child Cognitions, and Child Behavior subscales). As regards coping, anxiety presented negative correlations with problem focused strategies (Positive Attitude and Problem-Oriented Strategy subscale) but positive correlation with avoidant coping strategies (Avoidance Strategy subscale).

## Differences Between Intellectual-Disability and Typical-Development Siblings

The first step of the analysis was to check gender differences in terms of perceived relationships with siblings, which showed only one difference on the quality of sibling relationships, concerning the LSRS Adult Affect subscale for the ID-sibs (Table 3). Women obtained significantly higher scores than men,  $F(1.92) = 4.072$ ,  $p < .05$ . In the TD-sibs, there were no significant gender differences.

The next step was a comparison in terms of strategies for coping with stress. In this case, a gender difference in the TD-sibs was found,  $F(1.85) = 5.151$ ,  $p < .05$ . Men showed a higher score on transcendental coping strategies (COPE Transcendent-Oriented) than women. Comparing the two groups, there was a difference between women in the same subscale of COPE: Women in the ID-sibs group obtained a higher score on COPE Transcendent-Oriented than women in the TD-sibs group,  $F(1.100) = 4.416$ ,  $p < .05$ .

As regards anxiety, women in the ID-sibs group showed a significantly higher level of anxiety as a State than women in the TD-sibs group,  $F(1.94) = 5.112$ ,  $p < .05$ .

## Moderation Effect of Gender on Study Variables

The aim of the study was to examine whether the relationships between ID-sibs and TD-sibs influence their ways of coping with stress and anxiety level, with particular emphasis on gender differences. For this purpose, a series of moderation models focused on styles of coping with stress and anxiety level was performed (Figure



Table 3  
Correlation Between Demographic and Study Variables

Variable	ID-sibs				TD-sibs			
	Male		Female		Male		Female	
	<i>M</i>	<i>SD</i>	<i>M</i>	<i>SD</i>	<i>M</i>	<i>SD</i>	<i>M</i>	<i>SD</i>
Age	30.80	14.27	29.71	10.13	30.71	11.97	26.98	11.29
LSRS Child affect	28.18	6.91	29.13	7.39	29.03	6.85	29.20	6.50
LSRS Adult affect	28.12 <sup>a</sup>	8.05	31.33 <sup>a</sup>	7.34	29.70	6.43	30.69	7.95
LSRS Child cognitions	24.29	5.81	24.94	7.37	26.28	5.57	24.88	6.57
LSRS Adult cognitions	26.77	6.45	28.13	6.99	27.47	6.19	26.58	6.89
LSRS Child behavior	22.00	5.98	21.79	7.24	24.33	6.54	23.78	6.39
LSRS Adult behavior	19.59	5.39	20.81	6.66	19.46	5.31	21.61	7.58
COPE Social support	29.47	6.25	31.60	7.94	31.00	8.04	33.14	7.91
COPE Avoidance strategy	25.70	7.63	25.43	5.54	23.64	5.64	24.00	4.51
COPE Positive attitude	32.00	5.48	32.20	5.99	33.00	5.04	32.00	5.21
COPE Problem-oriented	33.44	5.99	31.04	5.80	33.68	4.61	31.35	6.79
COPE Transcendent-oriented	15.47	5.19	16.46 <sup>b</sup>	5.38	16.97 <sup>a</sup>	6.11	14.10 <sup>a,b</sup>	4.47
STAI State	37.57	11.43	40.60 <sup>b</sup>	11.36	34.46	8.94	35.67 <sup>b</sup>	9.85
STAI Trait	40.10	9.65	44.31	12.71	39.94	7.59	41.98	8.46

Note. ID-sibs: Siblings of people with intellectual disability; TD-sibs: Siblings of people with typical development.

<sup>a</sup>Significant differences between men and women in the same group.

<sup>b</sup>Significant differences between women in 1 group and women in 2 group.

1). In order to check differences in the relation between measures of quality of sibling relationships and coping strategies in the cases of women and men, a non-standard macro PROCESS (Hayes, 2017) Model 1 for SPSS was used.

The analysis conducted in the ID-sibs group showed a significant gender-interaction effect in the measure of quality of sibling relationships (LSRS Adult Affect – subscale) and transcendental coping strategy (COPE Transcendent-Oriented),  $F(3.88) = 4.2126$ ;  $p < .01$ . As regards women, the higher the score on the LSRS Adult Affect scale, the higher the score on the COPE Transcendent-Oriented,  $\beta = 0.36$ ,  $p < .01$ . For men, the relation is the opposite. The higher the score on the LSRS Adult Affect sub-scale, the lower the score on the COPE Transcendent-Oriented,  $\beta = -0.31$ ,  $p < .05$ . A significant interaction effect was also demonstrated for the TD-sibs group,  $F(3.81) = 4.2761$ ;  $p < .01$ . However, the results were different. In fact, for men in the ID-sibs group, with an increase in the quality of sibling relationships (LSRS Adult Affect sub-scale) the coping strategy based on transcendental and spiritual strategy (COPE Transcendent-Oriented) diminished, whereas in the TD-sibs group, with an increase in the quality of sibling relationship (LSRS Adult Affect sub-scale) the measure of transcendental based coping strategies (COPE Transcendent-Oriented) increased,  $\beta = 0.38$ ;  $p < .05$ . Regarding women, the result was similar to that of the ID-sibs group, although to a lesser extent,  $\beta = 0.24$ ;  $p = .07$ .

The analysis carried out in the ID-sibs group showed a significant gender-interaction effect in the measure of quality of sibling relationship (LSRS Adult Behavior – subscale) and the problem oriented coping strategy (COPE Problem-Oriented scale),  $F(3.84) = 4.0608$ ;  $p < .01$ . A significant effect occurs only for men. The higher the score on the LSRS Adult Behavior scale, the lower the Problem-Oriented,  $\beta = -0.51$ ;  $p < .01$ . The result is statistically significant also for the TD-sibs group,  $F(3.82) = 2.7769$ ;  $p < .05$ . In the case of the ID-sibs group, an

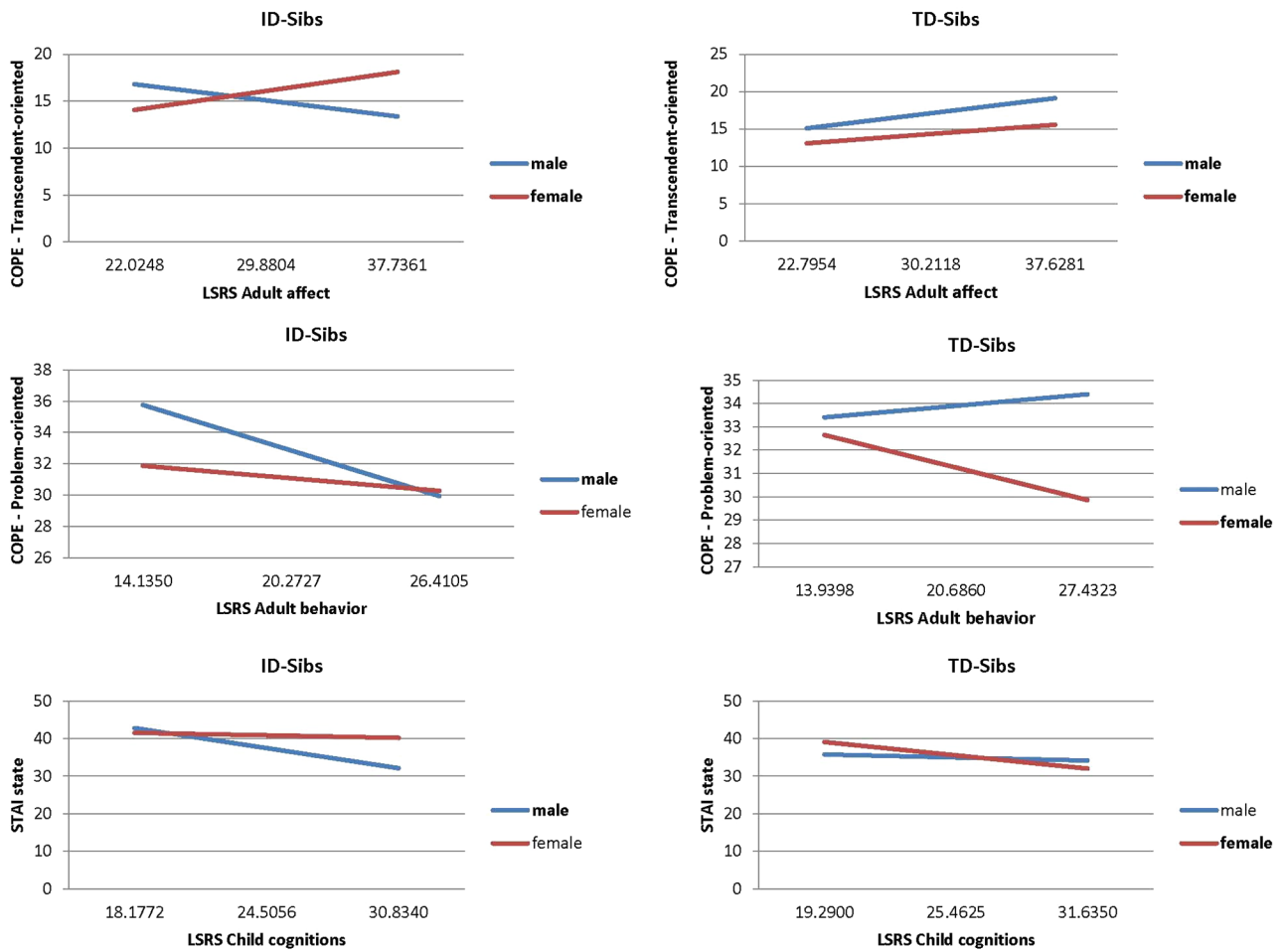


Figure 1. Moderation effect of gender on study variables.

important effect was shown for men, and in the case of the TD-sibs group, this effect is significant for women,  $\beta = -0.22$ ;  $p < .05$ . The relation of results for women in the group with TD siblings is the same as for men in the group with ID siblings, but the strength of the effect is less.



The analysis carried out in the ID-sibs group showed a significant gender-interaction effect in the relation between the quality of sibling relationships (LSRS Child Cognitions sub-scale) and anxiety as a state,  $F(3.85) = 2.7828$ ;  $p < .05$ . In this case, a significant effect for men was obtained,  $\beta = -0.51$ ;  $p < .05$ , which indicates lower anxiety in the case of higher quality of sibling relationships. The TD-sibs group also achieved a significant interaction effect,  $F(3.76) = 2.7351$ ;  $p < .05$ . In contrast to the ID-sibs group in this case, a significant relationship was found only for women,  $\beta = -0.34$ ;  $p < .05$ : the higher the score on the Child Cognitions scale, the lower the level of anxiety.

## Discussion

Sibling relationships are important for an individual's psychological and relational development. The quality of the relationship with siblings can influence development processes, especially when there is a sibling with ID. Over time, this relationship could be a source of stress (Tomeny et al., 2017), influencing anxiety levels and coping strategies adopted by siblings in adulthood. Gender differences are highly significant in this context (Orsmond & Seltzer, 2000). From our data, it emerges that women show a higher affective quality in relationships with ID siblings compared to men in the same group and compared to women with TD siblings. These data seem to be in agreement with the literature, which suggests that the female gender tends to establish more positive relationships with family members (Somantico, Donizzetti, De Rosa, & Parrello, 2019) and that females tend to be recognized as those who take more care of ID siblings in adulthood (Orsmond & Seltzer, 2007). Furthermore, compared to women with TD siblings, those with ID siblings in our study show higher levels of anxiety and make greater use of Transcendent-Oriented coping strategies. The experience of having an ID sibling can be a source of stress, and women in particular can be more at risk, although the literature is not always in agreement (O'Neill & Murray, 2016).

In our sample, men do not present greater use of Problem-Oriented coping strategies than women. However, as reported by Sica et al. (2008), the difference in choice of coping strategies is probably not linked so much to gender as to the type of situations that, due to cultural and social matters, they find themselves having to deal with more frequently. In fact, the differences in coping strategies between males and females are gradually disappearing as gender roles change (Sica et al., 2008).

Nevertheless, the study shows the importance of gender as a moderating factor between the variables investigated in the comparison between brothers/sisters with or without ID-sibs. While women show greater affective quality in relating with siblings (both TD and ID) and make more use of Transcendent-Oriented coping strategies, in men this correlation is significant only in men with TD-sibs. In men with ID-sibs, on the other hand, the greater the quality of the relationship with the sibling, the less they resort to passive coping strategies, based, for example, on seeking help from religion.

Gender proved to be a moderator in the relation between high levels of Adult Behaviors and low levels of Problem-Oriented coping. This effect, however, is significant for males in relating to their ID-sibs and for females in the TD-sibs group. Some studies have shown an association between close relationships with ID-sibs and greater use of Problem-Oriented coping strategies, both among minors (McHale et al., 1986) and adults (Orsmond & Seltzer, 2007). The Adult Behaviors assesses greater behavioral involvement in shared activities and contacts. It may be hypothesized that perceiving the involvement with adult siblings as less difficult could

diminish stress levels in the relationship and therefore lead to a lower use of Problem-Oriented strategies. More detailed studies are needed to understand the meaning of this association.

Finally, high scores on the Child Cognitions scale proved to be associated with low levels of anxiety for males in their relationships with ID-sibs but for females in their relationships with TD-sibs. It has already been noted that the experience of having an ID sibling could raise the anxiety level in adulthood, but a better-quality relationship with ID-sibs seems to be a protective factor for the onset of such symptomatology, as is shown in a sample of adolescents (Pollard et al., 2013). Our study shows that a better-quality relationship with ID-sibs, and in particular a better cognitive assessment, is associated with lower levels of anxiety only in males. In females, a specular relation is found only with TD-sibs. This result may be due to gender differences in family socialization processes, which may lead females to take greater care of their ID-sibs (Orsmond & Seltzer, 2000). This result could, therefore, reflect stereotyped differences in the distinction between gender roles which still view women as the primary caregivers.

The study shows the significant role played by gender in the quality of the relationship between siblings and the levels of anxiety and coping strategies of adult ID and TD siblings. At present, however, although these findings are interesting, they are difficult to place within the overall theoretical picture. Further studies are therefore needed, using variables not considered in this study, such as the gender of the ID and TD siblings and the presence of other brothers and sisters in the family, as well as the degree of independence of the ID siblings and the gravity of the type of disability affecting the latter.

In general, our study seems to show that the quality of the relationship with siblings, whether ID or TD, influences coping strategies and anxiety levels in adults. In particular, women seem to be more inclined to experience anxiety when they are relating to their ID sibling and also tend to use more Transcendent-Oriented coping strategies when they develop a good relationship with their siblings. In parallel, for males the quality of the relationship with ID siblings seems to be an important element in limiting the appearance of anxiety symptoms in adulthood, with reliance on coping strategies more Transcendent-Oriented than Problem-Oriented.

Our study has some limits. First, the design is cross-sectional, and this reduced the capacity to describe in causal terms the relation between the variables studied. Moreover, the study uses self-report instruments exclusively, so the data may suffer the effect of social desirability or factors related to the memory of past events. Lastly, our study takes into account the perspective of only one sibling and does not include the perspectives of the TD and ID siblings or of other members of the family.

The implications of the overall results are that sibling-focused interventions should focus on improving negative sibling relationships in order to reduce the impact of the difficulties of TD siblings of both genders and that the content and delivery framework of interventions should be shaped accordingly.

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## Competing Interests

The authors have declared that no competing interests exist.

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