



Articles

Attachment to the Romantic Partner and Sibling: Attachment Hierarchies of Twins and Non-Twin Siblings

Sascha Schwarz^{*a}, Maida Mustafić^b, Sonja Junker^a

[a] Bergische Universität Wuppertal, Wuppertal, Germany. [b] Université du Luxembourg, Esch, Luxembourg.

Abstract

Previous studies have shown that romantic partners and siblings are important attachment figures. This study compares the attachment to the romantic partner with the attachment to the sibling as a function of the participant's sibling type among monozygotic (MZ) twins, dizygotic (DZ) twins, and non-twin (NT) siblings. The results show that MZ twins prefer their sibling to their romantic partner whereas DZ twins are equally attached to their sibling and romantic partner. In contrast, NT siblings are more attached to their romantic partner compared to their sibling. These results indicate that genetic relatedness has profound impact on a person's attachment hierarchy and the relative rank of the romantic partner and the sibling.

Keywords: attachment hierarchy, sibling, monozygotic, dizygotic, twins, romantic relationships

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*Corresponding author at: Bergische Universität Wuppertal, Fakultät für Human- und Sozialwissenschaften, Lehrstuhl für Sozialpsychologie, Gaußstr. 20, 42119 Wuppertal. Phone: 0049-202-439-2323. E-mail: sschwarz@uni-wuppertal.de



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Introduction

Attachment plays an important role in a human being's life, serving as a buffer against life stressors (Hazan & Zeifman, 1994; Shaver & Mikulincer, 2008). It is understood as an emotional bond between two persons that is relatively long-lasting and in which the attachment figure is perceived as unique, individual, and irreplaceable (Ainsworth, 1991). In the social network of an adult, sibling relationships and close relationships between romantic partners are often among the most important. Therefore, the aim of this study was to test the role of genetic relatedness in the attachment to the sibling and the romantic partner. To do so, we compared monozygotic (MZ), dizygotic (DZ) and non-twin (NT) siblings in the way they form the relative rank of the sibling and the romantic partner in their attachment hierarchies.

Attachment relationships are characterized by four functions (Ainsworth, 1991; Hazan & Zeifman, 1994). The first is *proximity maintenance*, which is sought in attaining an attachment figure. Second, *separation distress*, is experienced when a relationship with the attachment figure is interrupted. The third is *safe haven* and is offered by the attachment figure especially in times of distress. And finally, the fourth is *secure base* in which individuals use the attachment figure to explore the world. In a person's life more than one person can serve as an attachment figure.

However, these attachment figures are not treated equally, resulting in a hierarchy (Bowlby, 1969; Bretherton, 1985). The person on top of this hierarchy is the person who fulfills the attachment best. When children grow older, this previously exclusive hierarchy of family members (i.e., parents and genetically related siblings) expands to other persons (e.g., romantic partners; Ainsworth, 1989; Colin, 1996; Fraley & Davis, 1997; Hazan & Shaver, 1987; Mayseless, 2004; Trinke & Bartholomew, 1997).

Sibling Relationships

In this paper, siblings are understood as genetically related relatives, forming specific types of relationships that typically last a lifetime (McHale, Updegraff, & Whiteman, 2013; Neyer, 2002). Usually, siblings share a history with many common experiences. Whereas other friendships come and go, relationships between relatives tend to persist (Ainsworth, 1991). The general development of sibling relationships in the course of life follows a u-curve, meaning that siblings interact continuously at a young age, separate in middle adulthood, and get together again after completing family planning (Neyer, 2002). Especially siblings similar in age often form a persistent, emotional bond while being playmates, becoming friends, and developing a reciprocal relationship, including mutual trust (Ainsworth, 1991).

Since twins are the same age they are special types of siblings. Due to the fact that DZ as well as MZ twins are same-aged, they share a lifelong period of common experiences, which is longer than those of non-twin siblings. Moreover, MZ twins share 100% of their genes. Thus, twins share more environmental and genetic factors (as in the case of MZ twins) than non-twin siblings, which foster a strong relationship between MZ as well as DZ twins ("twin situation"; Neyer, 2002; Fraley & Tancredy, 2012). This twin situation is a proxy for the developmental factors that are theorized to facilitate bonding. Therefore, from such an attachment theory perspective, MZ and DZ twins are probably equally likely attached to their sibling, whereas twins are probably more likely attached to their sibling than non-twin (NT) siblings ($MZ = DZ > NT$).

From an evolutionary perspective, it is adaptive for siblings to support each other and form special bonds. Due to Hamilton's (1964) inclusive fitness theory, besides investment in one's own reproduction, support of genetically related kin is also a way to increase one's fitness. Thus, if people care for their sibling, the chance of transmitting shared genes is likely to increase. Consequently, caregiving to close relatives enhances one's own reproductive success. As MZ twins are genetically identical, they should be especially interested in the well-being and protection of their twin. From an inclusive fitness perspective, DZ twins and NT siblings have, on average, a probability of 50% of sharing a particular gene by a common descent. Further, Fraley, Roisman, and Haltigan (2013) discuss that the equal environment assumption concerning MZ and DZ twins has not been tested explicitly in former studies. They suggest that a greater amount of interdependency between MZ twins compared to DZ and NT account for a stronger attachment between MZ twins. While previous studies had found strong evidence for shared environment effects on attachment styles of twins and sibling-pairs, a study of Fearon, Shmueli-Goetz, Viding, Fonagy, and Plomin (2014) supports the assumption of a primary genetic influenced similarity in attachment style, which means that attachment styles of monozygotic twin pairs are more similar to each other than those of DZ or NT siblings. It could be suggested that a greater similarity in attachment style can also facilitate bonding between siblings and therefore monozygotic twins are probably more attached to each other than other sibling types are. Taken together, it could be predicted that MZ twins are more likely attached to their twin, and DZ twins are probably equally attached to their twin as NT siblings to their sibling ($MZ > DZ = NT$; Neyer & Lang, 2003; Tancredy & Fraley, 2006).

Tancredy and Fraley (2006) propose that the attachment to the sibling as a function of sibling type is best predicted by attachment *and* inclusive fitness theory simultaneously (see also Eastwick, 2013). In their study, MZ twins were more attached to their sibling than DZ twins to their sibling, and DZ twins were more attached to their twin than NT siblings (MZ > DZ > NT).

Romantic Relationships

From an evolutionary perspective, however, the attachment to a romantic partner might be even more adaptive than the attachment to a sibling, possibly ensuring the direct survival of offspring and increasing direct fitness as the attachment to a romantic partner may fulfill the ultimate function to reproduce successfully (Hamilton, 1964). In line with these assumptions, when becoming an attachment figure, the romantic partner moves to the top of the attachment hierarchy (e.g., Trinke & Bartholomew, 1997).

Further, the important role of the romantic partner is based on the idea that the attachment between two romantic partners in a close relationship mirrors the attachment between a parent and a child (e.g., Hazan & Shaver, 1987; Hazan & Zeifman, 1994). For example, adult romantic partners feel safe in the presence of their romantic partner and are more likely to explore the environment if the romantic partner is perceived as available. The functions that are transferred from the parents to the romantic partner follow a particular order beginning with proximity seeking, followed by safe haven, separation distress, and secure base. The transfer period of the secure base typically takes place in the context of close relationships and lasts two years (Fraley & Davis, 1997), whereas the primary attachment strategy involves the activation of mental relationship partners who provide care and protection rather than actual proximity-seeking behavior (Mikulincer & Shaver, 2007). This emotional bond between two romantic partners accounts for much of the romantic partners' well-being and successful adaption (Hazan & Zeifman, 1994), making the romantic partner most likely to be at the top of the attachment hierarchy.

Previous Work on Intensity of Attachment to Sibling or Romantic Partner as a Function of Sibling Type

As romantic partners fulfill attachment functions similar to those of siblings, the question is whether individuals are more likely attached to their sibling or their romantic partner, depending on the strength of their genetic relatedness to their sibling. To our knowledge, only two previous studies shed some light on the emotional bonds to the romantic partner and the sibling as a function of the participant's sibling type.

Tancredy and Fraley (2006) compared in a sample of 62 twins (30 MZ and 32 DZ) and 928 NT siblings, whether twins and non-twins differed in their use of non-siblings (e.g., mothers, friends) as attachment figures. When restricting the sample to participants who were involved in dating and marital relationships (*n* for the subsample is unknown from the literature) they found that twins were less likely to view their romantic partners as attachment figures compared to NT siblings. Unfortunately, Tancredy and Fraley (2006) did not compare the attachment hierarchies of MZ and DZ twins, probably due to the restricted sample size.

Fraley and Tancredy (2012) subsequently reported results from a larger sample (108 MZ, 278 DZ, and 27,575 NT siblings). In this study, they focused on the influence of sibling type on the attachment to the sibling, but the information they gathered was limited (in fact only three items were presented to the participants). Especially due to their focus on sibling relationships, they did not directly investigate the attachment to the romantic partner. Nevertheless, they compared the attachment to the sibling as a function of marital status and sibling type. They found that married participants were less likely to report their sibling as an attachment figure than single participants, which generally indicates that romantic partners seem to move to the top of the attachment hierarchy. Further,

they found that, with age, people feel increasingly less attached to their siblings. Most notably, the decreasing attachment to the sibling in married participants was less pronounced in MZ twins, which further suggests that at least in MZ twins, the twin tends to hold a special position in their attachment hierarchy. Even if these results are interesting, these analyses are only a very indirect approach to investigate the relative rank of the romantic partner and the sibling in the attachment hierarchy as a function of sibling type.

Are romantic partners on top of the attachment hierarchy in close relationships in which one romantic partner has a twin sibling? To answer this, we combined the strengths of both Tancredy and Fraley studies (Fraley & Tancredy, 2012; Tancredy & Fraley, 2006). Our aims were (1) comparing the attachment between MZ, DZ, and NT siblings (similarly to Fraley & Tancredy, 2012); whereas at the same time (2) comparing the attachment to the sibling and the romantic partner (Tancredy & Fraley, 2006). Using this approach, we could straightforwardly compare the relative rank of the romantic partner with the rank of the sibling in the attachment hierarchy as a function of sibling type.

Predictions

In accordance with previous research regarding the attachment to the sibling (Neyer, 2002; Neyer & Lang, 2003; Tancredy & Fraley, 2006) we expected that: (1) twins feel a stronger attachment to their sibling than non-twin siblings. Additionally, we hypothesized that (2) MZ twins are more likely attached to their sibling than DZ twins (attachment to the sibling in predictions 1 and 2: $MZ > DZ > NT$; Tancredy & Fraley, 2006).

With respect to the attachment to the romantic partner, previous studies have shown that twins often give their twin sibling preference to others and are more likely to choose the twin as an attachment figure compared to other persons such as their mother or romantic partner (Tancredy & Fraley, 2006). This superior position of the twin can especially be expected for MZ twins, because their relationship is even closer than that of DZ twins (e.g., Neyer, 2002). Thus, we predicted that (3) MZ twins are more likely to choose their twin as a main attachment figure compared to their romantic partner.

Since the relationship between DZ twins and between NT siblings is less close than that of MZ twins (Tancredy & Fraley, 2006), it can be expected that DZ twins and siblings are more likely to regard their romantic partner as a main attachment figure compared to their sibling. From an attachment perspective, however, DZ twins are raised in the same environment, whereas a shared environment is not necessarily the case for non-twin siblings. Taken together, we expected that (4) DZ twins are more likely attached to their sibling as a main attachment figure compared to their romantic partner, whereas (5) non-twin siblings are more likely to attach themselves to their romantic partner compared to their sibling.

And (6) even if these predictions can be confirmed, it is theoretically, as well as empirically, not clear, if the attachment to the romantic partner suffers from the attachment bonds to the siblings depending on sibling type (i.e., the attachment to the romantic partner is strongest to the non-twin siblings, but less strong to DZ and MZ twins; $MZ < DZ < NT$). Perhaps the attachment to the romantic partner is equally strong independent of sibling type, and the predicted effects solely lie on the different rank of the sibling in the attachment hierarchy of the participants (attachment to the romantic partner $MZ = DZ = NT$). The results from this study are intended to shed light on this question.

Materials and Methods

Participants

A total of 515 participants (114 MZ twins, 63 DZ twins, and 338 NT siblings) took part in this study. When comparing these types of siblings, it should be kept in mind that non-MZ sibling pairs can be homogeneous or heterogeneous with respect to gender. Thus, to avoid a confounding effect of gender homogeneity and zygosity the primary analyses were restricted to same-sex siblings. A total of 331 participants (114 MZ, 42 DZ, and 175 NT siblings) between 19 and 72 years, $M = 27.21$, $SD = 8.09$, have had a sibling of their own gender. In this sample, the three sibling types differed significantly with regard to their age, $F(2, 328) = 4.46$, $p = .01$. Post-hoc analyses (Tukey HSD) revealed that MZ twins were significantly older than non-twin siblings, $p = .01$. Thus, when comparing the sibling types in the subsequent analyses, we controlled for age. Most participants, $n = 258$, 78%, were female, but gender of the participants was equally distributed with regard to sibling type, $\chi^2(2) = 0.48$, $p = .79$. The participants were either engaged in a close relationship, $n = 276$, 83%, or married, $n = 55$, 17%. However, relationship status did not differ significantly with regard to sibling type in this sample, $\chi^2(2) = 4.39$, $p = .11$. The participation was voluntary, but participants were invited to take part in a lottery (to receive vouchers for an online bookstore) as compensation for participation.

Procedure

Participants completed the questionnaire on the Internet. The link to the online questionnaire was spread through an e-mail distribution list of a twin agency and by using the snowball principle in social network systems (e.g., Facebook).

Measures

At the beginning of the questionnaire, subjects with more than one sibling were advised to concentrate only on one sibling while answering the following questions. Further, the participants were instructed to complete each question regarding four targets (sibling, mother, father, and romantic partner). The responses regarding the parents were irrelevant for this study but were included to distract the participants from the research question.

We assessed attachment to the sibling and the romantic partner with three different measures. The attachment functions (Tancredy & Fraley, 2006) primarily focus on attachment behavior. The Inclusion of Other in the Self-scale (IOS; Aron, Aron, & Smollan, 1992) measures the emotional closeness between the participant and the target persons. However, one caveat of the IOS scale in this study is that the participant is able to report the same level of emotional closeness to the romantic partner as well as the sibling. Thus, we included a more direct forced choice measure of the attachment hierarchy in this study.

Attachment functions — The items were adapted from Tancredy and Fraley (2006). The scale refers to the four main functions of attachment relationships: The use of the attachment figure as a target for proximity seeking, the feeling of separation distress while being separated, the use of the attachment figure as a safe haven in times of distress, and as a secure base from which to explore the world (Ainsworth, 1991; Hazan & Zeifman, 1994). These functions were assessed by a total of 14 items¹. The participants were instructed to complete each question with regard to the sibling, the mother, the father, and the romantic partner, on a scale ranging from 1 (*I do not agree at all*) to 5 (*I totally agree*). High values in this scale indicate that the target persons fulfill the attachment functions very well. Further analyses showed high correlations among these four subscales with regard to the sibling, $r >$

.77, $p < .001$, and to the romantic partner, $r > .54$, $p < .001$. Thus, in accordance with [Tancredy and Fraley \(2006\)](#), we focused our analyses on a unit-weighted composite index across all 14 items, which represent these four main functions of attachment relationships for the sibling, $\alpha = .94$, and for the romantic partner, $\alpha = .87$.

Inclusion of Other in Self — High levels of emotional closeness between romantic partners also characterize attachment relationships. To directly assess the emotional closeness and self-other inclusion between the participant and the four targets (sibling, mother, father, and romantic partner), the IOS-measure ([Aron, Aron, & Smollan, 1992](#)) was utilized for each target. High values indicate a high level of emotional closeness between the participant and the target person.

Attachment hierarchy — At the end of the questionnaire, the participants were also instructed to arrange an attachment hierarchy of the four persons. They were advised to make a ranking in which the four targets (sibling, mother, father, and romantic partner) were sorted according to the strength of emotional connectedness to these persons.ⁱⁱ Low values (i.e., a high rank) indicate a high level of emotional connectedness of the participant to the target person. In contrast to the continuous measurements in this study, the participants were forced to make a ranking order. A total of 294 participants (89%) completed this task.

Demographics — Finally, the participants indicated their sibling type (MZ twin, DZ twin, NT sibling), relationship status, gender of participant, gender of sibling, and age of participant. At the beginning and end of the questionnaire, to ensure that they had not switched to another sibling during the questionnaire, siblings were instructed to name the initials of the sibling they referred to in the questionnaire.

Results

Prior to the main analyses, we analyzed the associations among the three different dependent variables (attachment functions, IOS, attachment hierarchy) across all participants to validate our new rank place attachment hierarchy measure (see [Table 1](#)).

Table 1

Correlations Between Attachment Functions (Tancredy & Fraley, 2006), Emotional Closeness (Inclusion of Others in the Self Scale; IOS; Aron, Aron, & Smollan, 1992), and the Rank Place in the Attachment Hierarchy

	1	2	3
1. Attachment functions	(.94 / .87)	.43***	-.44***
2. Emotional Closeness (IOS)	.74***	^a	-.34***
3. Rank place attachment hierarchy	-.73***	-.73***	^a

Note. Values below the diagonal are the correlations between the scales with regard to the sibling. Values above the diagonal are the correlations between the scales with regard to the partner. In the diagonal reliability estimates are presented (first for the sibling, and second for the partner scales). Pearson correlations were used for the correlations between the attachment functions and the IOS scale, and nonparametric correlations (Spearman's rho) were calculated for the correlations with the rank in the attachment hierarchy.

^aAs the IOS scale and the rank order in the attachment hierarchy are one item measurements no reliability estimates can be reported.

*** $p < .001$.

First, the three dependent variables shared common variance. Specifically, for siblings, as well as romantic partners, the more the target person fulfilled the attachment functions, the higher the emotional closeness, and the higher

was the target's rank in the attachment hierarchy. Further, the larger the emotional closeness, the higher was the target's rank in the attachment hierarchy. Second, the correlations between the dependent variables for the siblings, $r > |.73|$, $p < .001$, were significantly larger than the correlations between the dependent variables for the romantic partner, $r > |.34|$, $p < .001$; $z > 5.86$, $p < .001$. As the three dependent variables differed conceptually, we decided to analyze our six predictions for each dependent variable as a function of sibling type.

As reported in the methods section, in this sample the three sibling types differed significantly with regard to their age. Thus, when comparing the sibling types, we controlled for age in the subsequent analyses.

Who Fulfills Attachment Functions: Siblings or the Romantic Partner?

A 3 (sibling type) \times 2 (attachment to sibling and to romantic partner) mixed-model ANCOVA with repeated measurements on the second factor and with age as covariate on the attachment functions, revealed that the sibling types differed significantly in the degree of their attachment, $F(2, 327) = 27.84$, $p < .001$, $\eta^2_{\text{partial}} = .15$. Post-hoc analysesⁱⁱⁱ revealed that MZ twins, $M = 4.56$, $SD = 0.45$, and DZ twins, $M = 4.42$, $SD = 0.44$, reported significantly more attachment than non-twin siblings, $M = 4.17$, $SD = 0.45$, both $p < .003$. Most importantly, and in line with our predictions, the main effect was qualified by a significant interaction between sibling type and attachment to the sibling and romantic partner, $F(2, 327) = 59.40$, $p < .001$, $\eta^2_{\text{partial}} = .27$; see Figure 1.

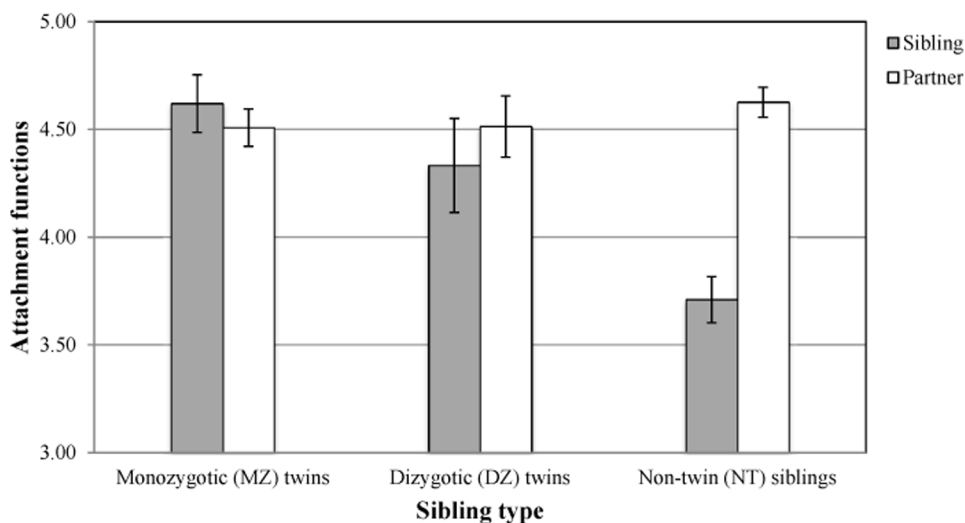


Figure 1. Attachment to sibling and partner as a function of sibling type (estimated marginal means corrected for age). Error bars represent 95% confidence intervals.

To understand the interaction, we first tested the attachment to the sibling (predictions 1 and 2). First, sibling type affected significantly the attachment to the sibling, $F(2, 327) = 58.68$, $p < .001$, $\eta^2_{\text{partial}} = .26$. Confirming the first prediction, MZ twins, $p < .001$, $d = 1.28$, as well as DZ twins, $p < .001$, $d = 0.87$, were significantly more attached to their twin than non-twin siblings to their sibling, $M = 3.71$, $SD = 0.71$. Contrary to the second prediction, however, MZ twins, $M = 4.62$, $SD = 0.72$, were only marginally significantly more attached to their twin than DZ twins, $M = 4.33$, $SD = 0.71$, $p = .08$.

Next, we tested the third prediction and compared the attachment to the sibling with the attachment to the romantic partner within sibling types. Contrary to the third prediction, MZ twins were as equally attached to their sibling as

to their romantic partner, $t(113) = 1.25, p = .22$. Contrary to the fourth prediction, DZ twins, $t(41) = 1.48, p = .15$, were as equally attached to their sibling as to their romantic partner. However, in line with our fifth prediction, non-twin siblings were significantly less attached to their sibling, $M = 3.73, SD = 0.86$, compared to their romantic partner, $M = 4.63, SD = 0.47, t(174) = 13.38, p < .001, d = 1.30$. Finally, and regarding the sixth question, our analyses showed that the attachment to the romantic partner differs marginally significantly by sibling type, $F(2, 327) = 2.62, p = .07$.

Emotional Closeness Between Siblings and Romantic Partners: Inclusion of Other in Self (IOS)

Similar to the prior analyses, a 3 (sibling type) \times 2 (emotional closeness to sibling and to romantic partner) mixed-model ANCOVA with repeated measurements on the second factor and with age as covariate on the IOS scale was conducted.

This analysis revealed that the sibling types differed in the degree of their emotional closeness to their sibling and romantic partner, $F(2, 326) = 25.96, p < .001, \eta^2_{\text{partial}} = .14$. Post-hoc analyses revealed that MZ, $M = 5.84, SD = 1.13, p < .001, d = 0.86$, and DZ twins, $M = 5.48, SD = 1.12, p = .006, d = 0.55$, reported significantly more emotional closeness compared to non-twin siblings, $M = 4.87, SD = 1.12$. The main effect was qualified by a significant interaction between sibling type and emotional closeness to the sibling and romantic partner, $F(2, 326) = 58.90, p < .001, \eta^2_{\text{partial}} = .27$ (see Figure 2).

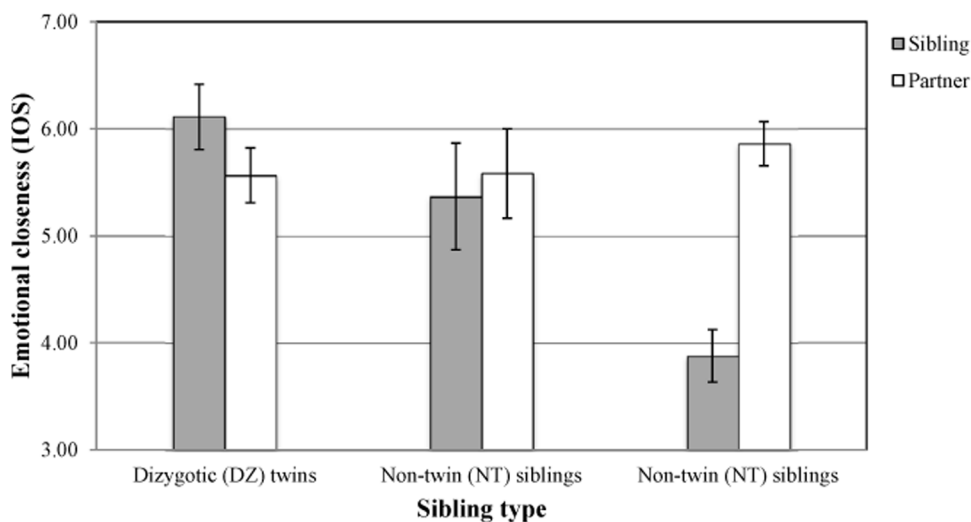


Figure 2. Emotional closeness (IOS) to sibling and partner as a function of sibling type (estimated marginal means corrected for age). Error bars represent 95% represent confidence intervals.

To understand the interaction, we first tested the emotional closeness to the sibling (first and second prediction) and found significant effects of sibling type on the emotional closeness to the sibling, $F(2, 326) = 67.33, p < .001, \eta^2_{\text{partial}} = .29$. MZ twins, $M = 6.11, SD = 1.63, p < .001, d = 1.39$, as well as DZ twins, $M = 5.37, SD = 1.61, p < .001, d = 0.94$, felt significantly closer to their sibling than non-twin siblings, $M = 3.86, SD = 1.60$. Additionally, MZ twins felt emotionally closer to their twin than DZ twins, $p = .03, d = 0.46$.

Next, we compared the emotional closeness to the sibling compared to the emotional closeness to the romantic partner within sibling types. Confirming the third prediction, MZ twins reported to be emotionally closer to their

sibling, $M = 6.09$, $SD = 1.47$, compared to their romantic partner, $M = 5.59$, $SD = 1.34$, $t(113) = 2.62$, $p = .01$, $d = 0.36$. However, contrary to the fourth prediction, DZ twins reported equal emotional closeness to their romantic partner, $M = 5.57$, $SD = 1.66$, as to their sibling, $M = 5.38$, $SD = 1.70$, $t < 1$. Finally, and in line with the fifth prediction, non-twin siblings felt emotionally closer to their romantic partner, $M = 5.85$, $SD = 1.28$, compared to their sibling, $M = 3.89$, $SD = 1.68$, $t(160) = 12.90$, $p < .001$, $d = 1.31$. Regarding the sixth question, the analyses revealed that sibling types did not differ in the intensity of their emotional closeness to the romantic partner, $F(2, 327) = 1.89$, $p = .15$.

Attachment Hierarchy

Across all participants, the romantic partner was on the top of the attachment hierarchy, *mean rank* = 1.78, $SD = 0.93$, followed by the sibling, *mean rank* = 2.19, $SD = 1.14$, and the mother, *mean rank* = 2.56, $SD = 0.86$. The father was at the bottom of the attachment hierarchy, *mean rank* = 3.47, $SD = 0.75$, $\chi^2(3, n = 294) = 274.61$, $p < .001$.

Further analyses (focusing first on the sibling and then on the romantic partner) revealed that the three sibling types differed significantly in their assigned rank to their sibling in the attachment hierarchy, $\chi^2(2) = 106.27$, $p < .001$. Supporting the first and second prediction, MZ twins ranked their sibling marginally higher in the attachment hierarchy than DZ twins, $z = 2.03$, $p = .04$, and DZ twins ranked their sibling higher in the attachment hierarchy than non-twin siblings, $z = 5.22$, $p < .001$.

Comparisons of the rank of the sibling and the romantic partner in the attachment hierarchy within each sibling type revealed in line with the third prediction that MZ twins placed the twin, *mean rank* = 1.42, $SD = 0.76$, significantly higher than the romantic partner, *mean rank* = 2.10, $SD = 0.88$, $z = 4.59$, $p < .001$. In contrast to the fourth prediction, DZ twins did not place the sibling, *mean rank* = 1.76, $SD = 0.99$, higher than the romantic partner, *mean rank* = 2.02, $SD = 1.01$, $z = 1.02$, $p = .31$. Non-twin siblings, however, placed the sibling, *mean rank* = 2.76, $SD = 1.02$, significantly lower in the attachment hierarchy than the romantic partner, *mean rank* = 1.47, $SD = 1.02$, $z = 8.48$, $p < .001$, confirming the fifth prediction.

Further, regarding the sixth question, the three sibling types also differed significantly in the assigned rank of their romantic partner, $\chi^2(2) = 47.18$, $p < .001$. Whereas MZ and DZ twins did not differ in the rank they assigned to their romantic partner, $z = 0.74$, $p = .46$, non-twin siblings ranked their romantic partner significantly higher in the attachment hierarchy than twins, MZ twins: $z = 6.67$, $p < .001$; DZ twins: $z = 3.89$, $p < .001$.

Summary of Results

Table 2 summarizes the predictions and the results from this study.

Table 2

Overview of Predictions and Results for the Three Dependent Measures Used in this Study: Attachment Functions (Tancredy & Fraley, 2006), Emotional Closeness (Inclusion of Others in the Self Scale, IOS; Aron, Aron, & Smollan, 1992), and the Rank Place in the Attachment Hierarchy.

Prediction	Attachment functions	Emotional closeness (IOS)	Rank place attachment hierarchy
1. S: (MZ + DZ) > NT	√	√	√
2. S: MZ > DZ > NT	(√)	√	√
3. MZ: SI > P	O	√	√
4. DZ: SI > P	O	O	O
5. NT: SI < P	√	√	√
6.a) P: MZ < DZ < NT	(√)	O	(√)
6.b) P: MZ = DZ = NT	(√)	√	(√)

Note. MZ = Monozygotic twins, DZ = Dizygotic twins, NT = Non-Twin siblings, SI = Sibling, P = Romantic Partner; √ = Prediction full supported, (√) Prediction partially supported, O = Prediction not supported.

Discussion

The aim of this research was to compare the attachment to the romantic partner and the sibling across three sibling types (MZ twins, DZ twins, and siblings). To achieve this aim, three different, but related measurements were used: (1) fulfillment of the relevant attachment functions (Tancredy & Fraley, 2006), (2) emotional closeness to the sibling and the romantic partner (IOS; Aron, Aron, & Smollan, 1992), and finally (3) a direct assessment of the attachment hierarchy by a ranking procedure. It was predicted that MZ twins should feel more attached, and feel emotionally closer to their sibling than DZ twins and normal siblings. DZ twins should be more likely attached to their siblings than NT siblings. Moreover, it was predicted that MZ and DZ twins are more likely to perceive their sibling as a main attachment figure compared to their romantic partner, but NT siblings are more likely to perceive their romantic partner as a main attachment figure. Finally, we investigated whether the attachment and the emotional closeness to the romantic partner suffer from the relationship to the sibling and were a function of sibling type as an open question.

These predictions could be mostly confirmed across the three different dependent measures for MZ twins and for NT siblings. The results for DZ twins were mixed. As expected, the relationship to the twin is more likely attached than to NT siblings, and in two of three measurements lower than the relationship between MZ twins. With regard to the romantic partner, however, DZ twins do not place the twin higher than the romantic partner. The results suggest that the twin and the romantic partner are treated equally. However, especially the results regarding DZ twins are preliminary as the sample size is small and replications of these findings are necessary. If, however, further studies replicate the finding that DZ twins are as equally likely attached to their sibling as to their romantic partner, it could be predicted that this attachment is a potential source of conflict in the relationship. The reason for conflict is that the rank of the romantic partner is definitely not on top of the attachment hierarchy (as in a relationship with an NT) sibling, nor is the partner definitely beyond the twin (as in a relationship with an MZ twin). This equal rank of the sibling and the romantic partner in relationships with one DZ twin involved might be a source for open conflict.

The results further reflect that the romantic partner is an important attachment figure for all three sibling types; in non-twin siblings the romantic partner is even the main attachment figure. In fact, the relationship to the romantic partner was equal between the sibling types in our continuous measurements of attachment and emotional closeness. Nevertheless, as soon as twins have to choose, the sibling is favored (in the case of MZ twins) or evaluated as equally important as the romantic partner (in the case of DZ twins), which results in a superior rank in the attachment hierarchy for the romantic partner in our ranking order measurement for twins compared to NT siblings. This finding has several important implications for research on close relationships. For example, the strong relationship between twins — especially MZ twins — might cause conflicts in close relationships, especially when the romantic partner expects to be the first in the attachment hierarchy (Pietilä, Bülow, & Björklund, 2012). Petersen, Martinussen, McGue, Bingley, and Christensen (2011) found that twins are less likely to marry and have lower divorce rates than non-twin siblings. It might be valuable for future research to consider the impact of the strong sibling relationship on the satisfaction in and the stability of a couple's relationship. On the other hand, it would also be interesting to investigate the impact of a close relationship on the relationship between siblings. As far as we know this idea has not been tested before, but we would predict that the quality of the relationship between twins would suffer less from a new romantic relationship than the quality of the relationship between non-twin siblings. Further studies are needed to test these predictions.

Comparison of the Different Measures

In this study, attachment was measured by three different measures. While the attachment functions (Tancredy & Fraley, 2006) primarily focus on attachment behavior (14 items), the Inclusion of Other in the Self-scale (IOS; Aron, Aron, & Smollan, 1992), as well as our attachment hierarchy measure, focuses on the emotional bond between the participant and the targets. As demonstrated in Table 2, the results are largely consistent across measures. As in our study the participants answered each item four times (sibling, romantic partner, and, to distract the participants from the purpose of this study with regard to mother and father), it seems to be sufficient to rely on shorter scales or our attachment hierarchy scale. However, as our attachment hierarchy scale has some limitations (see below), we would recommend the IOS scale in future studies.

Limitations and Implications for Further Research

Tancredy and Fraley (2006) proposed a mediational model between genetic relatedness, relational processes (shared experiences, separate lives, empathy, emotional closeness), and attachment to the sibling. As we focused our research on the relative rank of the sibling and the romantic partner in the attachment hierarchy, this research was not designed to test this mediational model. However, the model might also be fruitful to explain mediational factors in the attachment relationships between romantic partners (e.g., shared experiences, association value, perceptions, knowledge, and subjective theories of relationships). Further studies could test if the factors mediating siblings' relationships also mediate the relationships of romantic partners. As romantic partners are not genetically related, we suppose that these relational experiences are even more important in romantic relationships than in siblings' relationships.

It is important to note that our sibling definition targets a very narrow conceptualization of a family relationship marginalizing a great proportion of family constellations (e.g., reconstituted, blended, foster, and adopted). Therefore, in the future, it might be valuable to distinguish full siblings from half, step- or adoptive siblings. This information was not accessible to us, but it might attest for the effects of genetic similarity, shared childhood experiences, and frequency of contact during and beyond childhood.

Another limitation of this study is that not all participants completed the forced choice attachment hierarchy task. The reason is somewhat speculative at this point; however, we received some valuable comments from our participants after they completed the questionnaire. Some participants expressed that they just could not make up their mind as to how to rank the four targets or would have had a bad feeling in making such a decision, and for these reasons left the item unanswered. According to [Tancredy and Fraley \(2006\)](#), although a twin is at the top of the attachment hierarchy he/she can share this place with other important persons like a romantic partner or friends. This assumption can hold for all sibling types. For instance, one participant expressed that she “did not have the heart...to make a decision between mother and romantic partner...” and therefore left this item out. Probably many persons have several attachment figures that share one place in their personal attachment hierarchy, and attachment hierarchies are not as one-dimensional as had been previously suspected.

Further, as our participants indicated themselves as MZ, DZ, or NT sibling, we used a very limited measurement of zygosity ([Song et al., 2010](#)). However, this limited measurement should lead to error variance reducing the chance to find significant differences between MZ, DZ twins, and NT siblings.

We explicitly instructed the participants that only one sibling can take part in this study. Therefore, there is no a priori reason to expect a bias of sibling pairs depending on sibling type (e.g., both siblings in the NT sibling group, but absent in the MZ and DZ sample), which would be a confounding variable. However, we cannot completely rule out that some sibling pairs (and not only one sibling as instructed) completed the questionnaire. In a dyadic design, we would expect the attachment hierarchies of MZ and DZ twins to correspond better than the attachment hierarchies of NT siblings. Moreover, as our research involves three persons (participant, sibling, and the romantic partner of the participant) it would be fruitful to move beyond dyadic to triadic designs ([Kenny, 1996](#)) to explore the dynamics of sibling relationships and the impact on romantic relationships.

Further, on a theoretical level, this study cannot answer the question if the differences in attachment to sibling and romantic partner account primary for shared environment or shared gene effects. Previous studies showed inconsistency concerning the question which effect is stronger - concerning the attachment between sibling as well as the similarity of their attachment style ([Fearon et al., 2014](#); [Fraley et al., 2013](#); [Franz et al., 2011](#)). The potential association between similar attachment style and attachment to the sibling/twin should be further investigated.

Taken together, we think the presented results successfully complete and extend recent findings like those of [Tancredy and Fraley \(2006\)](#) and [Fraley and Tancredy \(2012\)](#). Most importantly, they provide insight into the understanding of the nature of twin and sibling relationships compared to the relationship of couples. Moreover, in psychological research, twins have been used primarily as a tool for behavioral genetic research (e.g., [Bouchard, Lykken, McGue, Segal, & Tellegen, 1990](#)). We hope that our research will also further inspire studies that see the relationships between twins as a phenomenon worthy of investigation in its own right (see also [Neyer, 2002](#); [Segal, 1999](#); [Tancredy & Fraley, 2006](#)).

Notes

i) In the original paper, [Tancredy and Fraley \(2006\)](#) used 16 items. We excluded two items (item 8 and 16; see appendix in [Tancredy and Fraley, 2006](#)) because they refer to situations in which the participants are instructed to indicate whom they would *actually* seek. With regard to our expected sample (mainly students, recently moving out from their parents), we found these items inappropriate.

- ii) The full instruction of this attachment hierarchy item was: “Please create a rank(ing) order of the persons in this questionnaire. The first rank is for the person you feel strongest emotionally connected to. Please rank your sibling, romantic partner, father, and mother.”
- iii) As MZ twins were significantly older than DZ twins and non-twin siblings, the marginal means are reported when comparing the sibling types.

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Competing Interests

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