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What's in a Name: An Exploratory Study of Similarities and Differences Between Twins and Single-born Siblings

Emma Otta
Universidade de São Paulo, BRAZIL

Gustavo Crivello Cesar
Universidade de São Paulo, BRAZIL

Eloísa de Souza Fernandes
Universidade de São Paulo, BRAZIL

Renata Defelipe
Universidade de São Paulo, BRAZIL

Keven Leandro dos Santos
Universidade de São Paulo, BRAZIL

Vinicius Frayze David
Universidade de São Paulo, BRAZIL

Nancy L. Segal
California State University, Fullerton, USA

ans-names.pitt.edu
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Abstract

The current paper investigates the intra-pair similarity of twins' first names in comparison to non-twin siblings. The dataset was composed of 2,387 pairs of Brazilian names of same-sex individuals as a function of sex, age (< 18 years vs ≥ 18 years), and self-reported zygosity (MZ: Monozygotic vs DZ: Dizygotic). We assigned scores to each pair of names according to a classification system of 12 categories of intra-pair similarity (0 = absent; and 1 = present). The final score was the sum of the points obtained. ANOVA revealed that MZ twins (95% CI 2.28-2.50) had more similar names than DZ twins (95% CI 2.03-2.26), who, in turn, had more similar names than non-twins (95% CI 1.45-1.87). Females (95% CI 2.38-2.57) generally had more similar names than males (95% CI 1.63-1.83), and siblings over 18 years of age (95% CI 2.34-2.56) were given more similar names than siblings under 18 years of age (95% CI 1.85-2.03). Our results support and extend previous findings providing insight into parental expectations about individuality-relationality that may influence the negotiation of relationship and construction of identity. By naming their twin children, parents emphasize twinness through similar names, whereas they emphasize the individuality of their single-born children through different names.

Keywords: first name, naming, twins, single-born siblings, anthroponyms, Brazil

Introduction

Assigning a name to a newborn is more than a legal requirement of birth registration. It reflects expectations and aspirations that parents have for their children (McAndrew 2022; Otta 1997). Forenames may constitute important symbols linked to self-identity during the life of an individual (Allport 1937). Liking one's name is an implicit measure of self-esteem and self-acceptance (Gebauer et al. 2008; Adelson 1957), which is significantly and positively correlated with life satisfaction and subjective well-being (Luo et al. 2014).

There seem to be biases in the way people perceive and react to given names (Cotton et al. 2008; Buchanan & Bruning 1971). A personal name creates a self-reference bias in memory for people (Brédart 2018, 2016). Affectively valenced name-based first impressions may evoke interpersonal reactions with impact on daily lives and may even influence long-term psychological and social outcomes (Gebauer et al. 2012). Studies conducted by psychologists and researchers in related fields, over the decades following the pioneering studies of Walton (1937), have shown that first names' popularity is a significant predictor of academic performance, employability, and professional achievement (e.g., Pascual et al. 2015; Erwin & Calev 1984). Twins and non-twins with unfavorable names (i.e., names that can lead easily to estrangement or to mockery) may be negatively affected. In Brazil, joining part of the father's name with part of the mother's name is a common practice and the result of this combination may be unusual, such as *Erlice* (Ernesto and Alice) and *Ediginio* (Edite and Eugenio). *Tospericargerja* was named not after his parents but after the football team that won the 1970 World Cup: "Tos" from *Tostão*, "pe" from *Pelé*, "ri" from *Rivelino*, "car" from *Carlos Alberto*, "ger" from *Gérson*, and "ja" from *Jaizinho*. To simplify, Mr. Tospericargerja da Silva Torres prefers to be called only by his surname *Torres*. There is a lack of studies regarding the cultural factors related to the choice of names for twins, in general and specially in Brazil, which is a large and populous country, culturally, ethnically, and economically diverse.

Although a considerable amount of research has been done internationally studying various aspects of names given to singletons, much less is known about the names given to twins. Naming a baby can be a difficult decision for expectant parents; and many factors could potentially be considered, including information obtained from ultrasound (e.g., sex; chorionicity, and amnionicity) leading to zygosity inference. A survey conducted in the United States with a sample of more than 4,000 respondents showed that one-third chose a name in the second trimester of pregnancy, one quarter in the third trimester, and another quarter finalized their choice after delivery (Bradford 2020). Most parents learned their baby's sex during an ultrasound done at 18 to 22 weeks of pregnancy; however, fetal sex identification may occur earlier. According to Gharekhanloo (2018), the success of fetal sex identification is approximately 91.00% in the 11th and 12th weeks of pregnancy. Chorionicity (number of placentas) and amnionicity (number of amniotic sacs) can be determined in the first trimester when ultrasound is as much as 98.00% accurate (Jha et al. 2019).

Dizygotic twins (DZ), resulting from independent fertilization of two ova, share 50% of their genes, on average, and always (with rare exceptions; see Chen et al. 2000) result in dichorionic-diamniotic pregnancies. Monozygotic (MZ) twins, resulting from the fertilization of a single ovum that divides into two, share 100% of their genes. It is generally believed, but not proven, that splitting at 1–4 days results in dichorionic-diamniotic twins (20.00–30.00% of MZ), at 4–8 days results in monochorionic-diamniotic twins (70.00–75.00% of MZ),

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at 1–2 weeks results in monochorionic-monoamniotic twins (1.00–5.00% of MZ) and at >2 weeks results in conjoined twins (<1.00% of MZ; see Herranz 2013). Placentation is a clue to twin type, but misleading results can emerge from this practice (Segal 2015). Expectant parents are in a liminal stage of transition to parenthood and are consciously or unconsciously engaging in anticipatory socialization with their fetuses that may facilitate movement to their new role. Ultrasound may help the fetuses seem more real and encourage expectant parents to conceptualize them as "persons" long before birth. Choosing names may be an important step to help parents "appropriately categorize them, form a cognitive-emotional response, and understand how [to] interact with them" (Barnes 2015, 196). We still have limited knowledge about this anticipatory socialization process.

The study of names chosen by parents for twins, compared to names chosen for non-twins (NT), could provide insight into parental expectations about individuality-relationality that may influence the negotiation of the twins' relationship and the construction of their identity. By naming twin children, parents can emphasize twinness through similar names or, alternatively, emphasize the individuality of each child through different names (Josse & Robin 1990). Based on Allen and colleagues (2020), we consider that twins make sense of their relationship on a continuum of high and low levels of twin intimacy that may be influenced by parental expectations and their lived experience. The names chosen may be a cue to parental expectations and may be a reminder of similarity (for example, *Indiry Caroline* and *Ingridy Caroline)* or difference (for example, *Esteban José* and *Julio Alberto)* continuously present in the siblings' daily experience, both at home and outside home. The similarity of names adds to the physical similarity, which is particularly remarkable between monozygotic twins, resulting in people have trouble telling them apart (Forget-Dubois et al. 2003). They may be dressed in identical outfits and frequently they study in the same classroom, sharing classmates, and friends (e.g., Thorpe, 2003; Robin et al. 1998).

Plank (1964) analyzed the names of 187 pairs of twins using three categories. Organizing the sample by zygosity, slight but significant differences were found. The similarity of the names was higher among monozygotic twins than among dizygotic twins (same initials: MZ 67.00% vs DZ 58.00%; other similarities in sound, rhyme, or rhythm (e.g., *Gail Marie* and *Dale Lee*, *Penny Sue* and *Billy Joe*): MZ 21.00% vs DZ 15.00%). In a second study, the sample size was increased (n = 576), and a breakdown by age showed that the pattern of giving twins similar names became more common among twins born after 1950 compared to those born before 1950. Among girls, similar names prevailed over different names, while among boys the opposite occurred.

As part of their line of research on parental attitudes towards twin rearing, Josse and Robin (1990) studied the process of name giving. They compared 300 sets of twins' first names with 300 sets of first names of pairs of siblings born as singletons. Two blind judges evaluated the level of similarity between each pair of names using a three points scale (0 = no, 1 = slight, 2 = strong), with 88.00% concordance. There was more similarity between twin names than between the names of siblings born as singletons. The effect was more pronounced in dyads made up of two girls than in dyads made up of two boys.

Present Study

The Painel USP de Gêmeos was created in 2017 with the aim of encouraging twin research from a psychological perspective in Brazil (Otta et al. 2019). From our perspective, twins' name choice constitutes a neglected issue that is worth researching. To the best of our knowledge, the few studies on twins' names were conducted several decades ago and none have been conducted in Brazil. Additionally, the methodologies used to categorize intra-pair similarities in first names depend, to some degree, on the subjective evaluation of a judge. The absence of an objective categorization makes it difficult to standardize an assessment procedure of intra-pair name similarity. The present study has two main aims: 1.) to develop a methodology for the categorization of twins' intra-pair similarity in first names in an objective and standardized manner; and 2.) to analyze intra-pair similarity of twins' first names as a function of zygosity, sex, and age in comparison to non-twin siblings.

Method

Dataset

The dataset was composed of 2,387 pairs of personal names, of which 1,019 were from MZ twins, 953 were from DZ twins, and 415 were from non-twin siblings (NT) born as singletons, with an average age difference of 2.12 years (SD = 2.66). Table 1 provides details of the composition of the sample. It consisted of same-sex pairs only, of which 60% were females. Individuals of 18 years of age and older (ranging from 18 to 76 years) comprised 47.00% of the sample, and individuals less than 18 years of age comprised 53.00%. Most participants lived in

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the Brazilian Southeast region (66.00%). The twins were registered members of the Painel USP de Gêmeos, a database of twins who are interested in participating in behavior related research housed at the Psychology Institute, University of São Paulo (USP). The non-twin siblings were participants in research conducted by our research group. To be included in the dataset, the names had to be of biological siblings of the same sex. The classification of sibling type (MZ twins, DZ twins, or Non-Twins) was based on self-report.

Table 1: Sample Composition by Frequency and Percentage

Type of Siblings	Age				Gender					
	Under 18		Over 18		Female		Male		Total	
	Freq	%	Freq	%	Freq	%	Freq	%	Freq	%
DZ Twins	631	66.20	322	33.80	510	53.50	443	46.50	953	39.90
MZ Twins	538	52.80	481	47.20	614	60.30	405	39.70	1019	42.70
Non-Twins	102	24.60	313	75.40	309	74.50	106	25.0	415	17.40
Total	1271	53.20	1116	46.80	1433	60.00	954	40.00	2387	100*

Classification System and Procedure

Our classification system is based on the similarity of the words that compose the given names of a pair of siblings, their phonemes, letters, and syllables (Keller 2019). Phonemes are the sound units that make up the speech and letters are the corresponding graphic signs. A syllable is a grouping of phonemes that are pronounced in a single voice emission. Syllables are the phonological "building blocks" of words, each of which must consist of a vowel and optionally of consonants. Taking *Eduardo* as an example, this name has seven phonemes /e/ /d/ /u/ /a/ /r/ /d/ /o/ and corresponding letters, and four syllables: *E-du-**ar**-do*. Additionally, we can distinguish the tonic syllable that receives the primary stress in the word, highlighted in bold. Phonemes and letters coincide in many words. For example, Ellen and Edlen are names that begin with the same phoneme and also with the same letter. However, this equivalence does not always exist. For example, *Hugo and Heitor* start with the same letter but not with the same phoneme ("H" is a letter of the Portuguese alphabet with no phonetic value—i.e., no sound). The similarity of each pair of names was classified using a system of 12 categories (Table 2). Each pair of names was scored according to each category, receiving a score 0 (= absent) or 1 (= present). There were three categories based on syllables: beginning with the same syllable (e.g., ***Da**vid* and ***Da**niel*), ending with the same syllable (e.g., *Débo**ra*** and *Sa**ra***), and same number of syllables (e.g., *Fe-li-pe* and *Gus-ta-vo*). The similarity of the name was also considered from the first tonic vowel onwards (e.g., *Karol**ine*** and *Kar**ine**)*. One category was based on phonemes: beginning with the same phoneme (e.g., ***E**llen* and ***E**dlen*). There were five categories based on letters: starting with the same letter (e.g., ***G**iovana* and ***G**abriela*), ending with the same letter (*Fernand**o*** and *Enric**o***), same number of letters (e.g., *Sofia* and *Julia* with five letters), identical names except for one letter (e.g., *Danilo* and *Daniel*), and same double letters (e.g., *Will**i**am* and *We**ll**ington*). At the word level, when a given name was double, we examined whether both members of the pair had a double name (e.g., *Ana Claudia* and *Julia Cristina*) and whether one of the double names was identical (e.g., ***Maria** Beatriz* and ***Maria** Carolina*).

A total similarity score was calculated, which was the sum of the scores for each of the 12 equal weighted non-mutually exclusive categories. For each category, a pair of names received 1 point per criterion met. Consider the pair of names *Davi* and *Daniel*. This pair received one point for "Same initial syllable" (Da), one point for "Same phoneme" (/d/), one point for "Same initial letter" (D), and one point for "Just a different letter". The pair Fernando and Enrico receive 1 point because they had only the last letter in common ("o").

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Table 2: Classification System of Intra-pair Similarity of Personal Names

	Category	Examples
Syllable-based	Starting with the same syllable	*Davi - Daniel*
	Ending with the same syllable	*Débora - Sara*
	Same number of syllables	*Felipe - Gustavo*
Stress-based	Identical from the first tonic vowel on	*Karoline - Karine*
Phoneme-based	Starting with the same phoneme	*Ellen - Edlen*
Letter-based	Starting with the same letter	*Giovana - Gabriela*
	Ending with the same letter	*Fernando - Enrico*
	Same number of letters	*Sofia - Julia*
	Identical names except for a letter	*Danilo - Daniel*
	Names with double letters	*William - Wellington*
Word-based	Both have double names	*Ana Claudia - Julia Cristina*
	One of the double names is identical	*Maria Beatriz - Maria Carolina*

Based on this classification system, one of the authors (K. L. S.) developed a software program to automatically assign scores to pairs of names. Twelve rules were implemented in Python scripting language through algorithm techniques and a data and search structure. The software analyzed the similarity of each one of the 2,387 pairs of names on each of the 12 criteria (0 = absent and 1 = present). The final score was the sum of the points obtained, which varied between the minimum score of zero to the maximum score of 12. The higher the total score, the greater the intra-pair similarity of the names.

Data Analyses

The Statistical Package for Social Sciences (SPSS) version 26.0 was used to conduct the data analyses. We used a 0.005 level of significance. First, we ran a three-way ANOVA using sibling type (MZ twins, DZ twins, or Non-Twins), sex (Females or Males) and age (under 18 years of age or above 18 years of age) as the independent variables, and the total score of name similarity as the dependent variable. Pairwise comparisons were made using the Bonferroni post hoc test. Second, we used R (v. 3.6.1), and the package polycor (v. 0.7-10) to perform a binary exploratory factor analysis to investigate the grouping structure of the categories that compose the classification system. We used polychoric correlations (hetcor function) to calculate the matrix of association, and the factanal function with VARIMAX rotation to calculate factor loadings. Third, the categories were weighted to create factor scores. We used a general linear model (GLM), based on a three-way MANOVA, to examine differences across factors, with sibling type (MZ twins, DZ twins, or Non-Twins), sex (Females or Males) and age (under 18 years of age or above 18 years of age) as independent variables and the factors scores of the three latent variables as dependent variables. Cohen's d was used to calculate effect sizes.

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Results

Total Score of Intra-pair Similarity of Names

Initially, the focus of our analysis was the total score of intra-pair names similarity. The three-way ANOVA revealed a significant main effect of type of sibling ($F_{2, 2375}$ = 19.492, p <0 .0001), sex ($F_{1, 2375}$ = 56.532, p < 0.0001), and age ($F_{1,2375}$ = 23.139, p < 0.0001) on the total score of name similarity. Post hoc tests showed that the three groups differed significantly: MZ > DZ > NT (p < .001). MZ twins (M = 2.39, 95.00% CI 2.28-2.50) had more similar names than DZ twins (M = 2.14, 95.00% CI 2.03-2.26), who, in turn, had more similar names than Non-Twins (M = 1.66, 95.00% CI 1.45-1.87). Females (M = 2.48 95.00% CI 2.38-2.57) generally had more similar names than males (M = 1.73, 95.00% CI 1.63-1.83). Siblings over 18 years of age (M = 2.45, 95.00% CI 2.34-2.56) had more similar names than siblings under 18 years of age (M = 1.94, 95.00% CI 1.85-2.03).

The three-way ANOVA also revealed a significant interaction effect between type of sibling and age ($F_{1,2375}$ = 4.037, p =0.018). Among siblings over 18 years of age, the difference MZ > DZ > NT was more pronounced (Figure 1). All pairwise comparisons were statistically significant. Among siblings under 18 years of age, MZ > NT was the only significant difference. DZ twins appeared as an ambiguous group that did not differ from MZ twins or from NT siblings.

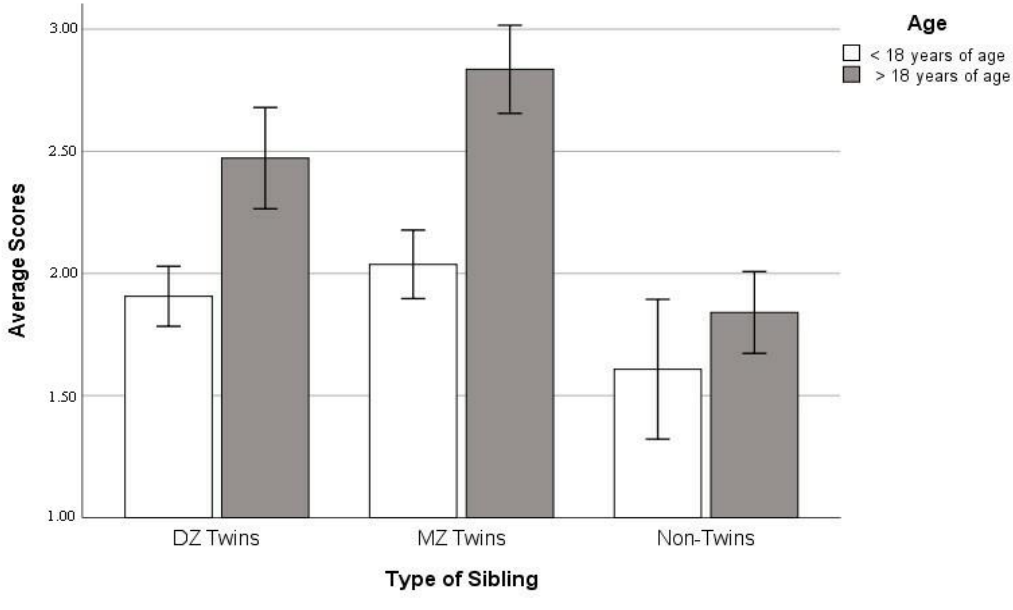

Figure 1: Average Scores of Intra-pair Names Similarity as a Function of Sibling Type and Age

Grouping Structure of the Categories

After analyzing the total intra-pair name similarity score, an exploratory factor analysis (EFA) was used to investigate the grouping structure of the categories that composed the classification system. The EFA yielded a three-factor structure, which accounted for 85.10% of the variance explained. Table 3 presents the factor loadings for this three-factor solution that includes a total of 10 categories. It was necessary to remove two categories, "Same number of letters" and "Same number of syllables", because the uniqueness of these two categories was high (u^2 = 0.90 and u^2 = 0.85, respectively), indicating that their variation was not explained by the specified factor structure.

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The first factor, which accounted for 30.0% of the variance, included four items with loadings between .722 and .933: "Starting with the same syllable", "Starting with the same phoneme", "Starting with the same letter", and "Identical names except for a letter". The second factor, which accounted for 27.80% of the variance, had four items with loadings between 0.547 and 0.953: "Ending with the same syllable," "Identical from the first tonic vowel on," "Ending with the same letter", and "Names with double letters". Finally, the third factor, which accounted for 27.30% of the variance, had just two items with factor loadings 0.80 and 0.78: "Both have double names" and "One of the double names is identical". Considering the preponderant categories in each grouping, the three factors were labeled, respectively, "Same Starting", "Same Ending", and "Double Names".

Table 3: Factors Derived from the Categories that Compose the Names' Classification System

Items	Same Starting	Same Ending	Double Names
Starting with the same syllable	0.933		
Starting with the same phoneme	0.925		
Starting with the same letter	0.806		
Identical names except for a letter	0.722		
Ending with the same syllable		0.953	
Identical from the first tonic vowel on		0.871	
Ending with the same letter		0.837	
Names with double letters		0.547	
Both have double names			0.997
One of the double names is identical			0.958
% of variance	30.00	27.80	27.30
Cumulative variance	30.00	57.80	85.10

Factor Scores as a Function of Type of Sibling, Sex, and Age

The GLM revealed the sensitivity of the intra-pair name similarity factors to the examined variables. Results showed significant multivariate main effects for type of sibling (Wilks' lambda = 0.968, $F_{6,4746} = 13.101$, $p < 0.001$), and interaction effects of type of sibling x sex (Wilks' lambda = 0.993, $F_{6,4746} = 2.737$, $p = 0.012$), and type of sibling x age (Wilks' lambda =0.993, $F_{6,4746} = 2.994$, $p = 0.007$). Subsequent univariate analyses revealed a significant main effect for type of sibling on the factor Double Names ($F_{2,2375} = 8.7061$, $p < 0.001$). Figure 2 shows average scores and 95% confidence intervals for the averages. Pairwise post-hoc comparisons showed that MZ twins scored significantly higher on double names than Non-Twins ($p = 0.002$), whereas the difference between DZ twins and Non-Twins was marginally significant ($p = 0.083$).

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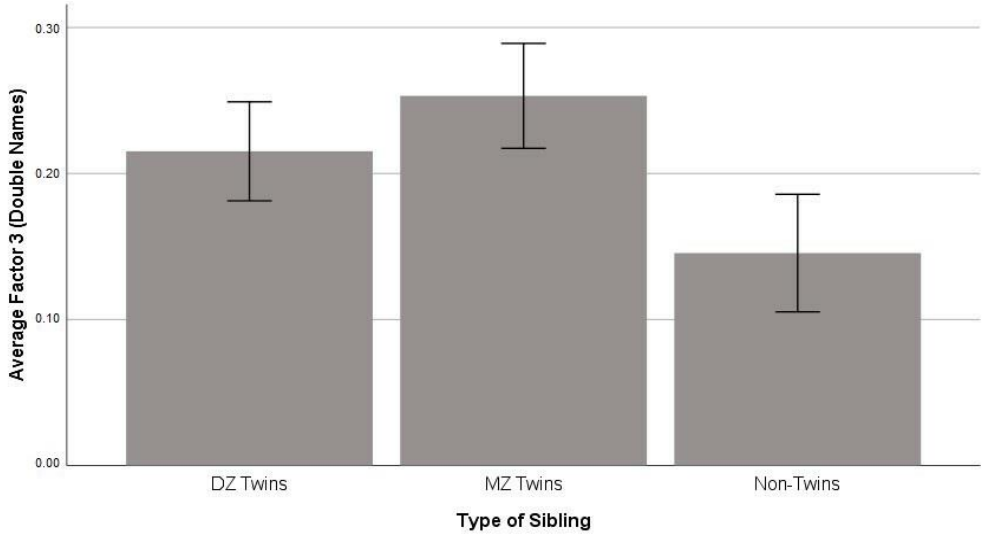

Figure 2: Average Factor 3 (Double Names) as a Function of Sibling Type

Univariate analyses revealed a significant interaction effect of Type of Sibling x Age on the factor Same Starting ($F_{2,2375}$ = 5.988, p = 0.003). Figure 3 shows average scores and 95.00% confidence intervals for the averages. Pairwise post-hoc comparisons showed that, among those above 18 years of age, MZ twins scored significantly higher than DZ twins (p < 0.001) and DZ twins scored higher than Non-Twins (p = 0.006) on the factor Same Starting. Among those below 18 years old, the pattern was less clear-cut, with MZ twins scoring higher than DZ twins (p = 0.023).

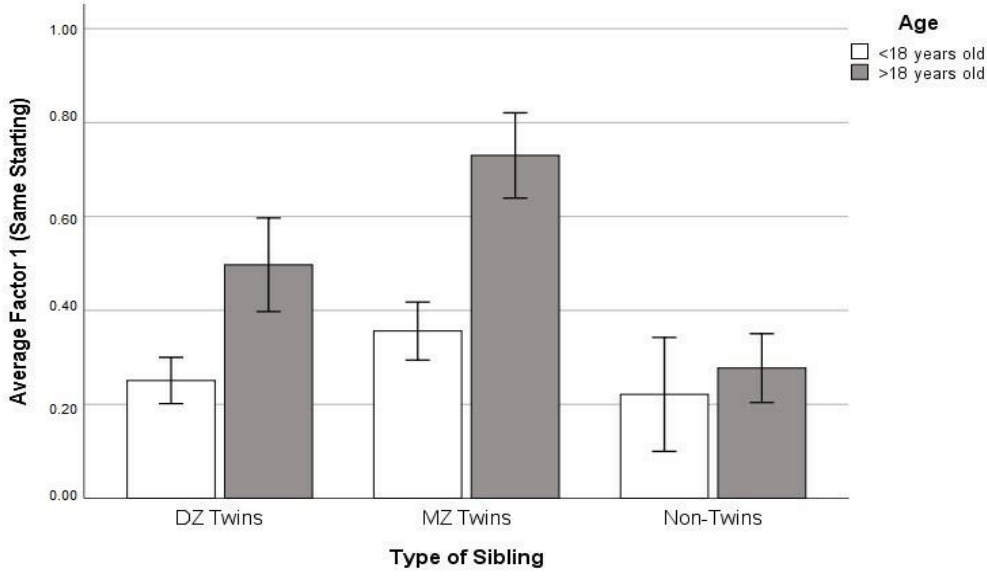

Figure 3: Average Factor 1 (Same Starting) as a Function of Sibling Type and Age

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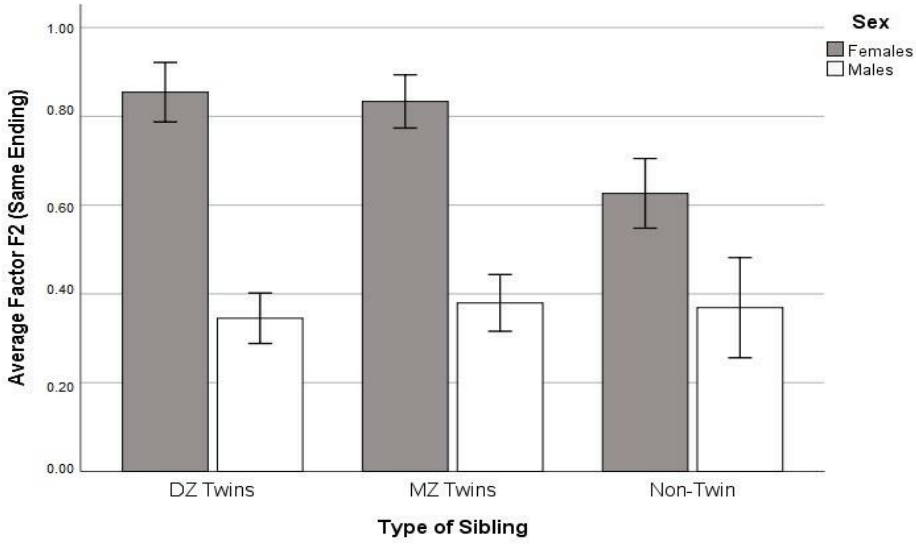

Figure 4: Average Factor 2 (Same Ending) as a Function of Sibling Type and Age

Univariate analyses revealed a significant interaction effect of Type of Sibling x Sex on the factor Same Ending ($F_{2,2375}$ = 3.5759, p = 0.028). Figure 4 shows average scores and 95.00% confidence intervals for the averages. Pairwise post-hoc comparisons showed that, among females, the pattern found was (MZ twins = DZ twins) > Non-Twins (p < 0.001) on the factor Same Ending. Among males, no significant differences were found.

Discussion

The main purpose of the present study was to assess and compare the intra-pair similarity of twins' and siblings' names, a neglected issue despite more than 100 years of contributions of psychological and social sciences to onomastics. Our categorization system and the software developed to automatically assign scores to pairs of names served this purpose. The methodological advancements of the research can be noted. Our sample size was 3 to 8 times larger when compared to previous studies. The classification system included a diversified system of 12 categories, giving the opportunity to provide more detailed information and a more comprehensive view of the studied names. In previous studies, the different possibilities have been reduced to only two categories: "Same initial" and "Other similarity in terms of rhyme, rhythm, or sound." We seek objectivity in the application of classification categories in our research by reducing dependence on the human evaluator. In the present study, software executed on a computer processor classified intra-pair names similarity through the coding rules of our classification system.

We have seen on websites created and aimed at mothers of twins that the individuality of twin children is a common concern. This is evident in lectures from professionals in the fields of psychology and education and from the experiences of mothers sharing child-rearing observations. For example, Lontra (2023) offers the following recommendations: a.) do not refer to them as the twins. Mothers are encouraged to call each twin child by name and to encourage the same behavior in the people around them; b.) to create an Only Child Day, in which mothers are encouraged to go out with only one of the twins and turn their attention to him or her; c.) to allow and encourage each one to have their own belongings from an early age; d.) to encourage each one's preferences; e.) to enroll your children in different classes at school; f.) to let them choose their clothes when they are aware of it; and g.) to replace labels with temporary characteristics to avoid creating limiting stereotypes.

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In scientific articles, we find support for some of these recommendations. Gallo, Reis, and Cordeiro (2020) recommend that parents of twins take some simple precautions, such as using different clothes for their children and selecting names with different sounds to help the babies begin to identify themselves as two and not a "package" of individuals. According to Fagundes (2021), wearing similar clothes and giving similar names make it difficult for people to correctly discriminate between the twins. To the extent that they are treated as completely identical, the twins themselves will feel confused about their own personalities.

The individualistic values exemplified above can be important factors that impact parents' social cognitions and parenting practices in families with twins. We hypothesize that, during the last decades, parents in Brazil have come to value individuality in their children more, as expressed in various aspects of their parenting practices, including the names they choose for their twin children. This explains why in the current study we found a generational difference in the given names to twins. Parents were more likely to give names to twins that emphasize uniqueness rather than similarity in the younger age range. However, it is important to bear in mind that this is a hypothesis and that there is a lack of supportive empirical studies. Systematic research is necessary to compare specific cultural values of parents and the relationships between cultural values and parenting practices in twin families across the country. Ferreira (2020) showed that mothers of high socioeconomic status (SES) were more in favor of separating their twin children in different classrooms compared to those of low SES. Those who lived in large cities were also more in favor of separating their twin children into different classrooms compared to those who lived in small towns. We hypothesize that more individualistic beliefs and practices, including naming practices that place greater value on uniqueness, will be associated with higher SES and living in larger cities. Personal names reflect an intangible cultural heritage of importance to the identity and culture of a population.

There is a lack of studies regarding the cultural factors related to the choice of names for twins and singletons in general and especially in Brazil, which is a large and populous, culturally, ethnically, and economically diverse country. In contrast to the lack of academic studies on the subject, we find interesting newspaper reports (e.g., Diário do Nordeste June 16, 2023; Grande Minas February 2, 2023) that point to a wealth of information awaiting investigation. Name blending is the practice of combining two existing names, usually those of the mother and father, to form a new name for the infant. Criticized by some because it can lead to strange names, this practice is defended by others as a creative homage resulting in original and unique names. We expect that this practice is more typical in the Northeast, but we do not have specific data on its influence considering the names of the participants in our sample. This is an important issue to investigate in future studies.

Systematic studies are necessary to compare specific cultural values of parents and the relationships between cultural values and parenting practices in twin families over the country. We hypothesize that, during the last decades, parents in Brazil have come to value individuality in their children to a greater degree and that this comes out in various aspects of their parenting practices, including the names they choose for their twin children. Parents were more likely to give names to twins that emphasized uniqueness, rather than similarity, in the younger age range.

With respect to sex in the present study conducted with Brazilians, twins' name similarity was higher in females than in males. It is notable that the same was found in the United States by Plank (1964) and in France by Josse and Robin (1990). We hypothesized that sex role standards may cause people to perceive that girls require more support, especially in times of difficulties, and that signs of emotional neediness are less acceptable in boys than in girls. Parents seem to consider dependency more favorably in girls, with a closer relationship being valued in female twins. In boys, parents seem to expect a greater search for autonomy. A study conducted in Israel with The Twin Relationship Questionnaire (TRQ) found that girls were perceived by their mothers as more dependent on their co-twins than boys (Fortuna et al. 2010). A study conducted in Brazil, by part of the research group of the current study, found that male twins were considered by their mothers to be more conflictive than female twins (Ferreira et al. 2022). Parental sex role standards involving expectations about individuality-relationality may influence name giving. By naming female children, parents may emphasize relationality through similar names and, alternatively, by naming male children they may emphasize their individuality through different names.

Although there is a lack of studies on twins' names, much work conducted with singletons has considered how names influence self-identity, social categorization, and social interactions that can be sources of hypotheses. More recently, a study was conducted about the consequences of personal name choice on speaking. Griffin and Wangerman (2013) found that parents who gave their children similar-sounding names set themselves up for speech errors. Individuals whose names shared with sibling initial sounds (***Ja**mie/**Ja**son*) or final sounds (*Amand**a**/Samanth**a***) reported that their parents unintentionally called them by the wrong name more often in comparison with individuals without such name overlap. These speech errors were especially prevalent with regard to younger siblings, who were close in age, of the same sex as their siblings, and physically alike. From this study we can hypothesize that the parents of the female twins were more prone to such speech errors than the parents of male twins.

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In addition to the total name similarity score, we conducted an exploratory factor analysis to identify grouping patterns, which categories loaded highly on which factor, and what these categories had in common. This exploratory analysis revealed a structure of three factors: 1.) one composed by the categories "Starting with the same syllable", "Starting with the same phoneme", "Starting with the same letter" , and "Identical names except for a letter"; 2.) another composed by "Ending with the same syllable," "Identical from the first tonic vowel on," "Ending with the same letter," and "Names with double letters" ; and 3.) a third composed by "Both have double names", and "One of the double names is identical". These factors, named according to the preponderant categories in each grouping "Same Starting", "Same Ending", and "Double Names", explained approximately the same percentage of variance (respectively, 30,00%, 27,80%, and 27,30%). The total proportion of variance explained by this set of factors was 85.10%.

For "Double Names", we found that MZ twins scored significantly higher than Non-Twins. For "Same Starting," among the names of siblings above 18 years of age, MZ twins scored significantly higher than DZ twins, and DZ twins scored higher than Non-Twins. Among those below 18 years old, only MZ twins scored higher than DZ twins. For "Same Ending," among females, twins had higher scores than Non-Twins with no difference as a function of zygosity. Among males, no significant differences were found.

There are some limitations to the present analysis. Parents may learn the zygosity of their twins prior to their birth, based on the arrangement of fetal membranes. (Of course, this can be misleading, given the rare pairs of DZ twins with shared chorions, leaving DNA analysis as the most effective measure of twin type; see Rodríguez et al. 2018.) This information may prompt parents to give MZ twins more similar names than DZ twins; unfortunately, the timing of parents' awareness of twin type was unavailable. There is also the possibility of misclassification of twin type, based on self-report, which may be unreliable in some cases. However, the large number of families in this study suggests that any misclassification would have a very small effect on the outcome.

In the current study most of the data came from Southeastern Brazil. The Southeastern region of the country has a relatively higher percentage of twins in comparison to other regions. In a previous study by some members of the research group of the current study, we found variation in twinning rates among the five major regions of Brazil (North, Northeast, Central-West, South, and Southeast), occurring between 2002–2013 (Varella et al. 2019). In general, the more developed regions (i.e., Southeast: 10.34‰ and South: 10.06‰) presented higher twinning birth rates than the developing ones (i.e., North: 7.32‰ and Northeast: 8.68‰), with the Center-West in between (9.05‰). Higher maternal age, greater access to assisted reproductive technologies, and higher nutritional diversity and abundance may contribute to the higher twinning rates in the Southeast and South developed regions, yielding regional discrepancies. Furthermore, ethnic composition may also play a role. In the North of Brazil, there is the highest proportion of indigenous intermixed individuals within the population (up to 32%), while in other regions it ranges from 11 to 16%. Brazilian Native Americans are closely related to Asiatic populations, which have the lowest twin rates compared to other ethnicities. It is, thus, possible that Asian ancestry may underlie the relatively lower twinning rate in the Northern region of Brazil. Future studies should further explore the relevant factors among the regions.

However, it has to also be considered that a convenience sample was used to expedite the collection of data. In the current study we analyzed the names of twins who were registered members of the Painel USP de Gêmeos (Otta et al. 2019), a twin database housed at the Psychology Institute of the University of São Paulo (USP). USP is the largest institution of higher education and research in Brazil, maintained by the State of São Paulo and located in the Brazilian Southeast region. It brings together twins interested in participating in research on basic psychological processes and behavior and who are also interested in accessing services provided by the university. Adult twins self registered, and children were registered by their parents. Although there were registered members from all regions of the country, there was a concentration from the Southeast and especially from the USP community. We have made efforts to make the sample more representative. At the international congress in Budapest, Hungary (Twins 2023), we presented the poster titled "National Extension of the USP Twin Panel: An Important Resource for Psychological Studies of Twins." This work presented the goal to expand our national action plan, aiming at greater effectiveness in conducting research on psychological processes and behavior with twins as models. The Executive Committee was expanded to include—in addition to members from the host institution—professors from three other institutions: Federal University of Rio Grande do Norte (UFRN), Federal University of Bahia (UFBA), and Federal University of Espírito Santo (UFES). We hope to expand twins' enrollment all over Brazil; to build a researchers' network that extends the contributions of the twin studies from a psychological perspective to the international community; and to demonstrate the results of our efforts in our database in the near future.

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Conclusion

We conducted an exploratory study on the similarities and differences in the names of twins and non-twin siblings. Our results support and extend previous findings providing insight on parental expectations about individuality-relationality that may influence negotiation of relationship and construction of identity. By naming their twin children, parents appear to emphasize twinness through similar names whereas they appear to emphasize the individuality of their single-born children through different names. Internationally, there is a lot of research on twins but not on this topic, which was pioneered by Plank (1964). To the best of our knowledge, our study is the first research on this theme in Brazil. A meta-analysis based on 50 years of twin research (Polderman et al. 2015) found that, of 2,748 publications, most were from US (34.5%) and UK (13.7%). South America (0.5%) was heavily underrepresented. A review of 100 years of research on proper names made by Lawson (1984) shows the contributions from psychology and related fields to onomastics. With the creation of the Painel USP de Gêmeos [USP Twin Panel] we hope to expand twin enrollment all over Brazil and to conduct and promote research with twins on psychological processes and behavior. Considering the potential scientific interest and the lack of information about the naming of twins, this is a line of research we want to focus on.

Future studies could investigate the reasons why names are chosen by parents for their twins. It may also be interesting to investigate the differences in name choices in the regions of Brazil, in order to understand the cultural factors involved. A third possible study would be the meaning of the name for the twin individual, whether or not he/she likes the name, as it is known that name-liking was taken as an implicit measure of global self-esteem (Luo et al. 2014; Gebauer et al. 2008).

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Notes on the Contributor(s)

Emma Otta is a professor of psychology and director of the Painel USP de Gêmeos [the USP Twins Panel] which she founded in 2017 at the Institute of Psychology, the University of São Paulo, Brazil. Her research interests include behavioral development of twins, how parents decide to name their children, as well as parental influence on self and social identity through naming practices.

Gustavo Crivello Cesar received a B.A. degree in psychology from the University of São Paulo, Brazil. He was awarded a PUBUSP grant to conduct the project "Names of twin siblings: similarities and differences". Currently he works with children and adolescents with learning difficulties.

Eloísa de Souza Fernandes received a B.A. degree in psychology and M.A. degree in psychology from the University of São Paulo, Brazil. As a researcher in the USP Twin Panel, she has been conducting studies on behavioral and psychological characteristics of twins. Currently, she is a Ph.D. student at the University of São Paulo Medical School.

Renata Pereira de Felipe received a B.S. degree in biology from the Universidade Estadual Paulista Júlio de Mesquita Filho, and Ph.D. in psychology from the Universidade of São Pauo, Brazil. Currently, she is a postdoctoral researcher on neurodevelopment at Mackenzie Presbyterian University.

Keven Leandro dos Santos got a systems analysis bachelor's degree from the Faculdade de Tecnologia da Zona Leste, FATEC/ZL, Brazil. Currently, he works in Computer Science.

Vinicius Frayze David received a B.A. degree in psychology and M.A. degree in Psychobiology, both from Faculdade de Filosofia Ciências e Letras, University of São Paulo (FFCLRP-USP), Ribeirão Preto, Brazil. Currently, he works as a data analyst and staff member at FFCLRP-USP where he provides support to researchers in the analysis of quantitative data.

Nancy L. Segal is a professor of psychology at California State University, Fullerton (CSUF) and Director of the Twin Studies Center which she founded in 1991. Her current recent interests include the behavioral development of twins, the nature of twins' social relationships, and the behavioral consequences of twin loss.

Correspondence to: Emma Otta, Departamento de Psicologia Experimental, Instituto de Psicologia da Universidade de São Paulo, campus; Butantan, São Paulo, Brazil. Av. Prof. Melo Moraes, 1721 Bloco F, CEP: 05588-030. E-mail: emmaotta@usp.br

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