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Article

The University of São Paulo Twin Panel: Current Status and Prospects for Brazilian Twin Studies in Behavioral Research

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Abstract

The University of São Paulo Twin Panel (Painel USP de Gêmeos), based at the Institute of Psychology of the University of São Paulo, started formally in 2017. Our registry is new, but in only two years of formal existence, it comprises a volunteer sample of 4826 registered individuals (98% twins and 2% higher-order multiples), recruited at the University of São Paulo and by social media campaigns. Our main aim is to conduct and promote research with twins on psychological processes and behavior. The University of São Paulo is the largest higher education and research institution in South America, and the Painel USP de Gêmeos has great potential for fostering research on twin-related issues from a psychological perspective in Brazil and South America.

Keywords: Twins; behavioral research; Brazil

(Received 24 April 2019; accepted 25 May 2019; First Published online 18 July 2019)

The University of São Paulo (USP) Twin Panel (Painel USP de Gêmeos) was formally founded in 2017 at the Institute of Psychology of the USP by a faculty team under the leadership of Professor Emma Otta. 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. The main areas of research include subjective well-being and personality, the twin relationship as an attachment bond, cooperation and competition, and the development and cross-cultural adaptation of psychological questionnaires. In spite of being a new registry, in only two years of formal existence, it now comprises a database of 4826 participants. The Painel USP de Gêmeos is registered at the USP Innovation Agency (AUSPIN) and at the Brazilian National Institute of Industrial Property (INPI-BR; Process 913418420). Figure 1 shows our logo. Considering that the USP is the largest higher education and research institution in South America, the Painel USP de Gêmeos has great potential for fostering research on twin-related issues from a psychological perspective in Brazil and South America.

Our research network brings together faculty and students from different Brazilian regions: Southeast (the USP), North (the Federal University of Para [UFPA]), Center West (the University of Brasilia [UnB]), and Northeast (The Catholic University of Salvador [UCSAL]). Our research network also includes colleagues from Uruguay (Universidad de la República [Udelar]) and the United States (Twin Studies Center at California State University, Fullerton [CSUF]). This research is part of the Center for Applied Research on Well-Being and Human Behavior, jointly sponsored by São Paulo Research Foundation, FAPESP, a public agency for research support, and Natura, a Brazilian private cosmetics company. We also receive funding from the Brazilian National Council for Scientific and Technological Development (CNPq), the Coordination for the Improvement of Higher Education Personnel (CAPES) and USP's Unified Scholarship Program (PUB USP).

Challenge Facing the Painel USP de Gêmeos: To Encourage Twin Research From a Psychological Perspective in Brazil

Brazil has not given enough priority to twin research from a psychological perspective. The most comprehensive meta-analysis,

based on 50 years of research with twins, was published in 2015 (Polderman et al., 2015). From 2748 publications, only five studies were conducted by Brazilian researchers in comparison with the United States (947), United Kingdom (377) and Australia (259). These few Brazilian studies were from the areas of genetics (Jacques et al., 1977, Rapaport et al., 1991), medicine (Custodio et al., 2007), and physical education (Machado et al., 2010; Reis et al., 2007). No Brazilian psychological research was included in the meta-analysis, which is remarkable, especially considering that among the most studied issues (according to the meta-analysis) were topics related to behavioral problems, cognition, and social interaction. We expect that Painel USP de Gêmeos will encourage high-quality twin studies on psychological processes and behavior in Brazil and throughout Latin America.

Recruitment

E-mails are sent by the Information Technology Superintendency at the beginning of the academic year to all faculty members, administrative staff and students of the Universidade de São Paulo inviting twins to become members of the Painel USP de Gêmeos and to participate in research studies. We created a website (https://www.paineluspdegemeos.com.br/) to explain to the public the importance of knowledge generated from studies of twins, disseminate research knowledge and to promote the register. Brazilian twins are invited to participate in our research program. The internet website domain was registered. We also use social media to promote communication and connection with and among twins. Our Facebook community has 2270 members (https://www.facebook.com/PainelUSPdeGemeos/). On Instagram (https://www.instagram.com/paineluspgemeos/) we have 1509 followers.

Annual Twin Festivals have been organized by the Painel USP de Gêmeos since 2016. We are now organizing the 4º Encontro de Gêmeos na USP [4th Twins' Meeting at USP] with the objective of offering recreational and cultural activities for twins and their families at the Sports Practice Center of the USP (Centro de Práticas Esportivas — CEPEUSP). The festivals have attracted interest from the media with interviews and articles in newspapers and coverage on TV, radio and internet, and the Painel USP de Gêmeos is becoming popular. We have been contacted by twins and multiple birth clubs (e.g., Confraria das Mães de Gêmeos, MeTwo).

The Painel USP de Gêmeos registration form can be completed online at https://www.paineluspdegemeos.com.br/voce-e-gemeo-cadastre-se in just a few minutes and is mobile-friendly. There are different forms for adult twins (>18 years), adult higher-order multiples (>18 years), parents/guardians of twins and parents/guardians of higher-order multiples. Each form consists of basic questions such as first and last name, twin's name, mother's name, age, sex, place of residence, contact (e-mail, mobile number, and preferred method of contact) and self-perceived zygosity. To fill out the registration form does not necessarily mean obligation to participate in research projects of the Painel USP de Gêmeos, but it does mean agreement to receive invitations to participate.

Ethical Commitment

The Painel USP de Gêmeos takes precautions to ensure the rights of the enrolled twins. We use an online tool integrated with our website for twins' registration. Information is sent encrypted across the internet and is stored in a worksheet that can only be accessed through an account login.

Fig. 1. Logo of the Painel USP de Gêmeos.

Our research projects are evaluated by ethics evaluation committees that follow the Brazilian ethical guidelines for research involving humans defined by the National Health Council (see Jácome et al., 2017) and that are in line with international ethical guidelines (see Sandu & Frunza, 2019).

We do not provide personal information of the registered individuals to third parties. Access to the data is restricted, and the data are anonymized for statistical analyses. The Painel USP de Gêmeos has a steering committee that examines requests from researchers interested in conducting collaborative research or inviting twins to participate in their studies.

We are also participating in discussions of Best Practices in Scientific Data Management. The Provost Office of Research of the USP and the São Paulo Research Foundation (FAPESP) are fostering information exchange and debates on challenges and opportunities in the management of research data, aiming to promote sound data management policies.

Current Status of Painel USP de Gêmeos

The Painel USP de Gêmeos has 4826 individuals currently registered (98% twins and 2% higher-order multiples). Figure 2 shows their distribution by the geopolitical macroregions into which Brazil is divided. It is noteworthy that all the macroregions of the country were represented in the Painel USP de Gêmeos, although with a stronger presence in the Southeast region, due to the base of the registry in the state of São Paulo. It is also notable that 59 participants were Brazilians living abroad.

Table 1 shows the sex distribution of the participants (self-registered or registered by their parents) according to zygosity (self-perception or parent-reported zygosity). Among the twins enrolled by their parents, the distribution with respect to sex is balanced, whereas adult females are overrepresented. This means that from their late teens onward, females are more interested in participating in research projects on psychological issues related to twinship. Furthermore, among self-registered participants, there is a slight predominance of MZ over DZ twins, whereas among participants registered by their parents, there is a clear predominance of DZ over MZ twins. This finding contrasts with that of Lykken et al. (1978), who reported an excess of MZ female twins in volunteer twin samples. It is possible that parents misclassified MZ twins as DZ. Since self-registered participants are adults and those
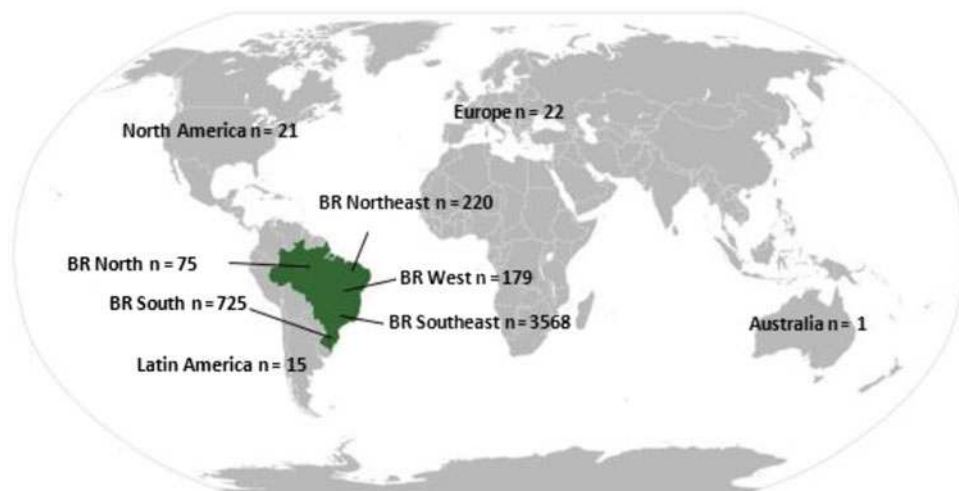
Fig. 2. Distribution of the participants of Painel USP de Gêmeos according to the five geopolitical macroregions of Brazil (BR). Participants living abroad are included. (Map licenced by Creative Commons. https://upload.wikimedia.org/wikipedia/commons/9/9c/Location_Brazil.svg.)

registered by parents are children, an alternative explanation could be the increase in DZ twins produced in the last decades due to ART.

The age distribution of the participants is shown in Table 2. A negative association of enrollment with age is notable. Among children, the highest percentage of enrollments was found in the younger age range (47.3% at 0–5 years), with a marked decrease thereafter (to 6.7% at 12–17 years). Among adults, the youngest age range of 18–30 years had more registrations (18.2%) than the older ones. The peak of registrations at 18–30 years may reflect the huge number of students at the university in which the Painel USP de Gêmeos is based, while the predominance of young children in our register may reflect the parents' needs and curiosity about the psychological and behavioral development of their twins.

Summary of Research

Table 3 presents an overview of the main research projects of Painel USP de Gêmeos, the current status and future directions. They will be briefly described below, with a focus on the key findings.

Population Studies on Twinning Rates

Having noted the lack of basic data on twinning rates in Brazil (e.g., Smits & Monden, 2011), before beginning studies in our main research focus, we conducted the first population studies investigating twinning rates: (1) this was based in the city of São Paulo, the most populous city of the country for the years 2003 and 2014, using data from the Brazilian Health Department database (Otta et al., 2016); (2) we also used data from all the Brazilian states for the years 2002 and 2013 (Varella et al., 2017a, 2019). Brazil is a huge (with an area of 8,510,820,623 km^2) and populous country (estimated population of 210,867,954 in 2019), and is culturally, ethnically and economically diverse, with much to offer for psychological twin research.

Considering the whole city of São Paulo (Otta et al., 2016), the overall average rates of twin and multiple births per 1000 maternities (‰) were 11.96 (7.15 DZ and 4.42 MZ) and 0.36, respectively. Over the whole time period considered, we found that the twin birth rate increased 30.8% from 2003 (10.19‰) to 2014 (13.33‰). Considering the whole country of Brazil (Varella et al., 2017a), the overall average rates of twins and multiple births

were 9.39% and 0.23%, respectively. Over the whole time period analyzed, we found that the twin birth rate increased 14.54% from 2002 (8.80%) to 2013 (10.08%). Analyzing the data according to the Brazilian regions, we found the highest twinning rates in the Southeast (10.34%) and in the South (10.06%) and the lowest rates in the North (7.32%), with intermediate values in the Central-West (9.05%) and in the Northeast (8.68‰). Among the factors that could explain this regional discrepancy are higher maternal age and greater use of assisted reproduction technologies (ART) in the more developed regions (Southeast and South). The ethnic composition could also play a role in explaining the regional discrepancy found. It is known that Asiatic populations have the lowest twinning rates compared to other ethnicities, and Brazilian native Americans are closely related to Asiatic populations. In the North of Brazil, there is the highest proportion of indigenous intermixed individuals within the population (Varella et al., 2019).

We took part in another population study in which the birth rate of Uruguay was investigated for the first time, over the years 1999–2015, from Uruguay's Ministry of Public Health database, in partnership with Painel USP de Gêmeos (Gómez et al., 2019). We expect that other countries in Latin America will feel encouraged to conduct similar population studies, since these data are still lacking. In Latin America; only Brazil (Ferreira et al., 2016, Varella et al., 2017b), Cuba (Marcheco-Teruel et al., 2013) and Chile (Ivanovic et al., 2006) have twin registries.

Zygosity Determination

Considering the need of a brief valid zygosity assessment questionnaire that could be widely and uniformly used by interested researchers, we took the initiative to validate in Brazil an instrument of four questions (Christiansen et al., 2003) about physical similarity between twins (for 'so alike as two peas in a pod', the corresponding Brazilian saying is 'cara de um, focinho do outro') and difficulties in telling them apart (see Appendix). This questionnaire has been used for more than half a century by the Danish Twin Registry.

Zygosity can be misdiagnosed from examination of placentae and fetal membranes (chorions and amnions) at the time of delivery, and this misdiagnosis may be communicated to parents. Approximately one third of MZ dyads have separate placentae and fetal membranes, as do most DZ dyads (Segal, 2017). Self-perception was compared with classification based on the zygosity

Table 1. Sex distribution of self-registered adult twins and of twins registered by their parents according to reported zygosity

Zygosity		Self-registered				Registered by parents				Overall total
		Females	Males	Mixed	Total	Females	Males	Mixed	Total	
MZ	n	472	161	0	633	565	533	0	1098	1731
	%	74.6	25.4	0.0	100	51.5	48.5	0.0	100	
DZ	n	230	148	180	558	637	611	798	2046	2604
	%	41.2	26.5	32.3	100	31.1	29.9	39.0	100	
Multiples	n	3	0	5	8	6	0	12	18	26
	%	37.5	0.0	62.5	100	33.3	0.0	66.7	100	
Unknown	n	51	19	0	70	111	129	0	240	310
	%	72.9	27.1	0.0	100	46.3	53.8	0.0	100	
Total	N	756	328	185	1269	1319	1273	810	3402	4671*
	%	59.6	25.8	14.6	100	38.8	37.4	23.8	100	

Note: MZ = monozygotic, DZ = dizygotic, UZ = unknown zygosity.
*Considering missing data for reported zygosity, the analysis was conducted with $N = 4671$.

Table 2. Age distribution of twins and multiple participants of painel USP de Gêmeos

Age range (years)		Twins			Multiples	Overall total
		MZ	DZ	Unknown		
0–5	n	656	1325	86	15	2082
	%	40.0	52.7	38.7	57.7	47.3
6–11	n	262	451	52	3	768
	%	16.0	17.9	23.4	11.5	17.4
12–17	n	102	179	16	0	297
	%	6.2	7.1	7.2	0.0	6.7
18–30	n	361	395	37	7	800
	%	22.0	15.7	16.7	26.9	18.2
31–40	n	150	94	17	1	262
	%	9.1	3.7	7.7	3.8	6.0
41–50	n	55	32	8	0	95
	%	3.4	1.3	3.6	0.0	2.2
51–60	n	37	30	4	0	71
	%	2.3	1.2	1.8	0.0	1.6
>61	n	18	8	2	0	28
	%	1.1	0.3	0.9	0.0	0.6
Total	n	1641	2514	222	26	4403*
	%	100	100	100	100	100

Note: MZ = monozygotic, DZ = dizygotic, UZ = unknown zygosity.
*Considering missing data for age, the analysis was conducted with $N = 4403$.

determination questionnaire. Of 52 twins self-perceived as MZ, 94% were classified as MZ by the questionnaire. Of 28 dyads self-perceived as DZ, 64% were classified as MZ by the questionnaire, and 36% were classified as DZ.

Overall, there are currently 90 twin pairs, 22 males and 68 females, with ages ranging from 12 to 65 years, who have had DNA analyzed by the team of Professor Cintia Fridman Rave at the USP Medical School (FMUSP). Genomic DNA was extracted from 5 ml of peripheral blood samples following a standard salting-out procedure (Miller et al., 1998). DNA samples were quantified using Nanodrop 2000 (Thermo Fisher Scientific) and stored at −20 ºC. The PowerPlex® Fusion System (Promega) kit was used to analyze 22 autosomic STR loci (D3S1358, D1S1656, D2S441, D10S1248, D13S317, D16S539, D18S51, D2S1338, CSF1PO, TH01, vWA, D21S11, D7S820, D5S818, TPOX, D8S1179, D12S391, D19S433, D22S1045, FGA, Penta E and Penta D) plus amelogenin and DYS391, according to manufacturer's instructions, in order to genotype the individual profile. Typing was

Table 3. Overview of research projects of Painel USP de Gêmeos: current status and future directions

Research project	N twins	Current status of the project
Population studies on twinning rates		
São Paulo	24,589	Otta et al. (2016) Varella et al. (2019)
Brazil	329,006	Varella et al. (2017a, 2019)
Uruguay (in partnership)	18,297	Gómez et al. (2019)
Zygosity determination		
Self-perception versus questionnaire classification	104	Ongoing
Questionnaire classification versus DNA (in partnership)	90	Ongoing
Anthropometric measures		
Height, weight, BMI	87	Ongoing
Waist-to-hip ratio (WHR), shoulder-to-hip (SHR)	87	Ongoing
Handgrip strength (HGS)	87	Ongoing
2D:4D digit ratio	87	Ongoing
Nonverbal behavior		
Facial expressions	87	Ongoing
Voice recordings	87	Ongoing
Gaze patterns	87	Ongoing
Psychological assessment tools		
Twin relationships in adulthood	233 48	Manuscript in preparation, de Costa (2018)
Klein Sexual Orientation Grid	50	Brandão (2017)
Twin relationships in childhood	1266	Manuscript in preparation
Well-being and personality	822	Data analysis
The Psychological Care Branch of Painel USP de Gêmeos		
Twinship psychological difficulties	18	Ongoing
New perspectives		
Behavioral research in children: cooperation and competition; emotional regulation		

carried out using ABI 3130 Genetic Analyser (Applied Biosystems) and the analysis was performed using GeneMapper ID Software v4.0 (Applied Biosystems). The zygosity determination was done to investigate the match between the genetic profile of each pair, since MZ twins have exactly the same genetic profile for the STR markers tested, while for DZ twins we can observe the variable number of shared alleles, as for non-twin siblings. The genetic analysis of the 90 twin pairs showed that 83% were MZ twins and 17% were DZ. The tetrachoric correlation with the questionnaire zygosity classification was .98 ($p = .001$). Comparable high agreement between the DNA test and zygosity determination by Christiansen et al. (2003) questionnaire has been found at the Danish Twin Registry.

Anthropometric Measures

Anthropometric measures are regularly taken at our laboratory. Height and weight are registered and the body mass index (BMI) is calculated. Waist and hip circumference, shoulder breadth and hip breadth are also measured using the methodology of Hughes and Gallup (2003). The waist-to-hip ratio is calculated by dividing the circumference of the waist by that of the hip. Shoulder-to-hip ratio (SHR) is calculated by dividing the shoulder breadth to hip breadth. HGS, a measure of the muscle strength of an individual, is measured using a digital dynamometer. Finger lengths are measured from scans (see Manning, 2002; Nanda &

Samanta, 2017). The 2D:4D ratio is used as a proxy measure of prenatal testosterone exposure. Anthropometric measures were taken from 87 twin pairs. HGS and finger-length measures were taken from both the right and left hands.

Nonverbal Behavior

Given our interest in unique twin nonverbal behavior signatures, we compared the facial expressions and voices of MZ and DZ twin pairs. Facial expressions were elicited by emotion-inducing films. Twins were simultaneously shown three short (on average 1 min) happiness-, disgust- and sadness-inducing films without seeing each other's reactions. The twins' facial responses were videotaped with a camera placed in front of them. We have videotapes of 87 adult twin pairs that are being analyzed by the software FaceReader (Danner et al., 2014; Lewinski et al., 2014). Data are still being collected. These analyses are being conducted at the Social and Cognitive Neuroscience Lab at Universidade Presbiteriana Mackenzie under the supervision of Professor Paulo Boggio.

Individual voice samples of the twins — all native speakers of Brazilian Portuguese — were recorded with no background noise in the laboratory with the help of a high-quality microphone. Voice recordings were made as each individual said a standard phrase: 'My name is …', read the lyrics of the well-known song 'Happy Birthday to You', and when he/she sang it. These data are being analyzed with the software Praat (version 6.0.50 by

Boersma & Weenink, 2019) with reference to the following parameters: formant frequencies F1(HZ), F2(HZ), F3(HZ), F4(HZ), Mean Pitch, Jitter, Shimmer, and Duration. A partnership was established with Professor Patricia Monticelli Almada and these analyses are being conducted at Faculdade de Filosofia, Ciências e Letras da USP Ribeirão Preto under her supervision.

Furthermore, we are studying gaze patterns in twins using eye tracking. Our main interest is to investigate the existence of 'gaze fingerprints' for the visual exploration of faces (neutral and with emotional expressions) comparable to that found by Kennedy et al. (2017) for the visual exploration of complex scenes. Specifically, we hypothesized that MZ twins would present greater similarity in gaze pattern to the regions of the face, and that this effect would vary between different facial expressions.

Twin Relationships in Adulthood

With the intention of encouraging the study of twin relationships by Brazilian psychologists and researchers from related areas, we searched for available instruments and translated them from English to Portuguese. We decided on the Attachment Features and Functions (AFF) questionnaire developed by Tancredy and Fraley (2006). Attachment theory, originally focused on understanding the nature of the infant–caregiver relationship, has been extended to adult relations and should offer a useful theoretical framework for understanding the nature of the relationships between adult twins. We planned a study to compare the association of twins and nontwins with their siblings and both parents. Our hypotheses were that twins were more likely than nontwins to use one another as attachment figures, and that MZ twins were more likely to use each other than DZ twins. We started to collect data with the newly translated questionnaire. A total of 230 participants (80 identical twins [MZ], 49 fraternal twins [DZ] and 101 nontwins [NT]) answered each of the 16 items of the questionnaire on a scale ranging from 1 (*strongly disagree*) to 7 (*strongly agree*). From the total of 230 participants, 175 were female (76.1%) and 55 were male (23.9%). Their ages ranged from 16 to 71 years (average 32 years). A multivariate analysis of variance (MANOVA) showed an interaction effect between attachments and type of twinship ($p < .001$). DZ twins and NTs were more attached to their mothers than to their siblings, and more attached to their siblings than to their fathers. Among MZ twins, we found the reverse: MZ twins were generally more attached to their co-twins than to their mothers. Our results showed that attachment seems to be related to genetic factors, since MZ siblings seem to be more attached to each other, even more so than with their mothers. These results will be presented at the International Society for Human Ethology (ISHE) Summer Institute on August 21–24, 2019, to be held in Zadar, Croatia.

Twin Relationships in Childhood

Twin relationships in childhood are being studied via maternal reports, using our Brazilian version of a questionnaire developed by Fortuna et al. (2010), which we are validating. A sample of 882 Brazilian mothers of twins answered the questionnaire online (41.6% MZ and 58.4% DZ). Exploratory and confirmatory factor analyses were conducted and five dimensions were extracted: closeness, dependence, conflict, rivalry and dominance. MANOVA analysis showed that closeness ($F_{1,880} = 22.026$, $p < .001$), dependence ($F_{1,880} = 39.413$, $p < .001$) and dominance scores ($F_{1,880} = 10.739$, $p < .001$) were higher among MZ than among DZ twins. MZ pairs were closer than DZ pairs within

the age range of 1–3 years ($F_{1,876} = 4.686$, $p < .05$). Our findings highlight the special nature of the twin relationship and are consistent with the theory of kin selection that predicts MZ twin pairs, who have the same genetic makeup, will have stronger bonds than DZ twins and share 50% of their genes (see Segal, 2011).

Members of the Confraria das Mães de Gêmeos do Rio Grande do Sul (a Brazilian Association of Twins' Mothers) participated in this research project. Results will be presented at the 9º Congresso Brasileiro de Avaliação Psicológica — UCSAL [9th Brazilian Congress of Psychological Evaluation], to be held in Salvador, Bahia, on June 25–28, 2019, and at the International Society for Human Ethology (ISHE) Summer Institute, on August 21–24, 2019, to be held in Zadar, Croatia.

Subjective Well-being

As members of the Centro de Pesquisa Aplicada em Bem-Estar e Comportamento Humano [Center for Applied Research on Well-Being and Human Behavior — CPBEC], we have a special interest in studying subjective well-being (SWB), life satisfaction and affect in twins. Diener et al. (1999), in a revision of three decades of progress in the area of SWB, emphasized the disappointment of researchers with the small effect sizes for external variables investigated in their studies (bottom-up approach). Personality proved to be a strong and consistent predictor of SWB (top–down approach), perhaps due to genetic predispositions to variability in affect, which might be caused by inborn individual differences in the nervous system (e.g., Caspi et al., 2003, van Roekel et al., 2018; Zheng et al., 2016).

Eight hundred and twenty-two Brazilian twins (78% females and 22% males) enrolled in the Painel USP de Gêmeos evaluated their life quality using Cantril's Self-Anchoring Scale (the ladder) and their emotional wellbeing (e.g., enjoyment, sadness yesterday; see Kahneman & Deaton, 2010). In this sample, there were 114 complete pairs. Some preliminary data analyses were made using within-pair intraclass correlation. They yielded higher correlation estimates for negative affect within MZ than DZ pairs ($r_{MZ} = .36$ vs. $r_{DZ} = .08$). For positive affect, the correspondent values were $r_{MZ} = .32$ versus $r_{DZ} = .24$. This is what we expected according to the two-factor theory of affect (Diener & Larsen, 1984; Zheng et al., 2016), which proposes that positive affect is more influenced by situational factors, whereas negative affect is more influenced by personality traits. We are continuing data collection with the aim of increasing the number of complete dyads and balancing the number of dyads with respect to sex and zygosity.

Future Research Directions

Besides continuing data collection with adult twins at the Human Ethology Laboratory at the Institute of Psychology of the USP, we will initiate a new research project with children. Potential participants will be selected from the database of the Multiple Pregnancy Unit of the University Hospital of the School of Medicine of USP, where mothers have been followed during their entire pregnancy and where their infants were born (Nakano et al., 2015). Mothers will be invited to answer the Brazilian version of Twin Relationship Questionnaire developed by Fortuna et al. (2010), and the Brazilian version of Reis et al. (2016) of the Emotion Regulation Checklist (ERC) developed by Shields and Cicchetti (1995). While mothers are responding to questionnaires, the children will be assessed individually for their physical traits (weight, height, cephalic perimeter) and cognitive development (Raven Test), and for their social and emotional skills. The twins will be filmed while they

complete a puzzle together (3 min). Based on the study by Segal (1988, 1993), we will use this design to test evolutionary hypotheses concerning cooperation and competition.

As an extension of this project, a new partnership will be established with the members of the pediatric dentistry section of the School of Dentistry of the USP. Interested mothers will have access to free dental treatment for their children. Those who agree will also participate in a research project under the supervision of Professor Fausto Medeiros Mendes, which is currently being designed. For previous studies of his team's work with twins, see the study by Teixeira et al. (2018).

The Psychological Care Branch of Painel USP de Gêmeos

Since its foundation, Painel USP de Gêmeos has been contacted by twins, their relatives and friends, asking for help with twinship-related psychological difficulties. To meet this demand, we created a new branch of our main research line called 'Braço Clínico do Painel USP de Gêmeos' [The Psychological Care Branch of Painel USP de Gêmeos]. Professor Maria Livia Tourinho Moretto of the Department of Clinical Psychology organized a team of clinical psychologists and students under her supervision to offer nonremunerated counseling and psychological services to people referred by our registry. One hundred and fifty individual consultations were carried out in 2017 and 212 in 2018 at the Centro Escola do Instituto de Psicologia da USP [Psychological Care Center of the Institute of Psychology of the USP]. Ten clients attended sessions regularly in 2017 and eight attended in 2018. The clinical setting is fostering research, and one of the psychologists in the team is pursuing his master's degree. New partnerships are being established by the leader of the Psychological Care Branch of Painel USP de Gêmeos with professors of the Instituto Sedes Sapietiae. In Brazil, there is a need for therapists specialized in twin-related issues, and this may be a groundbreaking initiative at the Psychological Care Center at our university that can spread to other psychology schools of the country.

Conclusion

The Painel USP de Gêmeos represents a valuable research resource, filling a gap in Brazilian research on behavior and basic psychological processes with twins. In the years ahead, we intend to continue increasing enrollments and to encourage the participation of twins and higher-order multiples from various macroregions of the country interested in building scientific knowledge with, and for, these people. Brazil is the fifth most populous country of the world, economically heterogeneous and a melting pot of ethnic and cultural diversity, with much to offer for research on psychological twin issues. We favor integrated and interdisciplinary studies, as well as new partnerships that will begin by including the Institute of Psychology, the School of Medicine and the School of Dentistry of the USP to use the available resource to its full potential. The USP is the largest higher education and research institution in South America, so Painel USP de Gêmeos has great potential for fostering research on twin-related issues in Brazil and also in other countries of South America.

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Appendix. Brazilian Version of Christiansen et al. (2003)

1. Sobre o quanto são parecidos(as), marque apenas uma alternativa. Você e seu(sua) irmão(ã) gêmeo(a):
   - ( ) são tão parecidos fisicamente como diz o ditado 'cara de um, focinho do outro';
   - ( ) são tão parecidos fisicamente quanto dois irmãos biológicos não gêmeos;
   - ( ) não são parecidos fisicamente, como vizinhos.

2. Na escola, é/era difícil para seus professores e colegas distinguirem um(a) do(a) outro(a)?
   - ( ) SIM
   - ( ) NÃO

3. É/era difícil para sua família ou amigos diferenciarem um(a) do(a) outro(a)?
   - ( ) SIM
   - ( ) NÃO

4. Na infância, você e seu(sua) irmão(ã) gêmeo(a) tinham ambos(as) a mesma cor de olhos e a mesma cor de cabelo?
   - ( ) SIM
   - ( ) NÃO