

Guest Editorial

Central and Eastern European Special Issue

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From November 16–19, 2014, twin researchers of the world will descend on the lovely city of Budapest, Hungary for the 3rd World Congress on Twin Pregnancy, held in conjunction with the 15th Congress of the International Society of Twin Studies (ISTS). It is the first time a Central and Eastern European country will host the congress. On this occasion, we were honored by the request from the editor of *Twin Research and Human Genetics*, Nick Martin, to put together a special issue highlighting twin research conducted in Central and Eastern Europe (CEE).

This task turned out to be more difficult than it seems at first glance. The integration of this community in the ISTS is inadequate, to say the least. Just to be able to send out a call, many hours of work went into finding the few dozen names from current and former members and authors who have published in the journal in this field from the CEE region. Beyond published articles in *Twin Research and Human Genetics* and membership of the ISTS, the poor integration of this community is further highlighted by the fact that when the journal published its third special issue on twin registries of the world, only one registry from the region was included. This was the Hungarian Twin Registry (Littvay et al., 2013). Prior special issues on registries contained no work from the region.

The situation is hardly an ISTS-specific phenomenon. Many other research communities are also not immune to the circumstances that lead to infrequent membership and insufficient publishing of articles. For example, one of the guest editors of this issue, Levi Littvay, is spearheading similar CEE integration efforts with the International Society of Political Psychology. Since the end of communism, research support in the region has rapidly diminished. The post-communist countries experienced a severe brain drain at the time. Even today, national research support appears as though it was loose change in the car seat cushion in comparison to the resources Western researchers have access to. High conference registration fees, society memberships,

and even publication fees obviously count on researchers' grant support. Unfortunately, for regions blessed with fewer resources, these constitute a severe barrier to entry. This being said, the ISTS has long been helping researchers from the region without adequate grant support, for example, by charging a reduced membership fee.

But the beauty of twin research is that it does not necessarily take money to build a twin registry and conduct high-quality research. The inspiring stories of Nick Martin and Lindon Eaves (and probably many others) going door to door, talking to twins one by one and convincing them to participate in research, taught us that hard work, the love of twin studies, and a good research idea substitute perfectly for the lack of financial resources. And because of this, the region is far from being the twin research wasteland it appears at first glance. There is high-quality, although quite sporadic, work present in the literature. An article in this issue by Oniszczenko and Dragan (2014) reviews their work in Poland. Not present in this special issue is the work by Ana Butkovic, Denis Bratko and colleagues of the Zagreb Twin Registry, which highlights the kind of door-to-door work mentioned above leading to excellent research (Bratko & Butkovic, 2007; Bratko et al., 2010; Butkovic et al., 2014). Klára Vítková Rulíková, as the head of The Czech Association of Twins and Multiple Birth Clubs, has regularly organized the international twin conferences in Prague, providing the possibility of genetic studies in young twins and multiples. Nancy Segal and Adam and David Tárnoki were also invited to this congress in 2011 and 2012, which was held in the Czech Parliament. The Hungarian Twin Registry was contacted recently by Professor Rafal Ploski, Department of Medical Genetics, Warsaw Medical University,

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Central and Eastern Europe



FIGURE 1

Distribution of twin registries, clubs/associations, and published twin studies in Central Eastern Europe.

Poland, about starting a project on whole genome/exome sequencing and genomewide methylation analyses in pairs of monozygotic twins discordant for chronic diseases which may have a genetic basis.

We also conducted a search for twin registries, associations and publications in this region; however, only some small twin and multiple associations, mainly for youth (such as the Czech one), were found (Figure 1).

There is a twin club consisting of young twin pairs in Kosice, Slovakia (www.dvojcata.kat.cz), but there is no twin registry in the country; as mentioned above, this is similar to the Czech Republic. However, more twin clubs have been identified in cities such as Prague, Ostrava, and Plzen (www.dvojcata.org, www.dvojcata-asociace.cz, www.dvojcata.net/klub-dvojcat, www.dvojcata-ostrava.webnode.cz, www.dvojcata-plzen.bluefile.cz). In Poland, there have been some sporadic research articles on twins (Jedrusik et al., 2004; Kempínska, 2006; Oniszczenko & Jakubowska, 2005), and a twins' festival has been organized in Szczecin since 1997, though it is not held on a regular basis. As discussed above, there is a Zagreb twin cohort in Croatia. In addition, a twin festival was organized in Omis in 2007 and 2008. There have been no further twin research/gathering activities identified in other CEE countries. An interesting article was published recently about a small village of only 4,000 people, not far from the borders of Hungary, Slovakia, and Romania, called Velikaya Kopanya, where 58 twin pairs live. Ukrainian scientists have explored whether the effect of the local drinking water can influence the high rate of twins, or whether the genetic isolation might be responsible for the phenomenon (Merkusheva, 2010). Needless to say, the list of twin organizations is far from complete.

When reigniting twin studies in Hungary in the mid-2000s, we were incredibly lucky to build on a strong foundation established by Júlia Métneki and Andrew Czeizel (Czeizel et al., 1979; 1994; Métneki & Czeizel, 1987; Métneki et al., 1984). While the registry of twin and multiple births faded shortly after the end of communism, the volunteer registries were easy to revive and grow through recruitment at twin meet-ups and media coverage of our scientific research. When we started in 2006, we were already able to publish research in abstract books or in low impact topical medical journals (Jermendy et al., 2011a; 2011b; Tarnoki et al., 2007; 2010; 2011). Today, we are able to publish articles in mid-to-higher-level journals, clearly highlighting the benefits of investments of CEE twin research (Molnár et al., 2013; Tarnoki et al., 2012; 2013). Of note, collaboration with other twin registries and researchers, such as the Italian Twin Registry (thanks to the continuous support of the head, Professor Maria Antonietta Stazi, and her colleagues) and Professor Kirsi Pietiläinen from the University of Helsinki, Finland, has made our work smoother. While the Hungarian registry is small (650 twin pairs or multiples, 50% MZ, 50% DZ, 14 triplets, two quadruplet, 70%

female, mean age 34 ± 22 years), it is constantly growing. In our 2013 introduction of the registry, these numbers were: 310 adult twin pairs or multiples (65% MZ, 35% DZ, six triplets, one quadruplet, 70% female, mean age 44 ± 16 years; Littvay et al., 2013). We counter the limitation of small samples by conducting, for example, radiological research or studies on rare diseases or special devices where small sample sizes are common. Our studies are underpowered and the results show only broad notions of heritability and environmental impact (with very wide confidence intervals); they are also novel and innovative, offering a first insight into the world of heritability for fields that may have thought little about the question. The number of researchers who want to collaborate with us are growing by the day as well, despite early warnings by some peers that this twin research will probably not yield a single impact factor, suggesting we (Adam and David Tarnoki) should look elsewhere if we ever want to receive a PhD.

Undeterred, today we are honored to be helping with the organization of the first Twins Congress in the region and, along with the abstracts of the conference, presenting a diverse set of articles on twin research from CEE and Hungary. First, Pári (2014) presents a historical and demographic overview of twin births in Hungary, followed by Kosinska-Kaczynska et al.'s (2014) Polish multicentric study on late prematurity in twins. Next is Hegedűs et al.'s (2014) sociological assessment of what advantages being a twin brings, followed by Molnár et al.'s (2014) case study of multiple valve disease found in triplets. Finally, Oniszczenko and Dragan's (2014) review of twin research in Poland is followed by an original article by Toth et al. (2014), assessing the genetic covariance between central corneal thickness and anterior chamber volume. The special issue is concluded by Vlckova et al.'s (2014) gene expression study highlighting that the most modern forms of twin research are present in the region and conducted to the highest standards.

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