

News, Views and Comments

Reared-Apart and Reunited: Extraordinary Dynamics/Twin Research Reviews: Twin Bereavement and Lifespan Associations; Identifying Novel Mutations in Twins; Parenting Premature Multiples; Conjoined Twins in Cross-Cultural Context/In the News: Madeline Albright, Mother of Twins, Passes Away; Identical Twin Songwriters Compose New Musical; Visually Impaired Twin Skiers; Identical Twin Brothers Undergo Heart Transplants; Naming the Genain Quadruplets

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Abstract

The focus of this article is on insights gained from the extraordinary dynamics that took place between a pair of reunited monozygotic female twins from Greece. Topics include visualizing the co-twin prior to meeting, the unique love and attraction between the twins, a mother's response to discovering her child's cotwin and the challenges posed by insufficient kinship categories. The following section of this article surveys four recent twin research reports. They include Bereavement and Lifespan Associations; Novel Mutations in Twins; Parenting Premature Multiples; and Conjoined Twins. The final part of this article presents interesting and informative news about twins from popular sources. The topics covered are the passing of Madeline Albright (Secretary of State and mother of twins); identical twin songwriters; visually impaired twin and sibling skiers; identical twin brothers who both received heart transplants; and the naming of the Genain quadruplets.

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Reared-Apart and Reunited: Extraordinary Dynamics

Every reared-apart twin pair offers unique insights into the origins of human behavioral and physical traits. However, the extraordinary dynamics and feelings that evolve between reunited cotwins have received relatively less attention. I was fortunate to be contacted by a 48-year-old monozygotic (MZ) female twin (Elpis) from Greece who was separated from her twin sister (Maria). These female monozygotic twins reared apart (MZA) were placed in an infant care center immediately after birth, on January 5, 1974 — their young single mother would otherwise have faced extreme social stigma for her out-of-wedlock pregnancy.

I spoke with Elpis, but not with Maria, for this article. Elpis is a creative writer and has developed a personal treatment — a dramatic monologue — of her experience that she will share publicly in the near future. She was also interested in the scientific side of having been a separated and reunited MZ twin and asked me to

provide this side of her story. I agreed to do this, but I have also added some details surrounding her separation, meeting and twin relationship, in addition to some descriptions of the twins' genetically based similarities and environmentally influenced differences. The twins can be classified as MZ based on their concordance for hair color, eye color, height and weight, and inspection of photographs taken of them at different ages. Their extraordinary physical likeness was observed by those who knew them well. According to Elpis, 'slight differences make up our uniqueness'. A picture of the twins is shown in Figure 1.

Separation

The twins were separated at 3 months of age when Maria's parents visited an infant care center in Patras, Greece, hoping to adopt a child. The twins were together at that time, but the couple chose Maria because she appeared to be the larger, healthier child; thus, they always knew that their child had a twin sister. They did not, however, disclose this information to her until she was an adult, nor did they tell her she had been adopted until she was of high school age. (Maria always suspected she had been adopted because her physical features did not match those of her adoptive family.) Elpis's parents arrived at the same care center several days after Maria had been taken, never imagining that the child they would bring home was part of a multiple birth pair. Interestingly, Elpis's

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Fig. 1. Elpis (L) and Maria during Elpis's visit to Patras, Greece, taken during the first week of their reunion. The twins were 32 years of age at the time. Photo courtesy of Elpis.

mother had wanted to adopt two children and would have welcomed twin girls into her home. The eventual discovery that Elpis had an identical twin sister was shocking and heartbreaking for her.

Summarized below are some of the events pertaining to Elpis's adoption history, the twins' discovery of one another, their first meeting, a mother's response to discovering her daughter's twin and the challenges posed by insufficient kinship categories. The unique love and powerful attraction between the reunited twin sisters are intriguing and insightful and will be discussed below. I will argue that a new term is needed to characterize a certain type of social connection between some reunited relatives, one that goes beyond ordinary love.

Elpis's Adoption

Elpis always knew she had been adopted. Her adoptive Greek father did not wish her to know, but her adoptive Greek American mother had been advised that children should learn this information from their parents. Elpis, an only child, always felt loved, accepted and secure in her immediate family. When she was 12 years old, a classmate told her she 'shouldn't be talking since she was adopted'. Elpis replied that she was 'chosen', a response reflecting a high level of self-esteem for which Elpis believes her mother is responsible. Then, inexplicably, Elpis forgot about being adopted until she was in her twenties and was dating her future, husband (I). I knew Elpis had been adopted, but she did not know that he knew — looking back, she suspects she was in a state of denial. When her mother confirmed the adoption, her memory and knowledge of it returned.

Discovery

The twins' discovery of one another occurred in 2007 when they were 32 years of age. The incident that triggered the process was the near drowning of Maria's mother, a frightening scene that Maria witnessed from a balcony. Maria was pregnant at the time with her second child and very close to delivering. Maria called for help and neighbors arrived to rescue her mother. Both mother and daughter were in the same hospital at the same time — one to regain consciousness and the other to give birth. When they

returned home several weeks later, Maria's mother decided it was time to tell her daughter the truth about her birth — that she had a twin sister. It was an emotional experience for Maria to learn this news, having just delivered and under the effects of maternal hormones (Buckley, 2015). She visualized a young twin — a child, a small version of herself; after all, she had been separated from her sister as a newborn. Of course, as an infant she would have had no knowledge of being a twin and what her sister looked like — but she now knew she was separated at a very young age and could visualize how her sister might have appeared.

Not wanting to upset her parents, Maria asked her husband (A), to locate her sister, so he hired a detective to facilitate the search. However, Maria's parents knew where Elpis was living because Elpis's mother sent yearly Christmas cards to the infant care center and, unknown to her, the staff forwarded the cards to Maria's family. Meanwhile, Maria visited the administrators who manage infants and adoptions and illegally obtained information about Elpis's residence — in 2007, tracing one's roots was illegal in Greece; at that time; a year later the law was changed to allow for such inquiries. According to Elpis, her sister's husband wisely began by visiting Elpis's husband, I, to assess the situation; specifically, to see whether a reunion between the twins was advisable. This is not unusual — in my experience having been associated with the Minnesota Study of Twins Reared Apart, some twins reunite reluctantly at first, despite their excitement at the prospect of meeting. Worries over lost identity, as well as financial or other requests that the cotwin might have can make some people cautious.

A phoned I (Elpis's husband, an orthopedic surgeon) to make an appointment as though he were a patient — he wanted to explain the situation in person. A arrived and proceeded to tell I the story of the near drowning and how his wife's twinship was revealed. He also noticed a photograph of Elpis on I's desk that looked exactly like Maria — and produced a photograph of Maria showing a perfect physical match with Elpis. When their meeting ended, I decided to tell his wife the story, certain she would wish to meet her sister. Elpis recalled crying for a minute before falling into a deep sleep, the hard questions involving when and where to meet came to her in the morning. It turned out that I had arranged to meet A at a coffee shop nearby and Elpis went with him. Again, A was stunned by the physical likeness between Elpis and his wife that he had seen by comparing the two photographs the day before.

The plan was for Elpis to meet her sister later, in person — it would take Maria about seven hours to make the trip. Maria did not wish to speak to her sister until they met — she wished to see her first. Maria understood that her sister was very emotional, while she was less so. This seems strange since Maria had had several weeks to come to terms with her twinship, while for Elpis it was a sudden revelation; I believe the opposite might have been expected. Meanwhile, Elpis informed her mother about her newly found twin. Her mother was heartbroken because she had always wanted to adopt two children. Her response reminded me of the reaction of parents who had adopted separated twins from New York City's Louise Wise Services (LWS) in the 1960s — specific requests for twins were denied despite their availability (Segal, 2021).

Reunion

The twins met at a hotel near I's office. A entered the lobby first, accompanied by his brother-in-law who was also stunned at the

physical resemblance between Maria and Elpis. As they rode upstairs in the elevator, Elpis sensed a relationship developing toward her on the part of the brother-in-law because she looked so much like the person (Maria) he knew. ‘So, you associate right away, just by being the prototype of a sister, brother or husband — it’s me and it’s her’, Elpis remarked. This phenomenon is familiar to me and to others who are acquainted with one MZ twin and meet the cotwin at a later date.

Seeing her sister for the first time Maria cried, kissed Elpis and held her; in contrast, Elpis laughed. These mixed reactions are typical of newly reunited twins. Having witnessed several twin reunions, I am familiar with the indescribable glee, nervousness and sense of unreality that characterize these exceptional events. At one point, Elpis and Maria stood in front of a mirror, and for a moment, there were four of them. As Elpis observed, outsiders might see copies of the same person, whereas she was mostly aware of their differences. Twin researchers emphasize that trait correlations, based on many pairs of MZ twins, are never perfect, meaning that twins are not exact replicas of one another. And twins who feared a loss of personal identity in anticipation of meeting soon learned that they retained their full sense of self. Some regarded their twinship as an additional identity, rather than as a replacement for the one they had.

Aside from their physical similarities, including right-hand preference, Elpis and Maria had both been teachers. Elpis had taught English to high school students, while Maria had taught Greek to first and second graders. There are also parallels that are difficult to explain other than by chance — for example, their closest childhood friends had the same name as their twin. The reunion was emotional for them both, although Elpis did not feel the full impact until sometime later. Perhaps her emphasis on the twins’ differences was a way of retaining her sense of self.

Elpis’s husband video-recorded the twins’ first meeting, but she has never watched it — somehow the right moment has never come. Perhaps that is because the moving image cannot capture what she was feeling inside — a sense of lost twinship and the potential for a relationship that might have been. And then, a different set of feelings emerged, some that frightened her, as I explain in the following section.

Twin-Twin Attraction

Most research on twin relationships shows that identical twins reared together are closer to one another socially than fraternal twins (Segal, 2012). This makes sense when we consider that MZ twins share all their genes and genes influence virtually all our cognitive abilities, personality traits, values and attitudes (Polderman et al., 2015). Consistent with these findings, studies of pairs of friends and significant others show that partners are similar in many measured characteristics (more so for behavioral traits than physical traits; see Hur, 2003), a situation that probably draws them together and sustains that relationship — not unlike what happens with most MZ and some dizygotic (DZ) twins. Related work with biologically unrelated look-alikes shows that simply sharing physical features does not imply that a close relationship will evolve (Segal et al., 2018).

Less is known about the social dynamics and feelings unfolding between newly reunited identical twins. We do know that reunited identical twins feel socially closer to, and more familiar with one another than reunited fraternal twins, mirroring what is observed among twins reared together (Segal et al., 2003; Segal et al., 2018). However, these results are based on ratings, which do not convey

the psychological processes behind them. It is important to consider genetic sexual attraction (GSA), a phenomenon that is familiar to many people in the adoption community.

GSA denotes the desire for close physical contact that may be experienced by some reunited biological relatives (Gonyo, 1987). Such feelings can eventuate in sexual desires and sexual relations. These feelings are unlikely to be experienced by biological relatives raised together due to the Westermarck effect, more commonly known as the incest taboo. The Westermarck effect can be thought of as an evolutionary adaptation for the avoidance of inbreeding or incest, which increases the probability of bearing children with a genetic defect. Biological relatives living together develop a sexual distaste for one another.

GSA has been discussed in reference to opposite-sex individuals — for example, fathers and daughters, mothers and sons, and sisters and brothers, including opposite-sex twins (Segal, 2021). However, perhaps it works in similar fashion with same-sex relatives who have lived apart — although the issue of conceiving genetically defective children would not be at issue. One example concerns MZA male twins who became lovers after reuniting (Segal, 2012). However, another example is of greater interest, given what happened between Elpis and Maria not long after reuniting: an MZA male twin wished to lie next to his brother and exchange kisses and caresses, behavior his cotwin rejected (Juel-Nielsen, 1965). These examples may seem rare, but their rarity may reflect researchers’ hesitancy to investigate these behaviors and/or some twins’ hesitancy to disclose them.

Even though Elpis highlighted the differences between herself and her sister (e.g., Maria never knew she had been adopted; Maria and A are now divorced), she experienced difficulties recognizing who she was. She asked Maria for pictures to see what she [Maria] was like growing up — ‘only it wasn’t me. One afternoon they engaged together in what Elpis called ‘an exploration’. They removed their clothes and touched each other’s bodies. They were in love, but they were not making love — the touching was never sexual in nature. Elpis’s feelings of confused identity persisted for several weeks, causing her some anxiety. Only once or twice did the twins discuss what had transpired between them. However, the feelings passed, and the episode was never repeated. Interestingly, Elpis’s husband who watched them interacting together on several occasions commented that, ‘They look like they’re in love, but they won’t be in a little while.’

There is a physical familiarity and comfort experienced by some reunited twins. An MZ female twin, born in South Korea but raised in the USA, first met her twin sister in Seoul when they were young adults. While riding a train to their home city of Busan, the Korean-raised twin wished to hold her sister’s hand and ‘cuddle together’ as they dropped off to sleep. The American twin told me that doing so felt normal and natural, admitting that such closeness would feel strange with someone else (Segal, 2012). A DZ female twin, separated in 1964 by the Louise Wise Adoption Agency in New York City, met her sister in 2018 at the age of 54. A film of their reunion showed one twin gently stroking the arm of the other, ‘a gesture that appeared so natural and easy it seemed to go unnoticed by both’ (Segal, 2021, p. 311). Sometime later, these twins were invited to New York City to film a sequence for CNN and slept together in the same bed at their hotel; one of them commented that it would have seemed ‘strange’ not to have done so. Another set of reunited twins, MZA females, born in South Korea, but raised in the USA and France respectively, shared a bed on the first night that they met (Miyamoto & Futerman,

2015). Even the six-foot, four-inch MZA male twin firemen from the Minnesota Study of Twins Reared Apart removed their shirts to compare their chests after knowing each other for just a few hours (Segal, 2017).

I suspect that these behaviors occur more often than they are observed or recorded. Because they have received little attention in the professional literature, the bases of this intriguing physical closeness are unknown. Some people attribute such behavior to twins' prenatal proximity, but much more careful study is required. Intrauterine knowledge of twinship does not exist — twins meeting for the first time are previously unaware of being a twin unless they are told. The possibility that the body 'remembers' what the mind does not has also been raised and not just with respect to separated twins. Some mothers of singleton twins believe that their infants' and toddlers' cravings for physical contact reflect prebirth experiences with the cotwin that did not survive. Such associations are easy to draw, but difficult to assess.

A new term is needed to denote the feeling of love between reunited twins (and other relatives), one that does not overlap with sexual attraction. *Genetically Related Intimacy* (GRI) could serve this need, but other suggestions are welcome.

Aftermath

Meetings between twins and other biological relatives expose the insufficiency of kinship categories in western cultures. Appropriate labels for my *newly discovered twin*, *my child's twin*, *my twin brother's mother*, *my granddaughters' twin sister*, and so on are unavailable. Elpis does not always tell people she has a sister or had been adopted; doing so requires telling a long story that she prefers to share with limited audiences. In fact, she uses her twin's name in conversations, rather than terms *twin* or *sister*. Other reunited twins I have known have made similar distinctions between the twin they just met and the sister with whom they were raised. A twin separated by LWS uses 'twin' for the former and 'sister' for the latter (Segal, 2021). Elpis's mother is happy that her daughter has a sister, secure in the belief that Elpis will not be left alone after her mother's death. However, Elpis has challenged this view — 'Relationships are built, they are not immediate,' she insisted.

Elpis and Maria are continuing to meet, both alone and with their families. It is a relationship that is still being built.

Twin Research Reviews

Bereavement and Lifespan Associations

Sibling loss in general and twin loss, in particular, have received relatively less research attention than the loss of a parent or child. Researchers from the Institute of Labor Economics in Uppsala, Sweden and Tilburg University in Tilburg, the Netherlands examined associations among longevity and the bereavement effects linked to the loss of a twin (van den Berg & Drepper, 2018). They reasoned that mortality can be compromised by bereavement effects, factors that are often overlooked. In order to explore these ideas, they used data from the Danish Twin Registry for twins who were still alive as of January 1, 1943, based on cohorts from 1873 to 1930 that included 9270 twin pairs (2808 MZ pairs and 6462 DZ twin pairs). Upon conclusion, the researchers offered evidence that their model separated the causal effects of bereavement and the contributions from genetic factors and childhood experiences. Among MZ males, losing a cotwin at age 75 years was found to

causally reduce remaining lifetime by over one year, on average. In addition, this bereavement effect was less severe among DZ twins or if the loss occurred at an older age.

Novel Mutations in Twins

Microtia, a rare anomaly of the ear, has been linked to both genetic and environmental factors. The first case study of microtia to involve twins was reported by investigators in China (Liu et al., 2022). The subjects of this investigation were 2-year-old MZ female twins. The twins were classified as MZ based on outcomes from an identity-by-descent (IBD) analysis. The twins' parents were a 25-year-old mother and a 26-year-old father. The infants were delivered by cesarean section at the 36th gestational week — microtia was detected in both twins after birth.

The researchers used genomewide sequencing and related methods to search for genetic mutations possibly associated with this condition. Based on their findings and information from a mouse model, they concluded that a BMP5 (bone morphogenetic protein) mutation may underlie the twins' microtia and a BMP2 mutation underlies the twins' facial deformity. They plan to construct BMP5 and BMP2 point mutations, using a mouse model, to further investigate these possibilities.

Parenting Premature Multiples

The challenges posed by parenting premature twins have been well documented (Mann, 1992; Segal, 2017). However, relatively less attention has been given to parenting premature higher-order multiples. Tabarsy, from Teheran University's School of Nursing and Midwifery, and Canadian colleagues conducted a qualitative analysis of the experiences of 15 parents raising three or more premature multiple birth babies (Tabarsy et al., 2020). Participants were living in Iran and were identified through hospitals, neonatal care units and word of mouth (i.e., by parents who were enrolled in the study; snowball sampling). In-person interviews were conducted between 2018 and 2019.

Four main themes emerged from the data: (1) 'being abandoned in an unknown endless path', (2) 'constant erosive concerns' (i.e., worry over present and future problems), (3) 'sacrificial self-forgetfulness' and (4) 'the manifestation of growth and maturity'. Parental moods could be located on a continuum, ranging from 'bitter' (e.g., inability, frustration) to 'sweet' (e.g., joyfulness, coping). Greater communication between parents of premature multiples and healthcare providers was encouraged for producing desirable outcomes.

Conjoined Twins

A highly original and informative overview of cross-cultural conceptions of conjoined twinning was recently presented by Tekendo-Ngongang from the National Institute of Health and colleagues in Minnesota and Pennsylvania (Tekendo-Ngongang et al., 2021). Two main points emerged from this paper. First, extreme departures from typical developmental outcomes are of universal interest, engaging the creative talents of artists worldwide. Second, there is a noteworthy artistic overrepresentation of the rare forms of conjoined twinning (parapagus dicephalus — joined at the trunk, but have separate heads or cephalopagus — joined from the top of the head to the umbilicus), as compared with the most commonly seen form (thoracopagus — joined from the upper thorax to the upper abdomen, always with cardiac involvement).

Several reasons for this observation were suggested, but the authors favored the explanation that the less common forms have the highest longevity.

Two comprehensive tables are useful additions to this work. The first table lists the types of conjoined twins, their embryogenesis, the site of union and their relative proportion. The second table concerns artifacts of conjoined twins with reference to anatomy, country and time period. Examples of artistic reproductions of conjoined twins, as depicted from different cultures, are displayed in the articles and are quite striking.

In the News

Madeline Albright, Mother of Twins, Passes Away

Madeline Albright, the first female Secretary of State, under President Bill Clinton, passed away in March 2022 (Kelly, 2022). She was 84 years of age. Albright, originally from Prague in what was then Czechoslovakia, was born in 1937; her original name was Marie Jana Korbelova. Her family escaped Europe 10 days after Hitler invaded their nation. In 1959, Albright graduated from Wellesley College and married Joseph Albright. The couple had three children, identical twins Alice and Anne in 1961, and Katharine in 1967. They divorced in 1983.

Madeline Albright is known for her political acumen, but also for discovering her Jewish roots later in life. Due to persecution, many Jewish people in Europe hid their Jewish background by practicing other religions. Prior to that revelation, Albright was raised Catholic before becoming an Episcopalian. She is also famous for the unique pins she fastened to her lapel when attending certain political events. For example, she wore a large pin when meeting with the Russians once she learned they had bugged the State Department. She chose a snake pin upon hearing that Saddam Hussein had called her a snake. Several years ago, I attended a wonderful exhibit of her jewelry collection at the Bowers Museum, in Santa Ana, California.

Identical Twin Songwriters Compose New Musical

Identical twins, Steven and Robert Morris, are pit musicians (i.e., individuals who play music during a theatrical production, ballet or other live performance; see Berklee, 2022). The twins and their partner, Joe Shane, spent time during the pandemic composing new songs and revising several others for a musical, *Everyone Comes to Elaine's*. Elaine's was a nightclub located in New York City's Upper East Side that was very popular among writers and celebrities in the years spanning 1963 and 2011. The musical is set in the late 1980s, soon after the release of Billy Joel's song, *Big Shot*, which mentions people who frequented Elaine's (Fernandez, 2011; Kilgannon, 2022).

Visually Impaired Twin Skiers

Four Austrian Aigner siblings — Veronika, age 19, and 16-year-old twins, Johannes and Barbara — earned more medals at the 2022 Paralympic games, in Beijing, China, than did the nations of Norway, Japan, Italy and Sweden (Waldstein, 2022). In total, they earned 11 medals, 6 of which were gold. Veronika and the twins are racers who suffer from congenital cataracts, a condition causing cloudiness of the lens, reduced vision, and blindness. They race with the assistance of guides who stay ahead of them to warn them of bumps and turns. One of the guides is Elisabeth, their 23-year-old sister.

The cause of congenital cataracts is unknown, but possible sources are mutations, pregnancy infections and hypoglycemia during pregnancy. The two forms are syndromic (the cataracts co-occur with another condition) and nonsyndromic (the cataracts are the only birth defect present; March of Dimes, 2022). Veronika and the twins have had two or more surgeries to prevent the condition from growing worse, but they still have visual difficulty on the ski slopes.

Identical Twin Brothers Undergo Heart Transplants

Identical twins, Donald and Ronald Crigler from Missouri, were both diagnosed with enlarged hearts (dilated cardiomyopathy), but in different years (Schmidt, 2022). Donald received his diagnosis in 2011, and Ronald received his diagnosis in 2014. They went on to have heart transplants, Donald in 2017 and Ronald in 2021. Their physician, Dr Andrew Kao at St Luke's Hospital, underlined the rarity of identical twins having exactly the same cardiac symptoms, responding to medications in exactly the same way *and* both undergoing heart transplantation. He believes that, like 15–20% of affected individuals, the twins' condition is explained by a genetic mutation; however, the mutation has not been identified. The twins have always been close to one another. They both agree that their unusual medical life history has given them reason to be closer.

Naming the Genain Quadruplets

The identical Genain quadruplets occupy a prominent place in psychiatric twin research. The four female co-quads were concordant for schizophrenia, albeit to varying degrees of severity (Rosenthal, 1963). I was privileged to assist on this project during the summer of 1974, following my first year of graduate school. It is well known that to preserve their confidentiality at that time, their real name (Morlok) was not used; instead, their last name was 'changed' to *Genain*, based on the Greek word meaning 'dire birth'. In addition, while they were being studied, the quadruplets were assigned first names corresponding to the four letters of the National Institute for Mental Health: Nora, Iris, Myra and Hester.

I recently learned that the quadruplets' real first names, given to them by their parents, also derived from their place of birth, the Edward W. Sparrow Hospital: Edna, Wilma, Sarah and Helen. The only living member of the set is Sarah Morlok Cotton, the sister who was the least affected. Her book reveals the names of all four quadruplets and their family members, so this information is now public knowledge (Cotton, 2018). I am grateful to author Audrey Clare Farley for calling my attention to the source of the quadruplet's actual names. Farley is currently writing a book on this subject titled, *Girls and Their Monsters*.

Conflict of interest. None.

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