

News, views and comments

Twins Standing in for Co-Twins: Explanation and Speculation/Twin Research Reviews: Single v. Multiple Embryo Transfer; Neurimaging of Twins with Periventricular Nodular Heterotopia; Twin Dietary Study; New Hungarian Text on Twins/Human Interest: Valedictorian and Salutatorian Twins; Twin Mother at Age Seventy; Twins Reunited by Tiktok; New Film on Twins with Selective Mutism; Becoming Twin Doctors

Nancy L. Segal

Department of Psychology, California State University, Fullerton, California, USA

Abstract

An overview of circumstances in which twins take the place of their co-twin is presented. Various explanations and speculations are proposed for understanding twins' willingness to do so in certain situations. This section is followed by reviews of timely twin research, namely single versus multiple embryo transfer; neurimaging of twins with periventricular nodular heterotopia; a twin dietary comparison; and a new book of twin-related readings from Hungary. The final portion of this article concerns human interest stories that both inform and entertain. They involve valedictorian and salutatorian twins; a mother delivering twins at age seventy; twins reunited by TikTok; a new film about twins with selective mutism; and twins becoming doctors.

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Twins Standing in for Co-Twins: Explanation and Speculation

Some monozygotic (MZ) twins substitute for one another with varying degrees of frequency, but the reasons behind these occurrences are rarely addressed. Most people assume that when twins change places or stand in for one another they do this purely for entertainment, but that assumption does not always apply. Over the years I have encountered situations in which MZ twins have found it variously convenient, protective, or amusing to adopt the identity of their cotwin. Examples include the inability to be present in two places simultaneously, efforts to avoid being charged with a crime or misdemeanor, and capitalizing on a cotwin's better test performance to raise a grade. Examples of the different forms of twin substitution are presented and reasons for their occurrence are proposed.

Corresponding author: Nancy Segal; Email: nsegal@fullerton.edu

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Convenience

There are times when events in occupational, academic or recreational schedules overlap, forcing a choice between them. MZ twins are a unique exception to this general rule, although recent interest in studying and finding one's doppelgänger (look-alike) may make MZ twins' physical advantage less exceptional (Joshi et al., 2022; Segal et al., 2018). In 2005, Julian Castro, then candidate for mayor of San Antonio, and former U.S. Secretary of Housing and Urban Development, was unable to attend a city parade to be attended by his constituents (News, 2005). His twin brother, Joaquin, then a member of the Texas House of Representatives and currently in the U.S. Congress, did attend. The twins were usually present at such events together and people were able to distinguish between them — but when they were apart it was often not possible.

When questioned later, Julian acknowledged that his twin had taken his place at the parade. He also claimed that Joaquin tried to tell the crowd of 250,000 that he was not Julian, but he could not be heard above the din. The twins insisted that they have never replaced each other in debates or in any official activities. Public announcement of the substitution was surprising to some, but disturbing to then retired appeals court judge, Phil Hardberger, who was Castro's mayoral opponent. Hardberger claimed the decision was problematic for a politician, far beyond what could be considered a youthful prank. It is conceivable that had Hardberger not been running against Castro he may have felt differently.



There have been other MZ twin politicians (e.g., the late Polish President Lech Kaczyński and Prime Minister Jaroslaw Kaczyński), as well as university presidents (e.g., Bernard and Harold Shapiro), actors (e.g., Tia and Tamera Mowry), and artists (e.g., Ivan and Malvin Albright) — perhaps these well-known individuals have changed places when it was convenient to do so, but were never discovered. I suspect that standing in for one's twin occurs less often than we suspect because identical twins are not identical in every way, especially to those who know them well — subtle cues can be revealing. It would be interesting to know whether twins who do change places with some frequency score relatively high on risk-taking, a suite of behaviors with a demonstrated genetic components (Wang et al. 2016).

I am reminded of MZ twins, Madeline and Margaret de Jesús from Puerto Rico. In 1984, Madeline was sent to Los Angeles to compete in the Olympics in the long jump and 4 × 400 meter relay (Simón, 2016). She was in 21st place in the qualifying round of the long jump and had suffered an injury. Margaret, who did not qualify, accompanied her sister to the games for support. Given the injury, the twins decided that Margaret should take Madeline's place. Margaret, also an excellent athlete, helped Puerto Rico qualify for the final. However, a journalist noticed a beauty mark on Margaret's cheek and realized it was not Madeline. He reported the incident and the team was pulled from competition. Madeline was initially banned from participating in future events, but returned to her sport (long jump) four years later. I suspect that these twins were thrill-seekers. They also show that twins do not have to be together to be identified by contrasting one with the other.

Protection

A recent devastating event involved MZ female twins in which one twin tried to spare her sister from a criminal conviction by changing places. On September 23, 2023, Samantha Jo Petersen from southeastern Minnesota, drove her car into a horse-drawn buggy killing two Amish children and injuring two others. At the time, she had an expired driver's license, no insurance, and was high on methamphetamine. Her twin sister Sarah agreed to switch places with her to avoid the severe charges that would be brought against Samantha due to the substance in her system; Sarah was drug-free, which would have reduced the severity of the charges. The deception ultimately failed because the clothing worn by Sarah differed from that of the true culprit, as described by eyewitnesses (Barrett, 2024; Ruiz, 2024).

In March 2024, both the *Wall Street Journal* (Barrett, 2024) and *Inside Edition* (2024) asked me to explain why one twin would come forward willingly to accept the penalty for a sister's crime. I referenced research showing that, in general, MZ twins have the closest social connection of all human relationships. Their mutual levels of love, closeness, acceptance, and protection can apparently override the difficult consequences one twin may face. A different example of one twin filling in for another exemplifies the strong connection between MZ twins. Female twin athletes, Lanny and Tracey Barnes, had both competed in biathlons for 15 years. In 2006, both twins earned places on the U.S. qualifying team in shooting and cross-country skiing; however, Lanny was ill on the day of the qualifying races. Tracey, who did qualify, relinquished her place to her sister for the Sochi Olympics in southern Russia. Tracey explained, 'She's having a great year, and I think when you

care enough about someone you're willing to make that kind of sacrifice' (Good News Network, 2014).

There are also accounts of innocent twins who willingly accept some form of punishment when their cotwin deserves the blame. An MZ twin who was stopped for speeding was driving without his license. His brother quickly handed him his own license before the officer noticed — he was aware that a speeding violation (for himself) was less serious than driving without a license (for his twin; Redditor, 2024).

In contrast, there are examples of twins who allow their cotwin to take the blame for something they did not do — evidence of how physical identity can pose disastrous consequences for one twin. Ken Dugar of Chicago, Illinois, was imprisoned for murder despite insisting on his innocence. Years later, his identical twin brother, Karl, confessed to the crime (Schneider, 2022). This is an extreme example — we do not know the relative frequency of twins who willingly accept a serious penalty for their cotwin, compared to those whose cotwin is falsely charged and take the blame, or how these tendencies vary according to the severity of the crime.

Entertainment

There are numerous cases of MZ twins who find it amusing to watch the reactions of others who mistake one twin for the other. I am aware of a different type of amusement that a reared-apart pair, Roger Brooks and Tony Milasi, created by quickly changing places in a restaurant that served unlimited plates of their signature dish. While one twin ordered and ate, his twin brother hid in the restroom. These exchange sequences repeated many times until the waitress grew disgruntled by the quantity of food being consumed and refused to provide further service. I suspect that the twins — then grown men — were unknowingly capturing a part of their childhood they had been denied, due to their separation.

Atypical Challenges

The genetic identity of MZ twins has prevented some attorneys and other officials from convicting twins or assigning responsibility. I have heard from MZ male twins who had sexual relations with the same woman who eventually conceived. At the time, DNA testing was less sophisticated than it currently is and failed to identify the true father, so neither twin could be ordered to pay child support (see Segal, 2017). Jewelry theft at the upscale German department store, Kaufhaus des Westens (KaDeWe), was traced to one of two 27-year-old MZ male twins. Both twins were eventually set free because the true culprit could not be identified (Himmelreich, 2009). However, current genetic technology, based on de novo mutations (i.e., gene changes detected in a person that are not inherited from his or her parents) has been able to distinguish between MZ twins. The procedure, developed in 2014 in Germany at Eurofins Genomics Campus, examines the entire genomes of twins and their children (in cases of disputed paternity), searching for unique genetic features (Weber-Lehmann et al., 2014). Epigenetic analysis using twins is also able to tell MZ twins apart with a high degree of certainty (Segal et al., 2017; Vidaki et al., 2017).

Twins will continue to change places for convenience, protection, and amusement — their's and other's. Some switches are harmless, others pose risks. Given the advanced genetic

technology that is now available it would be prudent for twins to carefully consider the consequences.

Twin Research Reviews

Single Versus Multiple Embryo Transfer

The first study comparing birth rates and physical outcomes from single embryo transfer (SET) and multiple embryo transfer (MET), using embryos that had undergone preimplantation genetic testing for aneuploidies (PGT-A), was completed by Gerber et al. (2024). (An aneuploidy is an abnormal chromosome number.) The data were collected retrospectively from the database of the Society for Assisted Reproductive Technology, using information gathered between 2014 and 2016. Embryos created from own and donated eggs were included. The live birth rate from MET exceeded the live birth rate from SET, but preterm delivery rates and low infant birth weights were higher with MET. These findings applied when eggs were provided by the self or by a donor. The researchers advise SET as a better procedure for assisting couples wishing to have children, asserting that this practice conforms to guidelines (not rules) set by the American Society for Reproductive Medicine. This is probably true in most cases; however, I believe a more judicious plan would be to assess each woman's health history and other personal factors in order to reach the best solution.

Neurimaging of Twins with Periventricular Nodular Heterotopia

Periventricular nodular heterotopia (PVNH) is a brain malformation of cortical development. In such cases, a small portion of cells fail to migrate to the surface of the brain from a location beside the ventricle (Alwaki, 2021). This condition is associated with a variant of the *MAP1B* gene. A case report of a family included MZ female twins (one of whom was the index case), their mother and their grandmother (Xue et al., 2023). Genetic testing revealed a heterozygous missense PVNH variant in the twins and mother; the grandmother was not tested. The seizure type, intellectual deficit and neuroimaging phenotype matched in the twins. In contrast, their mother had the same variation but without seizures; their grandmother (who lacked an MRI) displayed the epileptic phenotype and mild intellectual disability.

Twin Dietary Study

An elegant cotwin control study of dietary practices has provided dieticians with new information that should persuade people to choose healthier foods. Researchers at Stanford University recruited 22 MZ twin sets (17 female, 5 male) for a study in which one twin in each pair was randomly assigned to an omnivorous diet and the cotwin was assigned to a vegan diet (Landry et al., 2023). The twins maintained their diets for 8 weeks, receiving their meals by a delivery service for the first 4 weeks, and preparing their own food during the last 4 weeks. Twins visited Stanford University on several occasions for physical and cardiometabolic measures. They also completed three unannounced structured dietary recall interviews by telephone and maintained diet diaries by recording food intake via the *cronometer* app. When the study ended, twins assigned to the vegan diet showed significant mean decreases in low-density lipoprotein cholesterol concentration, fasting insulin level, and body weight.

I was particularly interested in this study because one of the 44 pairs had participated in my ongoing study of tacit coordination. It

was fascinating to hear their personal perspectives and responses to the assigned food regimens. The 'vegan twin' said, 'I feel like meat or chicken sit in your stomach and make you feel full, but as a vegan I was always hungry and had to take iron pills because I felt weak.' The 'omnivore twin' referenced the diet but, more importantly, an aspect of their twinship. 'Although I did not change my diet, it was very inconvenient to not eat the same meal as my twin. I would rather us both be vegan or omnivore.'

Note: These twin participants in my tacit coordination study were classified as MZ, based on their responses to items in a standard physical resemblance questionnaire; I did not see zygosity diagnosis methods explained in the Stanford study paper. The authors might have also addressed the male-female imbalance (77% female pairs). Of course, a skewed male-female distribution in a volunteer twin sample is both well documented and predictable (Lykken et al., 1987).

New Hungarian Text on Twins

Twin Studies in Social Science (Pári et al., 2024), a collection of papers on a range of twin-related areas, represents the diverse interests and efforts of researchers from multiple generations. Edited by András Pári, Szófia Drjenovszky, Rita Hegedűs and Agnes Engler, topics include fertility rates in families with twins, the health of twins, and sources of conflict between cotwins. The book, which resulted from a twin research workshop, was published by the Mária Kopp Institute for Demography and Families (KINGS). Additional information about this new entry into the scientific twin literature will be presented as part of a book panel (within the psychology session) at the International Society for Twin Studies (ISTS) congress in Assisi, Italy, September 26–28, 2024.

Human Interest

Valedictorian and Salutatorian Twins

Twin brothers from Herricks Public High School, in Searington, New York (on Long Island), Devon and Dylan Lee, are the valedictorian and salutarian, respectively, of their graduating class. Just 6/1000 of one point separated their grades (Charlesworth, 2024). The twins will be attending Cornell University (Devon) and Yale University (Dylan) in the fall of 2024. In addition to academics, the twins excel at running, volleyball, music, and mentoring. They appear to be fraternal twins from their photographs, but they look enough alike to be identical. Hopefully, a DNA test will reveal their zygosity since it is unusual — but conceivable — to have fraternal twins so closely matched in ability and talent.

Twin Mother at Age Seventy

In 2023, Ugandan mother, Safina Namukwaya, delivered opposite-sex twins, becoming one of the oldest women in the world to do so (Kupemba, 2023). She had given birth to a daughter just three years prior. The only older mother of twins could be Erramatti Mangayamma of India, who delivered a female-female pair in 2019, at age 73 (Gupta & Pokharel, 2019). Namukwaya conceived the pregnancy with the assistance of an egg donor, using her husband's sperm. The twins were born prematurely at 31 weeks gestation. Having children was very important to Namukwaya who recalled ridicule for being childless for so many years.

I was able to contact Namukwaya's physician, Dr Edward Tamale Sali, a fertility specialist at the Women's Hospital International and Fertility Centre, to confirm details of the

conception and delivery. (I tried contacting the physician for Mangayamma of India, Dr Sanakkayala Uma Shankar, but received no reply.) Dr Sali also indicated that being childless in Africa is so devastating that any physician would be willing to help an otherwise physically fit woman in need. Namukwaya's husband's sperm was used since the couple was legally married. The twins were born on November 29, 2023 and discharged from the hospital on January 6, 2024 (Abrahamson, 2024). Both twins are faring well — the girl (firstborn) is named Babirye Nabagala and the boy (secondborn) is named Kato Shafik.

Twins Reunited by TikTok

Twins reared apart are reunited in many different ways (e.g., the efforts of social workers or mistaken identity, to name a few). However, the first occurrence of twins brought together by TikTok has been reported (Nurse & Morris, 2024). Amy and Ano are identical twins from Georgia (once part of the Soviet Union) who were taken from their mother and sold separately as infants. It is estimated that tens of thousands of other newborns experienced a similar fate. Their reunion story is striking: At age 12, Amy was watching her favorite television program, *Georgia's Got Talent*, and noticed a girl who looked exactly like her, performing a dance routine. Amy's family and friends also noticed the resemblance. Seven years later, in November 2021, Amy posted a video of herself on TikTok, in which she had dyed her hair blue and was getting her eyebrow pierced. Living 200 miles from her twin, Ano received the video from a friend who saw the similarity. Unable to locate Amy, Ano shared the video on WhatsApp — then someone who knew Amy connected them through Facebook and they met a week later. Amy commented, 'I am her and she is me.' Ano admitted that they hugged, even though she does not care for hugs.

The birth dates on their certificates indicate that the twins were born two weeks apart, but that is not so. Amy and Ano next planned to meet their birth mother and to learn more about their early history. That is another story.

New Film on Twins with Selective Mutism

Most people know about June and Jennifer Gibbons, the British twins (born in Barbados) who became famous for selective mutism, crimes, and being the youngest women in history to enter Broadmoor, a high-security psychiatric hospital in England. The story of the twins, who grew up in Wales in the 1970s, became widely known as a result of the book, *The Silent Twins* (1986), by Marjorie Wallace. In 2023 and 2024, the BBC released a 10-part film series titled, *June: Voice of a Silent Twin* (BBC, 2023–2024). Other films have captured their story, but this latest series includes an interview with June, the surviving sister; Jennifer died in 1993 (Sturges, 2024). At the time of this writing I had not seen this newest production.

Becoming Twin Doctors

Identical twins, Kyle and Kendall Lewis from New Orleans, Louisiana, spoke on NBC to journalist Brittney Johnson about their path taken toward the medical field (NBC-DFW, 2024). Their medical interests were beginning in high school where both twins enjoyed science and sports before majoring in kinesiology at Louisiana State University (LSU). (Kyle attended Washington University for one semester, then joined his twin brother at LSU after missing both him and home). Upon graduation, the twins worked in physical therapy before deciding they were better suited

to becoming doctors. They were admitted to LSU Health, in Shreveport, Louisiana (Franklin & Lewis, 2023). From there the twins accepted residencies at John Peter Smith (JPS) hospital in Dallas/Fort Worth, Texas.

Watching and listening to Kyle and Kendall during their interview is a lesson in human behavioral genetics. The twins' matched faces, forms, manner of speaking, and deference toward one another are striking. Each twin speaks with a slight smile, recapping what his twin said previously while elaborating slightly. (Interestingly, only Kyle wore eyeglasses, a difference I had hoped the journalist would address, but she did not.) Kyle and Kendall also explained that they engage in 'friendly competition' — pushing each other to become the best he can be. They hope to establish a clinic together in the future. Recurrent themes throughout the conversation were the satisfaction of these young African-American doctors gained by assisting underserved communities in need and their desire to mentor young aspiring individuals hoping to fulfill their dreams.

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