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NEWS, VIEWS AND COMMENTS

Twins Switched at Birth: Frequency, Life Histories, Twin Relationships, and Critical Issues/Twin Research Reviews: Classroom Placement; Mirror Syndrome; Unusual Twinning; Parenting Stress/Human Interest: Triplet Film; Educational Achievement; Prison Release; Co-Twin Impersonation; Facial Recognition Technology

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Twins switched at birth are a rare subtype of twins who grow up apart. The frequency with which this event occurs, as well as selected life history events, twin relationships, and critical issues generated by the nine recorded cases are reviewed. This is followed by summaries of recent studies addressing classroom placement for twins, mirror syndrome in mothers, unusual twin types, and parenting stress. The article concludes with a review of human interest items from the general media, namely a triplet film, educational achievement, prison release, co-twin impersonation, and facial recognition technology.

Twins Switched at Birth: Frequency, Selected Life History Event, Findings, and Issues

Twins switched at birth are a rare subtype of twins who grow up in different families. In a previous issue of *Twin Research and Human Genetics*, volume 21, issue no. 4, August 2018, dedicated to Dr Irving I. Gottesman, I summarized a recent case of double switching, in which a newborn monozygotic (MZ) male twin in one pair was inadvertently exchanged with a newborn MZ male twin in another pair (Segal et al., 2018). This accidental exchange, which took place in Colombia, South America in December 1988, resulted in two sets of unusual virtual twins, that is, same-age unrelated siblings raised together who grew up believing they were dizygotic (DZ) twins. There are, however, other cases of switched twins that are of interest from many perspectives.

The frequency with which twin infants, as well as singleton infants, are switched at birth is nearly impossible to determine. That is because we learn only about the cases that are identified, leaving an unknown number of cases undiscovered. It has been estimated that between 20,000 and 23,000 misplacements of newborn infants occur in United States hospitals each year (e.g., bringing an infant to the

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wrong room for a procedure), with the qualification that such errors are quickly detected and corrected (DNA Diagnostics Center, 2010; Rusting, 2001). However, if these estimates are accurate, then it would be virtually impossible to discover and correct every error. It is also true that the nine documented switched-at-birth twin cases were detected because an identical twin was mistaken for his or her identical co-twin. This grants MZ twins a significant edge in discovering the truth about their birth; in fact, eight of the nine twin cases involved MZ twins, although I strongly suspect that one pair in the Puerto Rican double exchange case (see below) that was described as MZ is really DZ, based upon my inspection of photographs.

Listed below is a brief summary of the nine twin pairs. Note that the nine pairs were generated by seven cases of switching because of two instances of double exchange (Segal, 2011; Segal & Montoya, 2018).

- **Philippe, Paul — and Ernstli.** MZ twins Philippe and Ernstli were born in Fribourg, Switzerland, in July 1941, in a small hospital that identified babies by hanging a sign at the foot of their cribs. The inaccurate recording of one twin's weight was at the center of the switch. The truth was discovered when all three children were enrolled in a German-speaking school at age 6 and the striking resemblance between Philippe and Ernstli could not be ignored. Their monozygosity was determined by reciprocal skin grafts, the first time this procedure was used to assess twin type. A local judge decided that the twins should be returned to their biological families, a heartbreaking situation for the twins and their parents, and an experience from which the surviving family members have never fully recovered.
- **George, Marcus — and Brent.** MZ twins George and Brent were born in June 1971, 5 days later than Marcus, the unrelated sibling raised together with George as his alleged DZ twin brother. All three babies had been placed in temporary foster care until the twins' parents could claim them and Marcus could be adopted. When the elderly foster couple caring for the three babies decided to move the twins, they accidentally chose George and Marcus, leaving Brent (instead of Marcus) to be adopted. When a young woman at the University of Ottawa confused 20-year-old Brent for her friend George, the twins were reunited and became quite friendly — however, they did not suspect they were twins or even brothers for another year until they began discussing their early life events. DNA analysis confirmed the twins' monozygosity and the lack of biological relatedness between Marcus and his other family members.
- **Kasia, Nina — and Edyta.** MZ twins Kasia and Edyta, and a singleton infant named Nina were brought together in a Warsaw, Poland hospital when they were two weeks old. All three babies needed treatment for lung infections. Events leading to the exchange of Nina and Edyta are unknown, but at age 17, Kasia's friend informed her that a girl who looked exactly like her lived in another part of the city. The two look-alikes met and discovered they were MZ twins; their genetic identity was subsequently established by DNA studies.
- **Mari Tairí, Samantha — and Tairí Mari.** MZ female twins Mari Tairí and Tairí Mari were born in Puerto Rico to Dulce Hernández Ramos in December 1985. On that very same day, female twins Jennifer and Samantha were born to Rosaura Hernández Morales. Perhaps, the matching last names of the two mothers were responsible for the newborn baby exchange. Dulce, who had breastfed her infants, found something unfamiliar about one of the twins when she returned to the hospital to claim them. A nurse insisted that babies change all the time, dismissing Dulce's response as the unfounded concerns of a new mother. The switch was later discovered when the twins' aunt and daughter noticed a little girl in a medical waiting room who looked exactly like their niece and cousin. The two exchanged twins (Tairí Mari and Samantha), then about one and a half years of age, were returned to their biological families once their biological relatedness was confirmed. I was able to interview Dulce Hernandez and her husband years later and learned that the circumstances surrounding the switch and the relinquishing of a child whom they had raised for a year and a half were still traumatic for these parents.
- **Begoña, Beatriz — and Delia.** MZ twins Begoña and Delia, as well as non-twin Beatriz, were born in a crowded maternity hospital in Las Palmas, Gran Canaria several days apart, in January 1973. It is suspected that Delia was taken for a medical procedure and returned to the wrong location, but the exact circumstances responsible for the baby switch are unknown; the three babies did, however, share an incubator, a situation that may have been implicated in the exchange. The truth was revealed when all three women were 28 years of age and Begoña was confused for Delia by a sales assistant in a shopping mall clothing store. The real twins met that evening and their physical resemblance left little question that they were MZ twins; this was later established by DNA analyses involving the twins, Beatriz, and the twins' mother. The situation was extremely difficult for the family members on both sides, but the twins have since formed a meaningful relationship with one another.
- **Matías and Marcos.** Matías and Marcos are the fictional names of real separated twins in this second case from Gran Canaria. Their story appeared in a local Canarian newspaper with few details in order to protect the privacy of the family. It happened that Marcos encountered his identical twin when he visited a company where his brother was employed. The two brothers kept their relationship a secret from their families; unfortunately, Matías was killed in a car accident. Sometime later, a sister who had been raised with Matías saw Marcos on

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FIGURE 1

(Colour online) Left to right: William, Wilber, Jorge, and Carlos receiving their copies of *Accidental Brothers*, Spring 2018. Courtesy: The four twin brothers.

the street, a shocking event that caused the truth to be revealed — DNA testing showed that Marcos was not the son of his rearing parents.

- **Jorge, Carlos — and William. Wilber, William — and Carlos.** Two male MZ twin pairs were born in Colombia, South America, in December 1988, just one day apart. Jorge and William were born in the capital city of Bogotá, and Carlos and Wilber were born in Vélez, not far from the isolated farming area where their family was from. Carlos was a sickly newborn and needed immediate care at the better equipped hospital in Bogotá where the other twins had been born. While there, he was inadvertently exchanged with William, an event that created two sets of virtual twins (same-age unrelated siblings) in the process. The truth was discovered 25 years later when one of Jorge's friends confused William for Jorge whom she found working behind the counter of a Bogotá butcher shop. The life histories and research findings regarding DNA analysis, intelligence, personality, self-esteem, job satisfaction, medical health, and physical development have been published in book form by Segal and Montoya (2018), and in a paper reporting the first epigenetic analysis of separated twins (Segal et al., 2017). The twins are shown in Figure 1 on the day that they received their copies of the book *Accidental Brothers*.

A brief review of the evolving social relationships between the various reunited twins and a comparative appraisal of the relationships between the virtual twins are of interest. A member of three of the switched pairs completed the same Twin Relationship Survey administered to reared-apart MZ (MZA) and DZ (DZA) participants in the Minnesota Study of Twins Reared Apart (MISTRA). Key findings from the MISTRA analysis were that (1) MZA twins recalled greater closeness (a difference that approached statistical significance) and familiarity (a difference that was statistically significant) than DZA twins upon meeting; (2) MZA twins indicated greater social closeness and familiarity at the time of participation, although the differences were not statistically significant; and (3) twins as a group indicated significantly greater closeness and familiarity toward their newly found co-twin than toward the unrelated siblings who whom they were raised (Segal et al., 2003).

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Most reunited twins in the switched cases chose relatively high ratings of initial closeness and familiarity when rating their co-twins, values that increased over time. Interestingly, however, most twins gave their virtual co-twins slightly higher current ratings than their biological co-twins, possibly reflecting their shared life histories. However, during unstructured interviews, the twins described an easier rapport and greater understanding with their biological counterparts than with their non-biological ones.

Comments and reflections on some of the other twin relationships were provided either by twins in the other pairs and/or those who knew them. The virtual Swiss twins Philippe and Paul, reared together until age 7, ultimately saw each other as strangers. Still, Philippe stayed in contact with Paul and regarded him as a friend (LaFargue, 2008). As a young child and soon after the return of his twin brother, Philippe felt neglected by his parents, who focused on making Ernstli (who changed his name to Charles) feel at ease in his new home. Eventually, Philippe and Charles developed the kind of close relationship typical of MZ twins. When Charles contracted a terminal illness in his adult years, he noted that hospital visits from his brother Philippe were a high priority. 'He even came to see me at 11:30 pm … There is not a day without a phone call from Philippe' (Joye, 2011, p. 38). Brent and George experienced an immediate rapport with one another, presumably based largely on their shared interests in sports statistics, grunge music, and unusual films, as well as their matched temperaments and mannerisms (Segal, 2011). George eventually spent less time with his virtual co-twin, Marcus, although they always remained in touch (Segal, 2005a). Kasia and Edyta, reunited at age 17, showed initial signs of growing close; like Brent and George they had many similarities (e.g., personality traits, school achievement, and food preferences) that Kasia did not share with her virtual co-twin, Nina. Unfortunately, Edyta soon severed ties with all her family members for reasons that remain unclear (Segal, 2011).

The two Puerto Rican switched twins were returned to their biological families as toddlers and the only twin I was able to interview, Tairi Mari, had little recollection of her 18 months as Jennifer's virtual twin. However, following a reunion with her biological twin, Mari Tairí, their father described an instant bonding between the two girls (Segal, 2011). Sadly, Mari Tairí passed away at age 8 from cancer.

In summary, the switched twins generally display the same swift social connections as the reared-apart twins studied in Minnesota. Most of them also express closeness toward their virtual co-twins, a finding that may reflect the fact that they are a novel subset of virtual twins since they grew up believing that they were DZ twins. Most of them maintain continued family loyalty toward these individuals, despite acknowledging the marked behavioral differences between them.

Switched-at-birth twins raise four key issues that deserve attention:

1. Emotional response — How do people react to knowledge of a baby switch, namely the sudden and dramatic change in their identity, sense of self and life history?
2. Maternity certainty — or uncertainty: How do mothers know who their babies are?
3. Legal considerations: How can the courts compensate people for a life that was unintended?
4. Nature–nurture debates: What do switched-at-birth twins — and other reared-apart twin pairs — reveal about human development?

All four issues are of great importance to twin researchers, as well as to the psychological medical and legal professionals who help handle such cases. Individuals and family members confronting the switching of a relative also care deeply about the dramatic revision in their lives and its aftermath. As I indicated, switched-at-birth twins are a rare subset of reared-apart twins and the experience of each documented pair is unique, although there are commonalities across the four issues. (These issues also apply in cases of non-twin individuals who are inadvertently exchanged.) I would urge twin researchers everywhere to bring attention to any new cases for purposes of pooling the findings and identifying meaningful correlates that are shared and not shared among them.

Twin Research Reviews

Same or Separate Classrooms

A recent study by White et al. (2018) has examined the effects of twins' classroom placement on achievement, ability, and motivation. Samples included twins from Canada (ages 7–12 years) and England (ages 7–14 years), organized according to whether they were in the same classroom or separate classrooms. Academic achievement was assessed by teacher reports, although British participants provided their own grades at age 16. Intellectual abilities were measured by various verbal and non-verbal tests, and motivation was based on twins' self-reports.

Two key findings emerged from this research effort. The first finding was that twins (both MZ and DZ) who were separated in school did not differ in level of achievement, ability, or motivation from twins who were not separated. The second finding was that non-separated twins were not

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substantially more alike than separated twins; however, MZ twins and non-separated twins were slightly more similar than fraternal twins and separated twins. In particular, 12-year-old Canadian twins and 16-year-old British twins were slightly more alike in achievement if they were enrolled in the same class, with MZ twins showing greater resemblance than DZ twins, as expected. It is difficult to know the extent to which the MZ twins' identical genes or same classroom was the major source of their greater similarity — perhaps the more similar MZ twins chose to be together.

Mirror Syndrome

When most people hear about twins and mirror syndrome, they are likely to think about the physical reversals in handedness, hair whorl and/or dermatoglyphic characteristics that affect approximately 25% of MZ twin pairs. However, mirror syndrome has a different meaning when it comes to mothers carrying monochorionic–diamniotic twins with twin-to-twin transfusion syndrome (TTTS). In this case, mirror syndrome consists of maternal edema linked to hydrops fetalis (abnormal accumulation of fluid in the fetus) and placental edema. TTTS can cause hydrops fetalis, which in turn is associated with 18% of occurrences of mirror syndrome. A case report of this situation was reported by investigators in Japan (Kino et al., 2018).

Unusual Twinning

Single nucleotide polymorphism (SNP) array is a procedure performed during prenatal diagnosis (Zou et al., 2017). Specifically, it can evaluate copy number variations (repeated sections of the genome) and uniparental disomy (receipt of two copies of a certain chromosome from one parent), but its benefits for twin zygosity diagnosis have been underappreciated. A retrospective study of 386 twin pairs and 100 singleton twins in China showed that twin pregnancies conceived by assisted reproductive technology (ART) are at an elevated risk for resulting in unusual twin types. They include monochorionic DZ twins, MZ twins with discordant karyotypes, DZ twins following single embryo transfer and dichorionic MZ twins with vascular anastomoses (blood vessel connection), with the transfer of two 5-day-old embryos. Given the foregoing, SNP array is highly recommended for mothers of twins who undergo ART in order to conceive.

Parenting Stress

Co-parenting and social support are recognized factors that can ease parenting stress and the negative effects it produces. The extent to which parenting stress is linked to demographic, prenatal, obstetric, and postpartum characteristics remains uncertain. A study aimed at informing this area was recently conducted by researchers in Belgium (De Roose et al., 2017). The study sample included 151 mothers of singletons and 101 mothers of twins who had delivered their babies after 33 weeks' gestation. Data were collected by means of questionnaires that assessed parental stress, co-parenting, and social support.

Noteworthy differences between the two groups of mothers were that more twins than singletons had been admitted to the neonatology unit (62.6% vs. 11.9%); more singleton mothers than twin mothers had conceived spontaneously (92.1% vs. 59.4%), more singleton mothers than twin mothers had experienced a vaginal birth (82.1% vs. 50.5%); and more singleton mothers and their infants than twin mothers and their infants were free from maternal or neonatal difficulties before, during or after delivery (76.7% vs. 66.3%).

Among mothers of singletons, greater parenting stress was linked to higher educational levels, whereas lower levels of parenting stress were linked to a better co-parenting relationship. Among mothers of twins, higher parenting stress was associated with greater satisfaction with social support and a higher level of co-parenting. Twin mothers also experienced greater parenting stress when conceiving via assisted reproductive methods. The positive association between greater parenting stress and social support satisfaction seems counterintuitive, as the investigators acknowledge. They suggested that since most mothers in both groups indicated the importance of the co-parenting relationship, it may be that greater stress results when the partner is unhelpful, making outside support more highly valued.

Human Interest

Triplet Film

The newly released film *Three Identical Strangers*, by Tim Wardle, is highly recommended for twin researchers everywhere (Nevins, 2018). It focuses on the lives of identical triplets, Robert Shafran, Eddy Galland, and David Kellman, who were separated at 6 months of age by the Louise Wise (LW) Adoption Services in New York City. The three brothers met in 1980 at 19 years of age, when Robert enrolled in the same community college that Eddy had attended the year before. One of Eddy's close friends recognized the resemblance between the two and brought them together the day that Robert arrived. However, when a

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picture of the 'twins' appeared in New York City newspapers, two of David's friends recognized their striking similarity to David and knew immediately that he must be a third identical brother.

This reunion called attention to the fact that twins and the triplets separated by LW were part of a study that followed their early behavioral and physical development, while keeping their multiple birth status hidden from them and their parents. The data have been deposited in the Yale University archives with the stipulation that this information not be released until 2066; however, some material has been released to the twins (Perlman, 2005; Segal, 2005b). Over the years, I have followed events surrounding this study, which seems to capture public attention from time to time. I plan to write up the new discoveries I have made.

Educational Achievement

Thirty-year-old identical male twins, Lim Xin Xiang and Lim Xin Shan from Singapore, have led nearly parallel lives (Yang, 2018). Their educational histories are almost an exact match, beginning in primary school and extending through their doctoral studies in biology at the National University of Singapore — the only exception was a time when the twins attended different secondary schools, a decision that unfortunately was not explained. The twins' enrollment in separate schools may explain why others failed to notice that they had switched places at a fun fair held during those years.

It is not surprising to find that identical twins show similar interests and talents. However, two aspects of these twins' lives are worth noting. The twins came from very humble beginnings, such that they had to work hard to achieve what they did — their father, who valued education greatly, worked long hours to put them and their elder sister through school. The twins are also very articulate when it comes to expressing their reflections on their close relationship. Commenting on their skills as basketball players, Xin Xiang noted that, 'We know how each other would react. It is this natural, unspoken team work that I enjoy the most'. I have heard such sentiments before, stated differently by other identical twins — I believe such information would be very helpful to athletic coaches who work closely with twins. Xin Xiang and Xin Shan appear to be inseparable, although both are married and have young children.

Xin Xiang was the valedictorian at the graduation ceremony during which the university awarded the twins their PhD degrees. It is likely that their grade point averages and honors were nearly the same, but it would be fascinating to know Xin Shan's thoughts on this difference.

Prison Release

South Korean-born identical twins, Gina and Sunny Han, became famous when Gina allegedly attempted to murder her twin sister 20 years ago in order to claim her identity (Puente, 2018). Gina had sought the assistance of two teenage male companions to tie up her sister and her sister's roommate, while Gina waited in the car. Sunny was able to contact 911 and Gina, while in prison for 20 years, denied ever intending to kill her sister. Gina was eventually released from prison in June 2018. The sisters were known to have a close, but contentious relationship. Prior to this incident, the twins had been co-valedictorians at their San Diego, California high school.

Impersonation

Identical twins from Nigeria were arrested once it was discovered that one twin, Hussain Andulhammeed, had taken the UTME (Unified Tertiary Matriculation Examination) in place of his brother Hassan (Olowolagba, 2018). The twins had apparently tricked security personnel when they entered the building of the University of Maiduguri, in Borno. Hussain had completed the biometric registration for the exam but, based on their identical appearance, Hassan took the exam instead. When one twin was observed outside the examination room, the proctor became suspicious, determined what had transpired and penalized both twins.

Facial Recognition Technology

Facebook has been using facial recognition technology (FRT) to suggest friends for tagging in photos (Cipriani, 2018). In editorial correspondence to the *New York Times*, a mother of fraternal twin sons complained that one of her children is regularly misidentified as the other. She indicates that the twins 'look as similar as any two brothers, but not alike' (Carroll, 2018). Misidentification of individuals by FRT is, of course, a serious issue and it is possible that other Facebook users have experienced similar problems. It would, however, be important to scientifically verify the zygosity of the twins in question. It is well known that parents of identical twins are especially sensitive to subtle differences between them, making their misclassification as fraternal quite possible (Segal, 2017). Issues involving potential errors in identifying twins via FRT expand the list of reasons for why knowing twin type is so important for twins and their families (Craig et al., 2015).

References

Carroll, C. (2018, July 18). Identity mix-ups on Facebook. *New York Times* (Letter to the Editor), p. A20.

Cipriani, J. (2018, March 1). How to turn off Facebook's new facial recognition feature. Retrieved from https://www.cnet.com/how-to/turn-off-facebook-facial-recogition-feature/.

Craig, J. M., Segal, N. L., Umstad, M. P., Cutler, T. L., Keogh, L. A., Hopper, J. L., … Harris, J. R. (2015). BJOG debate: Zygosity testing should be recommended for all same sex twins. *British Journal of Obstetrics and Gynecology, 122*, 1641.

https://doi.org/10.1017/thg.2018.48 Published online by Cambridge University Press

De Roose, M., Beeckman, D., Eggermont, K., Vanhouche, E., Van Hecke, A., & Verhaeghe, S. (2017). Level of parenting stress in mothers of singletons and mothers of twins until one year postpartum: A cross-sectional study. *Women and Birth*, *31*, e197–e203.

DNA Diagnostics Center. (2010). Identification techniques for preventing infant mix-ups. Retrieved November 1, 2010, from http://www.dnacenter.com/science-technology/articles/infant-mix-up.html.

Joye, C. (2011). *Medical chronicle of an ordinary patient and the clan of Charles Joye vs. the clan of Sigismond metastasis*. Genthod, Switzerland: Editions du Satoir d'Or.

Kino, E., Maki, Y., Ohhashi, M., Furukawa, S., Maeda, T., & Sameshima, H. (2018). A case of mirror syndrome caused by hydrops fetalis after fetoscopic laser photocoagulation. *Clinical Case Reports, 6*, 1010–1013.

LaFargue, X. (2008, March 26). L'Encroyable Destin des Jumeaux Joye. *Le Matin*, *4*. Retrieved from https://web.archive.org/web/20080328104349/http://www.lematin.ch/fr/actu/suisse/l-incroyable-destin-des-jumeaux-joye_9-122866.

Nevins, J. (2018, June 28). Three identical strangers: The bizarre tale of triplets separated at birth. *The Guardian*. Retrieved from https://www.theguardian.com/film/2018/jun/28/three-identical-strangers-the-bizarre-tale-of-triplets-separated-at-birth.

Olowolagba, F. (2018, March 10). JAMB (The Guardian Nigerian Newspaper): Two identical twins arrested for malpractice in 2018 UTME. *Daily Post*. Retrieved from http://dailypost.ng/2018/03/10/jamb-two-identical-twins-arrested-malpractice-2018-utme/.

Perlman, L. M. (2005). Memories of the child development center study of adopted monozygotic twins reared apart: An unfulfilled promise. *Twin Research and Human Genetics*, *8*, 271–281.

Puente, K. (2018, June 22). Evil twin is released on parole. Orange County Register, 7, p. 1.

Rusting, R. R. (2001). Baby switching: An under-reported problem that needs to be recognized. *Journal of Healthcare Protection Management, 17*, 89–100.

Segal, N. L. (2005a). *Indivisible by two: Lives of extraordinary twins*. Cambridge, MA: Harvard University Press.

Segal, N. L. (2005b). More thoughts on the child development center twin study. *Twin Research and Human Genetics, 8*, 276–281.

Segal, N. L. (2017). *Twin mythconceptions: False beliefs, fables, and facts about twins.* San Diego, CA: Elsevier.

Segal, N. L. (2011). *Someone else's twin: The true story of babies switched at birth Amherst*. New York, NY: Prometheus Books.

Segal, N. L., Hershberger, N. L., & Arad, S. (2003). Meeting one's twin: Perceived social closeness and familiarity. *Evolutionary Psychology, 1*, 70–95.

Segal, N. L., & Montoya, Y. S. (2018). *Accidental brothers: The story of twins exchanged at birth and the power of nature and nurture*. New York, NY: St. Martin's Press.

Segal, N. L., Montoya, Y. M., Loke, Y. J., & Craig, J. M. (2017). Identical twins doubly exchanged at birth — Genetic and environmental influences on the adult epigenome. *Epigenomics*, *9*, 5–12.

Segal, N. L., Montoya, Y. S., & Becker, E. N. (2018). Twins reared apart and twins in families: The findings behind the fascination. *Twin Research and Human Genetics, 21*, 295–301.

White, E. K., Garon-Carrier, G., Tosto, M. G., Malykh, S. B., Li, X., Kiddle, B., … Kovas, Y. (2018). Twin classroom dilemma: To study together or separately?. *Developmental Psychology*, *54*, 1244–1254.

Yang, C. (2018, July 7). Identical twins and their almost inseparable journey from PSLE to PhD. *The Straits Times*. Retrieved from https://www.straitstimes.com/singapore/identical-twins-and-their-almost-inseparable-journey-from-psle-to-phd?&utm_source=google_gmail&utm_medium=social-media&utm_campaign=addtoany.

Zou, Z., Huang, L., Lin, S., He, Z., & Luo, Y. (2017). Unusual twinning: Additional findings during prenatal diagnosis of twin zygosity by single nucleotide polymorphism (SNP) array. *Prenatal Diagnosis, 38*, 428–434.

https://doi.org/10.1017/thg.2018.48 Published online by Cambridge University Press