

News, views and comments

From the Library of the Late Irving I. Gottesman: Memories and Treasures/Twin Research Reviews: Twin Study of Callous-Unemotional Traits; Depressive Symptoms in Prospective Chinese Twin Mothers; Twins With Sagittal Suture Craniosynostosis; Creative Expressiveness and Educational Achievement/Media Reports: Male-Female Twin Holocaust Survivors; Nontuplets Born in Mali; Indian Twins Marry Same Man; Twins Born From Longest-Frozen Embryos; Infant Twin Abduction; Twins Born in Different Years

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Abstract

The experience of going through the personal library of our late esteemed twin research colleague, Dr Irving I. Gottesman, is described. I came away with fond memories and unexpected treasures. This essay is followed by brief reviews of timely research on factors affecting callous-unemotional traits, depressive symptoms in prospective Chinese twin mothers, twins with sagittal suture craniosynostosis, and creative expressiveness and educational achievement. Media reports on informative topics of interest to researchers and the general public include male-female twin Holocaust survivors, nontuplets born in Mali, Indian twins who married the same man, twins born from the longest frozen embryos, an infant twin abduction and twins born in different years.

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From the Library of the Late Irving I. Gottesman: Memories and Treasures

The professional libraries of esteemed colleagues typically consist of endless rows of filing cabinets, filled with manila folders holding reprints and correspondence. Stacks of books — some authored by the library's owner, some sent by associates, and some acquired by various other means — crowd the shelves from floor to ceiling. These libraries also bear unanticipated treasures that trigger memories of past times and offer fresh insights on certain subjects. I always loved looking through Professor Thomas J. Bouchard Jr.'s reared-apart twin files when I was a postdoctoral fellow and research associate in Minnesota (1982–1991) and when I returned to write *Born Together-Reared Apart* (Segal, 2012). My unexpected discovery of comprehensive eye examination data for the twins led to some conference collaborations with faculty from the University

of Minnesota's Department of Ophthalmology (Tokarev et al., 2015). Letters from twins asking for help in locating their reared-apart co-twin were always captivating, but painful since the outcome was never certain.

In November 2022, I had the rare and privileged chance to visit Minneapolis to look through the library of the late Dr Irving I. Gottesman. It was an opportunity to assist Gottesman's widow, Carol, by sorting through material to be given to interested colleagues or donated to the University of Minnesota's archives. At the same time, it was a chance to learn new things about Irv and what transpired behind the scenes before a particular paper was accepted or a certain book was sent. Figure 1 shows a photograph of Irv.

Irv passed away in June of 2016, at the age of 85, so he had been gone for over 6 years when I arrived. Progress had been made toward organizing his materials, but a great deal was left to do.

I began by reviewing Irv's books, some of which Carol had already set aside for me. Prior to my visit, she had made photographs of the books and emailed them to me, so I could let her know which volumes were of interest. Of course, looking through the books personally was much more exciting, especially when it came to reading the personal inscriptions inside the covers and deciphering the notes and highlights Irv sometimes scribbled next to certain sections of text.

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Fig. 1. Irving I. Gottesman; estimated date is 2000. Photo courtesy: Carol Gottesman.

I came away with 15 books that are now displayed in my Twin Studies Center library at CSU Fullerton. Two books, *Human Infancy* (1974) and *Human Sociobiology* (1979), were authored by my dissertation director at the University of Chicago, the late Dr Daniel G. Freedman (1975, 1980). I owned both, but there is something special knowing that a particular volume had been looked through personally by a venerated colleague. *Human Infancy* had a note inside the cover that read: ‘For Irv, in tribute to our ever-growing friendship. Dan Freedman.’ Given that publishing is moving toward digital versions of books — because they are less costly to produce, less expensive to buy and friendlier to the environment than hard copies — we will see less of these meaningful dedications, and that is unfortunate. I thought back to October 1995, the year I hosted a festschrift for Freedman in Chicago, to which I invited Irv to present his work on the development of aggression (Gottesman et al., 1997) and marital status (Trumbetta & Gottesman, 1997). Irv grumbled somewhat when I pressed him for his promised chapters for the festschrift volume (Segal et al., 1997), but he was delighted with the finished product.

Not surprisingly, I found multiple copies of Irv’s classic work, *Schizophrenia and Genetics: A Twin Study Vantage Point* (1972), co-authored with James Shields, and various volumes authored by E. Fuller Torrey, one of Irv’s collaborators and co-authors (Torrey et al., 1994). As expected, there were other books on schizophrenia and mental disorder by Irv’s colleagues. I retrieved *The Transmission of Schizophrenia*, edited by Rosenthal and Kety (1968). Interestingly, that book belonged originally to Dr Norman Garnezy, Irv’s late University of Minnesota colleague and close friend, who remains famous for his work on resilience in children. Garnezy and Rutter’s (1983) edited work, *Stress, Coping, and Development in Children*, came with a personal note: ‘To Irv — Dear Friend and Colleague. Norm.’

The inscription inside *Down’s Anomaly* (Smith & Berg, 1976), dated ‘1.18.79’, read ‘Kindest Regards to Dr. Irving Gottesman. G.F. Smith.’ There was also *Behavioral Genetics* (Plomin et al., 2008), with a note from Robert Plomin, dated April 21, 2008: ‘To Irv, With great admiration and appreciation. Robert Plomin.’ In addition, books on a range of other topics reflecting Irv’s interests are now in my possession, including the medical effects of the Hiroshima and Nagasaki bombings (Ishikawa & Ishikawa, 1981; the sales slip was still tucked inside showing that Irv had acquired it for \$15.00 at Blue Whale Books while at the University of Virginia), genetic concepts (Crow, 1976), genetics and evolution (Dobzhansky, 1970), ethics of genetic control (Fletcher, 1988), genetic epidemiology (Morton, 1982), statistical power analysis (Cohen, 1977), and mental defect (Penrose, 1963).

Reproduced in Figure 2 is a photograph of one of the bookshelves. And taped to Irv’s computer was a picture of a gentleman that no one has yet identified. It is reproduced here in Figure 2b in the hopes that a reader of this journal will come forward with that information.

I found correspondence between Irv and his colleagues, and between his colleagues themselves. It was exciting to see a short note from James (Jerry) Shields to Sir Aubrey Lewis at London’s Institute of Psychiatry, dated October 9, 1963: ‘I am writing to inform you of the arrival of Dr. Irving Gottesman, Ph.D., a psychologist who comes to us from Harvard as a Special Fellow of the National Institute of Health . . . While he is here he plans to do some work on schizophrenic twins. He will be with us for one year.’ In fact, the Gottesman-Shields collaboration lasted for 15 years even after Irv left to take faculty positions elsewhere. This famous research team ended only with Shields’ untimely death in 1978 at age 59. I will say more about that below.

Erik Essen-Moller, from Lunds University in Sweden, wrote a note to James Shields dated February 24, 1967: ‘I was very pleased to have your reprints. Although I have as yet but superficially looked into your big survey, I have the impression that it is a most excellent exposition of great use to all interested in the matter. Please continue sending me your papers . . . With greetings, also to Dr. Slater and Dr. Gottesman (if still there).’ On April 1, 1972, Irv wrote to Eliot Slater, informing him of his financial support for a sabbatical: ‘I have just received notice that that gods have favored me with a Guggenheim Fellowship for my sabbatical in Denmark! Once again I must thank you for aiding and abetting my cause . . . I plan to do some things with Mednick-Schlesinger-Welner and some in Århus with Strömngren and Fischer . . . Affectionately, Irv P.S. We are collecting a nice set of reviews of your MMH.’ (Colleagues and I have been unable to determine what the letters MMH signify.)

I remember Irv’s regrets that email communications that have advanced scholarly progress to such an extent were unavailable during his collaboration with Shields. However, despite waiting weeks for comments on manuscripts forwarded by air mail, Irv and Jerry (Gottesman and Shields) were enormously productive.

I was touched by Irv’s hard-to-decipher note to ‘Vera’ (possibly a secretary?) scribbled in the margins of his June 30 note to Shields’s friends and colleagues, informing them of Shields’s death. ‘Dear Vera, I wish I were there . . . have someone to cry with. I’ve sent this out for Jerry’s friends around the world and am doing a formal bit for *Behavior Genetics* . . . Please don’t let anyone move or take anything from the Hut . . . With affection and sadness, Irv.’

I found a page copied from the program of the 4th Annual Meeting of the Behavior Genetics Association (BGA), held in



Figs. 2 (A). A bookshelf in Irving I. Gottesman's library. Photo credit: Carol Gottesman. (B). A picture of an unidentified gentleman taped to Irv's computer. Information about his identity should be forwarded to Nancy L. Segal.

June 1974 in Minneapolis, Minnesota. The symposium, 'The Twin Method: Dead or Alive?', included then University of Texas twin researchers, Joseph Horn, John Loehlin, Robert Plomin and Lee Willerman. Nearly 50 years later, we are having similar discussions (Craig et al., 2020) but, more importantly, we now know that the value of the classic twin method and its variants has withstood the test of time. With its increased application in other fields (e.g., political science and economics), its refinement from improved analytical methodologies and its enhanced power in light of molecular genetic advances, the twin method remains alive and lively (Hagenbeek et al., 2022). Incidentally, my first BGA meeting was the one held in Minneapolis — thinking about that meeting in Irv's library, I recalled my embarrassment at mistaking twin researcher Sandra Scarr for one of the hotel staff.

Irv had colleagues all over the country, having served on the faculties of Harvard University, the University of Minnesota, the University of Virginia, Yale University, and the University of Washington. His international collaborations included colleagues on virtually every continent.

I saved one of the most amazing findings for last. Upon Shield's death, Irv established the James Shields Lifetime Achievement Award, to be given annually to a deserving investigator. (Based on Irv's correspondence, it seems the award was initially targeted to students.) He solicited funds for the award and filed the envelopes with the names of the donors and the sums they had given. Donors included Drs Arthur Falek, Nikki Erlenmeyer-Kimling, Eiji Inouye, Ming Tsuang, Dan Hanson, Theodore Reich, Arthur Jensen, Robert Dworkin, and Susan Farber. Farber's dim view of reared-apart twin research at that time would seem to make her an unlikely contributor to such a fund. Note that the date of Farber's donation was October 11, 1978, approximately four years prior to Gottesman's (1982) generally unfavorable review of her book summarizing data from reared-apart twin studies (Farber, 1981). Donations ranged from \$25.00 to an estimated \$350. There was one more.

I was stunned, but not surprised to see, my own contribution — the only one from a student — for \$5.00. I cringed momentarily thinking of that meager amount. Then I remembered that Irv once spoke about my contribution publicly and in my presence — not to embarrass me, but to let others know that it really meant something to him. I had always been an admirer of Shields's twin research, and I was especially proud to have received the award in 2005 that bears his name.

I came away from Irv's library with several reprints. I was intrigued by a paper by Shields (1961) on fusional reserves in MZ twins. I learned that fusional reserves (FR) is a measure of how much vergence (simultaneous movement of the pupils toward or away from one another during focusing; EyeTools, 2023) a person has in reserve that can be used to overcome heterophoria (failure of the visual axes to stay parallel after visual fusional stimuli have been eliminated (Medical Dictionary, 2023). Shields found that MZ co-twins with the higher FR tended to be the more intelligent twin, the more introverted twin, and the twin who volunteered the pair for the study, as well as the firstborn and the taller of the two. He stressed that greater study of FR was needed before it could be considered a psychological variable.

Other materials in Irv's file drawers included a list of his doctoral mentees, twin data charts, his tribute to Eliot Slater, Greg Carey's notes on quantitative genetic analysis, and personally signed papers and correspondence from the late twin researcher Ron Wilson,

I mentioned earlier that Irv's reprint collection included numerous topics. Among them were the question of Hitler's missing psychiatric file, Josef Mengele's experiments at Auschwitz, the Nuremberg Code, IQ resemblance in MZ twins reared apart, genetic overlap across populations, and family studies of mental retardation. A paper titled 'Near Identity of Cognitive Structure in Two Ethnic Groups' (DeFries et al., 1974) was sent to Irv by Thomas J. Bouchard, Jr.; Bouchard had written 'TB → IIG' across

the top. Another paper had the title ‘Do Bacteria Have Sex?’ (Redfield, 2001).

In closing, I will say that it was awe-inspiring to see Irv’s original hand-drawn diagrams of reaction ranges (stress by incidence) for the development of schizophrenia . . . Irv was famous for these visuals.

Twin Research Reviews

Twin Study of Callous-Unemotional Traits

A comprehensive review of studies addressing genetic and environmental influences on callous-unemotional (CU) traits is currently available (Hyde & Dotterer, 2022). CU traits — those placing young individuals at risk for psychopathy — involve low empathy and guilt, with elevated chances for developing chronic and severe antisocial behaviors. Early twin studies found evidence of genetic effects on CU-related traits, ranging between 36–76%. These findings were supported by adoption data showing that children born to parents with CU traits displayed them as well, despite the absence of social contact. Antisocial behavior, while moderately heritable, was found to show greater heritability if CU traits co-occurred. Later twin research found that MZ twins receiving harsher treatment from parents showed a great frequency of CU traits, relative to their co-twins; however, not all studies concurred. Hyde and Dotterer (2022) noted that warm parenting can mitigate CU traits in children, illustrative of gene × environment interactions.

Depressive Symptoms in Prospective Chinese Twin Mothers

Researchers in China examined associations between prenatal depression in mothers of twins and infants’ physical health (Gou et al., 2021). The final sample consisted of 84 women from Peking University Third Hospital in Beijing who delivered their twins in the research facility. Initially, 130 women consented to participate, but only those who were age 18 years or older were included.

All participants completed the Edinburgh Postnatal Depressions Scale. Infants’ physical health was assessed via Apgar scores taken at 1 minute, 5 minutes and 10 minutes after birth. A key finding was that maternal depressive symptoms correlated negatively with male babies’ Apgar scores, but not with those of females. Thus, higher maternal depression was linked to lower physical health in males. The researchers noted that this relationship is consistent with males’ greater susceptibility to prenatal maternal stress, relative to females. They proposed an evolutionary explanation that was labeled the ‘sex-dependent viability-vulnerability tradeoff’. That is, the placenta of male fetuses makes minimal epigenetic adaptations to stress. In contrast, the placenta of female fetuses might employ an adaptive strategy that may lead to milder, but long-term consequences, such as behavioral inhibition or emotional difficulties. These interesting ideas require further investigation.

Twins With Sagittal Suture Craniosynostosis

In an earlier issue of *Twin Research and Human Genetics*, I presented a review and case study of twins with craniosynostosis (Segal, 2021). This rare condition involves early joining of the bones of the fetal skull, prior to full brain development; if left untreated, the skull will be misshapen. A recent study from the Netherlands examined ultrasound parameters (head circumference, cephalic index and biparietal diameter) in concordant and

discordant twin pairs diagnosed postnatally (Cinca et al., 2022). Affected twins’ values were compared with reference values and to the values of unaffected co-twins and singletons to test the theory that intrauterine constraint is responsible for the condition.

The twin sample included 8 pairs in which 10 twins were affected — this would appear to be 2 concordant pairs and 6 discordant pairs, although this is not stated. Over the course of pregnancy, differences in head circumference were not found between affected fetuses and reference values; however, reduced growth was observed for the biparietal diameter. In the case of affected twins, the cephalic index was lower in the beginning and decreased with time. Comparing affected and nonaffected fetuses showed the same differences in cephalic index and biparietal diameters, as observed among members of the control group. Growth parameter differences between nonaffected siblings and reference values, as well as those between affected twins and nontwins, were not found. It was concluded that the condition develops in twins during the early part of pregnancy and that the same atypical developmental processes, rather than intrauterine constraint, explain craniosynostosis in twins and nontwins. Unfortunately, the zygosity of the twins was not provided, a factor that may have affected interpretation of the outcomes regarding some measures.

Creative Expressiveness and Educational Achievement

Researchers from the United Kingdom, Spain and Russia examined associations between creative expression and other educational measures in twins studied at ages 9 and 12 years (Toivainen et al., 2021). The 1306 twin participants, comprised of MZ twins, same-sex DZ twins and opposite-sex DZ twins, were from the UK’s Twins Early Development Study (TEDS). Twins wrote a story based on pictures of three different animals and buildings that were evaluated for creativity by the Consensual Assessment Technique (CAT). Various measures of intellect and motivation were also collected. Many findings were reported; among them were associations between creative expression and both intellect and motivation at age 9. Variance in creative expression was explained by genetic (35%), shared environmental (21%) and nonshared environmental factors (45%). Some implications were that creativity can be observed in childhood writing and that early childhood creativity may be overlooked.

Media Reports

Male-Female Twin Holocaust Survivors

In the last issue of *Twin Research and Human Genetics*, in my News Views and Comments section, I described opposite-sex twins separated during World War II. Despite their years of separation, the twins were reunited when someone recognized the unusual accent that they shared. I since discovered another opposite-sex pair, Steven and Marion, who survived together with their family despite suffering unspeakable conditions in a series of concentration camps and other locations. They eventually came to America in 1947, where Steve became a journalist and then an advertising manager, photograph company division president, owner of a photography business and Holocaust scholar. Marion was a teacher before entering the public policy field. She has held positions at the American Enterprise Institute and the Institute of Medicine at the National Academy of Sciences. Additional information about their amazing life story can be found at the *Defiant Requiem* website: <https://www.defiantrequiem.org/survivor-stories/marion-ein-lewin-and-steven-hess/>

I learned about these twins through a contact at the Jewish Book Council of which I am a member. Authors were invited to an online social event and organized into small groups. One of the women in my group is writing a book about these twins and their family. Note that I also have a new book (Segal, 2023), focusing on twins who were cruelly experimented on by Dr Josef Mengele, the infamous ‘Angel of Death’ at the Auschwitz-Birkenau camp in Poland; see <https://www.academicstudiespress.com/cherry-orchard-books/9798887190860>.

Nontuplets Born in Morocco

Nineteen-month-old nontuplets, delivered in Morocco — five boys and four girls — were released from professional care in mid-December 2022 and joined their family home in Mali. They are the world’s only nontuplets, as certified by *Guinness World Records* (Pasquini, 2022). The children were conceived without reproductive assistance, causing physicians to speculate that some of the babies are identical twins; however, their zygosities have not been confirmed or reported (Hayne, 2021). The babies’ birth weights ranged from 500 grams to 1 kilogram. They were delivered at 30 weeks by caesarian section. At 19 months of age, the nontuplets seem to be doing well, but few details have been disclosed. It is well known that children in higher order multiple births are at elevated risk for serious physical and behavioral difficulties (Segal, 2022).

The nontuplets’ parents, Halima Cissé and Abdelkader Arby, also have a 4-year-old daughter. Extra attention will need to be directed toward this child since her younger siblings will continue to be in the news. I recall participating in a television program featuring quadruplets whose older sister tried to secure a place on the set, but producers told her to leave. She was clearly crestfallen. My experience is that twins and other multiples do not upset younger singleton siblings as much as they do older siblings, who find themselves ‘dethroned’ by children who attract attention where ever they go.

Indian Twins Marry Same Man

Identical Indian female twins, Pinky and Rinky, were wed to the same groom on December 5, 2022 (Rajesh, 2022). Widely cited research shows that identical twins tend to choose different types of spouses (Lykken & Tellegen, 1993), although not all studies concur (Rushton & Bons, 2005). I believe it is important to appreciate that people like many different types of significant others, a partial reason why identical twins do not choose similar mates. Perhaps a more meaningful issue is the extent to which each twin likes their co-twin’s partner and could imagine themselves being with that person.

If identical twins occurred more frequently in the population, perhaps there would be more similar partners from which to choose. I once witnessed an illuminating media experiment in which identical twins independently met other identical twins, introduced to them as potential dating partners. The twins chose similar partners much of the time, suggesting that their preferences align.

Twins Born From Longest Frozen Embryos

Opposite-sex twins, Lydia and Timothy, were born on October 31, 2023, to Oregon couple, Rachel and Philip Ridgeway (Christensen & Kounang, 2022). Lydia and Timothy were created via in vitro fertilization by another couple, after which the embryos were

frozen for 30 years; the embryos were created on April 22, 1992. As such, the twins earned the distinction of having come from the world’s longest frozen embryos. Of course, it is possible that other infants could claim that recognition, since length of embryo preservation is not tracked by the United States Centers for Disease Control and Prevention.

The terms ‘embryo donation’ and ‘embryo adoption’ have been used interchangeably, but physicians acknowledge an important difference. Embryo donation refers to embryos that are preserved and eventually donated for research or training purposes, or donated to couples wishing for families. Embryo adoption is an inaccurate and misleading term since adoption refers to a living child that becomes part of an unrelated family.

Infant Twin Abduction

Five-month-old male twins, Kason and Kayir Thomas, were abducted on December 19, 2022, in Columbus, Ohio, when their mother left them to enter a restaurant while her car was still in running (Behrens & Doyle, 2022). One of the infants (Kayir) was found the following day in the parking lot of Dayton, Ohio’s airport. The other twin, Kasson, was located by two Indianapolis police officers three days after he went missing. He was found alone in a car that had been parked for two days in a Papa John’s Pizza restaurant. A woman has been taken into custody.

Twins Born in Different Years

Fraternal twin girls, Annie Jo and Elfie Rose, were born in Texas just minutes apart (Pasquini, 2023). However, the 6 minutes between them resulted in Annie Jo’s birthday being December 31, 2022, and Elfie Rose’s birthday being January 1, 2023. Their parents are Kali Jo and Cliff Scott. The twins’ mother is excited about this distinction, especially since she will encourage the twins’ separate identities. Hopefully, Katie Jo and Cliff will refrain from treating one girl as the ‘older twin’, since this might foster unnecessary tensions within the pair. It is also possible that the difference in birth year could create complications when it comes to official rules or requirements based on age.

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