

“Bewitching Science” Revisited

Tales of Reunited Reared-Apart Twins and the Genetics of Behavior

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Introduction

In this article I will attempt to debunk one of the great “scientific” smoke and mirrors shows of the past half century—the claim that stories of reunited reared-apart (separated) MZ (monozygotic, identical) twin pairs show that genes play a major role in explaining behavioral differences and similarities among people. Many of these pairs were supplied to journalists by researchers of the “Minnesota Study of Twins Reared Apart” (MISTRA), a [behavioral genetic](#) study carried out between 1979 and 2000 by psychologists at the University of Minnesota. Stories about such pairs, which include the “Jim Twins,” the “Fireman Twins,” the “Giggle Twins,” the “Nazi and the Jew Pair,” and the “Necklace Twins” have been told and retold by researchers, journalists, textbook authors, and others since 1979.¹

These stories, which are often used to sell the false ideology of [genetic \(biological\) determinism](#), have entered the public imagination in a way that academic research results never could. As science writer and MISTRA critic John Horgan put it, “These tales of separated twins serve as a powerful rhetorical device, much more so than the statistical analyses and heritability figures.”² Here I will attempt to show that these stories provide no evidence at all that (as yet undiscovered) “genes for behavior” influence human behavioral development.

There are two main types of reared-apart MZ twin evidence: *statistical* and *anecdotal*. The statistical evidence, found mainly in academic publications, is based on psychological test score correlations (for example, IQ or personality) obtained from samples of reared-apart MZs and other types of twin pairs. Reared-apart MZs, who are said to share a 100% genetic similarity, are also known as “MZA” pairs, or “monozygotic twins reared apart.”

In [my recent book](#) *The Trouble with Twin Studies: A Reassessment of Twin Research in the Social and Behavioral Sciences*, I showed that the statistical reared-apart twin studies such as the MISTRA contained many potentially invalidating problems and biases, and were based on several questionable or false assumptions. In the three studies performed prior to the MISTRA, the original researchers provided ample information showing that most pairs were reared *together* for many years, and/or lived nearby to each other and attended school together, and/or had ongoing contact and a close emotional bond.³ Most pairs, therefore, were only *partially* reared apart. (A summary of the statistical reared-apart twin study critique can be found [here](#). A brief critique of reared-*together* twin study assumptions can be found [here](#).)

Here I focus on the [anecdotal evidence](#), which consists of stories written by journalists and twin researchers describing the “remarkable” or “astonishing” behavioral similarities of individual reared-apart MZ pairs. For the purposes of this article, the terms “reunited pair” and

“reunited twins” refer to reared-apart MZ (MZA) pairs who were reunited as adults and were the subject of anecdotal reports.

Cohort Effects

Suppose we read about a reunited pair said to share remarkable similarities. It is claimed that they share the same taste in food, the names of their children, similar job preferences, similar quirky habits, and so on. What should we conclude? Certainly, this story is interesting. But does it also provide information about genetic influences on human behavior? At first glance it appears that it would. After all, these are two people who grew up apart yet share a remarkable set of similarities. What else besides the genes they share could account for these similarities? A commentator cautioned, however, that in the “absence of an enormous amount of thought about twins, it is extremely easy to draw such erroneous conclusions.”⁴

Thinking more about twins and their stories, we might ask some questions: How were these twins discovered? Who discovered them? Did the people who reported them have information about dissimilar pairs, which they were not reporting? Were their similarities really so unusual? Had the twins met before being studied? Did the twins have financial or other motivations for exaggerating their similarities and degree of separation? Did the investigators have financial, career, or other motivations for exaggerating twins’ similarities and degree of separation? Did the journalists reporting their story exaggerate their similarities and downplay their differences? Were the twins’ stories verified? And most importantly, did factors other than genetic identity contribute to, or explain entirely, their behavioral similarities?

The journalists and twin researchers reporting on these pairs usually downplay, or fail to mention entirely, the many *non*-genetic “cohort effects” that contribute to reunited pairs’ behavioral resemblance. Even in the extremely rare cases where MZA pairs were separated at birth and met each other for the first time when studied, they shared a common prenatal environment, were the same age and sex, and shared a striking physical resemblance. The cohort effect concept refers to similarities in age-matched people’s behavior, preferences, beliefs, physical condition, and other characteristics that are caused by experiencing stages of life at the same time in the same historical period and cultural milieu. In addition to sharing a common prenatal environment and experiencing similar postnatal healthcare, most reunited MZA pairs grew up sharing at least ten different behavior-molding cultural/environmental influences in common: national, regional, language, ethnic, religious, physical resemblance, adoptee status, economic class, birth cohort, and gender cohort.

Behavioral genetic researcher Thomas J. Bouchard, Jr. and his MISTRA colleagues recognized only two of these cultural/environmental influences: common age and common sex. According to Bouchard and a colleague, “For most psychological, physiological, and medical variables there are substantial age and sex effects.”⁵ Based only on these two factors, we would

expect two infants of the same age and sex (twins, or genetically unrelated pairs), who are placed into different families around the same time, to subsequently share many adult behavioral characteristics simply because they are the same sex and grow up in the same era.

Psychoanalyst Susan Farber, in her 1981 book *Identical Twins Reared Apart: A Reanalysis*, addressed the issue of cohort effects. In an observation about dental records that applies to behavioral characteristics as well, Farber wrote that reared-apart MZ pairs are “not so much similar to each other as they are similar to people of their eras and SES [socioeconomic status].”⁶ Permit me to paraphrase and emphasize this critical point: *Behaviorally speaking, reunited twins are more similar to people of their era, culture, and socioeconomic status than they are to each other.* What researchers and journalists believe are genetic effects are more likely cohort effects based on same-sex pairs growing up in similar (non-familial) environments at the same time. As behavioral geneticist Richard Rose once observed, “Were one to capitalize on cohort effects by sampling unrelated but age-matched pairs, born, say, over a half-century period, the observed similarities in interests, habits, and attitudes might, indeed, be ‘astonishing.’”⁷

To test this out, readers could identify a genetically unrelated person of the same sex, who is close in age and was reared in the same class and culture. Sit down with this person and list all of the things you have in common—likes, dislikes, hobbies, values, music and clothing preferences, beliefs, and so on. Look hard for similarities, since journalists and genetically oriented researchers do the same with twins. When you are finished, you might have a list as impressive as any you have seen attributed to reunited twins. Also be aware that, between you, it is easy to invent similarities, especially if there are incentives to do so. The influence of cohort effects may become more apparent after completing this task.

Evolutionary psychologist and former MISTRA twin researcher Nancy Segal is currently the U.S. media’s main “go-to” expert on twin research. In her 2012 book *Born Together—Reared Apart: The Landmark Minnesota Twin Study*, Segal recognized the behavior-influencing effects of common age and sex:

“Two women, aged fifty-six years who were born in the 1950s would most likely have been childhood readers of the Bobbsey Twins, teenage fans of the Beatles, and adult users of calcium supplements to offset bone loss...If reading preferences, favorite songs, and medical treatments are associated with age and sex, then it is important to control for them.”⁸

Although Segal believed that she and her colleagues successfully controlled for age and sex effects in the statistical studies, “substantial” age and sex effects were prominent—and were *not* controlled for—in the anecdotal reports.

More Examples

Imagine that a male reunited pair is separated at birth and raised by different Pennsylvania Amish families. The Amish (population approximately 280,000) are traditionalist Christians known for simple living, plain dress, and a reluctance to adopt many conveniences of modern technology. If these twins meet each other for the first time at age 40, they would likely display many similarities in personality, IQ, behavior, religious beliefs, clothing, facial hair, and so on. This is because, although they grew up in different families and homes, they were raised in the same behavior-molding *culture* at the same time.⁹

Taking the opposite approach, we could imagine a pair of separated-at-birth Arab-American female reunited twins born in Berkeley, California.¹⁰ One twin is raised in a liberal non-religious Berkeley family, while the other is sent to Saudi Arabia and is raised there in a conservative Islamic Saudi Arabian family, and they have no contact with each other and do not know of each other's existence. In Saudi Arabia, women experience "gender apartheid" in a strict Islamic society, are not allowed to interact with men much of the time, and are required to be covered in black from head to toe when in public. If these twins are reunited for the first time at age 40, how much would we expect them to have in common?¹¹

Similar physical appearance contributes to the behavioral similarity of reunited twins because, though "separated," identical twins grow up receiving more similar behavior-influencing treatment from their social environments simply because they share many physical characteristics in common. It is good common sense that factors such as facial features, skin color, weight, height, overall attractiveness, acne in adolescence, premature baldness, and so on lead to different types of treatment, which have an obvious influence on the development of behavior and "personality."

Minnesota-Supplied Reunited Pairs

Because the first major peer-reviewed statistical publications based on the Minnesota (MISTRA) twin samples did not appear until the 1988-1990 period, the public's knowledge of the MISTRA up to the late 1980s was based mainly on selected reunited pairs that the genetically-oriented Minnesota researchers chose to release.¹² These pairs, and their supposed similarities, were "cherry picked" by the investigators and by journalists, a strategy defined by [Wikipedia](#) as "the act of pointing to individual cases or data that seem to confirm a particular position, while ignoring a significant portion of related cases or data that may contradict that position."

These cherry-picked pairs became the subject of several books, and articles in leading U.S. publications such as [National Geographic](#), [Rolling Stone](#), [The New York Times](#), [Science](#), [Scientific American](#), [U.S. News and World Report](#), [The Washington Post](#), and many other influential print and online sources. Bouchard's conclusions that genetic factors largely

explained the behavioral similarities of these selected pairs were quoted liberally in these publications.

A major theme of these publications was that the researchers discovered, often to their astonishment, that genetic factors play an important role in most aspects of human behavior and abilities. For example, barely one year into the investigation, with no more than 15 MZA pairs and no published data, Bouchard was quoted in a 1980 magazine article as saying, “The genetic effect pervades the entire structure of personality. If someone had come to me with results like this I wouldn’t have believed him. I was aghast.”¹³ In another 1980 article, *Science* writer Constance Holden quoted Bouchard as saying, “I frankly expected far more differences [between twins] than we have found so far. I’m a psychologist, not a geneticist.”¹⁴ Another journalist wrote that Bouchard was “boggled by the unexpected discoveries,”¹⁵ while another quoted Bouchard as being [“flabbergasted” by his findings](#). From a scientific perspective, however, it is irrelevant whether Bouchard was “aghast,” “boggled,” “flabbergasted,” or “astonished” by what he believed he had found, assuming that he actually was.

Popular writers usually portray the Minnesota and other twin researchers as objective scientists with little interest in the social and political implications of their findings. At the same time, these authors sometimes portray critics as politically motivated bad guys who employ faulty arguments against real scientists in the service of their “ideologies.” In fact, twin researchers in general, and the Minnesota researchers in particular, believe strongly that genetic influences are important, and then interpret twin data in favor of genetics to promote this belief. In a 2009 interview published in *Science*, Bouchard discussed how he was won over to the behavioral genetic perspective and [Arthur Jensen’s](#) hereditarian theories of intelligence in the early 1970s, drawing student protests at the University of Minnesota for teaching Jensen’s views.¹⁶

The social and behavioral sciences are unavoidably permeated with politics, even more so in fields such as behavioral genetics and psychiatric genetics, whose positions and “findings” bear directly on social and political policy decisions. As Horgan wrote, “the larger implication” of the Minnesota researchers’ conclusions was that “much of the social stratification found in the United States and elsewhere reflects genetic rather than environmental differences. Nurture doesn’t really matter. Genes rule.”¹⁷ In the process, science becomes a tool of genetic determinist ideology, and of the people and vested interest groups promoting the social and political policies that flow from it.

Were Twins Really “Reared-Apart,” and Were Their Accounts Reliable?

Another key, yet often overlooked aspect of reunited twins’ stories is that reports of their quirky similarities, and the degree to which they were truly reared apart, were based on the assumption that the twins were telling the truth. The MISTRA was based on volunteer twins who responded to media reports or appeals, and therefore all pairs were aware of each other’s existence when studied. The MISTRA researchers published very little life-history information

for the twins they studied, and then denied independent researchers access to their unpublished information and data.¹⁸ The information and data remain secret to this day. There is no published evidence that the MISTRA pairs often grew up in “vastly dissimilar circumstances,” as [one author recently claimed](#),¹⁹ but there is much published evidence from the earlier reared-apart twin studies showing that most MZAs grew up in similar circumstances.

For a number of reasons, it is unlikely that the Minnesota MZA pairs were any more “separated” than were the partially reared-apart pairs described in the earlier studies. In his 1981 book *Twins: An Investigation into the Strange Coincidences in the Lives of Separated Twins*, MISTRA-friendly journalist Peter Watson described a MISTRA reunited pair born in 1925, and separated at age two-and-a-half, who “had been seeing each other more or less regularly since 1946.”²⁰ The story of another MISTRA reunited pair described by Watson is illuminating. Gladys Lloyd and Goldie Michael were 57-years-old when they arrived in Minneapolis circa 1980:

“In 1964, Gladys was married to a businessman who, behind her back, also wanted her twin as his mistress. He asked Goldie if he could buy a house for her, and a car, in return for her secret favours....Gladys found out and divorced the man. Since then the relationship between the sisters has been off and on. When they were both pregnant, they were close. They were also so alike then that Gladys’s husband (another one) kissed Goldie by mistake as he came into the house one day from the office.”²¹

According to the Minnesota researchers, Gladys and Goldie qualified as a pair of “reared-apart” identical twins.

British reared-apart twin researcher James Shields worried in his 1962 study that he and his colleagues risked being “taken in” not only by twins, but by their own pre-existing biases: “It could be objected that almost any pair of individuals will be alike in some odd way and that it is all too easy to pick on such coincidences and to exaggerate others so that the twin investigator is easily taken in.”²² Shields’ study was also based on volunteer pairs who responded to media reports or appeals. Danish reared-apart twin researcher Niels Juel-Nielsen recognized that twin researchers are “consciously or unconsciously, in a position to choose to emphasize similarities between the twins, and at the same to omit to register, or be inclined to belittle, the differences.”²³

Shields questioned the truthfulness and memories of the twins he studied. In a largely unknown, yet key passage from his 1962 book *Monozygotic Twins Brought up Apart and Brought up Together*, he wrote,

“Twins themselves will take delight in relating stories of their buying identical presents and perhaps asking an aunt to hide them in the same place. Or they claim, perhaps, to have changed their hair styles at the same time and to have decided independently to have

their watches repaired before coming to London. They are said in many instances to come out with nearly the same remarks at the same time or to know what the other twin is thinking. *Nearly all such stories have in common that they cannot be independently confirmed, and one sometimes suspects retrospective falsification of memory.* Stories of twins falling ill at exactly the same time are not usually borne out by medical histories” (italics added).²⁴

In this passage the author of one of the three pre-MISTRA reared-apart twin studies recalled that reunited twins told him many lies, or at least embellished stories that “cannot be independently confirmed.” As Shields delicately put it, many pairs suffered from “retrospective falsification of memory.” When twins told similar stories to the MISTRA team, they were (and continue to be) put forward by journalists, textbook authors, and the researchers themselves as examples of the powerful influence of genetics.

Juel-Nielsen, in a case history of one of the 12 MZA pairs he studied, noted the “proclivity of both twins to misrepresentation”—or in simple language, to lie about themselves.²⁵ Shields and Juel-Nielsen attempted to verify many of the stories their twins told them. Did the MISTRA researchers, and the journalists sensationalizing the alleged similarities of the reunited twins they provided, attempt to do so as well?

Watson mentioned that British MISTRA reunited twins Daphne Goodship and Barbara Herbert (the “Giggle Twins”) “had told Bouchard the same lie,” and then broke into laughter about it. “We both said we wanted to be opera singers and neither of us can sing a note,” one of the twins confessed.²⁶ As an earlier pair of commentators noted, this story “makes it clear that twins could and did lie about themselves to the investigators.”²⁷ We know that Daphne and Barbara lied about wanting to become opera singers only because they decided to come clean about it. The number of lies invented by various other pairs remains unknown.

As in the earlier studies, in the MISTRA there were incentives for twins to exaggerate their degree of separation—or even to fake their separation—and to fabricate similarities between themselves.²⁸ All travel and hotel expenses were paid by the study (plus an honorarium, and credit for lost wages) for twins and their spouses to come to Minneapolis for the week.²⁹ According to Segal, “It became clear that having spouses, children, or friends travel with the twins provided an added incentive for the twins to participate.”³⁰ Almost 50% of the MISTRA pairs came from overseas, adding the additional incentive of an all-expense-paid international vacation for many who could not have afforded one otherwise.³¹

Potential motivations for reunited pairs to present themselves to twin researchers as more separated and more behaviorally similar than they actually were included:

- The possibility of selling their stories to the media or to movie studios
- The desire to impress the researchers, and to not disappoint the researchers by showing behavioral differences
- The desire to be the center of scientific attention and to feel important
- The opportunity to enjoy a fully paid one-week vacation in Minneapolis for themselves and their spouses
- To feel that they had more of a bond with their co-twin
- The belief that they should behave very similarly because they are identical twins

The Jim Twins

Most reunited pairs came to the attention of researchers and journalists *because of* their similarities. Stories about similar twins are newsworthy because they are interesting and compelling; stories about dissimilar twins are not. The most celebrated were the “Jim Twins” of Ohio, [first reported in 1979](#). Jim Lewis and Jim Springer were separated shortly after birth and were reunited at age 39. They were said to share an unlikely set of similarities, such as the names of their wives and children, career choices, and preferences for particular brands of beer and cigarettes. Bouchard invited Lewis and Springer to Minneapolis in 1979, and they became the first pair of MISTRA reared-apart twins.

A typical account of the Jim Twins is found in Peter Watson’s *Twins*:

“Both had married a girl named Linda, divorced her, *then* married a second time, to a woman called Betty. Lewis had named his first son James Alan, Springer had called his son James Allan. Both had owned a dog as a boy, and named it Toy....Both spent their holidays at the same beach near St. Petersburg in Florida....Both drove there and back in the same kind of car, a Chevrolet. Both bit their fingernails—right down until there is nothing left....Both have basement workshops and work in wood, building frames and furniture. Both chain-smoke Salems....Both enjoy stock car racing and dislike baseball....Both scatter love notes around the house.”³²

Similar accounts of the Jim Twins and other pairs were widely disseminated in the decades that followed as evidence of the power of genetic influences, and their stories continue to be [found in media reports](#) and in numerous [social and behavioral science textbooks](#). At Nancy Segal’s website, [the page promoting](#) her most recent book continues to highlight that the

“identical ‘Jim twins’ were raised in separate families and met for the first time at age thirty-nine, only to discover that they both suffered tension headaches, bit their fingernails, smoked Salems, enjoyed woodworking, and vacationed on the same Florida beach.”

Like all such pairs, the Jim Twins came to the attention of journalists because of their reported similarities. We have seen that most pairs had incentives to invent similarities, and there is little doubt that some who had previously led uneventful lives enjoyed their celebrity status, which in some cases included nationally televised talk show appearances and having book chapters written about them. The Jim Twins appeared on *The Tonight Show*, and they and other reunited twins hired talent agents and sought book and movie deals.³³ To the extent that their selectively reported similarities were real, they were the likely result of previously listed cohort influences, or were mere coincidences. As Bouchard recognized in relation to reunited pairs in general, some similarities “are surely coincidental—complete strangers at cocktail parties routinely discover ‘astonishing’ occurrences in their lives; imagine what they might find after fifty hours of filling out questionnaires.”³⁴

Oskar and Jack

Another celebrated case that has been [cited for decades](#) in support of genetics was the reunited pair Oskar Stöhr and Jack Yufe. Oskar and Jack were born in Trinidad in 1933 to a “Jewish” father and a “German” mother. A few months after they were born, their parents separated. Jack remained in Trinidad with his father, while Oskar went to live with his mother in the Czech Sudetenland, which was incorporated into Germany from 1938 until the end of World War II. Oskar was raised a Catholic and Nazi, whereas Jack was raised Jewish in Trinidad and had lived on an Israeli kibbutz. Although Oskar and Jack were described as leading “markedly different lives,” a supposedly amazing set of similarities was discovered upon their arrival in Minneapolis. According to a 1980 report in *Science*, one of the world’s leading scientific journals,

“Both were wearing wire-rimmed glasses and mustaches, both sported two-pocket shirts with epaulets. They shared idiosyncrasies galore: they like spicy foods and sweet liqueurs, are absentminded, have a habit of falling asleep in front of the television, think it’s funny to sneeze in a crowd of strangers, flush the toilet before using it, store rubber bands on their wrists.”³⁵

Jack and Oskar had corresponded by mail in the early 1950s, and then met in Germany in 1954.³⁶ Although their meeting did not go well, they remained in postal contact for the next 25 years.³⁷ After their cases were reported in the press, they sold their life stories to a Hollywood movie producer.³⁸ They had a clear financial interest in exaggerating (or inventing) their similarities, and underreporting previous contact. It is possible that they, in addition to other pairs, concocted and rehearsed many of their “spooky similarities” well in advance of their “reunion.”

The Fireman Twins

Jerry Levey and Mark Newman, another widely reported MISTRA reunited pair, were New Jersey firefighters brought together after being identified by another firefighter:

“Capt. Jim Tedesco looked across a crowded room at a firefighters convention and was startled at what he saw. There was Mark Newman, and that was impossible. He knew that Newman was back home in Paramus, N.J. But how many bald, 6-foot-6, 250-pound-plus New Jersey volunteer firemen are there who wear droopy mustaches, aviator-style sunglasses and a key ring on the belt on the right side?”³⁹

In other words, Jerry and Mark were discovered because they were similar. Had they been dissimilar, it is unlikely that they would have been reunited. It is not “spooky” or “weird” that these twins were both firefighters, wore droopy mustaches, aviator glasses, and a key ring on the right side. On the contrary, they were discovered *because* they were both firefighters, wore droopy mustaches, aviator glasses, and a key ring on the right side. Had Jerry been a florist instead of a firefighter, Captain Tedesco would not have made his discovery.

Like other publicized pairs, we were told about what Jerry and Mark had in common, but little about what set them apart. For example, it was said that both men were bachelors, were attracted to similar women, and enjoyed hunting, fishing, going to the beach, John Wayne movies, pro wrestling, and Chinese food. However, because journalists and twin researchers highlight the similarities, we could reasonably assume that they were *dissimilar* for many other, unmentioned comparisons. What were Jerry and Mark’s taste in music, magazines, newspapers, or shoes? What were their favorite high school subjects, planets, animals, baseball players, or musical instruments? What were their choices of toilet paper, deodorant, toothpaste, motor oil, paint, or ice cream brand? The list is endless, but because readers were presented with selected similarities, they were led to believe that the twins were more alike than they really were.

Segal recognized that Jerry and Mark’s childhood homes “seem similar,” and both grew up in “lower middle class” New Jersey families at the same time.⁴⁰ Both families raised their sons to be Jewish, and both had Bar Mitzvahs in 1967 at age 13. Segal even reproduced side-by-side photographs of each separated twin at his respective Bar Mitzvah, apparently failing to realize that these photos support the critics’ argument that, despite being reared in different family homes, these and other reunited twins usually grow up experiencing similar behavior-shaping environments.⁴¹

Photographs are also used to create the impression/illusion of similarity. In Segal’s 1999 book *Entwined Lives*, she reproduced a photograph of Jerry and Mark each holding a can of beer in his right hand, each curling his little finger under the can. Segal, who referred to this method of holding beer cans as the twins’ “signature quirk,” believed that “distinctive physical expressions co-occurring in identical twins reared apart suggest that genetic factors are involved.” As evidence, she captioned the photo, “Note that the twins’ little fingers support their

cans of beer,” and wrote that Jerry and Mark “held pinky fingers under cans of Budweiser long before they met.”⁴² The twins’ lives were chronicled, and their beer can holding styles were highlighted, on several [popular U.S. television programs](#).⁴³

In my 2004 book *The Gene Illusion*, I showed that the Minnesota researchers’ strong genetic biases influenced the way they interpreted their data, and pointed to their tendency to highlight behavioral similarities and downplay differences. Like most journalists, Segal ignored or dismissed non-genetic explanations for why these twins held their beer cans the same way in the photo. Some obvious possibilities include:

- That Jerry and Mark took cues from each other before the photo was taken in order to appear more “twinlike”
- That many people hold beer cans this way, which would mean that their similarity in this regard would not be so astonishing
- That men hold cans in this manner more often than women
- That New Jersey firefighters traditionally hold beer cans this way
- That Jerry and Mark were asked by the photographer to hold their beer cans this way
- That people growing up in their area and culture tend to hold beer cans this way (Jerry and Mark grew up only 65 miles apart)

The fact that Jerry and Mark were frequently photographed and filmed holding beer cans suggests that they intentionally reproduced their famous “signature quirk” in order to obtain more publicity for themselves, or possibly for other reasons such as those listed above. When photographers and reporters asked them to hold beer cans at the same time, they obviously chose to position their pinky fingers in the expected (or requested) position.

I concluded in *The Gene Illusion* that, although it was perhaps understandable that journalists would want to write about this photograph in terms of genetics, it was improper for Segal to provide a scientific seal of approval to such speculation. I pointed out that there is another photograph of Jerry and Mark showing only one twin curling his pinky under the can. This photo appeared in a 1987 article in *U.S. News and World Report*, and has been reproduced elsewhere.⁴⁴

In *Born Together—Reared Apart*, Segal continued to imply that Jerry and Mark’s shared “signature quirk” was influenced by their common genes.⁴⁵ Segal was familiar with the *U.S. News and World Report* article, having referred to it in another context in her book.⁴⁶ She also

suggested that a photograph of five other reunited pairs posing together for photographers with television host Lesley Stahl provided additional evidence that genes influence “hand and leg positions,” without mentioning that each pair was dressed alike.⁴⁷

Returning to Jerry and Mark, to the best of my knowledge there are only three possible places that one can position one’s pinky finger while holding a can of beer: pointing away from the can (an extremely unlikely pinky position for male New Jersey firefighters in the 1970s and 1980s), on the side of the can, or under the can. I ask interested readers to take a quick break and test this for themselves with a nearby canned beverage, if one is available.

Dan Sivoletta and Michael Meredith

Readers familiar with reunited twin stories may be scratching their heads, wondering why they have never heard of this pair. Dan and Michael were discussed in Peter Watson’s 1981 *Twins*, but have disappeared from the genre ever since.⁴⁸ Perhaps this is because, as Watson noted, “these twins have very few characteristics in common.” The twins themselves believed “that they were no more alike than any other two people picked at random.” There would be, of course, no cute twin pair name, no Hollywood movie deals, no talent agents, no textbook photos, and no *Tonight Show* appearances for these twins.

Dan and Michael were 33-year-old Indiana twins who met at age 17, and so “had plenty of opportunity to meet and influence one another.” They even worked in the same factory, which lends additional support to the evidence I presented in *The Trouble with Twin Studies* that, like Gladys and Goldie, most pairs found in reared-apart twin studies were only partially reared apart.

Although this reunited pair was supplied to Watson by Bouchard, I am not aware of any subsequent TV host or author mentioning Dan and Michael—journalist, twin researcher, textbook author, or otherwise. The reasons are clear. From a journalistic perspective, the story isn’t interesting because there are few if any behavioral similarities to write about or to photograph. From the perspective of twin researchers and others attempting to promote genetic theories, the twins’ behavioral dissimilarity does not support their claims.

In general, this pair drives home the point that behaviorally similar reunited twins are widely reported in the media, whereas behaviorally dissimilar twins are not. I encourage readers to test this by first Googling “[Dan Sivoletta and Michael Meredith twins](#),” followed by Googling “[Jim Lewis and Jim Springer twins](#)” and “[Oskar Stöhr and Jack Yufe twins](#),” and then comparing the results.

Although the sensational reporting of cherry-picked reunited pairs makes for entertaining reading, there is nothing scientific about it. Dan and Michael’s most “astonishing similarity” may have been that they did not seek notoriety or financial gain for themselves, and were completely honest about their differences.

Astrology, Ghost Sightings, Psychic Surgery, and Reunited Twins

We have seen that for the first decade or so of the MISTRA, selected reunited twins provided by the researchers were the main information available to the public. In a 1987 article entitled “Bewitching Science,” philosophy professor Val Dusek described the selective and misleading reporting of these pairs. For Dusek, a striking aspect of the anecdotal reunited twin literature was “its similarity to the sort of evidence often offered as proof for astrology or parapsychology such as extrasensory perception (E.S.P.).”⁴⁹

Dusek wrote of “striking coincidences [that] are reported as supposed grounds for belief in the phenomenon itself.” Furthermore, he wrote, in the “literature about astrology and E.S.P., cases where forecasts came true or where [a] thought of a friend was immediately followed by a phone call from that friend are offered as evidence. The cases where forecasts failed or where a thought of someone is not followed by a phone call from that person are forgotten or left unmentioned.” Dusek concluded that the stories of reunited twins offered by Bouchard “must remain on par with tales about astrology and E.S.P.,” and “would seem more at home in the pages of the *National Enquirer* than in those of *Science*.”

In her 1982 book *Twins: Nature’s Amazing Mystery*, journalist Kay Cassill described the MISTRA reunited pair Keith Heitzman and Jake Hellback, who grew up near New Orleans:

“Although the mighty Mississippi divided these two physically, it could not separate their parallel lives. The welder from one side and the pump mechanic from the other found that they are both allergic to ragweed and dust. Both had done poorly in school. Both disliked sports and had cut their gym classes whenever they could. They are both addicted to candy. Their similarity of dress includes a penchant for wearing cowboy hats, which matches their parallel interest in guns and hunting.”⁵⁰

As Dusek pointed out, “Even if ‘the mighty Mississippi divided’ the twins, the fact that they both wear cowboy hats and like hunting is not that unusual for two [white] working-class men in the same region of Louisiana.” A similar point can be made about the Jim Twins, two working-class white males who grew up in the same region of Ohio at the same time. Dusek wrote that reunited twins “may wish to exaggerate similarities of behavior or wear identical dress to receive publicity and scientific approval for themselves.” Keith and Jake were filmed by a CBS television crew while in Minneapolis. Clearly enjoying their potentially lucrative celebrity status, Jake remarked, “Today CBS, tomorrow Johnny Carson [host of *The Tonight Show*].”⁵¹

The potential problem of placing faith in testimonials, single case reports, and anecdotes was described by Robert T. Carroll in *The Skeptic’s Dictionary*. Carroll wrote that “testimonials and vivid anecdotes are one of the most popular and convincing forms of evidence presented for beliefs in the supernatural, paranormal, and pseudoscientific.” Carroll continued, “Testimonials

and anecdotes in such matters are of little value in establishing the probability of the claims they are put forth to support.” Accounts of people’s encounters with angels, extraterrestrials, ghosts, miraculous dowsers, a Bigfoot, or psychic surgeons “are of little value in establishing the reasonableness of believing in such matters.”⁵² This is because these accounts are unreliable and biased: “They are of no more value than the televised accounts of satisfied customers of the latest weight loss program.”⁵³

The reference to television commercials is relevant to this discussion. When we see advertisements showing people celebrating the fact that they achieved significant weight loss from a new diet, few people, if they stopped to think about it, would say that the commercial depicted a random sample of people using the diet. They would realize that people marketing the diet chose to show, and pay, only people happy with their product. If 90% of the people on the diet did not lose weight, the commercial would show only the 10% who actually did lose weight. Why then, on the basis of a few pairs of selected twins, are people willing to believe that human behavior is largely “in the genes”? Most likely because many people still believe, quite mistakenly, that scientists and the mainstream media would not try to “sell” them something.

While it might sound strange to compare the tales of reunited twins to astrology and ghost sightings, there are parallels. These include the selective presentation of information by journalists seeking sensational stories, attempts by supporters of dubious claims to provide evidence in support of their positions, and the frequent inability to independently verify stories and information. According to [Wikipedia](#) over 50 English language “paranormal reality television series” have aired in the past 30 years, a fact that provides no evidence whatsoever that ghosts actually exist.

All this suggests that—insofar as they are put forward as scientific evidence in favor of genetic influences on human behavior—stories of reunited pairs belong in the [pseudoscience category](#) currently inhabited by Bigfoot tracking, ghost sightings, astrology, psychic surgery, and other such areas. As Dusek suggested, their stories are appropriate mainly for the tabloids and celebrity magazines we pass by in the supermarket checkout lane.

Conclusions

Despite the lack of evidence, mainstream (corporate) media sources continue attempts to persuade us that behavioral differences are [strongly influenced by genetics](#), and that psychiatric disorders are genetically based brain disorders. Mainstream authors usually quote the scientists and twin researchers who promote these ideas, while largely ignoring or dismissing the views and arguments of their critics. The decades-old failure to identify genes for [psychiatric disorders](#), [IQ](#), and behavior in general, in addition to the [massive flaws](#), [false assumptions](#), and [invalid concepts](#) underlying behavioral genetic research, has done little to change this situation.⁵⁴

Reunited twins have provided the politically and economically powerful with a set of simple stories designed to hoodwink the public into accepting the genetic determinist point of view. According to philosophy professor Phil Gasper, the politically and economically powerful have two main objectives in this area. The first is to try “to convince us that the social order is a consequence of unchanging human biology, so that inequality and injustice cannot be eliminated.” The second is that “in the case of problems that are impossible to ignore, it tells us to look for the solution at the level of the individual and not at the level of social institutions. The problems lie not in the structure of society, but in some of the individuals who make up society. The solution is thus to change—or even eliminate—the individuals, not to challenge existing social structures.”⁵⁵

Richard Rose concluded in 1982 that the stories of reunited twins are “good show biz but uncertain science.”⁵⁶ These “show biz” stories certainly are *not* science, and as such have no place in academic or public discussions of the causes of human behavior.

NOTES

¹ Portions of this article were adapted from two previous publications: Joseph, J., (2004), [*The Gene Illusion: Genetic Research in Psychiatry and Psychology under the Microscope*](#), New York: Algora; Joseph, J., (2015), [*The Trouble with Twin Studies: A Reassessment of Twin Research in the Social and Behavioral Sciences*](#), New York: Routledge.

² Horgan, J., (1999), *The Undiscovered Mind*, New York: The Free Press, p. 145.

³ See Joseph, 2015, Chapter 2.

⁴ Moore, D. S., (2001), *The Dependent Gene: The Fallacy of “Nature vs. Nurture,”* New York: Times Books, p. 49.

⁵ McGue, M., & Bouchard, T. J., Jr., (1984), Adjustment of Twin Data for the Effects of Age and Sex, *Behavior Genetics*, 14, 325-343, p. 325.

⁶ Farber, S. L., (1981), *Identical Twins Reared Apart: A Reanalysis*, New York: Basic Books, p. 77.

⁷ Rose, R. J., (1982), Separated Twins: Data and their Limits, [Review of the Book *Identical Twins Reared Apart: A Reanalysis*, by S. Farber], *Science*, 215, 959-960, p. 960.

⁸ Segal, N. L., (2012), *Born Together—Reared Apart: The Landmark Minnesota Twin Study*, Cambridge, MA: Harvard University Press, p. 44.

⁹ As a thought experiment, imagine that a male MZ twin is placed at birth in an aristocratic Japanese family in 1802. His reared-apart MZ co-twin is placed at birth in a poor peasant family living in the highlands of El Salvador in 1960. Unlike reunited pairs, who in most cases are only partially reared apart and share many cultural influences, here we eliminate national, regional, political, ethnic, religious, economic class, and birth cohort influences. Would we find a reunited pair of this type to show many unusual behavioral similarities? Probably not, although genetic theories predict that we would.

¹⁰ Joseph, J., & Ratner, C., (2013), “The Fruitless Search for Genes in Psychiatry and Psychology: Time to Re-examine a Paradigm,” in S. Krimsky & J. Gruber (Eds.), [Genetic Explanations: Sense and Nonsense](#) (pp. 94-106), Cambridge, MA: Harvard University Press.

¹¹ Even though these twins would grow up in very different environments, they would still share common age, common sex, common prenatal environment, and similar appearance.

¹² Two major MISTRA peer-reviewed publications from this period are: Bouchard et al., (1990), Sources of Human Psychological Differences: The Minnesota Study of Twins Reared Apart, *Science*, 250, 223-228; Tellegen et al., (1988), Personality Similarity in Twins Reared Apart and Together, *Journal of Personality and Social Psychology*, 54, 1031-1039, p. 1034.

¹³ Jackson, D., (1980, October), Reunion of Identical Twins, Raised Apart, Reveals Some Astonishing Similarities, *Smithsonian*, 48-56, p. 53.

¹⁴ Holden, C., (1980), Identical Twins Reared Apart, *Science*, 207, 1323-1328, p.1323.

¹⁵ Wright, W., (1998), *Born That Way*, New York: Knopf, p. 41.

¹⁶ Holden, C., (2009), Behavioral Geneticist Celebrates Twins, Scorns PC Science, *Science*, 325, 27. See also Wright, L., (1997), *Twins: And What They Tell Us about Who We Are*, New York: John Wiley & Sons, p. 45. For an example of Bouchard’s pre-MISTRA hereditarian views on IQ, see Bouchard, T. J., Jr., (1976), “Genetic Factors in Intelligence,” in A. Kaplan (Ed.), *Human Behavior Genetics* (pp. 164-197), Springfield, IL: Charles C. Thomas. Bouchard later published [a favorable review of *The Bell Curve*](#). See Bouchard, T. J., Jr., (1995), Breaking the Last Taboo, [Review of the Book *The Bell Curve*, by R. J. Herrnstein & C. Murray], *Contemporary Psychology*, 40, 415-421.

¹⁷ Horgan, 1999, p. 144. The Minnesota (MISTRA) study was funded in large part by the [Pioneer Fund](#), an organization founded in 1937 and dedicated to supporting eugenics, racial segregation, and funding studies on racial differences. For more, see Joseph, 2015, Appendix A, and Lombardo, P. A., (2002), “The American Breed”: Nazi Eugenics and the Origins of the Pioneer Fund, *Albany Law Review*, 65, 743-830. For an excellent detailed account of the Pioneer Fund and its history, see Tucker, W. H., (2002), [The Funding of Scientific Racism: Wickliffe Draper and the Pioneer Fund](#), Urbana: University of Illinois Press. According to Tucker (p. 196):

“Whatever projects of scientific interest Pioneer may have supported—and there certainly are a few—it is also indisputable that the fund has continued to fill the role once played by its founder: to subsidize the creation and distribution of literature that could be used to support racial superiority and racial purity. Pioneer has indeed been scientific racism’s keeper of the flame.”

¹⁸ Joseph, 2015, Chapter 5.

¹⁹ Mukherjee, S., (2016, May 2), [Same but Different: How Epigenetics Can Blur the Line between Nature and Nurture](#), *The New Yorker*.

²⁰ Watson, P., (1981), *Twins: An Investigation into the Strange Coincidences in the Lives of Separated Twins*, London: Hutchinson, p. 56.

²¹ Watson, 1981, p. 58.

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- ²² Shields, J., (1962), *Monozygotic Twins Brought Up Apart and Brought Up Together*, London: Oxford University Press, p. 98.
- ²³ Juel-Nielsen, N., (1965/1980), *Individual and Environment: Monozygotic Twins Reared Apart* (revised ed.), New York: International Universities Press, Part I, p. 57.
- ²⁴ Shields, 1962, p. 94.
- ²⁵ Juel-Nielsen, 1965/1980, Part II, p. 135.
- ²⁶ Watson, 1981, p. 43.
- ²⁷ Kamin, L. J., & Goldberger, A. S., (2002), Twin Studies in Behavioral Research: A Skeptical View, *Theoretical Population Biology*, 61, 83-95, p. 86.
- ²⁸ Joseph, 2015. See also Kamin, L. J., (1974), *The Science and Politics of I.Q.*, Potomac, MD: Erlbaum; Taylor, H. F., (1980), *The IQ Game: A Methodological Inquiry into the Heredity-Environment Controversy*, New Brunswick, NJ: Rutgers University Press.
- ²⁹ Segal, 2012, p. 54.
- ³⁰ Segal, 2012, p. 25.
- ³¹ Segal, 2012, p. 45.
- ³² Watson, 1981, pp. 10-11, italics in original.
- ³³ Horgan, J., (1993), Eugenics Revisited, *Scientific American*, 268 (6), 122-131; Jackson, 1980; Wright, 1997.
- ³⁴ Bouchard, T. J., Jr., (1997, September/October), Whenever the Twain Shall Meet, *The Sciences*, 37, 52-57, p. 53.
- ³⁵ Holden, 1980, p. 1324.
- ³⁶ Segal, N. L., (2005), *Indivisible by Two: The Lives of Extraordinary Twins*, Cambridge, MA: Harvard University Press, Chapter 3.
- ³⁷ Wright, 1998.
- ³⁸ Horgan, 1993.
- ³⁹ Lang, J. S., (1987, April 13th), Happiness is a Reunited Set of Twins, *U.S. News and World Report*, 63-66, p. 63.
- ⁴⁰ Segal, 2005, p. 20.
- ⁴¹ Segal, 2005, p. 21.
- ⁴² Segal, N. L., (1999), *Entwined Lives: Twins and What They Tell Us about Human Behavior*, New York: Dutton, p. 144. Segal's use of the term "signature quirk" is from Segal, 2005, p. 13.

⁴³ As reported in Segal, 2005, p. 257, Jerry and Mark appeared on the *Late Show with David Letterman* in 1986, and *The Oprah Winfrey Show* in 1988.

⁴⁴ Lang, 1987. This photograph was reproduced in the psychology textbook Wade, C. & Tavris, C., (2006), *Psychology* (8th ed.), Upper Saddle River, NJ: Pearson Prentice Hall, p. 469.

⁴⁵ Segal, 2012, pp. 28, 64, 178.

⁴⁶ Segal, 2012, p. 354, Footnote 4.

⁴⁷ Segal, 2012, pp. 263-264.

⁴⁸ Watson, 1981. A discussion of reunited twins Dan Sivoilella and Michael Meredith can be found on pages 59-61 of this book.

⁴⁹ Dusek, V., (1987), [Bewitching Science](#), *Science for the People*, 19, (6), 19-22.

⁵⁰ Cassill, K., (1982), *Twins: Nature's Amazing Mystery*, New York: Atheneum, p. 183.

⁵¹ Watson, 1981, p. 45.

⁵² Robert T. Carroll, *The Skeptic's Dictionary* website: <http://skepdic.com/testimon.html>.

⁵³ This quotation about television weight loss advertisements is taken from a mid-2000s online version of *The Skeptic's Dictionary*.

⁵⁴ For an excellent analysis of gene discovery failures in behavioral genetics, and how researchers rationalize these failures while remaining publically optimistic, see Panofsky, A., (2014), [Misbehaving Science: Controversy and the Development of Behavior Genetics](#), Chicago: University of Chicago Press, Chapter 6.

⁵⁵ Gasper, P., (2004), [Is Biology Destiny?](#), *International Socialist Review*, 38.

⁵⁶ Rose, 1982, p. 960.