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Genetic Explanation for Similarities in Personalities of Twins Raised Apart

Dr. Priya Vij [a], Ashu Nayak [b]

[a] *Assistant Professor, Kalinga University, Naya Raipur, Chhattisgarh, India.*
E-mail: ku.priyavij@kalingauniversity.ac.in, Orcid: https://orcid.org/0009-0005-4629-3413
[b] *Assistant Professor, Kalinga University, Naya Raipur, Chhattisgarh, India.*
E-mail: ku.ashunayak@kalingauniversity.ac.in, Orcid: https://orcid.org/0009-0002-8371-7324

Abstract

Twins living in different countries provide a unique chance to delve into the connections between the differences we observe and the experiences they go through. The life stories, cognitive abilities, personality traits, psychomotor abilities, health histories, job satisfaction, social support, and relationships of dizygotic (DZ) female twins the longest-separated twins in history are examined in greater detail in this report. The twins were reunited at the age of 78. Their advanced age also allowed researchers to examine how differences between the twins in aging might relate to their current behaviours and social interactions. In line with earlier studies, these dizygotic twins raised apart (DZA) displayed inconsistencies in some traits, but not in all. The disparities in their reactions to meeting each other are probably explained by the different upbringings and life experiences they had. Although it doesn't offer conclusive answers about the extent to which genetic and parenting variables contribute to individual developmental differences, this case highlights the importance of both in influencing behaviour. However, this data contributes to the expanding corpus of studies on twins reared in diverse cultural contexts, generating novel theories that can be investigated with bigger sample sizes.

Keywords: Adoption, Twins, Personality, Intelligence, Health, and Job Satisfaction.

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Introduction

The authors of "The Minnesota Study of Twins Reared Apart" explore the intriguing individual differences found in monozygotic twins raised in different settings. The paper is divided into eight distinct sections. The authors begin by outlining the tests that the participants took as part of the study and providing a brief synopsis of their methods, findings, and interpretations. Each section goes into more detail about their data, insights, and techniques. The formula used to analyse the twins' exposure to environmental and genetic factors is explained in the first part. The details and findings of the numerous tests and evaluations the twins had during the study are covered in detail in the next section (McCartney et al., 1990). The authors then move on to the third segment, where they investigate the effects of similar rearing environments on the IQ scores of monozygotic co-twins raised apart. This investigation is carried out in the fourth phase, which focuses on the relationship between these twins' IQ scores. The authors point out a number of parallels between monozygotic twins in the sixth section. In the final three sections, the researchers examine their findings about the impact of both genetic and environmental influences on human development and offer various hypotheses that could account for the similarities between monozygotic twins raised apart.

The authors give a summary of the twins that are part of their study and the recruitment procedure they employed in the introduction. Using more than a hundred sets of twins from all over the world, including the US, UK, Canada, China, and Germany, they emphasize how uncommon it is to find twins who were raised apart. According to the authors, they recruited these twins using a variety of techniques. First, after learning about the research, they made it possible for the twins' friends and family—or even the twins themselves—to get in touch with the Minnesota Center for Twin and Adoption Research (MICTAR) (Bouchard Jr, 1994). Furthermore, social workers, adoption community members, and other professionals who encountered reared-apart twins served as a bridge between the twins and the researchers. Finally, the researchers were able to enlist people who knew they had a separated twin and had asked the MICTAR staff for assistance in locating them.

Review of Literature

One of the main criticisms of research involving twins who were raised apart is that their co-twin often grows up in a similar cultural environment. This similarity can limit the range of behaviours that might emerge from the interplay of genes and environment, making it harder to see how environmental factors influence behaviour (Burt 1966). The MISTRA study, which examined 12 out of 137 pairs, and an ongoing study on young Chinese twins who were separated (2 out of 15 pairs; Segal, Stohs, & Evans, 2011) are two examples of studies that have involved twins raised in different nations. However, data from these pairs are typically only included in larger group conclusions due to confidentiality regulations.

Most twins who are reunited are monozygotic (MZA), as their similar appearances make it easier to identify them or lead to unexpected discoveries of their twin status. The most recent reunions tend to involve young adults, likely because younger people are more adept at using the Internet compared to older generations (Pew, 2014). Consequently, elder twins and dizygotic twins raised apart (DZA) are less likely than their MZA and younger counterparts to be reunited and investigated. By evaluating the behaviour of DZA female twins who were reunited at the age of 78, this paper seeks to close that difference. Although one of the twins immigrated to the US in her late twenties, the other twins were brought up in England. These days, they reside outside of cities in tiny communities.

Understanding the genetic and environmental factors that influence behavioural development requires examining twins who were raised apart (Segal, 2012). Since monozygotic twins reared apart (MZA) share all of their genes but live in distinct settings, they offer a clear window into how genetics affect behaviour and health. Conversely, dizygotic twins raised apart (DZA) typically only have roughly half of their genes in common despite growing up in distinct circumstances.

The Crovitz and Zener (1962) Group Test, which evaluates hand and eye dominance, was used to detect handedness. A behavioural format was used for all fourteen items. In order to assess eye dominance, twins reduced their field of vision until they were only using one eye after focusing on an object.

The Grooved Pegboard Test (Trites, 2002), which assesses dexterity and intricate visual-motor coordination, was used to evaluate psychomotor skills. The grooves on the board and 25 pegs were matched by the participants (Bouchard et al., 2013). They positioned the pegs from left to right using their dominant hand in the first trial and in the opposite manner using their non-dominant hand in the second.

Interestingly, while the US participants had stronger reading skills, those from the UK excelled in episodic memory tasks. This could imply that the UK participants' reading difficulties improved their other cognitive skills. The

majority of the UK participants' mistakes, as anticipated, happened on the Stroop C exam, which involves reading words. Additionally, they did not spend more time on the Stroop CW test, suggesting that the words were not as distracting to them as they were to the more proficient readers in the US. Actually, studies indicate that Stroop interference is more common in stronger readers (Protopapas, Archonti, & Skaloumbakas, 2007).

The UK participants had a keen interest in crafts and had plenty of chances to hone their fine motor skills, which might explain their quicker times on the Grooved Pegboard. In general, mental processing speed and physical skills are positively correlated (see Kochunov et al., 2010). But in this instance, the American competitor performed better than her twin on the Stroop and Trail Making challenges.

The US has reported an increase in overall support, but both groups felt a lack of available support in all the areas we looked at. It's interesting to note that social support plays a crucial role in both mental and physical health. The twins' physical and mental health appear to have been more impacted by their perception of their level of support than by the actual amount of support they received (Uchino, 2009).

Most twins who were raised apart are happy to have finally met their co-twin. While the UK twin said that her life felt "complete" following the reunion, the US twin welcomed the reunion and the opportunity to take part in research. Despite her lack of interest in her biological family, she was enthusiastic about the prospect of meeting her twin. However, other separated twins have also shown this unexpected interest in a recently found twin, not simply their biological parents (Segal, 2000) (Bouchard Jr, 1984). This reaction really underscores how important the bond of twinship is within the broader context of human relationships.

Materials and Methods

On December 23, 1976, at the age of two and a half, US was accepted into her adoptive family. At the time, her father was thirty-five and her mother was thirty. She had already adopted a daughter who was three and a half years older than US, and both of her parents were Caucasian. While raising US, US's mother obtained her degree in General Educational Development, despite having dropped out of school at sixteen to marry. Her adoptive mother worked as a substitute teacher, a school cafeteria employee, and a staff member of a nursing facility throughout US's early years. Because of the security it provided, she enjoyed her employment in the cafeteria the most out of all of these responsibilities. She was raised in a Baptist tradition after converting from Catholicism to conform to her husband's faith. Her life was heavily influenced by religion; she attended Bible school until middle school and visited church frequently throughout elementary and high school.

Prior to beginning his work, US's adoptive father completed his high school education. He shared his wife's strong religious beliefs, and the family made it a point to routinely attend church services. He worked for the General Electric Company for thirty-three years as a machine operator. At the age of six weeks, US's adopted sister became a part of the family. She earned a certificate in administrative secretarial work after completing a year of college. She doesn't have a job right now, although she does occasionally take on housekeeping duties. She had four sons from her former marriage, although she is currently divorced (Bouchard Jr, & McGue, 1990). Regretfully, US adoptive family members could not be reached for comment.

However, SK grew up in a poor urban neighbourhood with her biological parents. Her mother only finished elementary school, but her father earned a high school diploma. But in her late sixties, she completed her middle school education at an older adults' school. Her mother sold drinks at a market in Seoul where her father ran a store.

SK became very involved in athletics after high school and was frequently selected as a school athlete. She majored in Japanese and finished a two-year vocational college course in three years. She worked during the day, which is why she received the extra year. Since she regularly received grades that put her in the top 10% of her peers, SK always considered herself to be a hard worker. Her favourite subject was Japanese, although she wasn't very interested in science or math.

SK grew up with her twins, an older brother and sister. Her brother became a licensed pharmacist after completing a four-year college program. He is currently happily married with two children and operates a non-pharmacy store. Additionally, their sister completed a two-year technical college program. She has two kids and is a stay-at-home mother. She is married. Regretfully, the twins' biological relatives were absent.

Being a Baptist who discovered her faith as an adult, SK's faith is very important to her. At her church, she does a lot of volunteer work. Her mother eventually converted to Baptistism and now attends church with SK, although neither of her parents were religious when she was growing up.

Based on the FES scales, an ICC of 0.05 indicated that K and US had highly diverse familial origins. On every category but Conflict, Moral-Religious Emphasis, Control, and Organization, the home environment in SK performed better than that in the US. This indicates that although the US had a more rigid, religiously oriented upbringing with greater family strife, SK was reared in a more loving and caring family environment that promoted personal development.

The US scored 31 on the SPM, taking 105 minutes to test but stopping at D7 after tackling 42 items due to frustration with the tougher questions. In contrast, SK managed to complete all 60 items in just 54 minutes, scoring 43.

Regarding personality qualities, SK did better than the US in terms of extraversion and neuroticism. Conversely, in the areas of conscientiousness, agreeableness, and openness, the US outperformed SK. Remarkably, in three of the five criteria, the difference between the two people is less than seven points, and they both fall into nearby T-score groups (Holden, 1987). This suggests that, all things considered, their personality characteristics are rather comparable. The US exhibits an average to high score in extraversion, agreeableness, and openness, a low score in neuroticism, and a noticeably high score in conscientiousness, whereas SK tends to be average to high in all five qualities.

Results and Discussion

Both twins are mentally healthy, as evidenced by their T-scores on the 11 clinical scales of the PAI, which were either within the normal range or only marginally below average. It's interesting to note that on five of the eleven scales somatic complaints, anxiety, anxiety-related disorders, depression, and antisocial features the scores of SK and US were nearly equal, differing by no more than three points. In terms of mania and schizophrenia, SK did do worse than the US, but in terms of paranoia, borderline features, alcohol problems, and drug problems, the opposite was true. Overall, the twins' ratings differed just slightly, indicating that their clinical symptom profiles are rather comparable (Fig. 1).

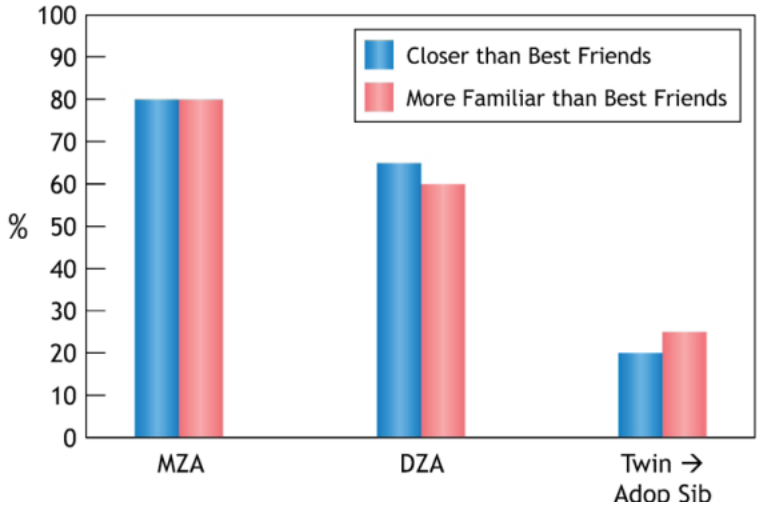


Fig. 1: Twin and Adoptive Sibling Relations—Current

The text we are examining is as follows: Three adult concussions have occurred in the US, all as a result of slipping on ice and auto accidents. In January 2018, the most recent and severe one occurred, resulting in common symptoms like light sensitivity and difficulty focusing. US struggles with increased anxiety and rage and feels like she's changed into a "different person." Although she has always thought of herself as a bad test-taker, she discovers that in some problem-solving situations, she needs more time to digest information.

Since she was seventeen, when she smoked only infrequently, US has proudly maintained her status as a non-smoker. On the other hand, SK has never touched a cigarette. Over the years, US has ramped up her involvement in sports and physical activities. Back when she was 13, she considered herself “sedentary,” but from ages 17 to 30, she enjoyed some light physical activities. By the time she hit 35, she was dabbling in active sports, and now, at 40 and beyond,

she's a regular participant. In contrast, SK was all about sports during her school years. She believes she still has the athletic spark and would love to get back into sports, but her current responsibilities keep her from doing so.

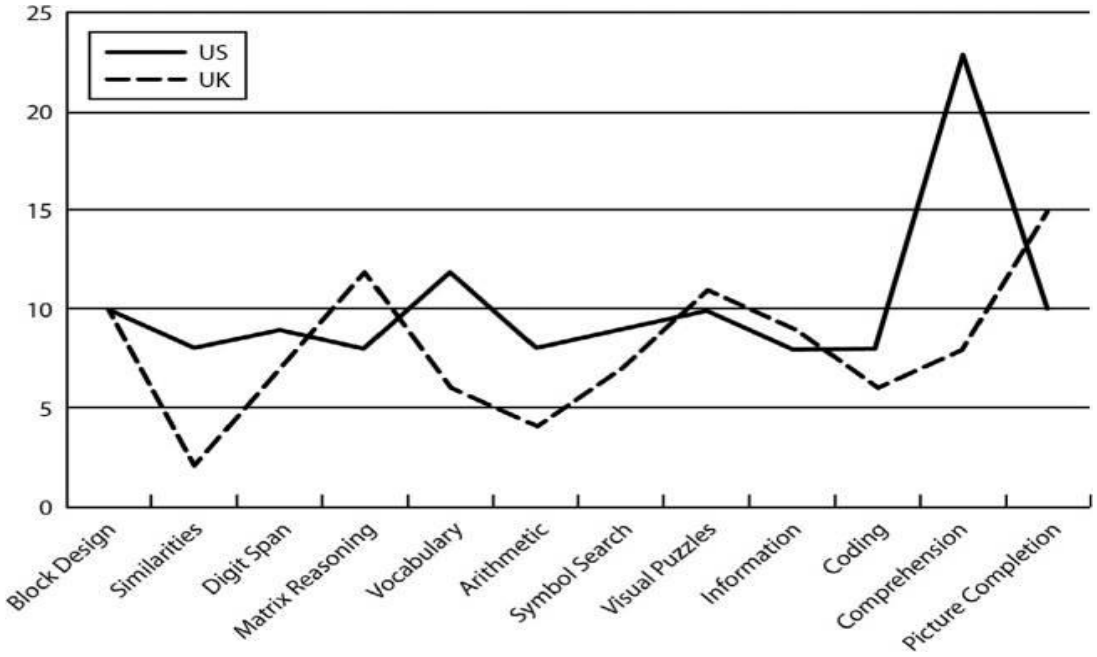


Fig. 2: T-Scores

The third section, "Do Environmental Similarities in Rearing Environments Explain MZA IQ Similarity?" delves into the data that Bouchard and his team collected on the raising of monozygotic twins. Here, they're examining the degree to which these twins' upbringings and IQs are comparable (Tellegen et al., 2013). According to their research, monozygotic twins' IQ scores were not considerably impacted by the circumstances in which they were raised separately. "Has Pre- and Post-Reunion Contact Contributed to MZA Twin Similarity in IQ?" is the fourth segment. Bouchard and his associates investigate the relationship between twin contact and IQ similarity. They came to the conclusion that contact has no bearing on the IQ similarity of monozygotic twins raised apart after looking at the frequency of interaction between various pairs of twins and comparing that to their IQ scores (Fig. 2).

Conclusions

In general, the twins' differences were more noticeable than their similarities. The differences were evident in areas such as overall intelligence, ideational fluency, psychomotor completion times, Stroop completion times, and even their health. However, they did have several things in common, especially when it came to social support, work satisfaction, and mental health. There was some variation in the personality data. The twins were very glad to have bonded, even though they had conflicting perspectives about their connection. In general, it appears that hereditary variables and childhood illnesses in the UK are linked to the behavioural and physical disparities between them. It's interesting to note that their independent lifestyles in England and the United States, which began when they were young adults, didn't appear to have a big influence on their growth. Future studies comparing the US and the UK will examine other topics such as recreational pursuits, food preferences, and the development of their relationship. Since the genetic similarities between MZA twins make it easier to examine how diverse circumstances impact development, studies on DZA twins provide important insights into MZA twin studies. You cannot conclude that one is more dominant based only on DZA twins or a single example because DZA twins exhibit variances for both genetic and environmental factors. Still, the insights gained from DZA pairs, when looked at alongside existing research on twins raised apart, can spark new ideas and research paths. Future studies on twins raised apart should definitely take into account the factors that influence personality changes and cognitive decline.

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