

PERSONALITY DIFFERENTIATION OF IDENTICAL TWINS REARED TOGETHER

Betsy Maxon

David N. Daniels, M.D.

Abstract

The personality structure of 36 pairs of identical twins reared together was determined using *The Essential Enneagram Test*, (Daniels & Price, 2000) plus interviews of the participants and their family members. The results were compared with results from pairs of randomly selected unrelated individuals of known types. The Chi Square Test showed significant differences between the identical twins and the random pairs ($p=0.003$). Contrary to expectation, only 2 of the 36 pairs had the same personality type as each other (5.5%), fewer than in the control group (16.8%) ($p=0.089$). However, the personalities of 30 pairs were connected in several other ways on the Enneagram diagram. We hypothesize that these findings reflect both a strong genetic influence and an environmentally based “drive” for differentiation between identical twins reared together.

Introduction

The genetics of identical twins are considered to be identical. We might expect, therefore, that their personalities would be the same. We wanted to find out if this was true. We did not want to base our findings on a collection of traits, but on a system that views personality as a whole. For this reason we used the Enneagram system, a comprehensive and dynamic indicator that views an individual not as a collection of various traits but as understandable and predictable patterns of attention, motivation, behavior, and emotion that combine to form a “type.”

In our study the participating twins made their own selections from descriptive material, and their choices were verified in interviews designed to explore the various ways and reasons why the twins differed from each other. We were looking for whatever might have an impact on the formation of a consistent and cohesive personality structure.

Comparing the personality structures of the twins with those of a randomly selected control group would presumably indicate the influence of genetics.

We originally expected that identical twins would show a higher incidence of identical personality types based upon shared genes than would random pairs. Researchers often agree that personality or temperament is inborn (Robinson,

Reznick, Kagan & Corley, 1992 p. 1030), but how malleable is this? For example, Plomin, Willerman, and Loehlin (1976) found that young identical twins do not have similar personalities.

By developing some of our own data, we hoped to weigh in on the question of nature versus nurture regarding personality.

Supporting Literature

Nature versus nurture; the concept that has caused so much discussion for so long, still remains unsettled. Rushton, Russell, and Wells (1985) state that “there is, in fact, a great deal of evidence that personality traits (a) exist, (b) are longitudinally stable, (c) can be assessed by several converging indices, and (d) are inherited” (p. 64). Temperament characteristics in children seem to be early predictors of adult personality differences according to Robinson, Reznick, Kagan, and Corley (1992). They write, “most investigators in this domain have suggested, either implicitly or explicitly, that a temperamental category implies heritable processes” (p. 1030). And lastly, in reference to their own study of young twins, “these data...suggest that this temperamental category (in this case the fearful-fearless dimension in novel situations) has a biological basis” (p. 1036).

Segal (1999) documents hundreds of twin studies that stress the many differences between identical twins; she emphasizes that these differences can be due only to environment. Environmental differences may begin in utero with different positions in the womb, unequal nutrition delivery, and a variety of other possibilities. Farber (1981) also stresses the importance of the womb environment: “The environment within the womb may have as decisive, and, in some instances, a more decisive influence than the world into which the neonate emerges at birth” (p. 13).

Piontelli (1992) has published a psychoanalytic study of her observations of eleven fetuses (three singletons and four sets of twins) in the womb using ultrasound scans followed by observing their development in the home up to the age of four years. Her central finding from the study of all four sets of twins shows clearly “how different the intra-uterine environmental conditions were for each member of the couple” (p. 112). Also with the twins it was possible to note clear individual temperament differences between the two members of the couple from the early stages. Some showed no reaction to being punched and kicked. Others reacted by withdrawing or by actually seeming to seek contact. Some twins stroked each other.

Piontelli also noted that, “Each couple, in fact, from the early stages seemed to have its particular mode of relating, which continued throughout pregnancy and could still be noted in post-natal life. Therefore from the very early stages one could observe the emergence of both individual and couple patterns which continued to be seen in later life” (p. 112). Piontelli also states the following in highlighting the independent behavior of twins in utero:

Ultrasonic imaging shows us the emergence of independent behavior at as early as six or seven weeks ...From the moment the fetus begins to have sensory experiences...it seems to show highly individual preferences and reactions. The fact that characteristic behavior patterns are established so early and evolve developmentally but without losing their characteristic form suggests that they may well involve some very rudimentary form of 'me-not me' differentiation. (Piontelli, 1992, pp. 235, 239.)

In a study of young twins' personality traits, Plomin, Willerman, and Loehlin (1976) write that "the greater resemblance in appearance in identical twins does not make them more similar in personality" (p. 43). Indeed, the data suggested a contrast effect in which identical twins who were easily mistaken in appearance tended to be rated as less similar in personality, and they go on to state, "MZ (monozygotic) twins who are very similar in appearance may strive to differentiate themselves from each other behaviorally in an effort to forge separate identities" (p. 43).

In the only published Enneagram study of twins, Brooks (1998) found, contrary to the Plomin, et al. study and to our results, that identical twins were of the same type in 19 of 20 identical twin sets (95%). Typing was based on a questionnaire that had not undergone validity and reliability study. There was no interview data or other confirmation given. This study suggests the importance of both accurate measuring instruments and the need for further twin studies as it is virtually the reverse of our findings of only 5.5% of the pairs being "Same."

Method

Description of the Enneagram

The Enneagram personality system describes "nine different personality types and how they interact with one another. Each type is defined by an emotional habit, a characteristic pattern of thought, and a style of relating to others, which together produce a distinct point of view" (Palmer, 1998, p.1).

This system sees an individual's type as a comprehensive entity with distinctive personality characteristics. An individual may discover his own type by comparing his own thoughts, feelings, and behavior to written descriptions of the nine types. Participants who have trouble recognizing themselves in the descriptive paragraphs may be assisted by interviews with certified teachers.

The Enneagram Diagram (Figure 1, on page 69) illustrates how the nine types are connected to each other, either on the circle's edge or by the internal lines. Explanations of the meanings of this diagram are found in the "Results" section of this paper.

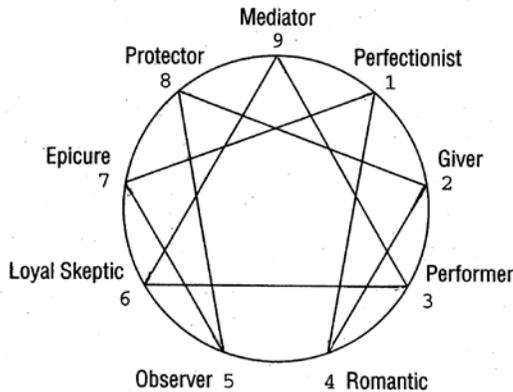


Figure 1

This diagram illustrates how the nine types are connected to each other, either on the circle's edge or by the internal lines. Explanations of the meanings of this figure are found in the Results section of this paper.

Participants

Thirty-six sets of identical twins participated in this study. Eleven sets were male and 25 female. Two sets were black; 34 were caucasian. Their ages ranged from age 8 to 67. Thirteen sets were children age 12 or younger. All were physically normal and functioning well.

Participants volunteered through the website of the National Organization of Mothers of Twins, Inc. or by referral. All were informed of the purpose of the study, that their interviews would be recorded, and that a report for publication would be written. They were not paid.

Two sets were DNA tested. In other cases, the doctor delivering the babies had told the parents that there was only one placenta, confirming that the twins were identical. The twins in our study look alike and people cannot easily tell them apart. Nine are mirror-image twins: i.e., one right-handed, the other left-handed, with hair growth patterns on opposite sides of the head and other physical differences on opposite sides of the body.

Design and Procedure

The adult twins took *The Essential Enneagram Test* from *The Essential Enneagram* by Daniels and Price (2000, p. 5-7). (See the Appendix for methodology.) We followed up with an experienced teacher's one-hour interview of each twin to confirm the type that he or she had selected. A similar set of paragraphs more suited to their age was given to the younger participants, children aged 8 to 12. Other family members were consulted when possible. Parents of the children were interviewed. Transcriptions of the recorded interviews were given to the participants who were encouraged to suggest corrections.

The members listed in the 2001 Directory of the Association of Enneagram Teachers in the Narrative Tradition provided a group of unrelated pairs to compare with the twin pairs. Included in this group were all those listed in the

directory except for those whose given names did not indicate their sex. The Directory provides their Enneagram types. This made a group of 262 individuals: 64 males and 198 females. Thirty-two pairs of males and 99 pairs of females were selected randomly as our control group.

Results

In examining the data we categorized those twins of the same type as “Same,” those with any connection on the Enneagram Diagram as “Connected,” and the rest as “Not-Connected.”

Thirty-two of our 36 twin sets (83.3%) were found to be “Connected” types. Of these 32: (1) the types of 6 (16.7%) were located on either side of a type on the circle’s edge; (2) the types of 11 sets (30.5%) were located side-by-side on the circle’s edge; and (3) internal lines connected the types of 13 sets (36.0%). Only 2 sets were the “Same” (5.5%). Four of the sets (11.1%) had types that were “Not-Connected.” In contrast, 22 (16.8%) of the control pairs were “Same” types with a total of 80 (61.1%) being “Connected” types and 29 (22.1%) being “Non-Connected” types. Table 1 shows the comparison of the “Same” types; (A), “Connected” types (B, C, D), and “Not-Connected” types(E).

Table 1

***Tallying Twin Pairs’ and Control Pairs’
Connections of Personality Types***

	Twin Pairs	Control Pairs	
Same types(A).	2(5.5%)	22(16.8%)	0.089
Connected types.	30(83.3%)	80(61.1%)	0.013
On either side of a type(B).	6(16.7%)	18(13.7%)	
Side by side on circle edge(C).	11(30.6%)	34(26.0%)	
Internal line connection(D).	13(36.1%)	28(21.4%)	
Not connected types(E)	4(11.1%)	29(22.1%)	0.141

We compared the pattern of these three major categories of types (“Same”, “Connected” and “Not-Connected”) across Twin Pairs and Control Pairs using a Chi Square Test of Association. The pattern of types showed a statistically significant difference between Twin and Control Pairs (X^2 $df=2 = 6.345$, $p = 0.042$).

The strongest differences appeared to lie between the “Same” and “Not-Connected” types for the two groups, i.e., 5.5% versus 11.1% and 16.8% versus 22.1% (X^2 $df = 1 = 8.96$, $p = 0.003$).

The five categories shown in Table 1 are illustrated in Figures 2 through 6 in order to provide a better sense of how they appear on the Enneagram Diagram:

A. Two sets of twins (5.5%) have types that are the same. These twins are, of course, the most alike in behavior.

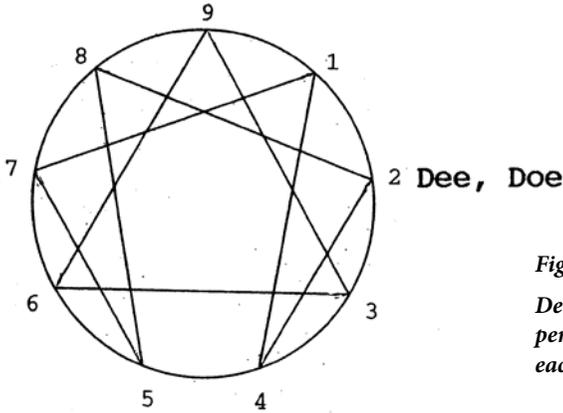


Figure 2

Dee and Doe, whose personalities are the same as each other. Both are Type 2.

B. Six sets (16.7%) have personality types located on either side of a type on the circle's edge in the diagram. According to the Enneagram model each personality type has access to the types on either side of it on the edge of the circle.

Eleven sets (30.5%) have personality types side by side on the circle edge of the diagram. These twins also may have easy access to each other's personality traits.

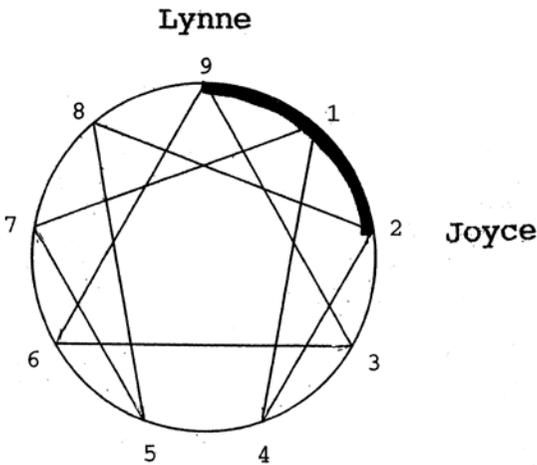
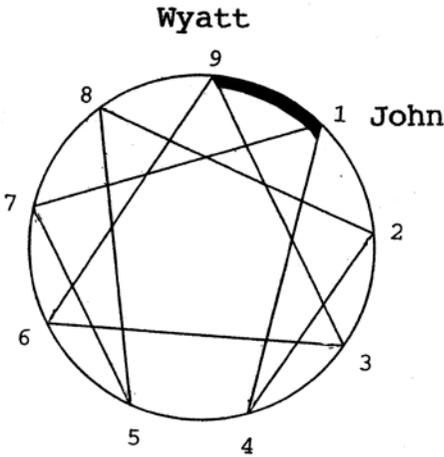


Figure 3

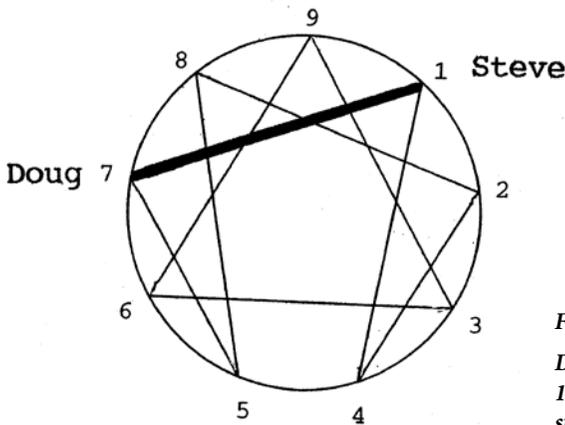
Lynne, Type 9, and Joyce, Type 2, whose personality types are on either side of Type 1 on the circle's edge.

C. Thirteen sets (36.1%) have types connected by the internal lines in the diagram. For example, a Type 7 personality, in a secure state of mind, may take on the appearance and behavior patterns of Type 5, or in a stressful state of mind may take on the appearance of Type 1.



*Figure 4
Wyatt, Type 9, and John, Type 1, whose personality types are next to each other on the circle's edge.*

D. Four sets of twins (11.1%) have types that are not connected either by internal lines or on the circle's edge of the diagram.



*Figure 5
Doug, Type 7, and Steve, Type 1, whose personalities are the stress or security type of each other.*

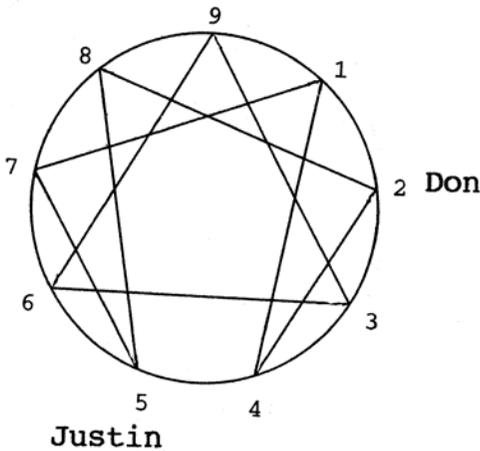


Figure 6

Don, Type 2 and Justin, Type 5, whose personalities are not connected to each other, either on the circle's edge or by the internal lines.

Discussion

Our initial expectation was that we would find more twin pairs of the same type than could be expected randomly. This was shown not to be the case. In the present study, we found that a large majority (94.5%) of identical twins do not have the same personality structure as one another. In fact, the random comparison group has a larger percentage of pairs with identical personalities (16.8% vs. 5.5% for the twin group). Likely due to the small numbers in this comparison, the p-value reached only 0.089. Identical twins' genetics are presumed to be the same; therefore there must be environmental factors that are causing their personalities to differ. This finding agrees with other studies that have concluded that a non-shared environment and peers represent large factors in determining personality (Harris, 1998, p.169).

The two sets of twins in our study who have identical personalities are a set of Type 2s and a set of Type 9s. Daniels and Price (2000) describe these types as "sharing the characteristic of pleasing others and meeting others' wants and needs" (p. 61). Their habitual focus of attention is on the "other" and not on the "self." Both types "orient toward the claims made upon them by others, losing awareness of their own needs and priorities" (p.61). We hypothesized that with these two pairs of twins this constant focus away from the "self" has overridden the more customary and automatic desire to individuate.

Of the 34 sets of twins in this study who have personality types that are not the same, 30 sets (83.3% of the total) have types that are connected in specific ways according to the Enneagram system. The comparison to the random pairs finding of 61.1% reached a p-value of 0.013. This points toward a genetic connection. This connection appears to be complemented by some factor or factors that cause differentiation.

Thus, the twin pairs tend to manifest personality types that have a relationship to each other yet are different (except for the 2 pairs that are the same). Of particular interest are the 36.1% of twins who are connected by the internal lines of the diagram. This line of connection is dynamic. Life events will thrust an individual from the position of his basic type to a position via an internal line either in the direction of stress or of security. Twins with this connection are uniquely bonded. The dynamics of their connection gives them automatic visits into the other's territory again and again.

Only four of the twin pairs (11.1%) have types that are not connected as compared to 29(22.1%) of the random group. Their types are not adjacent on the circle's edge, and the inner lines do not connect them. The p-value for this difference reached only 0.141, possibly due to the small number of twin pairs in the sample. These twins look exactly alike and their physical and intellectual abilities seem identical. But their personalities are different from each other.

As we discovered in our interviews, the majority of twins in this study have spent countless hours pondering their individual differences, and comparing their reactions and preferences. The tendency is for twins to find their own separate individualities and to know how different each one is from the other.

Identical twins give us a unique opportunity to study the roots and the development of personality. If a majority were found to have the exact same personality type as each other, an overriding role could be assigned to genetics. However, this does not appear to be the case.

The distribution of the randomly selected non-twin pairs in comparison to the identical twins showed greater proportions of both "Same" types (16.8% compared to 5.5%) and "Non-Connected" types (22.1% compared to 11.1%). This may simply point to greater diversity in the range of types that could be expected in a general population.

Examples

Specific examples from interviews may help to illustrate our conclusions:

Category A ("Same", Figure 2).

Dee and Doe, now age 33, are the most alike in personality of all the twins in this study. They are both Type 2: generous, helpful and giving, sensitive to the feelings of others, supportive and appreciative. They have always thought of themselves as two different people, yet they cannot think of any differences between them.

Dee and Doe probably know and understand each other better than any of the other twins in this study. By knowing the other, each one knows herself.

Category B (“On Either Side of the Type”, Figure 3).

Joyce (Type 2) and Lynn (Type 9) are located on either side of Type 1 on the circle edge. Both share Type 1 characteristics: the desire to do what is right and to do it well, to fulfill obligation, and to act responsibly. In looks and observable behavior, each might appear to be Type 1. Joyce, the giver type, has strong feelings of nostalgia about their early years, love, and connectedness. Lynn, the mediator or peacemaker type, is less attached and more go-along-to-get along about their relationship with each other. These differences have led to misunderstandings and judgments between them. This judgmental quality also likely reflects their shared Type 1 or perfectionist tendencies.

Category C (“Side by Side”, Figure 4).

As an example of twins connected on the circle edge, Janna (Type 1) and Nancy (Type 9), age 42 when interviewed, have explored their twinship to the extent of writing and publishing their own story as a reference for other twins. Their mother had noticed differences between them when they were babies and had treated them differently in response to each one’s needs. But everyone else in their lives treated them as a twosome. For them “this treatment produced a sense of over-identity with one’s twin and an under-identity with one’s self” (Sipes, 1998, p.50). “It took years for us to be able to analyze our own behaviors. Our reality was that together in our twinship, we had developed a full set of traits for one balanced, well-rounded person” (Sipes, 1998, p.152). Thus, while Janna and Nancy do share some personality traits, they are basically different personality types. They complement each other.

Category D (“Inner Lines,” Figure 5).

A pair whose personalities are connected by internal lines on the diagram are Dorothy (Type 3) and Liz (Type 9), now age 35, who were brought up with the understanding that Dorothy “had to win.” Type 3 is a personality focused on achievement, being personable, being the best, and avoiding failure. Type 9 is focused on being sensitive to others and trying to please them, and avoiding conflict. These roles were strongly encouraged by their parents. As girls, they were both good students and star athletes. Liz felt that it was her role to compete but come in second. She also felt that she must defer to Dorothy in order to keep their very close relationship with one another. Dorothy felt that she had to take care of Liz. “She had to give in and I had to work hard to be the best. She had to be second.”

Category E (“Not-connected”, Figure 6).

Justin (Type 5) and Donald (Type 2), age 15, are twins who most definitely do not want to be like each other. In high school now, Don tries to gain the approval

of his classmates. Justin thinks Don's behavior is inauthentic; he would not do this himself and does not admire Don.

How did they get going in such different directions? Their parents say that when they were babies, too little to crawl, and they were put on the floor, Don would always roll toward Justin. By contrast, Justin would never roll toward Don. Don was the leader as far as looking after his brother, rolling toward him, and reaching out. Justin was happy just by himself. For years Justin was willing to follow along looking to his brother for leadership. Now, Justin does not want to do as Don does. Neither one has much understanding of the other.

Conclusions

In this study, we have found that the large majority (94.5%) of identical twins studied did not share the same personality type as measured by the Enneagram. Something other than DNA has contributed to their personality makeup. Their personality differences seem to be due to differences in their individual environments. This could happen as early as when the fertilized egg divides in the womb, or it could begin any time after that. Once the differences are noticed, the twins are apt to be treated differently, reinforcing and strengthening their differences. A second factor is the great drive of each individual to have a recognizably separate self-image. In this study participants often mentioned being their own person. This "drive" to individuate is a finding among siblings in general (Plomin & Daniels, 1987, p.1-16).

The high level of connected or related types and at the same time the low level of identical types points to strong genetic influences in combination with strong influences to differentiate. This tendency to individuate is remarkably strong in identical twins who are seen as similar and often treated as similar. Driven to not be the same type, they remain attached through related or connected types.

The only twins, just two pairs, that were of identical Enneagram types were types (2 and 9) that tend to focus on others. And only 11.1% of the identical twins were unconnected in any way, suggesting a genetic as well as an environmental factor.

There are several limitations in this study. The control group was not ideal. Fraternal twin sets or at least siblings would have better matched the experimental group. Also, the small sample size reduced the statistical power of the findings. Although the Enneagram system has relatively little research documentation, the work of Daniels and Price has demonstrated both reliability and validity in determining type (Daniels & Price, 2000, p. 61).

It could be claimed that the data showed what already is known: that there are both genetic and environmental components in determining personality structure or type. The data here, however, demonstrates a powerful inter-relationship between genetic pull and environmental "drive" for differentiation.

Authors' Note

We thank the 36 sets of identical twins and their parents who participated voluntarily in this study. We also thank Denise Daniels, Laura Baker, Nico Peruzzi, Tom Chou, Bill Maxon, and Paul Maxon who assisted in various ways with the preparation of the paper.

References

- Brooks, David (1998). Are personality traits inherited? *South African Journal of Science*. Vol. 94.
- Daniels, David & Price, V. (2000). *The Essential Enneagram*. San Francisco: Harper.
- Farber, S. (1981). *Identical Twins Reared Apart: a Reanalysis*. New York: Basic Books, Inc.
- Harris, J. R. (1998). *Why Children Turn Out the Way They Do*. New York: Touchstone.
- Palmer, H. (1998). *The Enneagram Advantage*. New York: Harmony Books.
- Plomin, R. & Daniels, Denise (1987). Why are children in the same family so different from one another? *Behavioral and Brain Sciences*. 10.
- Plomin, R., Willerman, L & Loehlin, J. C. (1976). Resemblance in appearance and the equal environments assumption in twin studies of personality traits. *Behavior Genetics*. Vol. 6, No. 1.
- Piontelli, A. (1992). *From fetus to child: An observational and psychoanalytic study*. London: Tavistock/Routledge.
- Robinson, J. L., Reznick, J. S., Kagan, J. & Corley, R. (1992) The heritability of inhibited and uninhibited behavior: a twin study. *Developmental Psychology*. Vol. 28. No. 6.
- Rushton, J. P., Russell, R. J., & Wells, P. A. (1985). Personality and genetic similarity theory. *Journal of Social and Biological Structures*. 8.
- Segal, N. (1999). *Twins and What They Tell Us About Human Behavior*. New York: Dutton.

CONTRIBUTORS

David Burke is the founding and current director of the Australian Institute for Enneagram Studies and is a leading authority on the Enneagram personality system, lecturing throughout Australia and internationally. As Managing Director of Ingenius Communication Consultants, David consults widely to business, educational, and community-based organizations and is an experienced counselor and spiritual director. He is currently completing doctoral studies at the Centre for Islamic Research, Griffith University, with Imam Mohammad Abdulla, and he has worked for over a decade with the eminent Patristic scholar, Prof. Pauline Allen.

Beatrice Chestnut, Ph.D., M.A. has a Ph.D. in communication studies and an M.A. in psychology. She has taught at Northwestern University, the California Institute of Integral Studies, and The School of Law at the University of San Francisco. She has been trained as a group facilitator at Stanford's Graduate School of Business and does training, development, and coaching in organizations using the Enneagram. She has been studying the Enneagram for over 18 years, and she has a private psychotherapy practice in San Francisco.

Tom Condon has taught over 700 workshops in the United States, Europe, and Asia. The Director of Changeworks in Bend, Oregon, he has been an adjunct faculty member of Antioch University and the University of California at Berkeley. He is the author of over 50 audiotapes, videotapes, and books, including *The Enneagram Movie and Video Guide*.

David Daniels, M.D. is clinical professor of psychiatry and behavioral sciences at Stanford Medical School and co-author of *The Essential Enneagram*. He also co-developed the DVDs, *The Enneagram: Nine Paths to a Productive and Fulfilling Life* and *The Enneagram in the Workplace*. In private practice for more than three decades, David also has taught the Enneagram system at Stanford, in the local community, and internationally for 20 years. With Helen Palmer he co-founded the Enneagram Professional Training Program (EPTP) and was a founder of the International Enneagram Association (IEA). He has developed or co-developed many innovative Enneagram-related workshops. Visit www.enneagramworldwide.com for additional information.

Ron Esposito, B.G.S., M.A., is a certified Life Coach, Enneagram Teacher/Trainer in the Narrative Tradition and a 12-Step Recovery Facilitator at the Conscious Living Center in Cincinnati, Ohio. He is a practicing mystic drawing upon Eastern spirituality and philosophy as well as Western New Thought metaphysical principles. You can reach Ron through his email address, Ron.Esposito@gmail.com, or at his web site: www.GoConscious.com.

Karl Hebenstreit, Ph.D.'s 15-year career spans the areas of organization development, human resources, and executive coaching in the health care, pharmaceutical, telecommunications, professional services, high-tech, and real estate services industries. He is currently a Leadership Development Consultant at Kaiser Permanente and Principal of Perform & Function. He holds a Ph.D. and M.A. in Organizational Psychology from CSPP/AIU, and an MS in HR Management from Rutgers, where he also earned his BA in Psychology, French, and Political Science.

Betsy Maxon has a BA from Vassar. She was employed first as an office assistant in the Bureau of Personnel, State of Wisconsin, and then as a research assistant for the Department of Children and Youth, State of Wisconsin. In Michigan she developed a program to assist with the integration of the public schools. She became interested in the Enneagram with the publication of Helen Palmer's first book, and she studied first with Patrick O'Leary and Maria Beesing and later with Helen Palmer and David Daniels. She received certification as an Enneagram Teacher in the Narrative Tradition.

Uranio Paes received his MBA at Fundacao Getulio Vargas (FGV), Latin America's top business school. A business consultant since 1990, he has been a serious Enneagram student since 1996. He was the first Brazilian Enneagram teacher certified by Palmer-Daniels, and is now their affiliate teacher, organizing and co-teaching the Enneagram Professional Training Program (EPTP) in Brazil and Argentina. He currently runs his own company dedicated to providing Enneagram-based services for Latin American organizations (up9 Desenvolvimento Humano), and has been an Enneagram trainer, consultant, and coach since 2000.

Clarence Thomson has taught the Enneagram for 15 years and with Mary Bast, co-authored *Out of the Box: Coaching with the Enneagram*. His latest book is, *You're Fat; Your Fault?* You can visit his new web site at www.enneagramcentral.com.

Jerry Wagner, Ph.D. is a clinical psychologist, therapist, and consultant in private practice, and is a faculty member in the department of psychology and the Institute of Pastoral Studies at Loyola University, Chicago. He is the author of the *Enneagram Spectrum of Personality Styles: An Introductory Guide*; the *Wagner Enneagram Personality Style Scales (WEPSS)*; and *Two Windows on the Self: The Enneagram and the Myers-Briggs*. Jerry has been researching and teaching the Enneagram for over 30 years and has offered the Enneagram Spectrum Training and Certification Program nationally and internationally for the past 10 years. Jerry was on the Board of Directors of the International Enneagram Association and is an editor of the Enneagram Journal.

Reproduced with permission of the copyright owner. Further reproduction prohibited without permission.

Environment affected personality when twins were raised apart, but not when they were raised together, the study suggested. Reporter Daniel Goleman wrote in The New York Times at the time that genetic makeup was more influential on personality than child rearing — a finding he said would launch "fierce debate." "We never said [family environment] didn't matter," Segal said at the APA meeting. Segal, who wrote a book about the study called "Born Together — Reared Apart: The Landmark Minnesota Twins Study" (Harvard University Press, 2012), is now doing a prospective study of Chinese twins raised apart, often in different countries, by adoptive families. Follow Tanya Lewis on Twitter and Google+ . Importantly, identical twins raised in the same household — the same "outer" environment — still develop personality differences over time. Behavioral geneticists have long pegged these differences to influences by the "non-shared environment," though there's no real consensus on exactly what the non-shared environment consists of, Kempermann told io9. In twin studies, he says, these non-shared environmental influences essentially boil down to the individual experiences siblings have, and their own personal interactions with their environment. Kemperman and his colleag Personality differentiation of identical twins reared together. B Maxon. D N Daniels. Gemini: The psychology & phenomena of twins. J W Hagedorn. J W Kizziar. Subsequent or concurrent processes of differentiation between twins are also examined. The article concludes with suggestions for further analyses of twinship. View.