Elizabeth M. Bryan: Tributes From Home and Abroad; Research Reviews: Anorexia Nervosa in Opposite-Sex Twins, Twin Study of Self-Esteem, DNA Differences in Monozygotic Twins; Twins and More Twins: Twins Living Apart, Twins Playing Together, Twins Working Together, Twins Playing Apart, Multiple Birth Odds

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Elizabeth M. Bryan: Tributes From Home and Abroad

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The life and work of Dr Elizabeth M. Bryan, our late distinguished twin studies colleague, are remembered. Tributes come from colleagues in the United States and the United Kingdom, where Elizabeth lived and worked. This section is followed by reviews of twin research on anorexia nervosa, self-esteem and DNA differences in monozygotic twins. The lives of some noteworthy twins are also briefly chronicled, both for their scientific value and human interest. An update on current twinning rates follows.

I last saw Elizabeth Bryan at the opening reception of the 2007 meeting of the International Society for Twin Studies (ISTS), in Ghent, Belgium. Accompanied by her husband and author, Ronald Higgins, and some others she was speaking excitedly about the upcoming release of her book, *Singing the Life: The Story of a Family in the Shadow of Cancer (2007).* She showed me a reproduction of the cover, a most beautiful blend of purple, blue and orange flowers superimposed on a patterned background. Her zest for this newest work was apparent — and I understand it now having read the book on a recent cross-country flight. My admiration and respect for Elizabeth could not have been higher as I followed her story.

Elizabeth was born into a family that carried a BRCA1 mutation on the paternal side, a gene known to predispose its bearers to ovarian or breast cancer. (Elizabeth developed neither; her death was caused by pancreatic cancer.) In writing her book she performed the same great service for cancer victims that she did for families with twins — telling the complete story without hesitation and offering advice in a gentle, caring way.

Tributes to Elizabeth in *Twin Research and Human Genetics* come from two places: the United States and the United Kingdom. The remembrance from Britain comes from Jane Denton, Director of the Multiple Births Foundation, who also provided the photograph.

I have many memories of Elizabeth Bryan, as do most members of the ISTS. I will share some of them in this article after providing a brief overview of the professional work she did on behalf of twins and their families. The material has been drawn from various articles about her life and work (Gregson, 2008; *Telegraph*, 2008).

Elizabeth's first interest in twins came in 1973 when, as a junior physician, she assisted in a twin delivery. She was struck by the difference in size and health of the two babies. This event led to her research on the placenta, as well as to sustained involvement with parents of twins groups. Her efforts focused on the need to address the unique psychological and practical issues of raising multiple birth children. Toward this end, she founded the Twins and Multiple Births Association (TAMBA) in 1978, and served as its president until 1984 and as a trustee until 1991. In 1988, she founded the Multiple Births Foundation (MBF), an organization she directed until 1998. During these years and beyond, she wrote a great deal about the loss of a twin and its impact on the family.

Elizabeth served the ISTS in several capacities. In 1998, she became the ninth president, the year that the triennial congress was held in Helsinki, Finland. She also hosted the London

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meeting, in July, 2001. Together with her husband Ronald Higgins, she edited a special issue of *Twin Research* (2002), devoted to issues surrounding the loss of a twin. Many of the contributions came from a pre-conference symposium entitled, 'The Loss of a Twin: Theory and Practice Revisited.' Elizabeth authored or co-authored two of the eight papers in this collection, as well as the introduction.

My memories begin with the first time I met Elizabeth Bryan. I was introduced to her at the Fourth International Congress of Twin Studies, held in London, in June–July, 1983. I was instantly impressed with the intelligence, enthusiasm and joy that she brought to her work. Our paths crossed again when Elizabeth visited the University of Minnesota, probably in the late 1980s. I was a research associate in the Department of Psychology and had a wonderful time showing her the laboratory and listening to her seminar. She spoke about a pair of infant twins named Jasper and Oliver. I am amazed that I remember the names of those twins — this is information that was hardly central to the issues she was addressing — perhaps I remember them because she spoke about them in such an articulate and personal way. Soon after, I was a guest at her home in Vowchurch during which time we attended a summer gathering of TAMBA members. The experience of staying with Elizabeth and Ron reminded me of an earlier time when large groups of family and friends gathered for long weekends, spending time together and apart, and depending mostly on one another for entertainment. I strolled around her grounds wearing high rubber boots to keep clear of the mud. In the morning she prepared a fantastic summer pudding, a dish composed of several varieties of red berries. Finally, I remember Elizabeth serving as host at the Twin Congress held again in London, in July 2001. She delivered a number of speeches at that event, and they were all perfectly polished. She had a knack of making everyone feel like an honored guest. I feel honored to have known her.

Listed below, following Jane Denton's moving tribute, are the titles of Elizabeth's books; her many scholarly papers appear in *Twin Research*, the *Journal of Paediatric Medicine*, the *Journal of Perinatal Medicine*, the *International Journal of Obstetrics and Gynaecology* and other sources.

Tribute to Elizabeth Bryan

Jane Denton, Director, the Multiple Births Foundation, London, England

Dr Elizabeth Bryan was a distinguished consultant pediatrician who gained an international reputation for her pioneering work and expertise in the field of multiple births. As a junior pediatrician, her interest was aroused at the delivery of twins: 'I do not know who was more surprised, she (the mother) or I. One was a bouncing 6-pounder who looked as though he had had too much to drink; he was not only chubby, but bright red.' His brother, 'a little scrap' weighing little more than three pounds, 'was pale and wizened'.

Intrigued, Elizabeth embarked on research into the function of the placenta that brought her into contact with over 100 mothers of twins. Learning so much about the special problems of caring for two or more babies and astonished at the extent of and differences in their emotional, practical and financial needs made a huge impact. Realizing that she lacked the skills and knowledge to do more than 'offer a sympathetic ear and a means of contacting other parents of twins', the research proved to be a turning point in her career which she has devoted not only to the medical problems, but to the equally important holistic care of these families.

Recognizing the tremendous value of peer group support, Elizabeth was closely involved with the small number of local twins clubs that evolved into TAMBA, (a national UK organization run by parents and offering mutual support). A co-founder and then president until 1984, she continued as a trustee until 1991. Realizing also that there was a great unmet need for professional support for multiple birth families, Elizabeth set up the specialist twins clinics first in London (1987), followed by Birmingham and York.

Increasing experience with multiple birth families confirmed the overwhelming need for better professional support, not only from pediatricians but the whole multidisciplinary team. She also realized the importance of continuity of care from the diagnosis of a multiple pregnancy onwards, preparing parents to meet the unique challenges and understanding the needs of the children themselves through early childhood and adolescence. Convincing medical colleagues of the value of twin studies to understand more about these problems was an uphill struggle. Undeterred, Elizabeth set up the Multiple Births Foundation (MBF) in 1988, a charity based at Queen Charlotte's & Chelsea Hospital, London, which pioneered the provision of information and education for health care and other professionals combined with direct support for the families.

A wonderful communicator, Elizabeth was held in the highest esteem and won great affection from parents and children alike. Their confidence was a key factor in allowing her to learn about not only the pleasures, but also the difficulties of caring for, or being, a twin, triplet or more. Inevitably with the higher mortality and morbidity associated with multiple births, bereavement and disability affects many of these families. Elizabeth was a major influence in improving professional understanding and support for parents coping with the loss of one or more child while caring for the survivors. Elizabeth also applied her holistic principles to families with one or more disabled children. While traditionally care had always been focused on the disabled twin, she realized that the healthy child often needed as much help and support in different ways.

Never shirking from confronting difficult issues, as the ethical and legal dilemmas of multifetal pregnancy reduction and selective feticide were debated, Elizabeth's concern was for the couples and how best to support them and in the longer term the surviving children. Her extensive knowledge of the risks and consequences of multiple births made her a dedicated campaigner for the reduction of the number of embryos to be transferred in IVF treatments and improved monitoring of ovulation induction.

Always an active member of ISTS culminating in its Presidency (1998–2001), Elizabeth was a strong advocate for the interdisciplinary study of twins. The 2001 Conference she organized in London will long be

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remembered in the history of ISTS, not least for the unexpected heat wave and searing temperatures!

Elizabeth was exceptional not only for her professional achievements, but her personal charisma which was so abundant in every aspect of her life.

Always charming and self-effacing, she had the gift of recognizing potential in others.

When asked what she would like to be remembered for, her reply was as an enabler. She achieved this in no small measure and took great pleasure in others' achievements, always constructively critical, but ever generous. Elizabeth's legacy is her profound influence on our understanding of, and care for, multiple birth families, and having 'enabled' her work to continue.

Published Works by Dr Elizabeth M. Bryan

Books

Bryan, E. M. (1983). *The nature and nurture of twins*. London: Ballière Tindall.

Bryan, E. M. (1984). *Twins in the family: A parent's guide*. London: Constable and Company Ltd.

Bryan, E. M., & Harvey, D. (1991). The stress of multiple births. London: Multiple Births Foundation.

Bryan, E. M. (1992). *Twins and multiple births* (2nd ed.). London: Little Brown and Company.

Bryan, E. M. (1992). *Twins, triplets and more: Their nature, development and care.* London: Penguin Books.

Bryan, E. M. (1992). *Twins, triplets and more: Their nature, development and care*. (Amer. ed.) New York: St. Martin's Press.

Bryan, E. M. (1992). *Twins and higher multiple births: A guide to their nature and nurture*. Sevenoaks: Edward Arnold.

Bryan, E. M. (1996). Individuality in twins. London: Multiple Births Foundation.

Bryan, E. M. (1998). *Twins, triplets and more: From pre-birth through high school.* New York: St. Martin's Griffin.

Bryan, E. M. (2001). *The first five years (Guidelines for professionals).* London: Multiple Births Foundation.

Bryan, E. M. (2007). *Singing the life: The story of a family in the shadow of cancer.* United Kingdom: Vermilion.

Higgins, R., & Bryan, E. (1995). Infertility: New choices, new dilemmas. London: Penguin Books, Ltd.

Research Reviews

Anorexia Nervosa in Opposite-Sex Twins

The physical and medical consequences of opposite-sex co-twins' shared intrauterine environment continue to raise important developmental questions. The fact that anorexia nervosa occurs with greater frequency in females than in males has been well documented. However, recent work has demonstrated an increased risk of anorexia in male twins from opposite-sex pairs, relative to male twins from same-sex pairs (Procopio & Marriott, 2007). Specifically, the rate of anorexia in the female co-twins did not differ from that of females in the general population, but the risk for their male co-twins was at a comparable level.

The authors proposed that male twins' exposure to the unique hormonal prenatal environment of opposite-sex pairs might explain their findings. Sex steroids were suggested as the relevant hormones. Additional research on this question is required, but it is encouraging to see studies targeted to male-female pairs who were once overlooked by many investigators.

Twin Study of Self-Esteem

Self-esteem refers to appraisal of the self and can be either positive or negative. Sources of influence on self-esteem have been of interest to twin researchers and several studies have found evidence of genetic effects (e.g., McGuire et al., 1999; Neiss et al., 2006). A new longitudinal study was recently conducted to better understand factors underlying stability and change in self-esteem in males and females (Raevuori et al., 2007). The sample was composed of adolescent twins, drawn from the FinnTwin12 Study in Finland, who completed the Rosenberg Self-Esteem Scale at ages 14 and 17 years. Organizing the twins by zygosity and sex yielded 317 monozygotic (MZ) male (m) pairs, 366 dizygotic (DZ) m pairs, 346 MZ female (f) pairs, 325 DZf pairs and 670 DZ opposite-sex (OS) twin pairs at age 14 years. The sample size decreased slightly at age 17 years, given that data were provided by 290 MZm pairs, 329 DZm pairs, 346 MZf pairs, 321 DZf pairs and 630 DZOS pairs.

The correlations between self-esteem scores at the two time points were .44 for males and .46 for females. Heritabilities were .62 for males and .40 for females at age 14 years, and .48 for males and .29 for females at 17 years. The authors concluded that self-esteem follows a different developmental course in males and females — genetic factors played a substantial role for males, whereas shared environmental factors played a significant role for females. The authors suggested that future research efforts be directed at identifying sex-specific environmental factors that contribute to, and modify, self-esteem.

DNA Differences in Monozygotic Twins

Phenotypic differences between MZ twins have interested researchers for what they can potentially reveal about environmental effects. The assumption has been that because MZ twins share 100% of their genes, then differences between them reflect differences in environmental events, either before or after birth. However, that assumption has been increasingly challenged in light of evidence showing MZ co-twin differences in epigenetic patterns or gene expression (Fraga et al., 2005; Wong et al., 2005), as well as differences in X chromosome inactivation (in female twins only), chromosomal constitution, somatic mutations and mitochondrial mutations (Martin et al., 1997; also see Segal, 2000a,b). Thus, phenotypic discordance between MZ twins has a more complex causation than has been supposed. New research has contributed another intriguing piece to this story.

Bruder et al. (2008) have called attention to copy–number variations

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(CNVs), evidence that may explain some cases of MZ co-twin discordance and disease expression in non-twins. CNVs are a form of structural variation that can change the architecture of the chromosome. Specifically, they involve changes that alter the copy number of DNA fragments. The international research team examined CNVs in 19 MZ twin pairs, ten of whom were phenotypically concordant and unselected and nine of whom had been previously studied for Parkinson disease discordance. CNVs were detected in both twin groups, suggesting that (1) CNVs may offer insights into the onset and progression of disease, and (2) studies be conducted on larger numbers of twins to clarify the significance of CNVs in normal and disease-discordant co-twins.

Twins and More Twins

Twins Raised Apart

I was made aware of an intriguing situation involving MZ male twins. The brothers, Delbert (Del) and Dale were the sixth and seventh children born to August and Ella Block, on August 12, 1926, in Iowa. The twins' maternal aunt, Jennie, worried that Ella was not well enough to care for seven children, so she took Delbert to her home and raised him as her son; Jennie and her husband Conrad had a son of their own (whom they named Dean) 16 months later. The two families lived only 15 miles apart and visited each other on occasion. Given the family arrangements, the two cousins (Del and Dean) were raised as brothers and the two twins (Del and Dale) were raised as cousins. The families differed to some degree. Del's family lived on a farm and was better off financially than his twin's family, supported by their father who was a laborer.

The twins graduated from their respective high schools early, at the age of 16 years. During that time, they saw each other and even played basketball against each other. Eventually, both twins went on to pursue successful business careers. They are now in the process of compiling detailed installments of their separate and common life stories; the material here is excerpted from the first piece I received from Del. Some of his early memories are worth noting.

Del recalls that when he visited his birth family, his mother would accuse her sister of taking her twin son away. Del also recalls that Dale's family members were 'mesmerized when Dale and I were together because of our identical actions and expressions and looks'. His comments make great human interest and great science.

Twins Playing Together

The freshman year progress of Stanford University's twin basketball stars, Brook and Robin Lopez, was described in an earlier issue of *Twin Research and Human Genetics* (Segal, 2007). The twins, now in their sophomore year, helped bring Stanford's team into the Pac-10, accounting for approximately one-third of their team's points. According to their coach, they are great supporters of one another when playing on the same team, but become strong competitors when practicing one-on-one. Regardless, these twins are also fascinating off the court, as detailed in a recent review (Anderson, 2008).

Both brothers have strong interests in Greek mythology, Michael Jackson and comics. As 11-year-old children they had read *The Odyssey, The Iliad* and related works. They own every Michael Jackson song. They are also highly knowledgeable about the life and work of Walt Disney, and are working toward careers in film production — Brook plans to major in creative writing and Robin plans to major in studio art.

Anderson's review also includes wonderful pictures of the twins playing basketball, studying in their room and chatting with one another. She notes that zygosity testing at birth was inconclusive, so the twins did not know if they were MZ or DZ. (The types of tests that were performed was not indicated.) The twins are not difficult to distinguish because Robin's hair is long and Brook's hair is short. However, their otherwise matched physical features strongly suggest that they are MZ.

Twins Working Together

Twin research has revealed genetic influence on vocational interests (Moloney et al., 1991) and job satisfaction (Arvey et al., 1989). These findings are personified by 55-year-old identical twins, Ray and Roy Freitas, in Orange County, California (House, 2008). The brothers have had separate careers for most of their lives, but are now working side by side at Ray's Old Town Barber Shop (the shop bears the name of its previous owner). A frequent customer noted the difficulty in finding a good barber who can carry on a good conversation, but 'when you get both it's great'. It seems fitting that the small shop has rooms for only two seats.

Twins Playing Apart

Boxing and Olympic history might be made in the next month (Baxter, 2008). In early March 2008, one of the Molina twins from Commerce, California (Oscar) was in competition in Port-au-Spain, Trinidad, hoping to secure a place on Mexico's Olympic boxing team, headed to Beijing in August 2008. Unfortunately, Oscar lost his round to a Cuban competitor, but he will try again next month in the final regional qualifying boxing tournament in Guatemala (AP Press, 2008). However, Oscar's twin brother (Javier) will represent the United States at the 2008 Olympic Games (Prescott, 2008). If both twins succeed at their goals, this will be the first time that twin brothers will be competing in the same Olympic event on different teams.

The story behind these events is simple, but compelling. The twins' family believes in competition, but not between family members. Consequently, at the Olympic trials, the slightly heavier twin (Oscar) moved into a higher weight class, lost by a point and was dropped from the trials. Oscar is, however, able to represent Mexico because his parents were born there and emigrated to the United States. Olympic rules allow children to compete for the country of their parents' birth. Should the Molina twins participate in the 2008 Olympics, they will not be competing against each other because they would enter into different weight classes.

The twins are described as fraternal, yet they appear to be very physically similar in photographs. At present, it is safe to say that their zygosity is unknown.

Multiple Birth Odds

The dramatic increase in twinning seen since the 1980s is well known. The twinning rate increased to 32.3 twins/1000 births in 2004, as compared

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with. 22.6 twins/1000 births in 1990 and 18.9 twins/1000 births in 1980 (Martin et al., 2006). This rise is due mostly to artificial reproductive technologies, but also to delayed child-bearing which is associated with DZ twinning.

Given the high physical risks associated with multiple birth pregnancies, the current trend is toward implantation of only one or two embryos during vitro fertilization (New York Times, 2008). However, implanting fewer embryos reduces success rates. Many women are, therefore, asked to complete two cycles with one embryo transfer each; this procedure is as successful as implanting two embryos, but circumvents a multiple birth. Interestingly, it appears that women who produce higher numbers of egg cells or have higher number of eggs retrieved from their ovaries have higher conception rates, both twin and non-twin. This individual difference characteristic could contribute to decisions surrounding the optimal number of embryos to transfer.

References

Anderson, K. (2008, February 25). Twins peaking. *Sports Illustrated, 108*, 48–51.

AP Press (2008, March 18). U.S. Olympic Games: No boycott of Beijing. *Los Angeles Times.* Retrieved http://www.latimes.com/sports/olympics

Arvey, R. D., Bouchard, T. J., Jr., Segal, N. L., & Abraham, L. M. (1989). Job satisfaction: Environmental and genetic components. *Journal of Applied Psychology, 74,* 187–192.

Baxter, K. (2008, March 12). Twins go different routes. *Los Angeles Times*, pp. D1, D7.

Bruder, C. E. G., Piotrowski, A., Gijsbers, A. A. C.j., Andersson, R., Erickson, S., de Stahl, T. D., Menzel, U., Sandgren, J., von Tell, D., Poplawski, A., Crowley, M., Crasto, C., Partridge, C., Tiwari, H., Allison, D. B., Komorowski, J., van Ommen, G-J. B., Boomsma, D. I., Pedersen, N. L., den Dunnen, J. T., Wirdefeldt, K., & Dumanski, J. P. (2008). Pheno-typically concordant and discordant monozygotic twins display different DNA copy-number-variation profiles. *American Journal of Human Genetics, 82,* 763–771.

Fraga, M. F., Ballestar, E., Paz, M. F., Ropero, S., Setien, F., Ballestar, M. L., Heine-Suner, D., Cigudosa, J. C., Urioste, M., Benitez, J., Boix-Chornet, M., Sanchez-Aguilera, A., Ling, C., Carlsson, E., Poulsen, P., Vaag, A., Stephan, Z., Spector, T. D., Wu, Y-Z., Plass, C., & Esteller, M. 2005). Epigenetic differences arise during the lifetime of monozygotic twins. *Proceedings of the National Academy of Sciences, 102,* 10604–10609.

Gregson, J. (2008). *The Guardian.* Retrieved from http://www.guardian.co.uk/society/2008/frb/25.

House, C. (2008, March 9). A cut above. *Orange County Register,* p. 24.

Martin, N., Boomsma, D., & Machin, G. (1997). A twin-pronged attack on complex traits. *Nature Genetics, 17,* 387–392.

Martin, J. A., Hamilton, B. E., Sutton, P. D., Ventura, S. J., Menackerm. F., & Kirmeyer, S. (2006). Births: Final data for 2004. *National Vital Statistics Report, 55,* 1–101

Moloney, D. P., Bouchard, T. J., Jr., & Segal, N. L. (1991). A genetic and environmental analysis of the vocational interests of monozygotic and dizygotic twins reared apart. *Journal of Vocational Psychology, 39,* 76–109.

New York Times. (2008, February 19). Lowering odds of multiple births. *New York Times*. Retrieved from http://nytimes.com/2008/02/19/health/19mult.html.

McGuire, S., Manke, B., Saudino, K. J., Reiss, D., Hetherington, E. M., & Plomin, R. (1999). Perceived competence and self-worth during adolescence: A longitudional behavioral genetic study. *Child Development, 70,* 1190–1204.

Neiss, M. B., Sedkides, C., & Stevenson, J. (2006). Genetic influences on level and stability of self-esteem. *Self and Identity, 5,* 247–266.

Prescott, I. (2008, March 20). Eight Cubans win gold. *Trinidad and Tobago Express.* Retrieved from http://www.trinidadexpress.com/index.pl/article_sports?id=161296388.

Procopio, M., & Marriott, P. (2007). Intrauterine hormonal environment and risk of developing anorexia nervosa. *Archives of General Psychiatry, 64,* 1402–1407.

Raevuori, A., Dick, D. M., Keski-Rahkonen, A., Pulkkinen, L., Rose, R. J., Rissanen, A., Kaprio, J., Viken, R. J., & Silventoinen, K. (2007). Genetic and environmental factors affecting self-esteem from age 14 to 17: A longitudinal study of Finnish twins. *Psychological Medicine, 37,* 1625–1633.

Segal, N. L. (2000a). *Entwined lives: Twins and what they tell us about human behavior.* New York: Plume.

Segal, N. L. (2000b). Identical and fraternal: When words mislead. *Twin Research, 3,* 338–343.

Segal, N. L. (2007). Sports pairs: Insights on athletic talent. *Twin Research and Human Genetics, 10*, 528-533.

Telegraph (2008, 26 February). Elizabeth Bryan. *The Telegraph.* Retrieved from http://www.telegraph.co.uk/news/main.jhtml?xml=/news/2008/02/23/db2302.xml.

Wong, A.H.C., Gottesman, I. I., & Petronis, A. (2005). Phenotypic differences in genetically identical organisms: The epigenetic perspective. *Human Molecular Genetics, 14,* R11–R18.

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  - Parametric Linkage analysis
  - Non-Parametric Linkage (NPL)
  - Association Testing:
    - Family-based
    - Case/Control
- Analysis of **Quantitative** Traits including:
  - Variance Component Analysis
  - Association Testing

The course is designed to assist people who are actively studying the genetics of complex traits. It will cover both theoretical and practical gene mapping issues and will stress the interpretation of results.

Instructors: Professor Kenneth Lange and senior faculty from the Department of Human Genetics, University of California Los Angeles (UCLA)

Participants: No prior experience with these methods is required but participants should be "computer literate". Participants will be required to bring a laptop computer to run the analysis exercises.

Price: Full registration: AUD1500
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