

Co-Twin Controls: Facioplasty Twin Research Reviews: Congenital Anomalies; Personality and Coital Orgasmic Infrequency; Physical Activity Participation Newsworthy: Twins, Triplets and Quads; School Legislation Update; Premature Twins in Court

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The usefulness of monozygotic (MZ) twins for studying the efficacy of different face lift techniques is described. The data suggest that no particular procedure out of four under consideration is superior to any other. Next, reviews of recent twin studies of congenital anomalies, personality traits and coital orgasmic infrequency, and physical activity participation are presented. Finally, timely topics of public interest are also described. They include a rare birth consequence of artificial reproductive technology, an update on state legislation regarding parents' rights to decide the classroom placement of their young twins, and medical malpractice lawsuits involving premature twins.

Keywords: facioloplasty, congenital anomalies, school legislation, court case

Co-Twin Controls: Facioplasty

Dr Darrick E. Antell is a well-known plastic surgeon in New York City. I learned of his work with twins in 1997–1998 while working on *Entwined Lives*. Like some other professionals, Dr Antell discovered twins because they promised the best answers to his questions. In particular, he could compare monozygotic (MZ) twins with reference to differential aging of the skin, and attempt to link these differences to environmental factors. He has compiled a striking set of photographs showing that one twin's greater exposure to sun, cigarette smoke and other environmental toxins made this twin look significantly older than the co-twin; see Segal (2000).

A related interest of Antell's concerns identifying the most effective

facelift technique to use for a given patient (Antell & Orseck, 2007). However, comparing outcomes from different procedures becomes complex, given that multiple factors (e.g., facial features, propensity toward aging) affect the results. These differences are, however, largely minimized when one compares MZ twins, although they are not fully eliminated.

In 1997 and 1998, Antell performed one of four different surgical procedures on 16 women who were part of 8 MZ twin pairs. The zygosity of the pairs was confirmed by DNA analysis. Twins in six pairs were given a different procedure, whereas twins in two pairs were given the same procedure. Photographs of one side of the face were obtained between 13 and 60

months postoperatively, and compared with those taken preoperatively. Each pair of pictures was then evaluated by four plastic surgeons who were blind to the type of surgical procedure used. Three separate areas of the face were rated on a scale ranging from 1 = *no improvement* (poor) to 5 = *perfect result*.

The ratings showed that none of the four techniques was superior to the others. Co-twins in three of the pairs who had undergone a different procedure showed the same results, while co-twins in the other three pairs

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showed different results. Twins in one of the two pairs who had undergone the same procedure showed different results, while twins in the other pair showed the same results. However, the authors caution that the findings, while consistent with those from previous studies, do not allow for firm conclusions. Specifically, they recognized that the different techniques were not chosen randomly, but were selected carefully, based on each patient's severity of aging. Furthermore, the number of twin pairs was quite small. An ideal sample would consist of MZ co-twins (both male and female) who agreed to undergo different techniques chosen at random. Nevertheless, this twin study may serve as a model to other investigators with similar interests.

Many fascinating questions arise over MZ twins' physical resemblance. Over the years, many MZ twins have

told me that they do not believe that they look alike, and are surprised when other people confuse them. Nevertheless, loss of physical identity can be devastating to some twins, and has been an issue in some medical malpractice lawsuits (Segal, 2000). Winning the prize for 'most look-alike' twins at the annual Twins Days Festival, in Twinsburg, Ohio, is a coveted distinction.

I was fortunate to meet and talk to several of Dr Antell's twin pairs. They indicated that sharing the experience of facio-plasty was meaningful to them, and they enjoyed looking younger and more alike. (Of course, not all MZ twins enjoy their identical appearance. I recall meeting an MZ female twin who had rhinoplasty — nose surgery — to distinguish herself from her twin sister.) Additional information about Dr. Antell's twins is available at <http://www.antell-md.com/sunskintwins.html>.

Reading through the material raises other important concerns.

Sun exposure is an environmental factor, yet response to the sun could have a genetic component (Bataille et al., 2000). Quantification of nevi (skin blemishes formed before birth) and freckles for 127 MZ twin pairs and 323 DZ twin pairs showed that this was the case. Genetic factors did contribute to the number of nevi and freckles, with increased heritability indicated among twins older than 45 year of ages. In addition, genetic influence varied between sun-exposed and sun-protected body sites. Specifically, correlations for nevi were higher for both MZ and DZ twin pairs on sun-protected areas than on sun-exposed areas. It was concluded that age and site of nevus counts should be considered in future linkage and association studies concerned with identifying melanoma genes.

Twin Research Reviews

Congenital Anomalies

The greater frequency of congenital anomalies among twins than non-twins is well-known (Segal, 2000). However, associations between chorionicity and congenital defects have been less well investigated. Research by Glinianaia et al. (2008) attempts to fill this gap. Using data from the Northern Multiple Pregnancy Register, in England, congenital anomalies were detected among 405.8/10,000 twins, as compared with 238.2/10,000 non-twins.

Information on chorionicity was available for close to 85% of the sample. The prevalence of congenital anomalies in dichorionic twins was 343.7/10,000, and 633.6/10,000 in monochorionic twins. Given that approximately two-thirds of MZ twins are monochorionic, while all DZ twins (with very rare exception) are always dichorionic, MZ twins are at greater risk for birth difficulties. Interestingly, it more often the case that only one MZ co-twin is affected (Schinzel et al., 1979).

Personality and Coital Orgasmic Infrequency

British female twins were used to examine associations between normal

personality variations and coital orgasmic infrequency (Harris et al., 2008). This work builds on a previous study from this laboratory that found an estimated heritability of 34% for this behavior, implicating both genetic and environmental influences (Dunn et al., 2005).

Twins completed a self-report questionnaire that included items covering a wide range of sexual behaviors. A second survey, the TIPI (Ten-Item Personality Index), was administered at a later time to obtain self-report ratings of the Big Five personality dimensions of extroversion, agreeableness, conscientiousness, emotional stability and openness to experience. Perhaps the most interesting result came from analyses of a group of 24 MZ twin pairs and 49 DZ twin pairs. Specifically, personality traits were compared between co-twins discordant for orgasmic frequency (high: coital orgasm is achieved 75% or more of the time vs. low: coital orgasm is never achieved). Twins in the low frequency group were found to be more introverted and less emotionally stable than their twin sisters. Further research should elucidate the mechanisms underlying these differences, as

well as increasing understanding of personality, sexual behavior and the link between the two.

Physical Activity Participation

A number of twin studies have shown genetic influence on physical activity participation, as does the present report (Duncan et al., 2008). However, this most recent study implicates a substantial contribution to physical activity from unique environmental factors, thus departing from previous findings.

MZ and DZ twin pairs from the University of Washington Twin Registry completed brief questionnaires sent to them by mail. The key items were estimates of their weekly frequencies of moderate physical exercise (30 minutes or more) and vigorous physical exercise (20 minutes or more). Two dichotomous measures were created, based on these responses: exercise for 60 minutes and 150 minutes each week.

Genetic effects explained 45% of the variance using the lower values, consistent with earlier findings. However, the unique (nonshared) environment explained 72% of the

variance using the higher value. (The unique environment also explained a higher proportion of the variance, i.e.,

55%, than did genetic factors with the lower value.) The investigators concluded that a future goal is to identify

critical environmental variables that discourage physical activity, and work to modify them.

Newsworthy

Twins, Triplets and Quads

In April 2008, a woman from Belcamp, Maryland delivered a rare set of male quadruplets (Ballyblog, 2008). Three of the infants form a monozygotic triplet set, while the fourth infant is a dizygotic co-quad. The set resulted from in vitro fertilization, in which two embryos were implanted in the mother's womb. One of the embryos underwent two divisions, leading to the rare multiple birthset. The identical triplets include Joshua, Gavin and Cody; their nonidentical brother is Logan. The infants were born 11 weeks prematurely.

This family offers a rich resource for investigators: three MZ twin pairs, three DZ twin pairs, one MZ triplet set and three MZ/DZ triplet sets. It will be fascinating to follow the quads' physical and behavioral similarities and dissimilarities, as well as their social affiliations, as they develop.

School Legislation Update

Arizona Governor Janet Napolitano recently vetoed a bill that would have offered parents a significant voice in deciding between same or separate classrooms for their children. This event is a serious disappointment for families who disagree with many schools' mandatory policy of separating school-age twins. I quote from her letter: 'Classroom placement of children and their siblings should be addressed on a case-by-case basis in a decision collaboratively made between educators and parents. Legislative intervention on a state-wide level is unwarranted.'

I suspect that Governor Napolitano may not understand that parents do wish these decisions to be rendered individually for each twin pair. They also wish to work cooperatively with educators and administrators who may be unaware of twins' special circumstances. Unfortunately, many parents find that school officials are not receptive to the twins' situations, and prefer

to uphold the standard practice of separating them. If school officials gave greater consideration to parents' wishes, twins' legislation would not be needed.

Individuals interested in learning more about efforts to promote state-based legislation for twins at school should visit www.twinslaw.com. Another excellent resource is a recent legal analysis of this issue by Spencer Larche (2007) that supports such legislation.

Premature Twins in Court

A lawsuit involving the death of a premature male twin and the severe physical impairment of his co-twin will interest investigators and physicians who may be called upon to testify in similar cases (Kaplan, 2008). A woman carrying twins was hospitalized briefly after experiencing contractions at about 24 weeks into her pregnancy. Similar difficulties recurred a month later, and again she was admitted to the hospital and monitored. Fetal anomalies were not detected. Several weeks later, one twin showed a decelerated heart rate, although later recovered. Regardless, a decision was made to deliver the babies (by C-section), based on this episode. The first twin delivered survived for only 18 days, and was shown to have suffered from cytomegalovirus, a serious viral infection. The second twin, the focus of the lawsuit, suffered from respiratory distress syndrome and remained in the neonatal unit for two months. Upon discharge he was diagnosed with severe cerebral palsy and retardation.

The mother's allegations were inconsistent at first, but she eventually claimed that the babies suffered due to failure to deliver them earlier. Representatives for the plaintiff argued that the infant's impairments reflected events prior to delivery. In contrast, the defense experts, who represented the hospital, agreed that the infant's damage reflected the same virus found in his deceased twin. It appeared that the unity among the defense experts

ultimately led the plaintiff's attorney to reduce his demand from \$8 million to \$3.75 million, then to \$2 million. The hospital then offered to settle the case for 1 million dollars.

The author of this article, an attorney specializing in medical malpractice defense, argues that the different parties to such cases should work toward a 'palatable resolution.' The hospital was aware that the plaintiff had sufficient evidence to bring the case to court and press for high compensation. However, 'the hospital made a very difficult, reluctant, although reasoned, decision to settle the case at a 'discount,' rather than risk losing and having it be priced'.

Many views could be taken in this case. Kaplan's represents one of them.

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