Op-Ed/Editorials – Why does the apple fall near the tree?

January 31, 2007

The theme of the 2006 Institute for Research on Pathological Gambling and Related Disorders annual conference on gambling addiction was Lost in Translation? The Challenge of Turning Good Research into Best Practice. During the next few weeks, The BASIS is pleased to present a series of editorials from some of the faculty members of that conference. In this week's editorial, Dr. Donald W. Black discusses pathological gambling and the issue of genetic inheritance.

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Genes, that's why. Informally, we frequently make these observations. As my sister recently said to me about her 14year-old daughter: "She reminds more and more of myself at that age." And why not? My sister and niece share 50% of their genes. But genes can't explain everything. My sister and niece share attitudes, interests, and behaviors, I suspect, in part because my sister has provided close role modeling. Differences between them, too, could result from the other 50% of the genes they do not share, or the fact that my brother in-law is a "non-genetic" factor whose role in rearing my niece must also be taken into account. Thus, the precise mixture of genes versus behavior is difficult to tease apart, but both influences are undeniably present. Let me now turn to pathological gambling. Does the pathological gambler pass along his or her behavior to offspring as well? If so, is it through the genes or some other mechanism? I became interested in this question when it dawned on me that many of my gambling patients told me about the parent, aunt, uncle, cousin, etc, who was also a problem gambler. Could this be a learned behavior because the family gambled together over regular card games? Could something have been inherited that led to the behavior? As I was pondering these issues (this was the late 1990s), I came across Seth Eisen's work with the Vietnam Era Twin registry. He, and others, showed that genes and environment each played an important role in the etiology (i.e., causation) of pathological gambling. The nearly 3400 twin pairs were assessed in the early

1990s and, fortunately, the instrument used (the Diagnostic Interview Schedule) included assessment of pathological gambling. This allowed Eisen and colleagues to determine the heritability of PG, as well as particular combinations of symptoms, by comparing concordance rates for identical and non-identical twin pairs. They estimated that "inherited factors" explain as much as 62% of the propensity for PG. This was remarkable!

That a behavior which people assume is voluntary and due to choice (however bad the choice might be) could have genetic roots was astonishing. But why not? Many years ago, no one thought that alcoholism or drug addiction could have genetic roots either. In the words of the military, these problems constituted "willful misconduct." We now know better.

If there is a genetic component, what exactly is transmitted? Gambling is a social construct, and as such certainly cannot be transmitted. Yet, personality quirks or temperaments (i.e., impulsivity, sensation-seeking, novelty-seeking) could be transmitted and contribute to the likelihood of developing the disorder under the right conditions. What the right conditions constitute are debatable, but perhaps include gambling availability (one can't be alcoholic in the absence of alcohol, and likewise one can't be a pathological gambler unless gambling is available); role modeling within families (i.e., how one might spend leisure time, etc.), and other unknown factors.

The work by Eisen and others led me, in part, to pursue my own research. After completing two small family studies (in which close relatives are assessed), I concluded that not only does PG run in families, but that the families are filled with substance misuse, mood disorders, and behavioral problems (i.e., antisocial personality disorder). I have since obtained funding through NIDA to continue this work on a larger scale. The goal is not only to (presumably) confirm my earlier findings, but to contribute to a better understanding of the spectrum of disorders that are likely related to pathological gambling. One of the cherished beliefs in the gambling treatment community is that pathological gambling is an addiction, just like drug and alcohol addiction, but without the substance. Is this really true? Or, is pathological gambling related to obsessive-compulsive disorder, as Eric Hollander, and others, propose; or, is pathological gambling related to the impulse control disorders, as Suck Won Kim, Jon Grant, and others would propose. This study should help us to address this issue of classification. We will also have data to address the question of how and why the families are

dysfunctional. Gamblers' families have long been considered chaotic and unhealthy, but why? One clue from my work is that the families of pathological gamblers are large, and such families are known to be troubled. Another issue: is there a "gambling personality"? Some investigators think so, although the only personality disorder that appears linked to pathological gambling is antisocial personality disorder.

Where do we go from here? Clearly, the next step will be to collect DNA from pathological gamblers and conduct molecular genetic experiments. This has been done on a small scale, but the studies have been plagued by methodological and other problems, and the results have not been replicated. Larger, better controlled studies with standardized sampling methods and assessments, and more appropriate genetic techniques are needed. The end goal is to connect pathological gambling to specific genes or gene regions, and determine what their function is. The only way to truly understand pathological gambling – like any other behavioral problem – is to study it at the molecular level. Conceivably, with a better understanding, we will be in a position to better diagnose and treat pathological gamblers.

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