

## PARADIGMS, TEXTBOOKS, AND PSYCHIATRIC RESEARCH

# Inaccuracy and Bias in Textbooks Reporting Psychiatric Research: The Case of the Schizophrenia Adoption Studies

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**Abstract.** Mental health textbooks sometimes provide inaccurate information, typically supporting common beliefs in the field. Psychiatry and psychology textbooks' discussion of the schizophrenia adoption studies is examined. Particular attention is paid to the earlier studies, which helped pave the way for the current widespread acceptance of the importance of genetic factors influencing psychological trait differences. This article compares the accounts of 30 textbooks to the original studies they reviewed. Generally, problems with these textbooks' accounts include (1) the failure to critically assess the original researchers' methods and conclusions, (2) some textbooks' reliance on secondary sources, (3) the failure to discuss published critiques of the schizophrenia adoption studies, (4) inaccuracy in reporting the original findings, (5) the claim that studies finding nonsignificant results support the genetic position, and (6) a failure to discuss the potentially invalidating environmental confounds in the schizophrenia adoption studies (through the selective placement of adoptees). It is concluded that, in general, these textbooks have served to rubber-stamp mainstream psychiatry's questionable claims about the schizophrenia adoption studies at the expense of a thorough critical analysis.

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TEXTBOOKS CAN SERVE AS TOOLS for teaching students about important findings and ideas in their respective fields. Unfortunately, they can also serve to perpetuate myths. It is generally understood, for example, that history textbooks are often biased by the views of their authors and by the social and political environments in which they are published. We would probably expect history textbooks published in the United States and in Mexico to provide differing accounts of the battle of the Alamo. On the other hand, it is widely believed that science is "above politics" and that scientists are concerned primarily with an objective search for the truth. This view leaves out the fact that scientists (and those supporting and financing them) also have political beliefs, values, and vested interests (Savan, 1988; LaFollette, 1992; Joseph and Baldwin, in press). This is also true for the authors of textbooks.

Modern psychiatry is currently dominated by the biological/psychopharmacology paradigm, which must show that diagnoses are biologically/genetically based (Breggin, 1991), and the dominant views in psychiatry tend to influence psychology and the related fields. This article reports the results of an investigation into a specific area of psychiatric research: the study of adoptees as a means of determining whether there is a genetic basis for schizophrenia. The accounts of textbook authors are compared to information found in the original studies. We will see that the descriptions of this body of research more closely match the dominant views of psychiatry than the facts as reported in the actual studies. Although the focus here is on one issue, the discussion is clearly relevant to other fields where similar problems may be occurring.

Paul (1998) discussed the findings of her 1985 investigation into the way that the "Genetics of IQ" topic was presented in genetics textbooks. She found that the discussion of the heritability concept was "confused in the extreme" and that "the Cyril Burt scandal of the mid 1970s had only

trivially affected the content of the texts. While Burt's name had disappeared—except as an example of fraud in science—his data were still reported” (Paul, 1998:37). Paul noted that “the most astonishing feature of the textbooks was their similarity. The same data were cited in support of the same conclusions, often in practically the same words, in text after text” (1998:37). She went on to discuss the “dramatic changes that have taken place over the past quarter-century in the way textbooks are published” (1998:39). Among these changes she listed a greater emphasis on packaging as opposed to content, the tendency for textbooks to be similar (or “virtual clones, both stylistic and substantive, of a market leader” as she put it—1998:39), and the “widespread” practice of borrowing or “cribbing” from other textbooks (1998:39). Paul concluded by noting that the similarity of textbooks is explained by “publishers who want to maximize profits” and authors who “want to minimize time and effort” (1998:50).

In *The Structure of Scientific Revolutions*, Kuhn observed that textbooks, and the popularizations and philosophical works modeled on them, “record the stable outcome of past [scientific] revolutions and thus display the bases of the current normal-scientific tradition.” According to Kuhn,

To fulfill their function they need not provide authentic information about the way in which those bases were first recognized and then embraced by the profession. In the case of textbooks, at least, there are even good reasons why, in these matters, they should be systematically misleading. (Kuhn, 1996:137)

The publications reviewed in this article do not constitute a randomly selected sample. Rather, a search was made for available textbooks that discussed the schizophrenia adoption studies. When such a book was found, it was included in the sample. No book was rejected because it was perceived as presenting an accurate description of these studies.

This article looks at the way that adoption studies were reported, and offers a critique of the studies themselves mainly as a way of informing the reader that there are doubts about particular issues, which should have been discussed in the textbooks. Focus is placed on the Oregon study and on the early papers coming out of the Danish/American work because these investigations were crucial in turning public and professional opinion in the direction of the importance of genetic factors for all types of human psychological trait differences. As behavior geneticists Rowe and Jacobson recently noted,

When a single theory [environmentalism] is monolithic in a field, contrary findings can break paradigms....It is just this role, we believe, that the first adoption studies of schizophrenia played in the 1960s, several years before the formation of the Behavior Genetics Association in 1970. (1999:14)

The adoption studies of the 1980s and 1990s (which contain flaws similar to the older studies) are generally seen as confirming what is believed to have been established by these “paradigm breaking” investigations.

## The Schizophrenia Adoption Studies

Adoption studies are the most frequently cited evidence in favor of the genetic basis of schizophrenia. In theory, adoption studies are able to disentangle the effects of genetic endowment and rearing environment, since adoptees receive their genes from one family but are reared by another. These studies were necessitated by the view among many investigators that family and twin studies are unable to disentangle possible genetic and environmental influences. Schizophrenia adoption studies were carried out in three countries: Denmark, Finland, and the United States (Oregon). In spite of the common belief that adoption studies have provided definitive proof of the genetic basis of schizophrenia, they have been the subject of several critical reviews (e.g., Benjamin, 1976; Lidz, 1976; Cassou, Schiff, and Stewart, 1980; Lidz, Blatt, and Cook, 1981; Lidz and Blatt, 1983; Lewontin, Rose, and Kamin, 1984; Boyle, 1990; Breggin, 1991; Pam, 1995; Joseph, 1999a, 1999b, in press-b). The authors of these reviews argued that the schizophrenia adoption studies suffer from several important and potentially invalidating methodological flaws.

Here we will look at the way that schizophrenia adoption studies have been reported in 30 books. These include

- eleven psychiatry textbooks (van Praag et al., 1980; Kolb and Brodie, 1982; Hill, Murray, and Thorley, 1986; Judd and Groves, 1986; Nicholi, 1988; Trimble, 1988; Sutker and Adams, 1993; Kaplan and Sadock, 1995; Gelder et al., 1996; Tasman, Kay, and Lieberman, 1997; Hales, Yudofsky, and Talbott, 1999);
- eight abnormal psychology textbooks (Gottesfeld, 1979; Kazdin, Bellack, and Hersen, 1980; Martin, 1981; Coleman, Butcher, and Carson, 1984; Sarason and Sarason, 1984; Price and Lynn, 1986; Davidson and Neale, 1990; van Hasselt and Hersen, 1994);
- five books devoted entirely to schizophrenia (Bellack, 1979; Neale and Oltmanns, 1980; Gottesman and Shields, 1982; Gottesman, 1991; Keefe and Harvey, 1994);
- two books whose authors argue that genes play an important role in determining human behavioral differences (Rosenthal, 1970; Plomin, DeFries, and McClearn, 1990);
- two chapters from annual psychiatry reviews (Schulz, 1991; Byerley and Coon, 1995);
- a neuroscience textbook (Adelman, 1987); and
- the DSM-IV (APA, 1994).

Although these books are often assigned to or read by students in the mental health field, their accounts of the methods

and findings of the schizophrenia adoption studies are, in general, flawed, because

- emphasis is given to the conclusions of the original researchers at the expense of independent critical analysis;
- secondary sources are sometimes relied upon in discussions of these studies;
- the views of adoption study critics are typically not discussed or are mentioned only briefly, followed by a rebuttal;
- the methods and quantitative results of the studies are often misrepresented;
- while some surveyed textbooks discuss possible environmental confounds in the schizophrenia twin studies, few discuss the likelihood that genetic inferences from adoption studies are confounded by the selective placement of adoptees on the basis of the socioeconomic and psychiatric status of the index group biological families (see Joseph, 1999b; for problems with selective placement in adoptive twin studies, see Joseph, 2001);
- studies failing to report statistically significant results are put forward as evidence in favor of the operation of genetic factors;
- the original researchers' definition of schizophrenia (or "schizophrenia related disorders") is usually accepted without question. In particular, the Danish/American investigators' results are typically viewed as supporting a "schizophrenia spectrum of disorders," but the validity of this concept, which was usually necessary for the finding of statistically significant results, is rarely questioned (Joseph, in press-a).

For a detailed description of the methods and results of the adoption studies themselves, the reader is referred to the original papers and critiques. The purpose here is to review the factual errors and omissions of the surveyed textbooks. Space limitations dictate that only the most important issues will be discussed.

#### *Heston's Oregon Adoption Study*

Leonard Heston's 1966 report was the first published schizophrenia adoption study, and most of the 30 surveyed text-

books credited Heston with providing important evidence in favor of the genetic basis of schizophrenia. Heston's 47 experimental (index) adoptees were born to mothers residing in Oregon state mental hospitals who were diagnosed with schizophrenia. In no surveyed textbook, however, is it mentioned that during most of the period when these adoptees were placed (1915-1945), Oregon had laws on the books permitting the forced sterilization of "the insane" for eugenic purposes and had even established a State Board of Eugenics to oversee the process (Joseph, 1999b). It is therefore likely that the children of these patients, who were the presumed carriers of the "hereditary taint" of schizophrenia, were placed into environments inferior to those experienced by the "untainted" control adoptees. Thus, Heston's study was likely confounded by the selective placement of adoptees on the basis of the psychiatric status of their biological mothers. The readers of our 30 targeted textbooks are not given this information, leading to the erroneous belief that index and control adoptees were randomly placed into available adoptive homes.

Most of the textbooks discussing Heston's study failed to note the crucial fact that diagnoses were not made blindly. Heston personally collected information on all 97 of his subjects (47 experimental, 50 control) and had conducted interviews with 72. After Heston compiled dossiers for each adoptee, diagnoses were made "blindly and independently by two psychiatrists. A third evaluation was made by the author [Heston]" (Heston, 1966:821). When differences arose between these three raters, "a fourth psychiatrist was asked for an opinion and differences were discussed in conference" (Heston and Denney, 1968:368). Therefore Heston, who compiled the dossiers and was *not* diagnosing blindly, had an important input into the diagnostic process and was able to influence the "blind" raters in conference. Heston already knew from the records that five experimental and zero control adoptees had received a hospital diagnosis of schizophrenia and that this difference was statistically significant ( $p = .024$ ). If one less experimental or one more control adoptee had received a schizophrenia diagnosis, the experimental-control difference would have been statistically nonsignificant. If the two "blinded" psychiatrists had diagnosed a control adoptee with schizophrenia, Heston, who was aware of the adoptee's status and who was a strong advocate of the genetic position, could have influenced them into changing their diagnosis. Thus, it is clearly misleading to state that diagnoses were made by blinded raters.

On the subject of Heston's diagnostic process, Gottesman and Shields (1982:131) wrote, "It is important to note that diagnoses were made blindly by two psychiatrists in addition to the author." It would have been more accurate to note (as did Cassou, Schiff, and Stewart, 1980) that the diagnostic process was contaminated by the fact that one of the three diagnosticians was *not* blinded. According to Martin, "Five of the 47 children whose biological mothers were schizophrenic were diagnosed, *without knowledge of the*

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group to which they belonged, as schizophrenic; none of the children in the control group was so diagnosed" (1981:298; emphasis added). In Rose's discussion of the way in which Heston obtained information on his adoptees, he failed to mention that Heston was the person obtaining the information. Then, according to Rose, "The dossier compiled on each subject...was evaluated blindly and independently by two psychiatrists" (1980:103). The last phrase is taken directly from Heston's 1966 paper, but Rose left off Heston's next sentence, which read, "A third evaluation was made by the author."

The surveyed texts also failed to mention Heston's inadequate description of the criteria he used for making a diagnosis of schizophrenia. Heston stated only that diagnoses were made using "generally accepted standards" (Heston, 1966:822) and that the diagnosis of schizophrenia "was used conservatively" (Heston and Denney, 1968:369). Neale and Oltmanns (1980:194) claimed that diagnoses were made "by standard American criteria based on DSM-II," in spite of the fact that Heston did not state this in his papers. In fact, the DSM-II was not published until 1968.

Other problems in Heston's study not discussed in most textbooks include (1) that Heston had very little information about the experimental adoptees' biological fathers or about the control adoptees' biological mothers and fathers, (2) the questionable inclusion of the 25 experimental adoptees who were not interviewed, (3) the failure to publish case history material for those under study, and (4) the fact that almost half of the adoptees spent months or years in foundling homes (see Heston and Denney, 1968). Finally, Heston found a greater rate of "psychosocial disability" (e.g., criminality, alcoholism) among his experimental adoptees. Although this was reported in some textbooks, most failed to point out that this finding constitutes strong evidence that the experimental adoptees experienced more psychologically damaging rearing environments than controls. Instead, some textbooks followed Heston in speculating about the possible genetic link between schizophrenia and these psychosocial disabilities, and some authors (e.g., Neale and Oltmanns, 1980; Coleman, Butcher, and Carson, 1984; Gottesman, 1991) believed that these behaviors may have been inherited from the biological fathers.

### The Danish/American Adoptees Study

Rosenthal and associates' Danish "Adoptees" study (Rosenthal et al., 1968, 1971) was cited in most of the surveyed textbooks as providing important evidence in favor of the genetic position. None of the texts discuss the likelihood that the adopted-away offspring of index group parents were placed into inferior homes on the basis of the prevalence of psychiatric disorders in their biological families, which, as documented by Mednick and Hutchings (1977), played an important role in the Danish adoption process. As we saw in

Heston's Oregon study, compulsory eugenic sterilization laws were on the books for most of the period when the Danish adoptees were placed (see Hansen, 1996; Joseph, 1999b, in press-b). In addition, Rosenthal's study contained several glaring methodological problems (see Lidz, Blatt, and Cook, 1981; Lewontin, Rose, and Kamin, 1984; Boyle, 1990; Joseph, 1998a). Importantly, Rosenthal's papers (and two subsequent reanalyses) demonstrated that there was no statistically significant difference in schizophrenia spectrum diagnoses between the adopted-away offspring of spectrum parents and the adopted-away offspring of controls (for example, the figures from Rosenthal et al., 1971 are: 14/52 index versus 12/67 control,  $p = .17$ , Fisher's Exact Test, one-tailed).

In fact, Rosenthal found only one index adoptee with a hospital record of chronic schizophrenia and only one additional case was diagnosed by interview (Rosenthal et al., 1971). To reach statistical significance, Rosenthal had to include several offspring of parents diagnosed by one or more of the raters with "manic depressive disorder"—a condition that Rosenthal himself acknowledged was "genetically distinct and different" from schizophrenia (Rosenthal, 1971:124). In a later textbook chapter, however, Rosenthal would claim that his study looked at "individuals who had a history of schizophrenic disorder and who were the biological parents of children who had been given away at an early age for adoption by nonrelatives" (Rosenthal, 1980:4).

In general, the surveyed textbooks either claim or imply that Rosenthal's study confirmed Heston's (allegedly) significant results, which is clearly not the case. Higher—though statistically nonsignificant—index rates were frequently cited as evidence in favor of the genetic theory, even though the lack of statistical significance means that the null hypothesis, which states that there is no genetic influence on schizophrenia, is not rejected. Some examples follow:

- "Similar to the findings of Heston, the risk of schizophrenia was higher in the adopted-away children of schizophrenic persons" (Byerley and Coon, 1995:366);
- "Three of the forty-six index cases and none of the sixty-seven controls were diagnosed as definitely schizophrenic [3/47 versus 0/67,  $p = .065$ , n.s. Fisher's Exact Test, one-tailed]. This high rate in the index group points to a hereditary factor" (Sarason and Sarason, 1984:299);
- "In a study of children separated from schizophrenic mothers at an average age of six months, the findings confirmed those of Heston described above" (Gelder et al., 1996:268);
- "Rosenthal's studies strongly support the view that genetic factors are of considerable importance in the transmission of schizophrenia" (Murray, 1986: 351);
- "Of the 44 index cases, 3 were diagnosed as definitely schizophrenic. None of the controls were considered to be schizophrenic [nonsignificant difference]. This rate of 7%

(3/44) actual incidence of schizophrenia is quite similar to that observed by Heston, 11% (5/47)" (Neale and Oltmanns, 1980:195).

As for Rosenthal, he concluded the following on the basis of his preliminary findings of 1968, for which no statistically significant differences were claimed: "The data provide strong evidence indeed that heredity is a salient factor in the etiology of schizophrenic disorders" (Rosenthal, 1970:129).

There are only two exceptions in the 30 surveyed textbooks. Carson and Sanislow observed that "the main finding of this study had actually *failed* to confirm the hypothesized genetic transmission of a schizophrenia diathesis, according to accepted standards of evaluation" (1993:311), and Kendler and Diehl noted that Rosenthal's study "found similar results [to Heston] which, however, fell short of statistical significance, particularly when only parents with a consensus diagnosis of schizophrenia or schizophrenia spectrum were included" (1995:945). Strikingly, only one of the texts (Rieder, 1979) made reference to a paper published ten years after Rosenthal and associates' original 1968 report (Haier, Rosenthal, and Wender, 1978), in which Table 3 (1978:174) clearly showed that the index/control consensus diagnosis difference, using Rosenthal's own criteria, was statistically nonsignificant (index 21/64, or 33%, versus control 16/64, or 25%,  $p = .22$ , Fisher's Exact Test, one-tailed). Rieder argued that the high rate among the control adoptees was likely inflated by their supposedly undiagnosed biological parents, and he failed to conclude that the findings confirmed the negative results of the previous papers.

#### *The Lowing and Associates Reanalysis*

In the early 1980s, Lowing, Mirsky, and Pereira (1983) published a reanalysis of Rosenthal's data using DSM-III criteria. Although this study was not discussed in the majority of post-1983 surveyed texts, those citing it claimed that this investigation confirmed Rosenthal's allegedly significant findings. In fact, Lowing and associates confirmed Rosenthal's finding of only one case of chronic schizophrenia in the entire sample, and the index/control comparison remained statistically nonsignificant even when DSM-III schizotypal personality disorder (which was similar to the Danish/American borderline schizophrenia diagnosis) was counted along with DSM-III chronic schizophrenia. It was only through a widening of the spectrum to include schizoid personality—a diagnosis which even Kety (1983) acknowledged was genetically unrelated to chronic schizophrenia—that Lowing and colleagues were able to conclude, "We confirm the original finding [of Rosenthal et al.] concerning the heritability of schizophrenia spectrum disorders" (Lowing, Mirsky, and Pereira, 1983:1168).

Regarding the Lowing et al. reanalysis, Kendler and Diehl wrote that Rosenthal's study "has been the subject of a

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blinded reanalysis using DSM-III criteria, which...found a significant excess of schizophrenia spectrum in adopted-away offspring of schizophrenic parents versus those of control parents" (1995:945). They did not mention that only one case of chronic schizophrenia was found among the 39 index adoptees or that the significant difference was dependent on the schizoid diagnosis. Gottesman's 1991 account of the Lowing et al. reanalysis began by noting the low rate of chronic schizophrenia among index adoptees and ended with the claim that on the basis of the spectrum diagnosis rate, the results "are essentially in agreement" with those of Heston and Rosenthal (1991:141).

Apart from the reservations of a few authors, Rosenthal's adoptees study has been cited as providing important evidence in favor of the genetic transmission of schizophrenia—although the facts clearly suggest otherwise. Rosenthal and associates' conclusions were usually accepted without being subjected to critical analysis, and the results of subsequent reanalyses, which essentially confirmed the *negative* results of the original studies, were either ignored or were misrepresented.

#### **The Danish Adoptees' Family Studies**

The Danish/American "Adoptees' Family" studies, with Seymour Kety as the lead investigator (Kety et al., 1968, 1975, 1994), are the most frequently cited studies in favor of the operation of genetic factors in schizophrenia. Unlike Heston and Rosenthal, who looked at the adopted-away biological offspring of schizophrenic or schizophrenia spectrum parents (which in Rosenthal's case included parents diagnosed with non-spectrum manic depressive disorder), Kety and associates started with adoptees identified with a spectrum disorder and then obtained information on their biological and adoptive relatives. The 1968 study made blind diagnoses on the basis of psychiatric records; the 1975 and 1994 diagnoses were based on interviews.<sup>1</sup> In all three studies, the investigators concluded that the higher rate of spectrum disorders among index biological relatives when compared to control biological relatives provided evidence in favor of the genetic basis of schizophrenia.

Although the broad definition of schizophrenia afforded by the spectrum concept was necessary in order to find statistically significant results in the Danish/American studies, few textbooks questioned or provided evidence supporting its validity. The spectrum consisted of chronic (“process”) schizophrenia and several other “certain” and “uncertain” nonpsychotic or acute diagnoses, several of which were eventually dropped by the investigators themselves (e.g., “schizoid or inadequate personality” and “acute schizophrenia,” see Joseph, in press-a). Although Kety and associates’ 1975 index adoptee group consisted of 17 “chronic schizophrenia” (B1), 6 “acute schizophrenia” (B2), and 10 “borderline schizophrenia” (B3; also known as latent schizophrenia) cases,<sup>2</sup> the majority of textbooks reported that these adoptees were diagnosed with “schizophrenia.” For example:

- “In 33 of the 507 cases, a diagnosis of schizophrenia could be agreed upon by independent judges using an abstracted case history” (Rose, 1980:104-105);
- “Thirty-three adoptees who, when they grew up, had become schizophrenic were identified from the Copenhagen sample...” (Gottesman, 1991:143);
- Kety and associates “identified a group of early adoptees who had become schizophrenic” (Martin, 1981:298).

Kety and colleagues (1968, 1975) designated B1, B2, and B3 as “definite schizophrenia”—an unfortunate and misleading term repeated in several textbooks. When reporting diagnoses among biological relatives, typically left unmentioned is the fact that nearly two-thirds of the spectrum diagnoses were given to biological half-siblings, that is, to second-degree relatives.

None of the surveyed texts emphasized (and few reported) the fact that the rate of chronic schizophrenia among index and control biological relatives was not significantly different in either the 1968 or 1975 reports. One index biological relative received this diagnosis in 1968 and five cases were reported in 1975—four of which were given to *biological half-siblings*. But even if we count these half-siblings the same as first-degree relatives, the index/control difference remains statistically nonsignificant. This is due to the fact that the biological father of control adoptee C9 received a chronic schizophrenia diagnosis in the 1968 study, but had died before he could be interviewed (see Kety et al., 1975:160). In spite of the fact that several non-interviewed relative diagnoses were counted in other statistical calculations (e.g., the soon-to-be-discussed paternal half-siblings), Kety et al. did not count this control relative in their 1975 index/control chronic (B1) schizophrenia comparison; had he been counted, the comparison would have been statistically nonsignificant (5/173 index versus 1/174 control,  $p = .11$ , Fisher’s Exact Test, one-tailed). None of the textbooks questioned the removal of this chronic schizophrenic control first-degree biological relative by Kety and colleagues.<sup>3</sup>

Although there were only two first-degree relatives diagnosed with chronic schizophrenia among the 1975 biological relatives (one index and one control), one would not discover this by relying on the surveyed textbooks:

The rate for schizophrenia was greater among the *biological relatives* of the schizophrenic adoptees than among the relatives of controls, a finding which supports the genetic hypothesis.... The adoption findings reported above were for process [chronic] schizophrenia. (Gelder et al., 1996:268)

The schizophrenic children had significantly more biological relatives who were schizophrenic than the normal control group. (Gottesfeld, 1979:167)

Kety and colleagues looked at a group of schizophrenia patients who had been adopted out early in life and found a similar disorder in 12% of their biological parents and in less than 2% of the adoptive parents. (Schuckit, 1986:156)

The results [of the Kety et al. 1975 study] showed that the rate of schizophrenia was much higher in the biological relatives of adoptees with schizophrenia.... The rate of schizophrenia in the biological relatives of adoptees with schizophrenia was about 12%, compared to 1% to 2% in the biological relatives of adoptees without schizophrenia. (Keefe and Harvey, 1994:83)

Adoption studies have shown that biological relatives of individuals with Schizophrenia have a substantially increased risk for Schizophrenia, whereas adoptive relatives have no increased risk. (APA, 1994:283 [DSM-IV])

Among the biological relatives of index subjects, five were chronic schizophrenics; among the biological relatives of control subjects there were no chronic schizophrenics. Statistically, the difference between the two groups was highly significant. (Rosenthal, 1980:4)

According to Byerley and Coon, the 1968 Kety et al. report “found that the prevalence of schizophrenia was significantly higher in the biological parents.... The Danish adoption studies also found that the biological relatives of schizophrenic persons had elevated rates of ‘borderline schizophrenia’” (1995:366). In fact, *none* of the 63 biological index parents was diagnosed with chronic schizophrenia, and only *one* was diagnosed with borderline schizophrenia (see Kety et al., 1968:354).

#### *The Paternal Half-Siblings*

Although the findings presented by Kety and associates showed a significant concentration of spectrum diagnoses

among index versus control biological relatives, this finding was considered “compatible with a genetic transmission for schizophrenia, but it is not entirely conclusive” (Kety et al., 1975:156). Because of possible factors such as birth trauma, in utero influences, early mothering experiences, etc., “one cannot, therefore, conclude that the high prevalence of schizophrenia illness found in these biological relatives of schizophrenics is genetic in origin” (1975:156). Kety and associates then made their case for the discovery of “compelling evidence” in support of the genetic hypothesis:

The largest group of relatives which we have is, understandably, the group of biological paternal half-siblings. Now, a biological paternal half-sibling of an index case has some interesting characteristics. He did not share the same uterus or the neonatal mothering experience, or an increased risk in birth trauma with the index case. The only thing they share is the same father and a certain amount of genetic overlap. Therefore, the distribution of schizophrenic illness in the biological paternal half-siblings is of great interest. (Kety et al., 1975:156)

Kety and associates pointed out that there were 16 record- and interview-based spectrum diagnoses among these paternal half-siblings, but that the distribution was “highly unbalanced” (14 index, 2 control). They concluded, “We regard this as compelling evidence that genetic factors operate significantly in the transmission of schizophrenia” (1975:156).

All textbooks discussing this claim endorsed Kety and colleagues’ conclusion that the significantly higher rate of spectrum diagnoses among the biological paternal half-sibs provided important evidence for the genetic basis of schizophrenia. Aside from the questionable nature of this claim and the fact that no information was provided about the life circumstances of these half-siblings (or about any other subjects), it turns out that *the index/control difference is not statistically significant when all schizophrenia spectrum diagnoses are included*. As discussed in the Kety et al. 1975 paper, and shown in their Table 3 (1975:154), Category C (schizoid and inadequate personality) was included in the schizophrenia spectrum. However, as noted by Lidz and

Blatt (1983), and shown in a table by Kety et al. (1976:418), the difference is not statistically significant ( $p = .094$ ) when spectrum Category C is included. The investigators simply excluded Category C from the paternal half-sibling comparison *but not from the spectrum itself*.<sup>4</sup> Thus, a comparison supposedly providing “compelling evidence” in favor of the genetic basis of schizophrenia *is not statistically significant*—a fact not discussed in any of the surveyed textbooks. The following examples show how the half-sibling results were discussed:

In investigations of paternal half-siblings of schizophrenia probands, the incidence of schizophrenia was higher than in control cases, ruling out intrauterine contributions to the congenital effects. (Trimble, 1988:202)

A significant concentration of schizophrenia and uncertain schizophrenia was found in the paternal half-siblings of the schizophrenia index cases with whom they shared no prenatal or postnatal environment. (Kety and Matthyse, 1988:142)

Considering the *total* absence of common environmental factors among the [biological paternal half-sibs], these data are indeed convincing support for a hereditary component in the development of schizophrenia. (Neale and Oltmanns, 1980:197)

Using the results of both hospital diagnoses and psychiatric interviews, the frequency of hard schizophrenic spectrum in paternal half-siblings of schizophrenic and non-schizophrenic adoptees was determined.... These important data again confirm a genetic hypothesis... (Plomin, DeFries, and McClearn, 1990:357)

A paternal half-sibling study was performed as a part of the Danish adoption investigation and demonstrated that siblings who shared a relationship only through the father had an expected prevalence of schizophrenia even though the offspring had not shared the same uterine environment. (Schulz, 1991:82-83)

Whereas most of the surveyed authors ignored or were unaware of the fact that spectrum Category C was excluded from this comparison, several reported the findings from other studies (e.g., Rosenthal et al., 1971; Loring, Mirsky, and Pereira, 1983) which required the Category C diagnosis in order to reach statistical significance.<sup>5</sup>

#### *The Kendler and Gruenberg Reanalysis*

Several textbooks noted that the Kety et al. 1975 data were subject to a blind reanalysis by Kendler and Gruenberg (1984) using DSM-III criteria. All surveyed books

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mentioning this study implied that Kendler and Gruenberg, in the words of Black and Andreasen, “essentially replicated the original results” (1999:449). According to Gottesman (1991:144), Kendler and Gruenberg found that “the overall occurrence of schizophrenia or schizophrenia spectrum disorders is still significantly higher in the biological relatives of schizophrenic adoptees.... Thus, the original interpretation was sustained and strengthened.” Even Carson and Sanislow, who took a more critical stance than the others, found Kendler and Gruenberg’s data to be “relatively convincing” (1993:311).

There are, however, some striking results in the Kendler and Gruenberg reanalysis that were not discussed in any of the surveyed textbooks published after 1984. Looking at the original diagnoses by Kety and associates, who used the so-called “global diagnostic method,” Kendler and Gruenberg found that only 11 of the 17 Kety et al. chronic schizophrenia diagnoses (65%) met DSM-III diagnostic criteria for schizophrenia. Even more striking, they diagnosed only *one* of the original ten borderline schizophrenia adoptees (10%) with schizotypal personality disorder, the DSM-III borderline schizophrenia equivalent. One could argue that this finding calls into question the entire Danish/American diagnostic process and speaks to some critics’ observation that psychiatric diagnoses are unreliable and often arbitrary. Among the 35 biological relatives of DSM-III schizophrenia index adoptees, Kendler and Gruenberg found only 2 with the same diagnosis, and the rate among first-degree relatives was 1/10. Like Kety and associates, Kendler and Gruenberg found significant differences only through the highly questionable use of a schizophrenia spectrum.

Kendler and Gruenberg also revealed that several of Kety and associates’ “interviews” used for diagnostic purposes never took place, but *were made up by the Danish investigators*. Kendler and Gruenberg called them “pseudointerviews” and noted further that they could tell the difference between a “real interview with a control adoptee” and a “pseudointerview with an index adoptee” (p. 556). Lewontin, Rose, and Kamin (1984) also discussed the Danish/American pseudointerviews—the existence of which was not mentioned in any paper published by the Danish/American researchers or in any of the surveyed textbooks.<sup>6</sup>

## Summary and Conclusions

There have been three other schizophrenia adoption investigations: the Danish/American Crossfostering study (Wender et al., 1974), the Danish Provincial Adoptees’ Family study (Kety et al., 1994), and the Finnish Adoptive Family Study of Schizophrenia (Tienari et al., 1987, 1994). Due to space limitations, the way these studies were treated in the surveyed textbooks will not be analyzed here other than to point out that they were discussed in much the same way as the other

studies. (For a critique of the Finnish study, see Joseph, 1999a.)

In general, it is concluded here that the 30 surveyed textbooks have served to rubber-stamp the original investigators’ and contemporary psychiatry’s questionable conclusions about the results of the schizophrenia adoption studies. The descriptions of the studies are frequently inaccurate and leave the reader with the impression that the authors did not carefully review the original studies, and a clear bias in favor of the views of the original investigators is evident. In fact, only 4 of the 30 textbooks cited a publication critical of the findings of a schizophrenia adoption study (Coleman, Butcher, and Carson, 1984; Judd and Groves, 1986; Adelman, 1987; Carson and Sanislow, 1993), and only two attempted to provide a limited critical analysis (Gottesman and Shields, 1982; Carson and Sanislow, 1993).

The most striking feature of the way that the schizophrenia adoption studies were presented is not what was said about them, but what was *not* said about them. While these textbooks occasionally discussed the equal environment assumption, which is the basic underlying assumption of the twin method (Joseph, 1998b; Joseph, 2000), only one (Gottesman and Shields, 1982) discussed the possibility that the psychiatric status of the index biological families led to the placement of index adoptees into more psychologically harmful environments than control adoptees. However, genetic inferences from adoption studies are based on the assumption that index adoptees were not systematically placed into inferior rearing environments, which could lead to a higher rate of the condition in question for nongenetic reasons. Because most of the adoptees in the American, Danish, and Finnish studies were placed at a time when eugenic ideas were strong and the status of index adoptees’ “tainted” biological relatives was an important factor affecting placement, it is unlikely that index and control adoptees were placed into similar types of rearing environments.

The “nature-nurture” question has profound political implications. The view that schizophrenia and other types of “abnormal behavior” have an important genetic component typically leads to a different set of political positions than the view that these behaviors are caused by environmental factors. The correlation between one’s political views and one’s position in the environmentalist-hereditarian argument has been noted by Pastore (1949) and others. While many today view the nature-nurture question as *passé*, it is important to note that, as Paul (1998:82) observed, “the most striking feature of the nature-nurture debate is the number of times it has ostensibly ended.” Whether an individual is viewed as suffering from an inherited brain disease or as a victim of abusive childhood conditions and an alienating society has important political ramifications (Laing, 1967).

In summary, textbooks produced by psychiatry and the related fields have, in general, provided a misleading description of the schizophrenia adoption studies, and contain many factual errors and omissions. Paul (1985:317)

concluded from her investigation that the genetics textbooks she reviewed “perpetuate a fundamentally inaccurate understanding of the genetics of intelligence.” The same can be said for textbooks handling the genetics of schizophrenia question. Clearly, those studying the causes of schizophrenia must be exposed to a wider variety of viewpoints than they currently receive, and inaccurate reporting and bias must be further documented. In other fields, similar investigations into possible textbook inaccuracy and bias should also be undertaken.

## Notes

1. As an example of the inaccuracies that can result from inattention to detail and the reliance on secondary sources, one surveyed psychiatry textbook listed the authors of the 1968 Adoptees' Family report—one of the most famous studies in the history of psychiatry and performed by Kety, Rosenthal, Wender, and Schulsinger—as “Kety, Rosenfeld, Winther, and Scholfinger” (Kolb and Brodie, 1982:351).
2. Relatives in the Kety et al. studies receiving a “borderline schizophrenia” diagnosis displayed few if any of the symptoms commonly believed to differentiate “psychosis” from “nonpsychosis” (see Joseph, in press-b). In the mid-1980s, Kety discussed the types of people who received this diagnosis in the 1975 Adoptees' Family interview study: “Our diagnoses of latent and uncertain schizophrenia in the relatives, therefore, included a majority with flat affect, bizarre thinking, poor contact, and poor interpersonal relationships rather than the positive symptoms which appeared to characterize the [1968] hospitalized group” (Kety, 1985:592).
3. By the late 1980s, Kety began retroactively counting the biological father of control adoptee C9 as a chronic (B1) schizophrenic (see Ingraham and Kety, 1988:122; Kety et al., 1994:452).
4. A 1974 paper by Kety saw the first publication of the 14 to 2 index/control paternal half-sibling distribution, which did not include Category C in spite of the fact that, one page earlier, Kety had written, “A diagnosis of schizoid or inadequate personality, with some schizoid features, was included in what we termed the ‘schizophrenia spectrum’ as being possibly related to schizophrenia” (Kety, 1974:960). In 1975, Rosenthal wrote, “I think that the soft spectrum, which includes a number of syndromes that we call schizoid, is indeed genetically related to process [chronic] schizophrenia” (Rosenthal, 1975:201).
5. Sometimes commentators imply that adoption researchers predicted an outcome or noted the importance of a comparison before the collection of data, when it is clearly not the case. According to Neale and Oltmanns (1980:197), “Kety (1974) suggested that a comparison of the prevalence of schizophrenia in the paternal half-siblings” would eliminate the possibility that in utero experiences led to greater index biological relative spectrum rates. However, because Kety made this suggestion *after* he had collected the data (see Kety, 1974:961; Neale and Oltmanns, 1980:197) there is no evidence that the importance of this comparison was determined *before* the data were collected. As another example, a group of prominent non-survey reviewers wrote, “Kety et al.... predicted that ‘if schizophrenia were to some extent genetically transmitted, there should be a higher prevalence of disorders in the schizophrenia spectrum among the biological relatives.’...Kety did, indeed, find a concentration of schizophrenia spectrum diagnoses in the biological relatives of schizophrenic adoptees” (Lyons, et al., 1991:131). Kety and associates were thus credited with “predicting” and “finding” such a concentration in the same 1968 paper.
6. In spite of being one of the most important critical analyses of the schizophrenia adoption studies, the 1984 work of Lewontin and associates was neither discussed nor cited in any of the textbooks examined in this article.

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