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Optical Differences in Cases of Multiple Personality Disorder

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Nine patients diagnosed with multiple personality disorder (MPD) and nine control subjects role-playing MPD were given complete ophthalmological examinations to test whether the MPD subjects would show greater variability in visual functioning across alter personalities than would control subjects role-playing MPD. An analysis of variability of eight optical measures in four prominent areas of vision was performed by comparing two covariance matrices for equality. The test on the equality of the two covariance matrices showed that the two groups were significantly different ($p < .05$). That is, MPD subjects had significantly more variability in visual functioning across alter personalities than did control subjects. Because the test of equality of the two covariance matrices rejected the null hypothesis, univariate analyses of variance were performed on the eight individual ophthalmological measures that comprised the matrix. The results of these analyses showed that MPD subjects had significantly more variability across alter personalities than did their control counterparts on measures of visual acuity with correction, visual acuity without correction, visual fields, manifest refraction, and eye muscle balance.

The data were also analyzed for clinical significance. Blind ratings of the data were performed by comparing the results of the individual dependent measures *across* the alter personalities of individual MPD and control subjects according to established ophthalmological criteria. The ratings for clinical significance showed that the MPD subjects had 4.5 times the average number of changes in optical functioning between alter personalities of the control subjects, with a mean of 2.56 clinically significant changes for the MPD subjects and .55 clinically significant changes for the control subjects. This difference was also statistically significant ($p < .01$).

As a clinical psychiatric disorder, multiple personality disorder (MPD) was described as early as 1646 by Paracelsus (Bliss, 1980). An argument can be made that other cases of MPD predated that reported by Paracelsus but were recorded and explained in the terminology of the prevailing philosophy and culture of the time (*e.g.*, demonic possession, wandering uterus, and witchcraft; Hilgard, 1977). For example, the New Testament contains the account of Jesus Christ's encounter with a man reported to be possessed by demons. According to the account in the Gospels, Jesus was confronted by a man shortly after arriving in the country of Gadarenes who wished to be healed. When Jesus asked the man, "What is thy name?" The man responded, "My name is Legion: *for we are many*" (emphasis added) (Mark 5:1–5, *The Holy Bible*). This account, as well as other similar reports in scripture and literature—consider, for example, the fictional account of Dr. Jekyll and Mr. Hyde (Greenberg, 1982) or Doestoevsky's *The Double* (Mochulsky, 1947)—could possibly be construed as MPD interpreted within the prevailing zeitgeist of their time (Coleman et al., 1980; Greenberg, 1982; Hilgard, 1977; Sarason and Sarason, 1984; Stern, 1984; Thompson, 1985; Varma and Wig, 1981).

Since the first clinical report by Paracelsus, over 300 cases have been reported in the scientific literature (Beal, 1978; Bliss, 1986). In 1984, a prominent researcher in this area (Braun, 1984) estimated that there were 1000 cases of the disorder currently in treatment. Once thought to be "extremely rare" (American Psychiatric Association [APA], 1980), MPD has recently become diagnosed, treated, and studied with increasing frequency (Kluft, 1987).

Despite this increase, clinicians' interest and belief in MPD seems to vacillate. Indeed, the validity of MPD as a clinical psychiatric entity has been and continues to be debated in the literature (Braun, 1984; Gruenewald, 1984; Kluft, 1987; Rosenbaum, 1980; Spanos et al., 1985, 1986).

One recent method that has been used to substantiate the disorder as a clinical entity and that may be used in the future to make the diagnosis of MPD with

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more accuracy has been to test and measure physiological differences that occur between personality states (or "alter personalities") within an individual suffering from MPD (Braun, 1983a, 1983b; Putnam, 1984). Currently, psychophysiological differences reported in the literature include changes in cerebral electrical activity as measured by EEG (Ellenburger, 1970, cited in Braun, 1983b; Larmore et al., 1977; Ludwig et al., 1972; Morselli, 1953), galvanic skin response and skin temperature (Cocores et al., 1984; Coons et al., 1982), cerebral blood flow (Mathew et al., 1985),[2] thyroid function,[3] (Hunter, 1986), electrodermal activity (Brende, 1984), voice, posture, motor behavior, and response to medication (Putnam, 1984) and perception, visual functioning, and visual evoked potentials (Larmore et al., 1977; Rosse, 1892).[4]

This research, however, is complicated by an almost equal number of studies that find little or no difference in physiological functioning across personalities of individuals with MPD (Bliss, 1980; Coons et al., 1982; Salama, 1980). Furthermore, some researchers (Spanos et al., 1986) have criticized studies reporting significant findings on the basis of limitations in research design, specifically the small number of MPD subjects and the lack of matched control subjects.

One area in which physiological differences between alter personalities of persons with MPD have been consistently reported and that may be helpful in establishing the validity of the disorder is visual functioning. Reports from the popular literature on patients with MPD, such as Sybil (Schreiber, 1973), Billy Milligan (Keyes, 1982), and Eve (Condon et al., 1969; Osgood et al. 1976; Thigpen and Cleckley, 1957) called early attention to the occurrence of changes in visual functioning between alter personalities.

One of the first truly experimental studies of optical differences in cases of MPD was presented at the 1985 Conference on Multiple Personality and Dissociative Disorders by Shepard and Braun.[4] In a preliminary study of seven cases of MPD, these researchers reported finding *clinically* significant optical differences between alter personalities on measures of visual acuity, manifest refraction, color vision, pupil size, corneal curvature, and intraocular pressure. They concluded that their findings "clearly provide[d] support for the notion that changes in visual functioning are observable when MPD patients switch from one personality state to another" (p. 8).

The purpose of the present study was to replicate the study by Shepard and Braun with some design modifications to improve the validity, and therefore, the generalizability of the results; most notably, the addition of a control group and single-blind testing arrangement. This study sought to determine whether persons with MPD had greater optical variability across personalities than persons without the disorder (control subjects).

Methods

Subjects

Nine female subjects diagnosed with MPD were recruited from the patient population in the Department of Psychiatry, Psychology, and Behavioral Medicine at Utah Valley Regional Medical Center (UVRMC) in Provo, Utah. One male subject with MPD was recruited from the Utah State Penitentiary in Draper, Utah. The MPD subjects ranged in ages from 24 to 43, with an average age of 34. Because of the apparently rare nature of the disorder, subjects were admitted into the study when they were located and indicated a willingness to participate. For this reason, the subjects varied on many dimensions that the nonrandom selection procedure could not control, such as age, gender, demographics, psychiatric history, amount and/or type of therapy already received, and total number of personalities and/or personality fragments. However, all 10 participants did meet the three diagnostic criteria outlined in the DSM-III (APA, 1980).

Nine control subjects were recruited from the nursing and secretarial staff in the Department of Psychiatry, Psychology, and Behavioral Medicine at UVRMC. These subjects ranged in age from 22 to 43, with an average age of 30. The control subjects were screened by a psychiatrist to ensure that none met any of the diagnostic criteria for MPD.

Procedure

An initial appointment was made for each MPD subject during which the nature of the project was explained, informed consent obtained, and a standard psychodiagnostic interview conducted. The inmate subject was similarly briefed and interviewed in a holding facility at the penitentiary. Three stable "alter personalities" were identified during the psychodiagnostic interview for each individual MPD subject and thereafter interviewed while being videotaped. Throughout these interviews, a consistent attempt was made to establish rapport and commitment with each personality identified for participation.

The control subjects also had an initial appointment

[2] R. deVito, B. Braun, S. Karesh, et al. Regional cerebral blood flow in multiple personality. Paper presented at the Conference on Multiple Personality and Dissociative Disorders, Chicago, 1986.

[3] M. Hunter. Variations in thyroid function levels in multiple personality alters. Paper presented at the 1986 Conference on Dissociative Disorders and Multiple Personality, Chicago, 1986.

[4] K. Shepard and B. Braun. Changes in visual functioning of the multiple personality patient. Paper presented at the Conference on Multiple Personality and Dissociative Disorders, Chicago, 1985.

during which the nature, purpose, and design of the study were discussed in detail and a screening interview conducted to ensure that the subjects did *not* have MPD. Subjects were then scheduled for further participation during convenient nonworking hours. During their participation, control subjects were paid their normal working wage.

The MPD subjects, with the exception of the prison inmate, who was examined at prison facilities, came for their second appointment to the office of Robert H. Hales, M.D., an ophthalmologist in private practice, for the ophthalmological examinations. Each of the three alter personalities was then given a standard ophthalmological examination. The personalities were each instructed to complete the examination procedure as much as possible without the assistance or interference of other personalities and to alert the experimenter should such problems arise. While the subjects in the study had varying amounts of treatment experience, all were personally capable of "switching" from personality to personality. After each "switch" and before the next examination, a time period of between 5 and 10 minutes was allowed to elapse to better ensure that the identified personality was indeed present and capable of remaining present for the examination. While the subjects "switched" from one alter personality to the next before the next exam, the ophthalmologist stepped out of the examination room.

The control subjects came to their second appointment to UVRMC, where they first viewed the motion picture "Sybil." The film is based on the real life story of Sybil Dorsett, a woman with MPD. This viewing was intended to give control subjects a more complete example of MPD. Thereafter, the control subjects viewed a videotaped interview of an MPD subject and were asked to impersonate the MPD subject while undergoing the eye examinations. Each subject was then given three standard eye examinations while role-playing the three alter personalities. The ophthalmologist left the examination room during the time the "mock" switching took place. The ophthalmological examinations were conducted using a single-blind arrangement—the ophthalmologist being unaware of which subjects were merely role-playing MPD and which subjects were actually diagnosed with the disorder—to avoid any experimenter-expectancy bias.

Results

Although a complete ophthalmological examination was conducted, only eight measurements representative of four prominent elements of vision were included in the statistical and clinical analyses. Central vision was assessed by measuring visual acuity with a Snellen chart, both with and without correction. Peripheral vision was assessed by measuring the number of points seen in the visual fields as projected on a Humphery Automated Perimeter. Refraction was assessed by measuring manifest refraction including the sphere, cylinder, and axis. And finally, eye-muscle balance was measured by the Maddox wing test. The number of ophthalmological measures was limited for three reasons: a) the low number of subjects in the study; b) previous research in this area and clinical experience together suggesting that these measures had the greatest promise for significant findings; and c) the redundancy built into the standard eye exam by the use of multiple procedures to assess the same functions in an attempt to increase the accuracy of the findings.

Nine MPD and nine control subjects were ultimately included in the final statistical and clinical analyses. Although 10 MPD subjects were actually tested, one MPD subject was dropped from the analyses when a control subject decided not to participate.

Statistical Significance

The researchers hypothesized that MPD subjects would have greater variability in the ophthalmological assessments across alter personalities than would the control subjects. To test this hypothesis, covariance matrices were constructed and tested for equality (Srivastava and Carter, 1983). First, two covariance matrices were constructed for each subject, one for each eye. Separate covariance matrices were constructed for each eye because the ophthalmological measures used yielded separate scores for each eye. Subject matrices were then pooled into four matrices: MPD-right eye, control-right eye, MPD-left eye, control-left eye. These four matrices were then pooled into two matrices: right eye and left eye.

The test on the equality of the two covariance matrices for MPD-right eye and control-right eye yielded a value of 75.28. The test of the equality of the covariance matrices for MPD-left eye and control-left eye yielded a value of 79.19. Because both were greater than the critical χ^2 value of 41.34 ($df = 28$, $p < .05$), the two groups were found to be significantly different. That is, MPD subjects had significantly greater variability in visual functioning across alter personalities than did control subjects.

Because the test of equality of the two covariance matrices was in the hypothesized direction, univariate analyses of variance were performed on the eight individual ophthalmological measures that comprised the matrix. The results of these univariate analyses showed that MPD subjects demonstrated significantly more variability in visual functioning across personalities than did their control counterparts on measures of visual acuity with correction, visual acuity without cor-

TABLE 1
Univariate F-Values for Comparison between MPD and Control Groups on Visual Measures

Visual Measure	MPD Pooled Variance	Control Pooled Variance	*F*
Right eye[a]			
Visual acuity without correction	17147.62	7622.619	2.25†
Visual acuity with correction	22.02381	2.380952	9.25**
Visual field (number of points seen of 76 points)	25.90476	6.238095	4.15**
Manifest refraction, sphere	.0401784	.0343362	1.17
Manifest refraction, cylinder power	.1130952	.0267857	4.22**
Manifest refraction, axis	2200.595	.2370.238	.953
Left eye[b]			
Visual acuity without correction	25083.33	7086.485	3.54**
Visual acuity with correction	44.27083	4.166667	10.63**
Visual Field (number of points seen of 76 points)	44	1	44.00**
Manifest refraction, sphere	.0299479	.04427081	.677
Manifest refraction, cylinder power	.09505206	.01822916	5.21**
Manifest refraction, axis	3982.292	2027.083	1.965

[a] Critical $F[13,13]$ alpha .05 = 2.58; critical $F[13,13]$ alpha .01 = 3.92.
[b] Critical $F[15,15]$ alpha .05 = 2.40; critical $F[15,15]$ alpha .01 = 3.52.
† $p < .10$; ** $p < .01$.

rection, visual fields, manifest refraction, and eye muscle balance. These results are summarized in Tables 1 and 2.

Clinical Significance

The data were next examined for "clinical significance." The examining ophthalmologist performed blind ratings of the data for clinical significance by comparing the results of the individual dependent measures *across* the alter personalities of individual MPD and control subjects according to established ophthalmological criteria. The ratings for clinical significance showed that MPD subjects had 4.5 times the average number of changes in optical functioning between alter personalities than did the control subjects, with a mean number of 2.56 clinically significant changes for MPD subjects and .55 clinically significant changes for control subjects ($p < .01$, $t = 3.00$, $df = 8$).

TABLE 2
Univariate F-Values for Comparison between MPD and Control Groups on Maddox Wing Verticle Muscle Balance Visual Measure

Visual Measure	MPD Pooled Variance	Control Pooled Variance	$F[13,13]$
Maddox wing, muscle balance test vertical[a]	1.428571	.04761904	30.00**
Maddox wing, muscle balance test horizontal[b]	4.541667	1.5541667	2.95*

[a] Critical $F[13,13]$ alpha .05 = 2.58; critical $F[13,13]$ alpha .01 = 3.92.
[b] Critical $F[15,15]$ alpha .05 = 2.40; critical $F[15,15]$ alpha .01 = 3.52.
* $p < .05$; ** $p < .01$.

Clinical Observations

A number of cases of MPD displayed highly unusual, personality-specific fluctuations in visual functioning not amenable to the statistical or binomial clinical analyses used thus far. None of the control subjects demonstrated similar fluctuations. Three representative cases are briefly reviewed.

The first involved the clinical observation of accommodative-type esotropia in an alter personality that was not present in the two other personalities tested. Ophthalmologists divide esotropia, or the turning in of the eyes, into two types: a) nonaccommodative esotropia, in which the child is born with the eyes turned inward; and b) accommodative type esotropia, in which turning in of the eyes is observed to develop over time, usually around age 4 or 5. Generally, children outgrow accommodative-type esotropia whereas surgery is usually required to correct the nonaccommodative type. The findings are considered significant because the accommodative-type esotropia ordinarily seen in children was in fact observed in an alter personality reported as being 4 years old, and not in the older personalities, aged 17 and 35.

A second case also showed differences in visual functioning between the reported adult and child alter personalities that were consistent with differences commonly seen between adults and children. Ophthalmologists point out that accommodation, the power of the eye to adjust the thickness and curvature of the lens, thereby allowing both distant and near objects to alternatively be seen clearly and distinctly, decreases with age. The gradual loss of accommodation, beginning at birth and continuing to maximal loss around age 50, results in a condition known as pres-

byopia. This condition is often corrected for in the portion of the prescription for eye glasses (reading lenses) known as the "add." In this second case, much like the first case, the older birth personality (aged 38 years) reported that the "add" significantly improved her vision. This finding was considered consistent with her age. However, two young alter personalities (aged 6 and 8) reported no such improvement with the addition of the "add" and rejected the correction when it was offered. This finding was also ophthalmologically consistent with the reported ages of the alter personalities.

In a third and final case, one personality was examined and shown to have better than average visual acuity with and without correction (20/15) and no muscle balance problems. Upon switching to one other alter personality, however, visual acuity without correction markedly deteriorated to 20/30 in the right eye and 20/50 in the left. Moreover, upon emerging, the alter personality developed a muscle balance disorder known as left exotropia, or turning outward of the left eye. This condition *completely* resolved when the person returned to the first personality tested.

Discussion

The results from this study statistically confirm earlier clinical, anecdotal, and experimental reports that individuals with MPD may experience differences in visual functioning between alter personalities. The results further found that such differences were not present in control subjects attempting to simulate the disorder.

Specifically, the study confirmed the earlier results of Shepard and Braun[4] that MPD subjects had significantly more variability in visual functioning on measures of visual acuity and manifest refraction (the power of the cylinder). The findings from the present study conflicted with the earlier study with regard to fluctuations of eye-muscle balance (the Maddox wing) and visual fields. Specifically, Shepard and Braun found clinically significant changes in eye muscle balance and visual fields in only one of seven cases tested, whereas the present study found that MPD subjects had statistically and clinically greater variability on both measures than did the control subjects. No assessment was made in this study on measures of color vision, corneal curvature, and intraocular pressure, which were found to vary to a clinically significant degree in the previous study. Pupil size, which was reported as varying to a clinically significant degree in the Shepard and Braun study, was *not* found to vary in the present sample. This finding, although not explicitly examined for in this paper, was made by the examining ophthalmologist who has compiled independent ratings on a number of measures, including pupil size variation, for publication elsewhere.[5] The reason for the disparate findings is currently unexplainable and further study involving the discrepant measures is recommended. A comparison of the results from both studies is summarized in Table 3.

TABLE 3
Summary Comparison of Shepard and Braun (1985) and Present Study

Test	Shepard and Braun (1985)	Present Study
Visual acuity without correction	Yes[a]	Yes
Visual acuity with correction	Yes	Yes
Manifest refraction	Yes	Yes
Eye-muscle balance	No	Yes
Visual fields	No	Yes
Pupil size	Yes	No
Color vision	Yes	N/A
Keratometry	Yes	N/A
Intraocular pressure	Yes	N/A

[a] *Yes* indicates that a difference in visual functioning was observed between personalities in the cases of MPD. *No* indicates that no differences were observed. *N/A* indicates that the test was not used in the study.

Currently, the most consistently discriminating ophthalmological measures appear to be those that are dependent on examinee self-report or that require some interaction among the examiner, patient, and test situation or device; that is, those measures that involve the examiner presenting a situation or choice that requires a response from the examinee. Ophthalmologists title these measures "subjective." Such measures would include patient history, corrected and uncorrected visual acuity as measured by the Snellen and Jaeger charts, manifest refraction, some muscle balance tests (including the Maddox wing and the red lens test), and visual fields. Less consistent results have been obtained on measures in which there is little or no interaction between the examiner and examinee or that measure physiological characteristics of the eye. Ophthalmologists title these measures "objective." Such measures include slit lamp examination (including assessment of lens, eyelids, anterior chamber, iris and cornea), ophthalmoscope examination (including assessment of the pupils, fovea, retina, macula, optic disk, and blood vessels), keratometry (or curvature of the cornea), intraocular pressure, and some measures of muscle balance (including the cover test and head position test).

The above-mentioned findings seem to suggest that individuals with MPD experience differences in some aspects of visual functioning between alter personalities. However, although these differences may prove to be diagnostically useful in the future, the current

[5] R. Hales, manuscript in preparation.

findings are not considered consistent enough to be useful at this time for such purposes. Furthermore, the results of the present study leave a number of questions unanswered. For example, because the study employed a control group comprised of normal subjects, the question of whether the findings are *specific* to individuals with MPD or might also be found in other psychiatric populations (*e.g.*, affective disorders, other dissociative disorders) remains unanswered. Moreover, while the findings indicate that MPD subjects were more variable than were control subjects on the optical measures, they do not address the question of whether different personalities of individuals with MPD have consistently the same optical characteristics every time they "emerge."

The major criticism of the present study may be the reliance on subjective ophthalmological measures. In their study, Shepard and Braun used five subjective and four objective measures. It was explained that they used both types of measures because the researchers felt that subjective tests were "more easy to fake and . . . most likely to be susceptible to the examiner's cues and expectations," whereas objective variables would be "difficult, if not impossible . . . to fake" (Shepard and Braun, 1985, p. 3).

The implication is that subjective measures may be less useful in the differentiation of real and malingered visual fluctuations. However, such a judgment may be premature for a number of reasons. First, the designation of certain ophthalmological procedures as subjective may not actually suggest that the methods are less reliable, but may only be descriptive of the method. In other words, subjective measures are merely those that involve examinee self-report or an interaction between the examiner and examinee. Indeed, some of the tests used by ophthalmologists in the differentiation of malingering are subjective by definition. Second, it is not at all certain to the present researcher that all measures classified as subjective are of necessity more transparent and, therefore, susceptible to faking as suggested by Shepard and Braun. Furthermore, often multiple measures of the same function occur at different stages of the standard eye examination that ensure the reliability and consistency of measurement. Whereas a subject may be able to consciously malinger particular tests in a desired direction, it is not clear that subjects would possess the knowledge needed to malinger consistently across the entire exam. And finally, Shepard and Braun noted that such measures would potentially be more "susceptible to the examiner's cues and expectations." In the present study, however, the examinations were conducted in a single-blind arrangement, thereby avoiding any possible experimenter-expectancy bias. However, it is recommended that future research include a greater mix of subjective and objective measures.

One explanation that might be offered for the observed differences is the effect of certain psychotropic medications on vision. Decreases in visual functioning (*e.g.*, blurring of vision, mydriasis, and miosis) associated with the anticholinergic properties of some psychotropic medications are well known (Kaplan and Sadock, 1985; Schatzberg and Cole, 1986). In the present study, however, only two MPD subjects were taking medication with known strong anticholinergic properties (Doxepin) at the time the examinations were performed. Furthermore, although it is clear that such medication might account for an overall decrease in visual acuity when compared with measures taken before taking the medication, it is not clear how the medication would account for the observed fluctuations across all visual measures in three consecutive eye examinations conducted in the space of 1.5 hours.

Another explanation for the findings involves the hypnotic alteration of sensory and physiological functioning. Some authors have postulated that MPD is a trance state or self-hypnotic disorder (Beahrs, 1982; Bliss, 1986). Studies have shown that hypnosis can alter various sensory and physiological functions, such as vision and visual acuity, audition, olfaction, blood flow, and pain (Crasilneck and Hall, 1975; Graham and Leibowitz, 1972; Hilgard, 1977; Rossi, 1980). Given that research has demonstrated the hypnotic alteration of various physiological processes, including visual functioning, and that MPD may be a spontaneous self-hypnotic or trance state disorder, future studies may find that hypnosis is in part responsible for the observed fluctuations. For this reason, it may be recommended that future physiological studies employ control subjects capable of entering deep hypnotic states while role-playing.

Conclusions

In summary, this author suggests that further studies be conducted with some modifications in design. First, the measures of color vision, corneal curvature, and intraocular pressure, found to vary to a clinically significant degree in the study by Shepard and Braun but excluded in the present study, should be repeated in future studies. Also, the measures of pupil size, visual fields, and eye muscle balance, which had conflicting results in the two studies, should likewise be repeated. Second, a group comprising highly hypnotizable subjects might be used as a comparison group in future physiological studies as opposed to present studies, which have relied solely on normal subjects. Use of hypnotizable subjects would allow researchers to determine with more confidence whether the ob-

served differences in visual functioning are the partial result of hypnotic alteration of visual processes or, as Putnam (1984) has postulated, a systematic artifact generated only by MPD subjects. Further, the use of such subjects may provide a valuable assessment of the trance state, self-hypnotic disorder models of MPD. And finally, in addition to a comparison group of highly hypnotizable subjects, it is recommended that future physiological studies include a second comparison group comprising some other psychiatric populations (*e.g.*, affective disorders, other dissociative disorder). The addition of this group would allow researchers to determine whether any observed physiological changes are specific to MPD or are more generally present across a number of psychiatric disorders.

References

American Psychiatric Association (1980) *Diagnostic and statistical manual of mental disorders.* (3rd ed). Washington, DC: Author.

Beahrs J (1982) *Unity and multiplicity.* New York: Brunner/Mazel.

Beal E (1978) Use of the extended family in the treatment of multiple personality. *Am J Psychiatry* 135:539–542.

Bliss E (1980) A report of 14 cases with implications for schizophrenia and hysteria. *Arch Gen Psychiatry* 37:1388–1397.

Bliss E (1986) *Multiple personality, allied disorders, and hypnosis.* New York: Oxford University Press.

Braun B (1983a) Psychophysiologic phenomena in multiple personality and hypnosis. *Am J Clin Hypn* 26:124–137.

Braun B (1983b) Neurophysiologic changes in multiple personality due to integration: A preliminary report. *Am J Clin Hypn* 26:84–92.

Braun B (1984) Foreword. *Psychiatr Clin North Am* 7:1–2.

Brende J (1984) The psychophysiologic manifestations of dissociation. *Psychiatr Clin North Am* 7:41–50.

Cocores J, Bender A, McBride E (1984) Single case study: Multiple personality, seizure disorder, and the electroencephalogram. *J Nerv Ment Dis* 172:436–438.

Coleman J, Butcher J, Carson R (1980) *Abnormal psychology and modern life* (6th ed). Palo Alto, CA: Scott, Foresman.

Condon W, Ogston W, Pacoe L (1969) Three faces of Eve revisited: A study of transient microstrabismus. *J Abnorm Psychol* 47:618–620. In Braun B (1983b) Neurophysiologic changes in multiple personality due to integration: A preliminary report. *Am J Clin Hypn* 26:84–92.

Coons P, Milstein V, Marley C (1982) EEG studies of two multiple personalities and a control. *Arch Gen Psychiatry* 39:823–825.

Crasilneck H, Hall J (1975) *Clinical hypnosis: Principles and applications.* New York: Grune & Stratton.

Ellenburger H (1970) *The discovery of the unconscious.* New York: Basic.

Graham C, Leibowitz H (1972) The effect of suggestion on visual acuity. *Int J Clin Exp Hypn* 20:169–186.

Greenburg W (1982) The multiple personality. *Pers Psychiatr Care* 20:100–104.

Gruenewald D (1984) On the nature of multiple personality: Comparisons with hypnosis. *Int J Clin Exp Hypn* 32:170–190.

Hilgard E (1977) *Divided consciousness: Multiple controls in human thought and action.* New York: Wiley.

The Holy Bible (King James Version). Salt Lake City: Deseret.

Kaplan H, Sadock B (1985) *Comprehensive textbook of psychiatry* (4th Ed). Baltimore: Williams & Wilkins.

Keyes D (1982) *The minds of Billy Milligan.* New York: Bantam.

Kluft R (1987) An update on multiple personality disorder. *Hosp Community Psychiatry* 38:363–373.

Larmore K, Ludwig A, Cain R (1977) Multiple personality: An objective case study. *Br J Psychiatry* 131:35–40.

Ludwig A, Brandsma J, Wilbur C, et al (1972) The objective study of a multiple personality: Or are four heads better than one? *Arch Gen Psychiatry* 26:298–310.

Mathew R, Jack R, West W (1985) Regional cerebral blood flow in a patient with multiple personality. *Am J Psychiatry* 142:504–505.

Molchulsky K (1947) *Dostoevsky: His life and his work.* Paris: YMCA Press. In Greenburg W (1982) The multiple personality. *Pers Psychiatr Care* 20:100–104.

Morselli G (1953) Personalities alternate e pathologia affectiva. *Arch Psicol Neurol Psichiatr* 14:579–583.

Osgood C, Luria Z, Jeans R, et al (1976) The three faces of Evelyn: A case study. *J Abnorm Psychol* 85:247–286.

Putnam F (1984) The psychophysiologic investigation of multiple personality disorder. *Psychiatr Clin North Am* 7:31–39.

Rosenbaum M (1980) The role of the term schizophrenia in the decline of the diagnosis of multiple personality disorder. *Arch Gen Psychiatry* 37:1383–1385.

Rosse A (1892) Triple personality. *J Nerv Ment Dis* 19:186–191.

Rossi E (Ed) (1980) *The hypnotic alteration of sensory, perceptual, and psychophysiological processes: The collected papers of Milton H. Erickson on hypnosis.* New York: Irvington.

Salama A (1980) Multiple personality. *Can J Psychiatry* 25:569–572.

Sarason I, Sarason B (1984) *Abnormal behavior: The problem of maladaptive behavior* (4th ed). Englewood Cliffs, NJ: Prentice Hall, Inc.

Schatzberg A, Cole J (1986) *Manual of clinical psychopharmocology.* Washington, DC: American Psychiatric Press.

Schreiber F (1973) *Sybil.* Chicago: Regnery.

Spanos N, Weeks J, Bertrand L (1985) Multiple personality: A social psychological perspective. *J Abnorm Psychol* 94:362–376.

Spanos N, Weeks J, Menary E, et al (1986) Multiple personality symptoms: A simulation study. *Psychiatry* 49:298–311.

Srivastava M, Carter E (1983) *An introduction to applied multivariate statistics.* New York: North-Holland.

Stern C (1984) The etiology of multiple personality. *Psychiatr Clin North Am* 7:149–159.

Thigpen C, Cleckley H (1957) *The three faces of Eve.* New York: McGraw-Hill.

Thompson H (1985) Functional visual loss. *Am J Ophthalmol* 100:209–213.

Varma V, Wig N (1981) Multiple personality in India: Comparison with hysterical possession state. *Am J Psychotherapy* 35:113–120.