ANXIETY AND OTHER PERSONALITY FACTORS IN TEENAGERS BEFORE AND AFTER ABORTION

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A THESIS

in

The Department

of

PSYCHOLOGY

Presented in Partial Fulfillment of the Requirements for
the Degree of Master of Arts at
Sir George Williams University
Montreal, Canada

September, 1972

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A B S T R A C T

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The Sixteen Personality Factor Questionnaire was given to patients who appeared at the clinic, early, before the 12th week of their pregnancy, and late, after that time. The early group underwent a suction curretage, the late group a saline abortion. At pretest, neither group differed from each other or from matched, nonpregnant controls along 11 primary and 3 secondary factors, including the anxiety dimension. But both groups were similar to depressive patients insofar as they were relatively shy, serious and introverted with respect to controls ($p < .01$). Both patient groups were also more calculating and self-sufficient than were controls ($p < .05$). Three weeks after operation, those in the early group who had been high in preoperation anxiety, demonstrated lower anxiety scores than did either the late group or the controls ($p < .01$). In a separate study, 31 aborted teenagers were retested 8 months later. Changes in scores demonstrated increased self-reliance ($p < .05$), and a usual maturational course in 10 out of 12 other factors ($p < .05$). An increase in psychopathology was not demonstrated subsequent to abortion.

Acknowledgements

The investigator is grateful to Dr. A. Hilton of the Sir George Williams Psychology Department for his counsel and encouragement during this research.

The advice and assistance of Dr. D. Gold and Dr. D. Andres, other faculty members, is also acknowledged with appreciation.

Through the effort and concern of Dr. P. Benjamin, Dr. R. Kinch and Dr. R. Aikman, the Adolescent Clinic of the Montreal Children's Hospital offers assistance to the pregnant adolescent girl. Without this clinic team such a study would not have been possible.

Mrs. I. Lipper provided instrumental correlational data from her psychothereutic work with these patients.

Mrs. E. Franzios, Miss E. Pilley, and Mrs. M. Lee were valuable partners as nurses and organizers at the clinic.

The research was supported, in part, by Federal-Provincial Health Grant No. 604-7-694, awarded to Dr. P. Benjamin and Dr. R. A. Kinch.

Table of Contents

List of Appendices

List of Tables and Figures

ANXIETY AND OTHER PERSONALITY FACTORS IN TEENAGERS BEFORE AND AFTER ABORTION

General Introduction

Abortion has probably always been practiced in one form or another. But the heavy toll of resulting casualities and deaths has probably also always inhibited the practice. Because of its inherent dangers some early societies may have preferred infanticide (Devereux, 1955) as a method of disposing of unwanted children.

Sterile medical procedure, antibiotics by which to control infection, and transfusions for compensation in the case of serious hemorrhage, have all helped to remove the physical dangers from abortion. Since the advent of these techniques, its practice has consequently increased, and it is currently becoming an acceptable procedure by which to deal with unwanted pregnancy (Sloane, 1971).

In countries such as those of Eastern Europe, Great Britain and Japan, an abortion can easily be obtained. It is reported by Tietze & Lewit (1969) that the frequency of abortion has, during recent years, surpassed the birthrate in Hungary. But it is only within a small sector of North America that abortion can be obtained easily, notably in Hawaii, Maryland and New York. The current trend throughout the world is toward a loosening of the legal controls which have inhibited the practice.

The subject of abortion has many aspects. Although its practice has increased, it still arouses deep feelings, feelings which are based on underlying attitudes toward an area generally

regarded as taboo (Hordern, 1971). It touches upon the current issue of population control, and it is the focus of a debate about the inviolability of early human life. However, these were not the issues that were central when the taboo on abortion became noticeably weaker. The factors that brought with them a greater acceptance of abortion were medical safety, the psychological and physical state of the pregnant woman, and the life in prospect for the unborn child. Those who first obtained legal abortions in North America, were women who did so by virtue of having been raped, women of subnormal intelligence, and women who were mentally deranged. It can easily be seen then that abortion has been encumbered with negative connotations and prohibitions for a variety of reasons.

When mental and emotional states were cited as reasons by which to justify a legal abortion that decision brought abortion into the domain of the psychiatrist. Psychiatrists regularly served on hospital abortion committees. But as medical procedures improved and social taboos weakened, the mental symptoms which were "required" in order to obtain an abortion became milder, and eventually vague depressions were sufficient justification. Psychiatrists have recently tried to divest themselves of the responsibility for decisions concerning abortion. The Group for the Advancement of Psychiatry (1969) has stated its position strongly, "We believe that a woman should have the right to abort or not, just as she has the right to marry or not."

Abortion met with further justification as a result of developments in several other areas. (a) It was found that if a

woman had contracted rubella in the early stages of pregnancy the chances of her having a deformed child were greatly increased. (b) The medical technique of amniocentesis permitted early detection of some genetic diseases in utero, e.g. Mongolism. (c) Women gave birth to deformed children if they had taken thalidomide during certain stages of their pregnancy. (d) The notion that drug-taking among teenagers might lead to the birth of deformed infants received some attention. (e) A Scandinavian study of children (Forssman & Thuwe, 1965) who had been born to women who had been refused abortion, showed that they did more poorly in life in several ways than did control subjects.

With the increase in the practice of abortion there has developed greater concern for accompanying problems and effects. So long as legal abortion was contingent upon desperate situations such as pregnancy after rape, mental breakdown, or threatened suicide, little attention was paid to its aftereffects. It is fairly obvious why the illegal abortionist would not have published studies about the psychological consequences of his operations. Even if he had been willing to publish under a pseudonym, his interest in his patients was more likely to have been financial or altruistic than scientific, and he probably did not see his patients in the afterstages of their operations. Now that legal abortions have become available to a larger population of women it is the concern of obstetricians that aftereffects be clarified. Is there such a thing as an "abortion hangover"? If so, what are its dimensions with respect to time and severity? It was with such

general questions in mind that the investigator approached the present study.

The number who obtain legal and illegal abortions annually, currently runs into millions of women (Tietze & Lewit, 1969). It is unreasonable to suppose that all of these women are either mentally unbalanced to begin with or very debilitated afterward. It is also very unlikely that an aftereffect of any consequence could have remained hidden in such a large population. But is it also not difficult to accept that a woman who undergoes an abortion can do so summarily? Can the vital function of childbearing be dispensed with, without some debilitation? These arguments led the present investigator to look for subtle aftereffects such as anxiety and depression, rather than something as severe as psychosis or suicidal preoccupation.

Researchers have so far failed to do justice to the problem of the psychological sequelae of abortion. Perhaps they have been neglectful because of the moral and legal prohibitions which have surrounded the subject. Because abortion is still a questionable procedure in a majority of minds, both obstetric staffs and their patients might be expected to resist a completely open exploration of its consequences. Such an exploration might challenge not only their own inculcated beliefs, but those of society as well. Investigation might threaten to force a face to face encounter with their own guilt for dealing in an area that is somewhat taboo.

The patient herself is not an easy subject for investigation. She more than likely feels ambivalent and anxious about

her predicament, and she will fear the procedure itself. At such a time, she cannot be expected to be pleased to participate in a research investigation which might by its nature probe into her most intimate attitudes and feelings.

Abortion is an operation that is performed during the early stages of pregnancy, at a time when a great many of the hormonal changes of pregnancy have already taken place. Although little of a technical nature has been written about the recovery of a normal hormonal balance after abortion it is common for gynecologists to equate the postabortion period with the postpartum period after childbirth (Hamilton, 1962). One parallel is that both types of patient can experience difficulty in regaining normal menstrual periods. The fact that this can be treated somewhat successfully with hormones (Rovinsky, 1972) suggests that further investigations of hormonal imbalance after abortion might be productive. A study by Reinold (1971) has shown that human chorionic gonadatrophin disappears from the uterine cavity in half of his patients by 48 hours, and in all of them by the tenth day. A number of other hormones are highly active during the early stages of pregnancy, therefore they may be relevant to postabortion symptoms, but it is unclear from research reports thus far available, just how a normal non-pregnancy balance after abortion comes about. Some hormones which might be investigated are human placental lactogen, progesterone, prolactin, estrogen and other placental steroids.

Psychiatric Literature

According to a review of the early psychiatric literature by Simon & Senturia (1966), studies of long-standing frequently reported that psychosis and depression were consequences of abortion. As time has gone by, and as the laws concerning abortion have begun to be relaxed, so the psychiatric literature has become less pessimistic about abortion. This change may have resulted from an improved outlook for the abortion patient from a medical point of view, but it is also likely that it is the result of a change in the social acceptability of abortion throughout society.

Sloane (1971) concluded that little new psychiatric illness appeared after therapeutic abortion. Simon & Senturia (1966) found that abortion had no adverse effect on the majority of women seen in a followup evaluation. Peck and Marcus (1966), in a prospective study of 50 women, half of whom were aborted for psychiatric reasons, found that most had obtained a therapeutic result; 49 of these patients stated, that if they were asked to make the decision again, they would still have preferred to have had the abortion in preference to continuation of the pregnancy.

Kummer (1963) studied the experience of 32 psychiatrists in Los Angeles and reported that most had never seen any moderate or severe psychiatric consequences after abortion. He suggested that the whole concept of postabortion psychiatric illness might be a myth.

David (1972) looks forward to the self-administration of prostaglandins as a method of dealing with unwanted pregnancy

in the future. He offers no experimental evidence for his point of view but he succinctly states his position with regard to abortion, and in a manner that makes it seem to be a more balanced position than is commonly found in the literature. "It may well be a truism that there is no psychologically painless way to cope with an unwanted pregnancy. While an abortion may elicit feelings of guilt, regret, or loss, an alternative solution, such as entering a forced marriage, bearing an out-of-wedlock child, giving a child up for adoption, or adding an unwanted child to an already strained marital situation, is also likely to be accompanied by psychological problems for the woman, the child, the family, and society."

Young (1954), a psychoanalyst, is well known for her study of illegitimate pregnancy. She would argue that abortion might not be an effective way of dealing with unwanted pregnancy as the patient, for various reasons, might have an unconscious need to mother a child. In such a case the abortion would not only fail to satisfy her maternal need, it would also create a problem of guilt for the patient. Supporting this argument to some degree is the large number of unmarried women who have a further illegitimate pregnancy after the first one. Depending on the study reported the percentage varies from 16 to 25 (Pannor et al, 1971; Vincent, 1961). The motivational aspects of pregnancy are difficult to assess, but it seems likely that as abortion becomes easier to obtain, women will become more acutely aware of their reasons for doing so, when they do in fact have a child.

Psychological Studies

Pannor et al (1971) used the California Psychological Inventory with which to study both unmarried mothers and unmarried fathers. Abortions were not available to these patients and no comparable control group was studied, so the study is relevant here only insofar as it considers the personality functioning of the unmarried mother. Her character here was described as "...moderately spontaneous, intelligent, aggressive, and self-centred. (The unmarried mother and unmarried father) ...are partners who are deficient in the areas of maturity and responsibility and who lack deep concern for others." This group of unmarried mothers was not found to be very psychologically abnormal.

In Aberdeen, Scotland, a liberal interpretation of the abortion laws has made such operations more accessible than in the rest of Britain for several years (Hordern, 1971). Olley (1971) studied 370 women who requested pregnancy termination by admistering Cattell's Sixteen Personality Factor Test. His study included 72 teenaged girls. He summarized that, "The personality pattern of women who sought abortion was found to be more 'neurotic' than the general population. Women with illegitimate pregnancy showed personality characteristics similar to persons described as accident prone." This study is the first one which was found in the literature in which test measures were used to study healthy women who obtained abortions. His work has the distinction of being the first to use a control group for comparison purposes, but it is debatable whether a highly uniform group of student nurses might properly be used for controls in relation to an unselected

patient group. He promised a followup study after abortion but this has not so far appeared.

Ford (1971) investigated 40 women of lower socioeconomic status with the MMPI, before and after operation. Many of these women were serious psychiatric problems. It was common for these patients to admit to mild depression in ensuing months, but on followup testing with the MMPI the majority had fewer psychiatric symptoms. There was improvement in six out of ten scales: hypochondriasis, depression, hysteria, psychasthenia and obsessive anxiety, psychopathy and paranoia. It is unclear from Ford's article whether these patients might have elevated their MMPI scores in order to obtain the abortion. It is said that, "...approval was granted by the committee when it was believed that there was substantial risk to the woman's mental health if the pregnancy were allowed to continue ..." It seems likely that these women would know that they must demonstrate mental ill-health in order to obtain an abortion. They had serious psychiatric problems. Even if they had not distorted their MMPI scores it would be unfair to generalize from this sample of lower socioeconomic status to the general population of women who do at one time or another seek to be aborted.

Osofsky & Osofsky (1972) recently rated 250 abortion candidates before and after their operation on the following dimensions: predominant mood, physical emotionality, feelings about abortion and attitude toward the self. They also rated the

difficulties that the patient had in making her decision. They intercorrelated their findings. The predominant emotion immediately after abortion and one month later was a sense of relief. The woman who had had difficulty in making up her mind about having the abortion suffered more during the operation itself. The experience increased these aborted patients' desires for effective contraception. With regard to the negative consequences of abortion the authors state, "Some minor negative feelings have been present, but few women have felt strong guilt, unhappiness, or self-anger; and few have been objectively distressed." These authors plead for more objective studies, but it is clear from this article and another publication (Osofsky, 1968), that they are strongly proabortion. They state, "...regardless of the outcome of present or future studies, the woman's right to self-control should not be obscured." They do not report exactly how their ratings were made and they do not mention any consideration of rater reliability. It is therefore not impossible that some of their conclusions might have been influenced by their strong proabortion position.

Medical Aspects of Abortion

Abortion can be a relatively safe medical procedure (Hall, 1970). When performed by skilled practitioners in modern hospital units there is less chance of physical injury from an abortion than there is from fullterm pregnancy (Hordern, 1971). Undesirable effects which normally do not elicit much medical

concern are limited bleeding, lacerations to the uterus wall, and opening of the cervix. Severe bleeding, perforation of the uterus wall, and postabortion infection are more serious, and although they occur rarely, when they do, they lead respectively to rehospitalization, further surgery, and possibly to some interference with fertility (Diggory, 1970). If abortion is performed after the 12th week of pregnancy on teenage patients there is a 47% incidence of complications, whereas if it is performed before the 12th week there is an incidence of complications of 26% (Cowell, 1972). This was one of the reasons why the upper limit of expired pregnancy time, previous to which an abortion was still performed, was lowered from 18 weeks to 15 weeks, in the present study.

Before the 12th week of the pregnancy the presently accepted medical method of abortion is suction curretage under light anaesthetic. Heavy general anaesthetic is avoided as it encourages bleeding because of the accompanying relaxation. In the case of early abortion the patient can usually leave the hospital in less than one day. At a later stage, when the implantation in the uterus wall has progressed and the placenta is further developed, a saline solution is injected into the amniotic sac through the abdominal wall. Succeeding this in approximately 36 hours, natural processes induce the abortion of the foetus. Adolescents, more than mature women, frequently present themselves to a clinic later and consequently they more often require the latter more difficult technique (Vincent, 1961; Osofsky, 1968). It is thought by local

obstetricians that this later technique is more traumatic, not only because the patient is conscious during the administration of the saline injection, given under local anaesthetic, but because of the long wait for the discharge of the foetus, and the feelings which confrontation with the foetus itself must produce. Those who undergo suction curretage or early abortion by contrast are simply put to sleep and when they wake the operation is over and they are soon able to leave the hospital.

It should be mentioned in passing that early aborters, because they are still within the first trimester of pregnancy, will still be experiencing symptoms of breast change, distorted appetite, depression, fatigue, morning nausea, and possibly increased salivation. The late aborters will have achieved a more settled state and possibly even a sense of well-being from their pregnancy. Most of the earlier symptoms will have disappeared by this stage, according to Short (1969).

Pregnancy and Abortion in Teenagers

Nearly 40% of illegitimate pregnancies occur in the unmarried teenaged population (Vincent, 1961; Pannor et al, 1971). Teenagers demonstrate inferior judgement by their failure to take contraceptive precautions; about half of all unmarried mothers however, have used no contraceptive, but an even larger fraction of teenagers have failed to protect themselves from pregnancy (Pannor et al, 1971). It has been found at the Adolescent Unit of the Montreal Hospital, that although 92% of a sample of 80 pregnant teenagers demonstrated understanding of the mechanisms of contraception and the need for this precaution during sexual

intimacy, only 14% had actually practiced their use. Apparently contraception requires an act of will and an anticipation which is beyond the maturity of many in the younger age bracket.

If teenage judgment is inferior with regard to prevention of pregnancy, it is probably also inferior with regard to the termination of pregnancy. At the present stage of general understanding with regard to the effects of abortion, the woman who has had a previous abortion may be the one who is in the best position to assess its sequelae. Scientific report is sparse, and what there is tends to be partial. How susceptible then is the teenager who becomes pregnant! She is nearly always pregnant for the first time and she therefore cannot be informed by experience. Being supported by parents whose values may vary and who will certainly be displeased by her predicament, she can seldom act independently and with adequate judgement. Adult women on the other hand can more easily obtain counsel from books and professionals, and some of them can even travel to another country to obtain services which are not freely given in their own. Professionals who make abortion available to teenagers take unto themselves a good deal more responsibility than they do when they simply make this service available to more mature women.

Why are some teenagers vulnerable to pregnancy? Certainly many are involved in sexual intimacy without having to face the emergency of pregnancy. The point has already been made that teenagers frequently fail to take contraceptive steps. They take a chance when having sexual intimacy. In a preliminary survey for

the present study some other factors suggested themselves. It was found for example, that the population who attended this clinic came from disproportionately large families, they had younger mothers, and they had more separated and divorced parents than did non-pregnant controls. The imitative effect suggested by Elder (1972) to explain marital age might also apply to adolescent pregnancy. If a mother has engaged in early sexual intimacy, so might her daughter. Children apparently do not have to be around to watch in order to imitate their parents in these important matters. The effect of having many siblings may be comparable to an effect shown by Harlow (1962) in monkeys; a lack of peer relationships in early life correlated with inadequate sexual functioning in maturity. Arguing along the same dimension it is not difficult to conceive the converse; an array of peers all but guarantees early peer relationships, and this then, according to the above finding, might very well correlate with superior sexual functioning in maturity. A possible further footing for this argument was discovered in the fact that among 46 unmarried fathers, about whom information had been gathered, an even longer sibline could be predicted. They were found to have a median sibline length of four members.

The effect of separated and divorced parents is more difficult to explain. Authors such as Young (1954) might incline to the view that the girl who has separated parents, by virtue of the lack of consistent control over her daily existence, develops poorer defenses in relation to her own unconscious need for intimacy. Relevant here are the findings of Kinch et al (1969) who

were able to demonstrate less supervision of dating behaviour among pregnant adolescents than among controls.

Several authors (Vincent, 1961; Kinch et al, 1969; Pannor et al, 1971), including the present investigator, have found that illegitimately pregnant girls usually have had a relationship of considerable standing with their boyfriend before the pregnancy. Of 102 couples studied at the Montreal Children's Hospital it was found that they had gone out together for a median term of 8 months prior to pregnancy. It is easily understood why a longer lasting relationship might predispose a couple to intimacy. Promiscuity or brief sexual affairs do not seem to be characteristics of the illegitimately pregnant teenage population.

Present Study

Although this investigation was primarily concerned with whether or not there is a pathological reaction after abortion, it had to deal with several other issues simply because of the nature of the investigation and the nature of the population.

The population divided itself naturally into those who come early and who therefore undergo a suction curretage, and those who come later and who therefore undergo a saline abortion. This presented a methodological problem. If a pathological effect were clearly demonstrated in one of these groups could it be attributed to the technique used, the hormonal balance at this stage, or personal and sociological predispositions which had brought one patient to the clinic early and one late? There was no simple way to separate

these issues.

Legitimately, the study could only address itself to the question of whether there was more or less psychopathology after an abortion than before, and to the question of whether there were differences between the early and late groups in this respect. While it would be important to know the reasons for any differences, should they exist, the present study would only be able to report them, it could not, neither was it designed to explain them.

The study was subdivided into three experiments, as follows:

Experiment I. It was hypothesized that while responding to the avoidance-avoidance conflict of not wanting to be pregnant, and not wanting to have an abortion, that the patients would be more anxious and more depressed. Because of their willingness to undergo an abortion, and because of their presumed sexual behaviour, it was also hypothesized that they would be less moralistic than would comparable non-pregnant controls. The Sixteen Factor Personality Test would allow partial answers to these questions to be obtained, and the questionnaire would also provide a probe through which to consider other personality differences within this group, and as such lead the investigator into more productive research.

Experiment II. It was hypothesized that after a patient's abortion, her anxiety level would fall, simply because her unwanted pregnancy had been terminated, and her current problem thereby resolved. It was also hypothesized that the anxiety scores of the

early group, because this group demonstrated more concern and decisiveness by coming early, should fall more than the anxiety scores of the late group, who by their lateness were thought to have demonstrated ambivalence and indecision. The fall in scores was expected to be greater in those who were initially more anxious simply because their anxiety was greater at that time.

Experiment III. It was hypothesized that after a period of several months any psychopathological reaction which might have occured with regard to the pregnancy or to the abortion should have had time to dissipate; levels of anxiety and depression should have decreased to normal and trends toward normal maturation should by now be apparent.

II Method

The design of the three experiments with respect to time and technique is presented in Table 1.

Subjects

Subjects were English speaking patients who presented themselves for abortion at the Adolescent Unit of the Montreal Children's Hospital. In 1971, 80% of the 178 pregnant patients who presented themselves at this clinic elected to undergo an abortion. It is possible in practice for a teenage girl to obtain an abortion at this clinic so long as she presents herself before the fifteenth week of her pregnancy, and so long as a parent or guardian will sign a consent for the operation.

The age group was normally distributed around a mean of

Table 1

Schema of Experimental Procedure

Subject Group	Experiment I Preoperation Test	Experiment II Postoperation Test-3 weeks	Experiment III Postoperation Test-8 months
Control N = 34	16 PF	Anxiety Scale	-
Early Patient N = 34	16 PF	Anxiety Scale	-
Late Patient N = 34	16 PF	Anxiety Scale	-
Deferred Followup N = 31	16 PF	-	16 PF

16 years, 5 months, and it ranged from 14 years, 8 months to 19 years, 3 months. All of the patients were unmarried. Among 92 patients, the majority were attending school or college, and 7 were working. 34 obtained a saline abortion because they came to the clinic later; 58 obtained a suction curretage, they constituted the early group.

The occupations of their parents were rated according to the Blishen (1958) occupational scale. The percentage of patients and controls at each level, as well as figures for the Canadian population are presented in Appendix A. A chi^2 test did not demonstrate that they were from different populations (df,18,X^2,28.8), although there seemed on inspection to be slight over-representation at upper levels.

Four patients were rejected from the study because they either were mentally defective or had such a low level of school achievment that the reading of the questionnaire would have been too difficult for them. One patient refused to participate in the study.

They came from families that were larger than the typical Montreal area family, according to the 1966 Census of Canada ($p < .001$), but when they were compared with nonpregnant controls this difference was not significant. It is possible that larger families were more typical of the period 1953-57, when these children were born, compared to the Montreal population as a whole.

Twenty had separated or divorced parents (21.7%). In one instance both of the patient's parents were deceased, in 3 oth-

er instances patients reported deceased fathers. Two were adopted children.

58% of the patients were Catholic, 40% were Protestant, and 2% were Jewish. It is not known if there was a higher representation of Catholics than one would expect in the English speaking population, but this seems likely. A number of patients were of mixed parentage, i.e. French and English, they reported themselves to be Catholic, and they preferred to do the questionnaire in English, as they considered that to be their first language. It was also know that Jewish patients attend another hospital in the city, where they receive a similar service. An unanswered question is whether Catholics were over-represented because they are more vulnerable to pregnancy. The religious issue did not seem to be of concern to the patients themselves although that aspect occasionally was of concern to their parents. Roberts (1966) has suggested that with the secularization of knowledge, religious and racial differences with regard to illegitimacy, are tending to disappear.

Controls

Ideally, control measures should have been taken from patients who were both single and pregnant, and who were going to go through with their pregnancy. Then both patients and controls would have been comparable in terms of hormonal balance and the psychological fulfillment which is a normal function of pregnancy. A small group of such patients was available to the investigator, but their numbers did not justify meaningful comparisons.

On the other hand it seemed important in terms of their

future adaptation, to compare aborting teenagers with non-pregnant controls, since presumably their future would resemble that group more than it would resemble a group of unwed mothers whose life-style would gradually undergo a major change by virtue of the pregnancy.

88 controls were tested in two local schools, one a Catholic school and one a Protestant school. These schools were chosen on the following basis. The city was considered by telephone district and previous pregnant patients who had presented themselves at the clinic were distributed according to prefix district. Particular schools were chosen because the clinic had received a high number of pregnant patients from the areas served by them.

Total classes were tested at grades 9, 10, and 11. Grade levels were indistinct as some students were working at more than one grade level at a time. Two classes were considered brighter, four classes were considered average. No special classes were tested. No student refused to do the test, but six were unable to complete the first set of tests in the time allotted during a regular school period of fifty minutes.

Personality Measures

The Sixteen Personality Factor Questionnaire (16 PF) (Cattell, Eber & Tatsuoka, 1970) was chosen for this study for several reasons. (a) It provides sensitive measures of anxiety and depression, measures which correlate highly with most clinical-pathological groups (Cattell, 1962). (b) The factors in the test have withstood several factorings, an aspect that strengthens con-

fidence in the dimensions which are being measured (Cattell et al, 1970). (c) It is a broad spectrum technique, which might well provide research clues concerning the problem. (d) The Questionnaire is subtle, it is not focussed on severe pathology. Therefore the questions are not disturbing to the patients who are requested to answer them. They simply assess attitudes and feelings about a number of commonly experienced situations. (e) The 16 PF gathers a large amount of information in a relatively short time, and therefore it is possible to use it during a clinic visit for another purpose, such as seeing other professionals. Form A requires about 50 minutes in which to complete. It is of the approximate reading difficulty of a daily newspaper.

Form A has been subdivided according to the 16 factors, and it is presented in Appendix B. It was administered during the first visit to the clinic by the pregnant patients.

The Anxiety Scale was administered at the first followup clinic visit, which in practice took place close to three weeks after the patients' operations. It required about ten minutes of the patients' time. This scale (Cattell & Scheir, 1963) has been developed from a large number of objective and physiological measures which correlate with the good-adjustment - anxiety dipole , a second order factor of the 16 P. F. (Hundleby, Pawlik, & Cattell,1965). Many measures have been factored including valuations of blood, urine, and saliva chemistry, muscle tension and pencil pressure, to mention only a few. Responses to questions about annoyances, skills, embarrassments, and the sensation of emotions, all load well with the

factor.

It has been found that questionnaire assessment is more successful in tapping the factor of anxiety than are objective methods. It is likely that by drawing upon conscious attitudes and memories, that this kind of test can cover a wider area of a person's reactions and thereby be a more effective measure than is direct observation. It is an easily administered test. But it must be said that it is probably susceptible to the vicissitudes of conscious intrigue, and therefore it is less than a perfect instrument. To try to compensate for this test weakness in the current investigation a good deal of effort was taken to win and maintain the cooperation of the patient.

The Anxiety Scale is presented in Appendix C.

Cattell and Bartlett (1971) have made attempts to separate anxiety as a state from anxiety as a trait. Their efforts have met with limited success. Anxiety as a very short duration state of stress, as measured by elevated pulse rate and sweating, was not the kind of anxiety with which the present investigation was concerned. There would have been little point in picking up the temporary tension which normally occurs when a girl visits an obstetrical clinic. But neither would there have been much point in measuring anxiety as a lifelong characteristic of the person, unless this trait directly interacted with the psychological reaction to abortion with which the study was concerned. There would be some concern among doctors if "abortion hangover" in fact lasted for days, and there would be much more concern if it lasted for weeks; it was

a response of this latter magnitude which the investigator was concerned about in the present study.

Cattell and Bartlett (1971) concluded, " ...that the patterns are so cooperative (similar) that they will not separate in factor analysis without special precautions (including finding some items loaded on one and not on the other). In other words they are both trait and state patterns and the latter would perhaps, therefore, better be called trait change patterns."

In one of his publications (Cattell, 1962) refers to the anxiety factor as the best measure of general adjustment that is available among psychological tests. This was a major reason it was chosen for this investigation, in an area where little is known it seemed wiser to begin by considering a broad rather than a narrow question.

Reliability studies for the Anxiety Scale reported by Cattell and Scheir (1963) are .87 and .93. Measures of split-half homogeneity are quoted as .84 and .91. The test has been correlated with change in psychotherapy, with the stress that follows failure in an important life goal, with certain kinds of drug therapy (Barrett & DiMascio, 1966), and with psychiatrists' diagnosis of anxiety (Cattell, 1962; Cattell, 1964; Cattell, 1961).

For similar data concerning the 16 PF the reader is referred to the Handbook for the 16 PF (Cattell, Eber and Tatsuoka, 1970).

Procedure

The tests were administered when the patients first arrived at the clinic. To give the patient a continuing contact during her clinic visit, a nurse assisted during the initial contact with the investigator as well as during the obstetrical examination and the patient's registration procedures. It had previously been determined by telephone when her appointment was made at what approximate stage the girl had reached in her pregnancy. It was therefore possible to assure her with some confidence that she could in fact obtain an abortion, providing she was sure that she wished to take that action, and if one of her parents would give their consent, should she be below eighteen years of age.

Demographic data was first obtained during the interview with the experimenter and the reason for requesting the questionnaire was outlined in truthful terms, approximately as follows: "We are going to ask you to fill out a questionnaire which asks about your feelings and attitudes. After you have your abortion you will be asked to return to the clinic after two weeks and again after six weeks; on these occasions you will be asked to fill out a similar questionnaire, but then it should only take you about ten minutes to finish. Today, it will take you more than a half hour to complete. You are now registered and when you have finished with the questionnaire you will be asked to see the obstetrician and the social worker. The reason that we are asking you to fill out the questionnaire is to help us to come to a better understanding of girls who become pregnant and to get to know better how you

are before and after abortion. Your answers will be kept confidential. I am the only person here who will be concerned about them. As a further check on how you are doing, I will be asking you to fill out the longer questionnaire after six months. Is this plan alright with you? . . .Have you any other questions? . . . Let me show you a quiet office where you can work on it."

Patients were for the most part unconcerned about the test, although some regarded it as lengthy when they first looked at it. They often asked questions about where and when their abortion would take place. Once settled into answering the questions they seldom complained and they nearly always completed 100% of the items. It is believed that the positive way in which they received the test, demonstrated their trust in and cooperation with the total clinic.

When they returned for followup visits after their operation, they were simply greeted, asked informally about their health, and invited to fill out the questionnaire. No difficulties were encountered here but occasionally in the case of the long-term follow-up test a special appointment had to be arranged so that their clinic visit did not interfere with school or work activities.

Pilot Studies

To consider the appropriateness of the Anxiety Scale as a retest of the anxiety dipole in the 16 PF, 29 consecutive patients were given these tests simultaneously. A Pearson r calculated from standardized percentile scores was found to be .93 ($p < .001$).

To consider the validity of the Anxiety Scale in reference to this particular clinic, the social worker, who had seen each of

a number of these patients on repeated occasions for counselling both before and after their abortion operations, was requested to rank order the disturbance of these girls during the postabortion period when the Anxiety Scale had been administered. A Spearman rank order correlation was calculated to be .63 ($p<.01$).

Experiment I

Three groups were compared with respect to their 16 PF scores: controls, early patients, and late patients. Before this was done they had been matched on a number of factors, and 34 members of each of the three groups were finally used for this experiment. Table 2 summarizes a number of aspects of these three matched groups.

They were matched faultlessly for language, religion, and death or separation of a parent. Less satisfying matching was achieved along other dimensions. With regard to intelligence each three-group was never separated by more than 3 points along a 13 point scale (factor B of the 16 PF). With regard to age they were never further than 18 months apart. With regard to parental occupation they were never further than two levels on the seven-level Blishen scale. Large families were considered to be those of four or more siblings, here matching was attained with regard to the two categories of large and small.

Anxiety scores as calculated from the initial 16 PF tests of the 88 control subjects were correlated with age, grade, occupational level of parents, number of siblings in the family, place in the sibline, mother's age, and intelligence. Correlations here

Table 2

Mean Scores to describe the Character of the Groups in Experiment I after Matching (N = 34/group)

	Control	Early	Late
Age in years	16.5	17.3	16.3
School grade	10.4	10.4	9.7
Intelligence (Factor B)	7.9	7.2	7.1
Parental Occupational Level	47.9	45.5	47.6
Sibline Length	4.1	4.2	4.3
Place in the Sibline	2.4	2.1	2.9
Mother's Age	42.2	42.9	44.6
Anxiety Score	49.8	51.9	49.5
Number of Roman Catholics	20	20	20
Number of Protestants	14	14	14
Number with Separated Parents	5	5	5
Number with Deceased Fathers	2	2	2
Number of Large Siblines (>3)	18	15	17
Number of Small Siblines (1-3)	16	17	15

were respectively .07 (age), .03 (grade), .01 (occupational level), .08 (number of siblings), -.12 (place in the sibline), .12 (mother's age), and .10 (intelligence); none of these were significant correlations. As these correlations did not reach a criterion level of .24 matching was not indicated in any one area. With the possibility in mind that a combination of these factors might have had a significant correlation with anxiety level, the subjects were matched in order to control for this variation. Some research has suggested that anxiety level is negatively correlated with occupational level and age. Cattel (1963) has demonstrated that it is not significantly correlated with intelligence. In fact a check of F values in the final analysis of variance indicated that matching had in fact increased these values by several decimal points, not enough however to change any of the results of the experiment.

Among the 16 PF scales high anxiety is represented by higher scores on the L, O, and Q_4 factors, and lower scores on the C and Q_3 factors. Depression would be represented by lower scores on C, F, H, and Q_3 factors, and higher scores on the I, L, M, O, Q_4 factors; there is however no depression scale as such,as there is with anxiety.

Anxiety score was calculated by the following formulae (Cattell et al, 1970, Tab. Supplement), where the factor values are in sten values: $(2L + 30 + 4Q_4 - 2C - 2H - 2Q_3)/10$. For comparisons the sten score result was converted to a standard percentile.

Orthogonal comparisons were used to analyze the data.

Hypotheses were stated on page 16.

Experiment II

A comparison was made between preoperation scores and postoperation scores of the two patient groups. Controls were retested after a similar interval, i.e. $4\frac{1}{2}$ weeks. The intervals were similar for controls and patients as the patients were not operated on immediately when they arrived at the clinic, nor did they return punctually for their followup visits.

For this experiment, because of the importance of initial anxiety level, the patients were matched only on their initial anxiety level; the three groups were then split into a high anxiety group and a low anxiety group, with 12 patients in both groups; a total of 72 were considered in this experiment.

Hypotheses were stated on page 16. An analysis of variance was performed on the data. Particular differences between subgroups were considered through orthogonal comparisons and the Newman Keuls test.

Experiment III

The 16 PF was readministered approximately 8 months after their operation to 31 aborted patients. Sixteen of these were early abortion patients, and fifteen were late abortion patients, but a separate analysis of these two groups was not attempted because of the limited sample size. Change was to be assessed by comparing factor scores with correlated t tests, and by comparing the number of factors which appeared to be moving in a normal maturational course with those which were not.

Hypotheses were stated on page 17.

The indications for depression and anxiety in the 16 PF have already been indicated on page 29. Normal maturation would be reflected by increases in scores along factors A, C, H, and M, and decreases along factors F, G, L, O, Q_1 and Q_4 (Cattell et al, 1970, Tabular Supplement). Maturational personality changes are of necessity small changes, and it was consequently not expected that such changes would be statistically significant in such a small sample in the case of independent factors, nevertheless the direction of the changes and the number of these changes could be assessed by a sign test.

III Results

Experiment I

That the profiles of the three abortion groups are highly similar is demonstrated in Figures 1 and 2. An orthogonal analysis of differentiating factors and the anxiety factor are presented in Table 3, and such a table for non-differentiating factors is presented in Appendix E.

Abortion groups had lower scores ($p < .01$) along factors F (serious - enthusiastic), and H (shy - bold), and along the introversion -extroversion dipole, than did the control group.

Both abortion groups also had higher scores ($p < .05$) along factors N (natural - calculating) and Q_2 (group-tied - self-sufficient) than controls had along these factors. These differences were not anticipated.

Along the good adjustment - anxiety dipole expected differences between abortion and control groups were not demon-

Fig. 1. Sixteen Personality Factor Profiles of Abortion Patients and Controls at Preoperation Test (N = 34 / group).

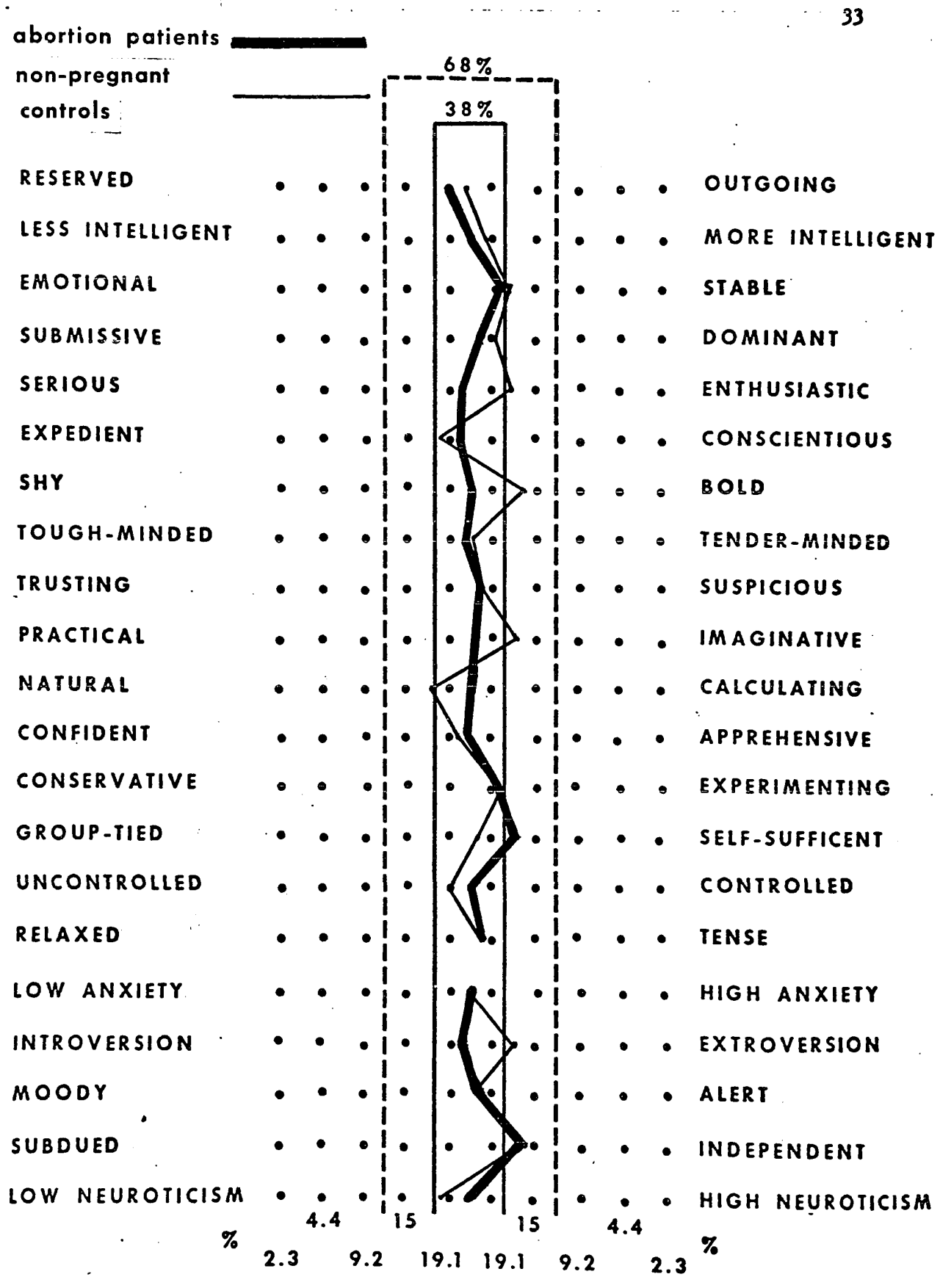

abortion patients
non-pregnant controls
68%
38%
RESERVED
OUTGOING
LESS INTELLIGENT
MORE INTELLIGENT
EMOTIONAL
STABLE
SUBMISSIVE
DOMINANT
SERIOUS
ENTHUSIASTIC
EXPEDIENT
CONSCIENTIOUS
SHY
BOLD
TOUGH-MINDED
TENDER-MINDED
TRUSTING
SUSPICIOUS
PRACTICAL
IMAGINATIVE
NATURAL
CALCULATING
CONFIDENT
APPREHENSIVE
CONSERVATIVE
EXPERIMENTING
GROUP-TIED
SELF-SUFFICENT
UNCONTROLLED
CONTROLLED
RELAXED
TENSE
LOW ANXIETY
HIGH ANXIETY
INTROVERSION
EXTROVERSION
MOODY
ALERT
SUBDUED
INDEPENDENT
LOW NEUROTICISM
HIGH NEUROTICISM
%
4.4
15
15
4.4
%
2.3
9.2
19.1
19.1
9.2
2.3

Fig. 2. Sixteen Personality Factor Profiles of Early and Late Abortion Patients at Preoperation Test (N = 34/group).

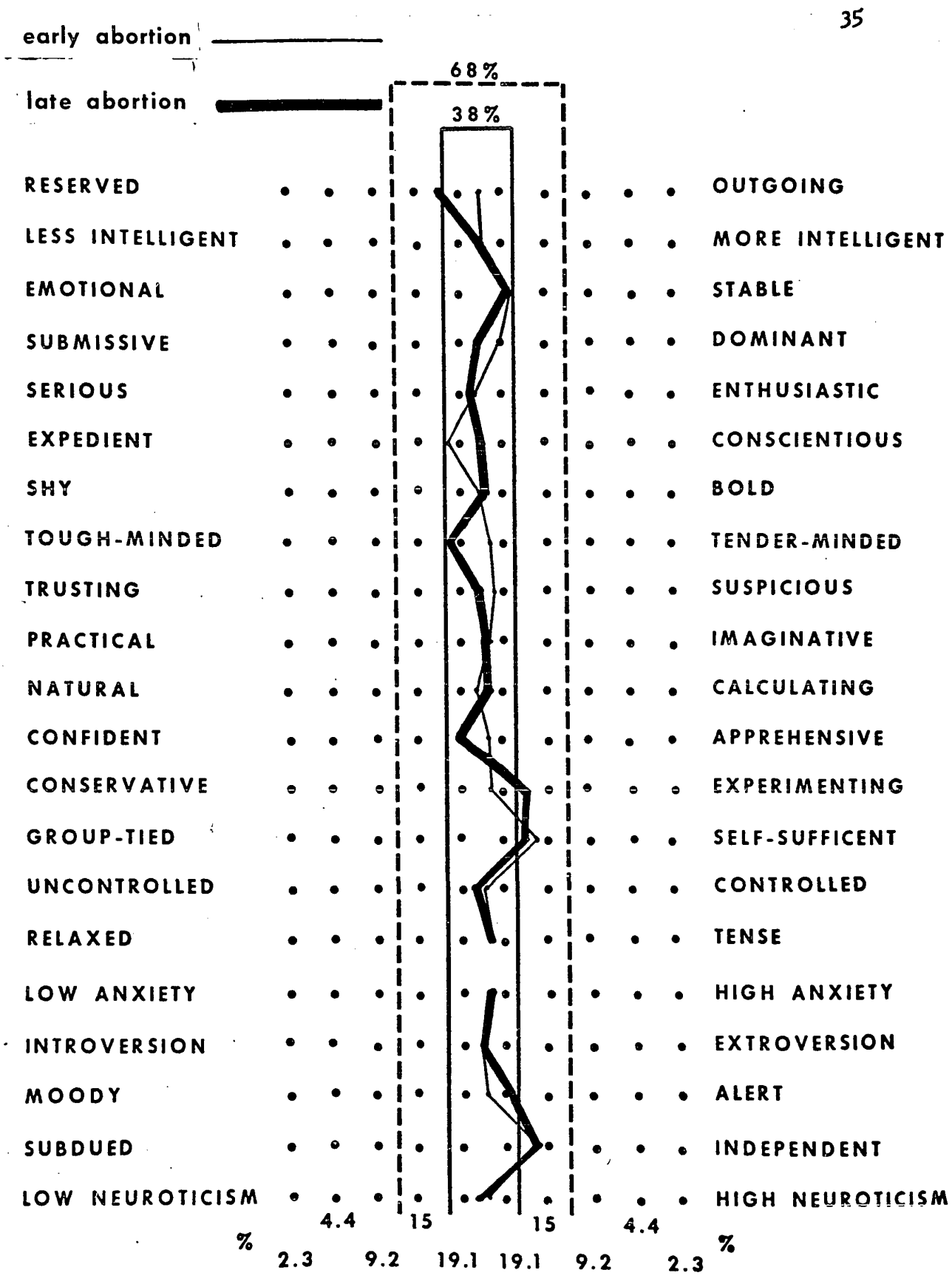

early abortion
late abortion
68%
38%
RESERVED
OUTGOING
LESS INTELLIGENT
MORE INTELLIGENT
EMOTIONAL
STABLE
SUBMISSIVE
DOMINANT
SERIOUS
ENTHUSIASTIC
EXPEDIENT
CONSCIENTIOUS
SHY
BOLD
TOUGH-MINDED
TENDER-MINDED
TRUSTING
SUSPICIOUS
PRACTICAL
IMAGINATIVE
NATURAL
CALCULATING
CONFIDENT
APPREHENSIVE
CONSERVATIVE
EXPERIMENTING
GROUP-TIED
SELF-SUFFICENT
UNCONTROLLED
CONTROLLED
RELAXED
TENSE
LOW ANXIETY
HIGH ANXIETY
INTROVERSION
EXTROVERSION
MOODY
ALERT
SUBDUED
INDEPENDENT
LOW NEUROTICISM
HIGH NEUROTICISM
4.4
15
15
4.4
%
2.3
9.2
19.1
19.1
9.2
2.3
%

Table 3

Orthogonal Analysis : Experiment I

Source	df	MS	F
Factor F			
Φ_1-Control vs. Abortion	1	235.10	14.09 $\phi\phi$
Φ_2 Early vs. Late Abortion	1	.01	<1
Subjects	33	15.82	
Error	66	16.69	
Factor H			
Φ_1-Control vs. Abortion	1	176.96	7.68 $\phi\phi$
Φ_2 Early vs. Late Abortion	1	4.76	<1
Subjects	33	28.34	
Error	66	23.05	
Factor N			
Φ_1-Control vs. Abortion	1	32.16	4.29 ϕ
Φ_2 Early vs. Late Abortion	1	6.48	<1
Subjects	33	9.27	
Error	66	7.50	
Factor Q_2			
Φ_1 Control vs. Abortion	1	59.31	5.13 ϕ
Φ_2 Early vs. Late Abortion	1	8.47	<1
Subjects	33	10.82	
Error	66	11.56	

ϕ $p < .05$, $\phi\phi$ $p < .01$ Φ - orthogonal notation for "phi"

Table 3 (continued)

Orthogonal Analysis : Experiment I

Source	df	MS	F
Introversion - Extroversion			
$\bar{\phi}_1$ - Control vs. Abortion	1	7803.36	8.55 $\phi\phi$
$\bar{\phi}_2$ - Early vs. Late Abortion	1	242.82	<1
Subjects	33	757.37	
Error	66	912.66	
Good Adjustment - Anxiety			
$\bar{\phi}_1$ - Control vs. Abortion	1	51.42	<1
$\bar{\phi}_2$ - Early vs. Late Abortion	1	454.49	<1
Subjects	33	699.20	
Error	66	943.77	

ϕ $p < .05$ $\phi\phi$ $p < .01$ $\bar{\phi}$ - Orthogonal Analysis, "phi"

strated.

Expected differences were also not demonstrated between the patient and control groups along factor G (superego strength).

Experiment II

The results of this experiment are presented in graphic form in Figure 3. A statistical analysis is presented in Table 4, and the alteration in anxiety scores, on which this experiment was based, are offered in Appendix F.

As can be seen from the graph, all low anxious groups tended to raise their scores on retest, but this rise was not apparent in high anxious groups. According to the F test this is a significant difference ($p < .01$) between low and high anxious groups.

The anxiety scores of the late abortion group are highly similar to the scores of the controls in all instances.

As predicted, the early group whose preabortion anxiety level was high, shows a dramatic drop in score after abortion when compared to controls ($p < .01$). All groups raise their scores in the low anxious sector, but the early group shows a similar effect by failing to rise as much as the others ($p < .01$).

Experiment III

A profile of the results of this experiment is presented in Figure 4, and pre and post abortion 16 PF mean scores are presented in Appendix G.

Applied to the 16 PF factors, correlated t tests revealed only one significant change in score. Along the I factor (self-reliance - overprotected), scores diminished after the eight-month

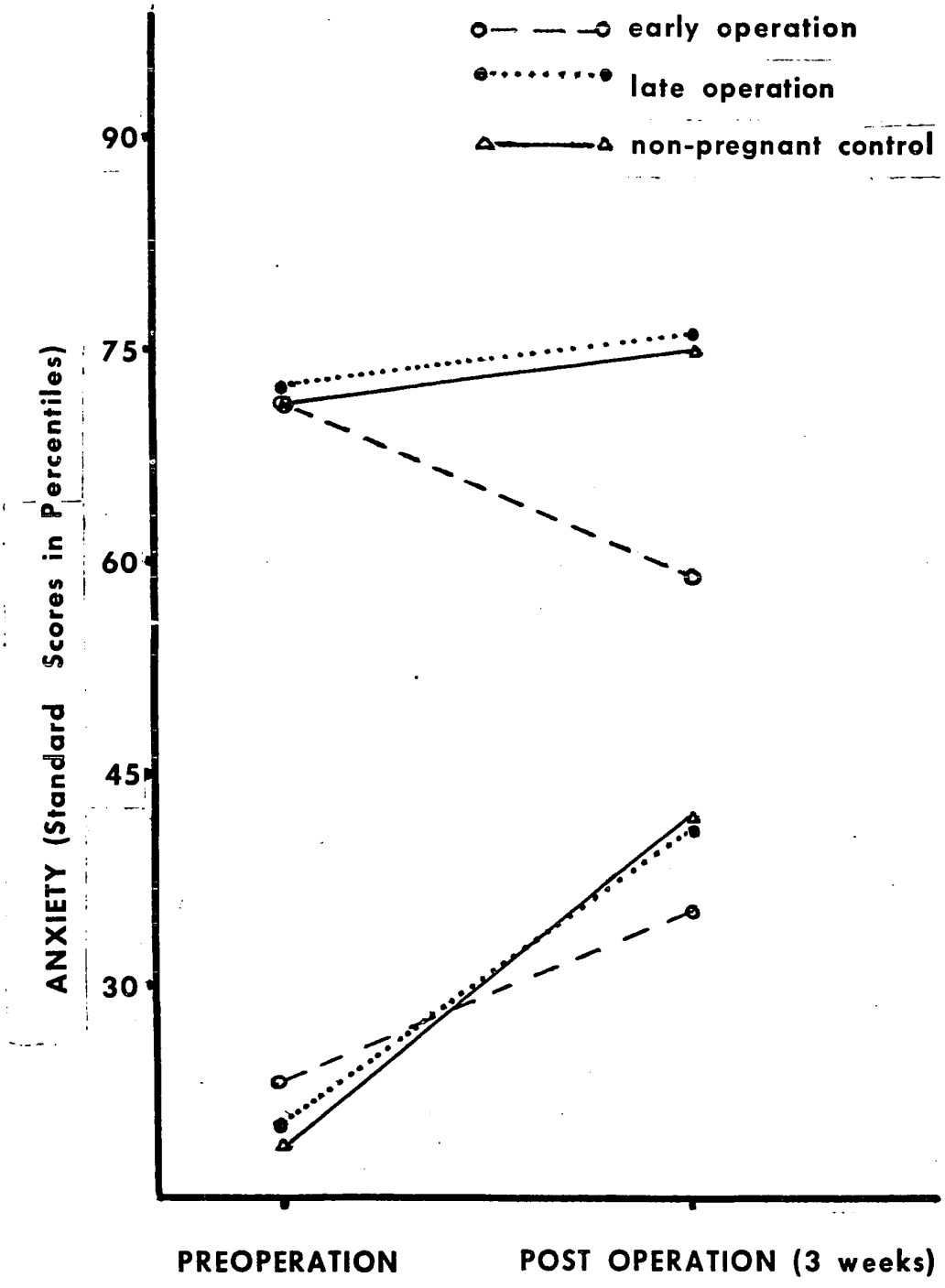


Fig. 3. Alteration in Anxiety after Abortion of Two Groups of Patients (High and Low Preoperative Anxiety) compared with Controls.

Table 4

Analysis of Variance : Experiment II

Source	df	MS	F
Anxiety	1	8018.0	7.94 ϕϕ
Subjects	22	1009.4	
Control vs. Abortion ($\bar{\phi}_1$)	1	831.9	2.13
Early vs. Late Abortion ($\bar{\phi}_2$)	1	2121.4	5.45 ϕ
Abortion x Anxiety	2	76.1	<1
Subjects	44	389.4	

ϕ $p < .05$, ϕϕ $p < .01$ $\bar{\phi}$ - Orthogonal Analysis "phi".

Table 5

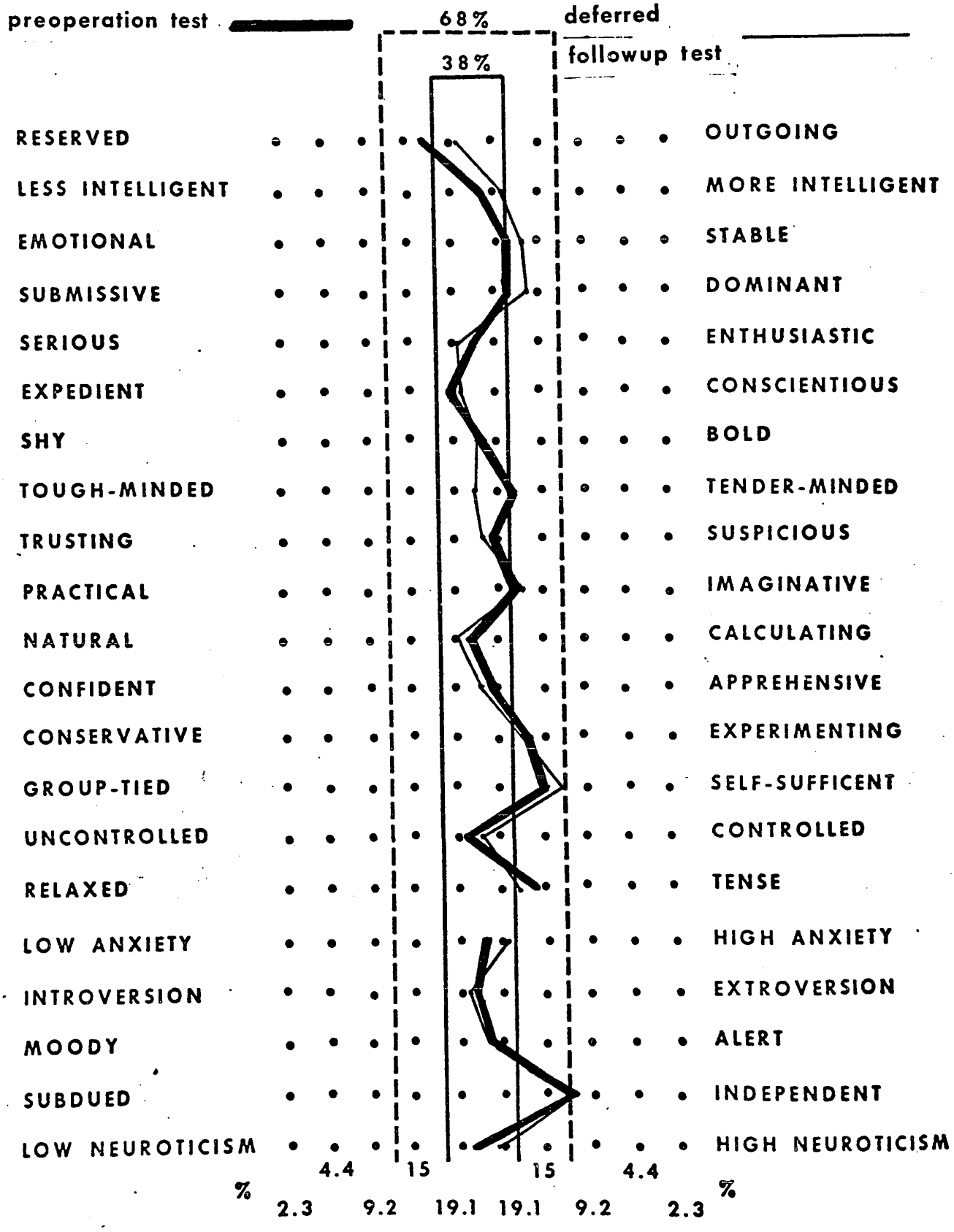
Newman Keuls Tests of Internal Differences

Between Groups : Experiment II

Groups paired	df	q
Control : High Anxious vs. Low Anxious	1	41.0 ϕϕ
Early : High Anxious vs. Low Anxious	1	25.0 ϕϕ
Late : High Anxious vs. Low Anxious	1	39.7 ϕϕ
High Anxious : Control vs. Early	1	35.5 ϕϕ
High Anxious : Control vs. Late	1	<1
High Anxious : Early vs. Late	1	21.3 ϕϕ
Low Anxious : Control vs. Early	1	23.2 ϕϕ
Low Anxious : Control vs. Late	1	2.3
Low Anxious : Early vs. Late	1	56.0 ϕϕ

ϕ $p < .05$ ϕϕ $p < .01$

Fig. 4. Sixteen Personality Factor Profiles of Abortion Patients at Preoperation and after Deferred Followup. (N = 31)


preoperation test
68%
38%
deferred
followup test
RESERVED
OUTGOING
LESS INTELLIGENT
MORE INTELLIGENT
EMOTIONAL
STABLE
SUBMISSIVE
DOMINANT
SERIOUS
ENTHUSIASTIC
EXPEDIENT
CONSCIENTIOUS
SHY
BOLD
TOUGH-MINDED
TENDER-MINDED
TRUSTING
SUSPICIOUS
PRACTICAL
IMAGINATIVE
NATURAL
CALCULATING
CONFIDENT
APPREHENSIVE
CONSERVATIVE
EXPERIMENTING
GROUP-TIED
SELF-SUFFICENT
UNCONTROLLED
CONTROLLED
RELAXED
TENSE
LOW ANXIETY
HIGH ANXIETY
INTROVERSION
EXTROVERSION
MOODY
ALERT
SUBDUED
INDEPENDENT
LOW NEUROTICISM
HIGH NEUROTICISM
4.4
15
15
4.4
%
2.3
9.2
19.1
19.1
9.2
2.3
%

interval ($p<.01$), and moved from the polar end of tender-minded sensitivity toward the opposite end of tough-minded, self-reliance. This change was anticipated as part of a lessening of depression.

Although the anxiety score decreased 7.8 percentile points, this did not withstand statistical analysis and this change must therefore be considered to be inconsequential. Similarly there were apparent positive but insignificant changes along the scales of neuroticism and susceptibility to accidents.

Along ten out of twelve factors these patients seemed to move toward normal maturation ($p<.05$). These factors were A (reserved - outgoing), C (emotional - stable), F (serious - enthusiastic), L (trusting -suspicious), M (practical - imaginative), O (confident - apprehensive), Q_1 (conservative -experimenting), Q_4 (relaxation - tension), good adjustment - anxiety, and introversion - extroversion.

The two factors along which negative maturational shift was apparent were G (superego strength) and H (shy - bold).

IV Discussion

Unexpected, in the first experiment, was the fact that anxiety was not higher in abortion patients during their first clinic visit than it was in controls who had been tested in a classroom. It seems that these patients did not demonstrate unusual concern when presenting themselves for abortion.

Unexpected also was the finding that the abortion patients did not demonstrate any lack of superego strength on the test; as measured here they were just as moralistic and conscientious as were

controls.

Abortion patients seem to differ from controls more in terms of depression than in terms of anxiety. The patients diverged from controls in the direction of seriousness, shyness, and introversion, all three of which contribute substantially to the distinctiveness of the profile of patients who are known to be in depressive states. It is a question for further research whether these differences do in fact represent depression, a depressive reaction to the crisis of the pregnancy, or whether they are constant and unchanging trait differences of this particular group.

If group differences can be explained away or demonstrated to be a temporary reaction, then a strong argument is generated from such a study as the present one for rejecting the notion that the pregnant girl has a distinct and identifiable personality configuration. As was stated in the introduction, sociological differences such as number of siblings, mother's age, etc. seem much easier to detect than consistent personality factors. If this turned out to be in fact the case, then researchers should turn away from personality function toward environmental and situational aspects of the problem. In either case, research should be pursued, so that finally the goal of intervention may be achieved at some earlier stage and the necessity for abortion reduced.

The unanticipated finding that this group of abortion patients was more calculating and worldly (factor N), as well as more self-sufficient and resourceful (factor Q_2) than was the control group along either of these factors, leads to a different specula-

tion concerning the behaviour of these patients. According to Cattell et al (1970) individuals who have higher scores on these two dimensions are often disliked by others. Such scores are frequently found among criminals! The high scoring N subject is represented as a"Machiavellian social climber", or as a "street urchin smart-aleck". However high N scores correlate negatively with mental disturbances such as schizophrenia and neurosis. High Q_2 individuals tend to go against the grain of the group. The factor is one of the major components of introversion. Attempting to integrate some of this with the illegitimate pregnant teenager one might come up with the interpretation that she is to some degree a social isolate but unwilling to accept such a role.

In the second experiment it was strongly apparent that low anxious subjects of all kinds raised their scores on retest. It is hard to believe that they all simply became more anxious during the interval. The shift may be a fault in the test. It is also possible that the initially low anxious group were defensive and reluctant to admit that negative quality on paper, on second testing they became more comfortable and honest. Cattell et al (1970) have detected something similar for the entire 16 PF, and the authors interpret the shift as a function of test-taking. They say, "...the doubtful (in between) responses became fewer (and somewhat in favor of less socially desirable or popular responses); responses in general become more stable and certain. These experiments with repetitions of the 16 PF (once a week over several weeks) suggest that, as with other psychological tests,

some psychometric gains result through repeated contact with the questions. Possibly the individual even gets to know himself better, and certainly to decide more definitely."

Also important in the second experiment was the fact that the early aborters experienced a decrease in anxiety after three weeks. This decrease was not apparent either in the controls or in the late abortion group. The hypothesis that this group showed their concern about their pregnancy, were decisive, and gained some relief after the operation is to a certain degree supported. However because the late group did not seem to experience any such relief one has to consider the fact that the early group might simply have lost the symptoms of pregnancy, as discussed earlier. One possible way of clarifying these issues would be to run serial tests with both psychological and hormonal measures simultaneously. Before this was attempted however it would seem wise to replicate this experiment to determine if it is reliable.

It was demonstrated in Experiment I that there were few differences between early and late abortion groups with regard to their personality function. If this is a true finding then it seems wiser to look at the findings in Experiment II as depending on hormonal state or the technique of abortion itself rather than upon predisposing personality factors.

In the long term study there was a shift from being overprotected and sensitive toward being more self-reliant and tough-minded. Cattell reports that this factor is largely environmental and cultural in its origins, and that it can in the case of high

scores be associated with an overprotected upbringing. A trend toward a lower score is a trend toward involvement and participation, and a trend away from mental breakdown. The fact that the patients in this study became more realistic and less overprotected and sensitive, to use Cattell's terms, can be considered a healthy and positive development. A similar long term retest on a control group would be necessary to reveal if this positive effect might be attributed to the experience of having an abortion.

Most factors, on repeat testing, moved in a normal maturational direction after a period of several months. Such a finding can give some assurance to obstetricians who perform abortions and who are concerned about the long-term effects of such operations upon the adolescent patient. More important, they can give assurance to the patients themselves, who need and choose to undergo such a procedure. Apparently little psychological harm is likely to result. It is even within the region of possibility that some psychological benefit can occur.

This investigation is in accord with recent psychiatric and psychological research (Ford, 1971; Osofsky & Osofsky, 1972), insofar as it did not demonstrate an increase in psychopathology following abortion. It is in keeping with a growing body of evidence which demonstrates that psychopathology subsequent to abortion, if it exists at all, is minimal.

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APPENDIX A

Occupational level of the Parents of Patient and Control groups according to the Blishen Scale

Level	Control	Early	Late	Canada
1	3.5 %	1.8%	0.0%	0.9%
2	27.1	22.2	9.6	10.7
3	12.9	14.8	12.9	6.3
4	14.1	5.6	12.9	7.0
5	18.8	24.1	22.6	34.2
6	16.5	11.1	22.6	19.6
7	7.1	20.4	19.4	21.3
Total %	100.0	100.0	100.0	100.0
Total No.	85.0	54.0	34.0	-

Appendix B

Sixteen Personality Factor Questions from Form A

(High-scoring responses are underlined)

Factor A (Reserved - Outgoing)

3. I would rather have a house: a. in a sociable suburb, b. in between, c. alone in the deep woods.

26. With the same hours and pay, it would be more interesting to be: a. a carpenter or cook, b. uncertain, c. a waiter in a good restaurant.

27. I have been elected to: a. only a few offices, b. several, c. many offices.

51. If I had to choose, I would rather be: a. a forester, b. uncertain, c. a high school teacher.

52. For special holidays and birthdays, I: a. like to give personal presents, b. uncertain, c. feel that buying presents is a bit of a nuisance.

76. In starting a useful invention, I would prefer: a. working on it in the laboratory, b. uncertain, c. selling it to people.

101. It would be more interesting to work in a business: a. talking to customers, b. inbetween, c. keeping office accounts and records.

126. If the earnings were the same, I would rather be: a. a lawyer, b. uncertain, c. a navigator or pilot.

151. It would be more interesting to be: a. an artist, b. uncertain, c. a secretary running a club.

176. If asked to work with a charity drive, I would a. accept, b. uncertain, c. politely say I'm too busy.

Appendix B (continued)

Factor B (Intelligence)

77. "Surprise" is to "strange" as "fear" is to: a. brave, b. anxious, c. terrible.

102. "Size" is to "length" as "dishonest" is to: a. prison, b. sin, c. stealing.

127. "Better" is to "worst" as "slower" is to: a. fast, b. best, c. quickest.

152. Which of the following words does not properly belong with the others? a. any, b. some, c. most.

153. "Flame" is to "heat" as "rose" is to: a. thorn, b. red petals, c. scent.

177. Which of the following words does not belong with the others? a. wide, b. zigzag, c. straight.

178. "Soon" is to "never" as "near" is to: a. nowhere, b. far, c. away.

Factor C (Easily upset - emotionally stable)

4. I can find enough energy to face my difficulties, a. always, b. generally, c. seldom.

5. I feel a bit nervous of wild animals even when they are in strong cages. a. yes (true), b. uncertain, c. no (false).

29. I sometimes can't get so sleep because an idea keeps running through my mind. a. true, b. uncertain, c. false.

30. In my personal life I reach the goals I set, almost all the time. a. true, b. uncertain, c. false.

55. I have been let down by my friends: a. hardly ever, b. occasionally, c. quite a lot.

Appendix B (continued)

79. Some people seem to ignore or avoid me, although I don't know why. a. true, b. uncertain, c. false.

80. People treat me less reasonably than my good intentions deserve. a. often, b. occasionally, c. never.

104. When people are unreasonable, I just: a. keep quiet, b. uncertain, c. despise them.

105. If people talk loudly while I am listening to music, I: a. can keep my mind on the music and not be bothered, b. in between, c. despise them.

129. When the time comes for something I have planned and looked forward to, I occasionally do not feel up to going. a. true, b. in between, c. false.

130. I can work carefully on most things without being bothered by people making a lot of noise around me. a. yes, b. in between, c. no.

154. I have vivid dreams, disturbing my sleep. a. often, b. occasionally, c. practically never.

179. If I make an awkward social mistake, I can soon forget it. a. yes, b. in between, c. no.

Factor E (Submissiveness - Dominance)

6. I hold back from criticizing people and their ideas. a. yes, b. sometimes, c. no.

7. I make smart, sarcastic remarks to people if I think they deserve it. a. generally, b. sometimes, c. never.

31. An out-dated law should be changed: a. only after considerable discussion, b. in between, c. promptly.

Appendix B (continued)

32. I am uncomfortable when I work on a project requiring quick action affecting others. a. true, b. in between, c. false.

56. I have some characteristics in which I feel definitely superior to most people. a. yes, b. uncertain, c. no.

57. When I get upset, I try hard to hide my feelings from others. a. true, b. in between, c. false.

81. The use of foul language, even when it is not in a mixed group of men and women, still disgusts me. a. yes, b. in between, c. no.

106. I think I am better described as: a. polite and quiet, b. in between, c. forceful.

131. I occasionally tell strangers things that seem to me important, regardless of whether they ask about them. a. yes, b. in between, c. no.

155. If the odds are really against something's being a success, I still believe in taking the risk. a. yes, b. in between, c. no.

156. I like it when I know so well what the group has to do that I naturally become the one in command. a. yes, b. in between, c. no.

180. I am known as an "idea man" who almost always puts forward some ideas on a problem. a. yes, b. in between, c. no.

181. I think I am better at showing: a. nerve in meeting challenges, b. uncertain, c. tolerance of other people's wishes.

Factor F (Serious - Enthusiastic)

8. I prefer semiclassical music to popular tunes. a. true, b. uncertain, c. false.

Appendix B (continued)

33. Most of the people I know would rate me as an amusing talker. a. yes, b. uncertain, c. no.

58. I like to go out to a show or entertainment: a. more than once a week (more than average), b. about once a week (average), c. less than once a week (less than average).

82. I have decidedly fewer friends than most people. a. yes, b. in between, c. no.

83. I would hate to be where there wouldn't be a lot of people to talk to. a. true, b. uncertain, c. false.

107. I attend social functions only when I have to, and stay away any other time. a. yes, b. uncertain, c. no.

108. To be cautious and expect little is better than to be happy at heart, always expecting success. a. true, b. uncertain, c. false.

132. I spend much of my spare time talking with friends about social events enjoyed in the past. a. yes, b. in between, c. no.

133. I enjoy doing "daring," foolhardy things "just for fun". a. yes b. in between, c. no.

157. I would rather dress with quiet correctness than with eye-catching personal style. a. true, b. uncertain, c. false.

158. An evening with a quiet hobby appeals to me more than a lively party. a. true, b. uncertain, c. false.

182. I am considered a very enthusiastic person. a. yes, b. in between, c. no.

183. I like a job that offers change, variety, and travel, even if it involves some danger. a. yes, b. in between, c. no.

Factor G (Superego strength)

9. If I saw two neighbors' children fighting, I would: a leave them to settle it, b. uncertain, c. reason with them.

34. When I see "slopoy", untidy people, I: a. just accept it, b. in between, c. get disgusted and annoyed.

59. I think that plenty of freedom is more important than good manners and respect for the law. a. true, b. uncertain, c. false.

84. People sometimes call me careless, even though they think I'm a likable person. a. yes, b. in between, c. no.

109. In thinking of difficulties in my work, I: a. try to plan ahead, before I meet them, b. in between, c. assume I can handle them when they come.

134. I find the sight of an untidy room very annoying. a. yes, b. in between, c. no.

159. I close my mind to well-meant suggestions of others, even though I know I shouldn't. a. occasionally, b. in between, c. no.

160. I always make it a point, in deciding anything, to refer to basic rules of right and wrong. a. yes, b. in between, c. no.

184. I am a fairly strict person, insisting on always doing things as correctly as possible. a. true, b. in between, c. false.

185. I enjoy work that requires conscientious, exacting skills. a. yes, b. in between, c. no.

Factor H (Shyness - Boldness)

10. On social occasions I: a. readily come forward, b. in between, c. prefer to stay quietly in the background.

35. I get slightly embarrassed if I suddenly become the focus of attention in a social group. a. yes, b. in between, c. no.

Appendix B (continued)

36. I am always glad to join a large gathering, for example, a party, dance, or public meeting. a. yes, b. in between, c. no.

60. I tend to keep quiet in the presence of senior persons (people of greater experience, age, or rank). a. yes, b. in between, c. no.

61. I find it hard to address or recite to a large group. a. yes, b. in between, c. no.

85. "Stage-fright" in various social situations is something I have experienced: a. quite often, b. occasionally, c. hardly ever.

86. When I am in a small group, I am content to sit back and let others do most of the talking. a. yes, b. in between, c. no.

110. I find it easy to mingle among people at a social gathering. a. true, b. uncertain, c. false.

111. When a bit of diplomacy and persuasion are needed to get people moving, I am generally the one asked to do it. a. yes, b. in between, c. no.

135. I consider myself a very sociable, outgoing person. a. yes, b. in between, c. no.

136. In social contacts I: a. show my emotions as I wish, b. in between, c. keep my emotions to myself.

161. I somewhat dislike having a group watch me at work. a. yes, b. in between, c. no.

186. I'm the energetic type who keeps busy. a. yes, b. uncertain, c. no.

Appendix B (continued)

Factor I (Self-reliant - Overprotected)

11. It would be more interesting to be: a. a construction engineer, b. uncertain, c. a writer of plays.

12. I would rather stop in the street to watch an artist painting than listen to some people having a quarrel. a. true, b uncertain, c. false.

37. In school I preferred (or prefer): a. music, b. uncertain, c. handwork and crafts.

62. I have a good sense of direction (find it easy to tell which is North, South, East, or West) when in a strange place. a. yes, b. in between, c. no.

87. I prefer reading: a. a realistic account of military or political battles, b. uncertain, c. a sensitive, imaginative novel.

112. It would be more interesting to be: a. a guidance worker helping young people find jobs, b. uncertain, c. a manager in efficiency engineering.

137. In enjoy music that it: a. light, dry, and brisk, b. in between, c. emotional and sentimental.

138. I admire the beauty of a poem more than that of a well-made gun. a. yes, b. uncertain, c. no.

162. Because it is not always possible to get things done by gradual, reasonable methods, it is sometimes necessary to use force. a. true, b. in between c. false.

163. In school I preferred (or prefer): a. English, b. uncertain, c. mathematics

Appendix B (continued)

Factor L (Trusting - Suspicious)

13. I can generally put up with conceited people, even though they brag or show they think too well of themselves. a. yes, b. in between, c. no.

38. When I have been put in charge of something, I insist that my instructions are followed or else I resign. a. yes, b. sometimes, c. no.

63. If someone got mad at me, I would: a. try to calm him down, b. uncertain, c. get irritated.

64. When I read an unfair magazine article, I am more inclined to forget it than to feel like "hitting back." a. true, b. uncertain, c. false.

88. When bossy people try to "push me around," I do just the opposite of what they wish. a. yes, b. in between, c. no.

89. Business superiors or members of my family, as a rule, find fault with me only when there is real cause. a. true, b. in between, c. false.

113. If I am quite sure that a person is unjust or behaving selfishly, I show him up, even if it takes some trouble. a. yes, b. in between, c. no

114. I sometimes make foolish remarks in fun, just to surprise people and see what they will say. a. yes, b. in between, c. no.

139. If a good remark of mine is passed by, I: a. let it go, b. in between, c. give people a chance to hear it again.

164. I have sometimes been troubled by people's saying bad things about me behind my back, with no grounds at all. a. yes, b. un-

Appendix B (continued)

certain, c. no.

Factor M (Practical - Imaginative)

11. You can almost always notice on a man's face when he is dishonest. a. yes, b. in between, c. no.

15. It would be good for everyone if vacations (holidays) were longer and everyone had to take them. a. agree, b. uncertain, c. disagree.

39. For parents, it is more important to: a. help their children develop their affections, b. in between, c. teach their children how to control emotions.

40. In a group task I would rather: a. try to improve arrangements, b. in between, c. keep the records and see that rules are followed.

65. My memory tends to drop a lot of unimportant, trivial things, for example, names of streets or stores in town. a. yes, b. in between, c. no.

90. In streets or stores, I dislike the way some persons stare at people. a. yes, b. in between, c. no.

91. On a long journey, I would prefer to: a. read something profound, but interesting, b. uncertain, c. pass the time talking casually with a fellow passenger.

115. I would enjoy being a newspaper writer on drama, concerts, opera, etc. a. yes, b. uncertain, c. no.

116. I never feel the urge to doodle and fidget when kept sitting still at a meeting. a. true, b. uncertain, c. false.

140. I would like to work as a probation officer with criminals on parole. a. yes, b. in between, c. no.

Appendix B (continued)

parole. a. yes, b. uncertain, c. no.

141. One should be careful about mixing with all kinds of strangers, since there are dangers of infection and so on. a. yes, b. uncertain, c. no.

165. Talk with ordinary, habit-bound, conventional people: a. is often a quite interesting and has a lot to it, b. in between, c. annoys me because it deals with trifles and lacks depth.

166. Some things make me so angry that I find it best not to speak. a. yes, b. in between, c. no.

Factor N (Natural - Calculating)

16. I would rather take the gamble of a job with possibly large but uneven earnings, than one with a steady, small salary. a. yes, b. uncertain, c. no.

17. I talk about my feelings: a. only if necessary, b. in between, c. readily, whenever I have a chance.

41. I feel a need every now and then to engage in a tough physical activity. a. yes, b. in between, c. no.

42. I would rather mix with polite people than rough, revellious individuals. a. yes, b. in between, c. no.

66. I could enjoy the life of an animal doctor, handling disease and surgery of animals. a. yes, b. in between, c. no.

67. I eat my food with gusto, not always so carefully and properly as some people. a. true, b. uncertain, c. false.

92. In a situation which may become dangerous, I believe in making a fuss and speaking up even if calmness and politeness are lost. a. yes, b. in between, c. no.

Appendix B (continued)

117. If someone tells me something which I know is wrong, I am more likely to say to myself: a. "He is a liar," b. in between, c. "Apparently he is misinformed."

142. In traveling abroad, I would rather go on an expertly conducted tour than plan by myself the places I wish to visit. a. yes, b. uncertain, c. no.

167. In education, it is more important to : a. give the child enough affection, b. in between, c. have the child learn desirable habits and attitudes.

Factor O (Confidence - Apprehension)

18. Once in a while I have a sense of vague danger or sudden dread for reasons that I do not understand. a. yes, b. in between, c. no.

19. When criticized wrongly for something I did not do, I: a. have no feeling of guilt, b. in between, c. still feel a bit guilty.

43. I feel terribly dejected when people criticize me in a group. a. true, b. in between, c. false.

44. If I am called in by my boss, I: a. make it a chance to ask for something I want, b. in between, c. fear I've done something wrong.

68. There are times when I don't feel in the right mood to see anyone. a. very rarely, b. in between, c. quite often.

93. If acquaintances treat me badly and show they dislike me: a. it doesn't upset me a bit, b. in between, c. I tend to get downhearted.

Appendix B (continued)

94. I find it embarrassing to have praise or compliments bestowed on me. a. yes, b. in between, c. no.

118. I feel some punishment is coming to me even when I have done nothing wrong. a. often, b. occasionally, c. never.

119. The idea that sickness comes as much from mental as physical causes is much exaggerated. a. yes, b. in between, c. no.

143. I am properly regarded as only a plodding, half-successful person. a. yes b. uncertain, c. no.

144. If people take advantage of my friendliness, I do not resent it and I soon forget. a. true, b. uncertain, c. false.

168. People regard me as a solid, undisturbed person, unmoved by ups and downs in circumstances. a. yes, b. in between, c. no.

Factor Q_1 (Conservative - Experimenting)

20. Money can buy almost everything. a. yes, b. uncertain, c. no.

21. My decisions are governed more by my: a. heart, b. feelings and reason equally, c. head.

45. What this world needs is: a. more steady and "solid" citizens, b. uncertain, c. more "idealists" with plans for a better world.

46. I am always keenly aware of attempts at propaganda in things I read. a. yes, b. uncertain, c. no.

70. As a teenager, if I differed in opinion from my parents, I usually: a. kept my own opinion, b. in between, c. accepted their authority.

95. I would rather have a job with: a. a fixed, certain salary,

Appendix B (continued)

b. in between, c. a larger salary, which depended on my constantly persuading people I am worth it.

120. The pomp and splendor of any big state ceremony are things which should be preserved. a. yes, b. in between, c. no.

145. If a heated argument developed between other members taking part in a group discussion, I would: a. like to see a "winner," b. in between, c. wish that it would be smoothed over.

169. I think society should let reason lead it to new customs and throw aside old habits or mere traditions. a. yes, b. in between, c. no.

170. I think it is more important in the modern world to solve: a. the question of moral purpose, b. uncertain, c. the political difficulties.

Factor Q_2 (Group-tied - Self-sufficient)

22. Most people would be happier if they lived more with their fellows and did the same things as others. a. yes, b. in between, c. no.

47. As a teenager, I joined in school sports: a. occasionally, b. fairly often, c. a great deal.

71. I would prefer to have an office of my own, not sharing it with another person. a. yes, b. uncertain, c. no.

72. I would rather enjoy life quietly in my own way than be admired for my achievments. a. true, b. uncertain, c. false.

96. To keep informed, I like: a. to discuss issues with people, b. in between, c. to rely on the actual news reports.

Appendix B (continued)

97. I like to take an active part in social affairs, committee work, etc. a. yes, b. in between, c. no.

121. It bothers me if people think I am being too unconventional or odd. a. a lot, b. somewhat, c. not at all.

122. In constructing something I would rather work: a. with a committee, b. uncertain, c. on my own.

146. I like to do my planning alone, without interruptions and suggestions from others. a. yes, b. in between, c. no.

171. I learn better by: a. reading a well-written book, b. in between, c. joining a group discussion.

Factor Q_3 (Uncontrolled - Controlled)

23. I occasionally get puzzled, when looking in a mirror, as to which is my right and left. a. true, b. uncertain, c. false.

24. When talking, I like: a. to say things, just as they occur to me, b. in between, c. to get my thoughts well organized first.

48. I keep my room well organized, with things in known places almost all the time. a. yes b. in between, c. no.

73. I feel mature in most things. a. true, b. uncertain, c. false.

98. In carrying out a task, I am not satisfied unless even the minor details are given close attention. a. true, b. in between, c. false.

123. I have periods when it's hard to stop a mood of self-pity. a. often, b. occasionally, c. never.

147. I sometimes let my actions get swayed by feelings of jealousy. a. yes, b. in between, c. no.

Appendix B (continued)

148. I believe firmly "the boss may not always be right, but he always has the right to be boss." a. yes, b. uncertain, c. no.

172. I like to go my own way instead of acting on approved rules. a. true, b. uncertain, c. false.

173. I like to wait till I am sure that what I am saying is correct, before I put forth an argument. a. always, b. generally, c. only if it's practicable.

Factor Q_4 (Relaxation - Tension)

25. When something really makes me furious, I find I calm down again quite quickly. a. yes, b. in between, c. no.

49. I sometimes get in a state of tension and turmoil as I think of the day's happenings. a. yes, b. in between, c. no

50. I sometimes doubt whether people I am talking to are really interested in what I am saying. a. yes, b.in between, c. no.

74. I find myself upset rather than helped by the kind of criticism that many people offer one. a. often b. occasionally, c. never.

75. I am always able to keep the expression of my feelings under exact control. a. yes, b. in between, c. no.

99. Quite small setbacks occasionally irritate me too much. a. yes, b. in between, c. no.

100. I am always a sound sleeper, never walking or talking in my sleep. a. yes, b. in between, c. no.

124. Often I get angry with people too quickly. a. yes, b. in between, c. no.

Appendix B (continued)

125. I can always change old habits without difficulty and without slipping back. a. yes, b. in between, c. no.

149. I get tense as I think of all the things lying ahead of me. a. yes, b. sometimes, c. no.

150. If people shout suggestions when I'm playing a game, it doesn't upset me. a. true, b. uncertain, c. false.

174. Small things sometimes "get on my nerves" unbearably, though I realize they are trivial. a. yes, b. in between, c. no

175. I don't often say things on the spur of the moment that I greatly regret. a. true, b. uncertain, c. false.

Last question is not factor scored

187. I am sure there are no questions that I have skipped or failed to answer properly. a. yes b. uncertain c. no.

Appendix C

Anxiety Scale Questionnaire

(High-scoring responses are underlined)

1. I find that my interests, in people and amusements, tend to change fairly rapidly. True. In between. False.
2. If people think poorly of me I can still go on quite serenely in my own mind. True. In between. False.
3. I like to wait till I am sure that what I am saying is correct, before I put forward an argument. Yes. In between. No.
4. I am inclined to let my actions get swayed by feelings of jealousy. Sometimes. Seldom. Never.
5. If I had my life to live over again I would: plan very differently, in between, want it the same.
6. I admire my parents in all important matters. Yes. In between. No.
7. I find if hard to "take 'no' for an answer", even when I know what I ask is impossible. True. In between. False.
8. I doubt the honesty of people who are more friendly than I would naturally expect them to be. True. In between. False.
9. In demanding and enforcing obedience my parents (or guardians) were: always very reasonable, in between, often unreasonable.
10. I need my friends more than they seem to need me. Rarely. Sometimes. Often.
11. I feel sure that I could "pull myself together" to deal with an emergency. Always. Often. Seldom.

Appendix C (continued)

12. As a child I was afraid of the dark. Often. Sometimes. Never.

13. People sometimes tell me that I show my excitement in voice and manner too obviously. Yes. Uncertain. No.

14. If people take advantage of my friendliness I: soon forget and forgive, in between, resent it and hold it against them.

15. I find myself upset rather than helped by the kind of personal criticism that many people make. Often. Occasionally. Never.

16. Often I get angry with people too quickly. True. In between. False.

17. I feel restless as if I want something but do not know what. Very rarely. Sometimes. Often.

18. I sometimes doubt whether people I am talking to are really interested in what I am saying. True. In between. False.

19. I have always been free from any vague feelings of ill-health, such as obscure pains, digestive upsets, awareness of heart action, etc. True. Uncertain. False.

20. In discussion with some people, I get so annoyed that I can hardly trust myself to speak. Sometimes. Rarely. Never.

21. Through getting tense I use up more energy than most people in getting things done. True. Uncertain. False.

22. I make a point of not being absent-minded or forgetful of details. True. Uncertain. False.

23. However difficult and unpleasant the obstacles, I always stick to my original intentions. Yes. In between. No.

Appendix C (continued)

24. I tend to get over-excited and "rattled" in upsetting situations. Yes. In between. No.

25. I occasionally have vivid dreams that disturb my sleep. Yes. In between. No.

26. I always have enough energy when faced with difficulties. Yes. In between. No.

27. I sometimes feel compelled to count things for no particular purpose. Yes. Uncertain. False.

28. Most people are a little queer mentally, though they do not like to admit it. True. Uncertain. False.

29. If I make an awkward social mistake I can soon forget it. Yes. In between. No.

30. I feel grouchy and just do not want to see people: occasionally, in between, rather often.

31. I am brought almost to tears by having things go wrong. Never. Very rarely. Sometimes.

32. In the midst of social groups I am nevertheless sometimes overcome by feelings of loneliness and worthlessness. Yes. In between. No.

33. I wake in the night and, through worry, have some difficulty in sleeping again. Often. Sometimes. Never.

34. My spirits generally stay high no matter how many troubles I meet. Yes. In between. No.

35. I sometimes get feelings of guilt or remorse over quite small matters. Yes. In between. No.

Appendix C (continued)

36. My nerves get on edge so that certain sounds, e.g. a screechy hinge, are unbearable and give me the shivers. Often. Sometimes. Never.

37. If something badly upsets me I generally calm down again quite quickly. True. Uncertain. False.

38. I tend to tremble or perspire when I think of a difficult task ahead. Yes. In between. No.

39. I usually fall asleep quickly, in a few minutes, when I go to bed. Yes. In between. No.

40. I sometimes get in a state of tension or turmoil as I think over my recent concerns and interests. True. Uncertain. False.

Appendix D

Experiment I 16 PF Raw Score Means (N = 34/ group)

16 Primary Factors	Control	Early	Late
A	10.79	10.88	9.88
B	7.94	7.24	7.06
C	14.59	14.35	14.29
E	12.27	11.21	10.35
F	17.56	14.35	14.32
G	10.79	10.53	11.76
H	14.53	12.00	11.47
I	13.35	13.76	12.76
L	9.88	9.74	9.38
M	11.97	10.71	10.82
N	8.56	9.44	10.06
O	12.18	13.44	11.91
Q_1	9.24	8.74	9.79
Q_2	8.94	10.91	10.21
Q_3	9.91	10.91	10.47
Q_4	14.44	15.09	14.53
Second order factors			
Good adjustment - Anxiety	46.0	51.0	47.0
Introversion - Extroversion	67.4	45.0	45.0
Moody - Alert	53.0	48.0	61.8
Subdued - Independent	71.5	73.4	72.6
Neuroticism	39.2	51.0	44.0
Freedom from Susceptibility to Accidents	39.2	44.0	51.0

Appendix E

Orthogonal Analysis : Experiment I

Source	df	MS	F
Factor A			
$\tilde{\phi}_1$ - Control vs. Abortion	1	3.84	<1
$\tilde{\phi}_2$ - Early vs. Late Abortion	1	17.00	2.53
Subjects	33	5.23	
Error	66	6.73	
Factor B			
$\tilde{\phi}_1$ - Control vs. Abortion	1	4.29	2.17
$\tilde{\phi}_2$ - Early vs. Late Abortion	1	0.53	<1
Subjects	33	9.68	
Error	66	1.98	
Factor C			
$\tilde{\phi}_1$ - Control vs. Abortion	1	1.59	<1
$\tilde{\phi}_2$ - Early vs. Late Abortion	1	0.06	<1
Subjects	33	13.13	
Error	66	16.75	
Factor E			
$\tilde{\phi}_1$ Control vs. Abortion	1	50.00	3.54
$\tilde{\phi}_2$ Early vs. Late Abortion	1	12.37	<1
Subjects	33	18.37	
Error	66	14.12	

ϕ $p < .05$, $\phi\phi$ $< .01$

$\tilde{\phi}$ - orthogonal notation for "phi"

Appendix E (continued)

Orthogonal Analysis : Experiment I

Source	df	MS	F
Factor G			
$\tilde{\phi}_1$ - Control vs. Abortion	1	2.82	<1
$\tilde{\phi}_2$ - Early vs. Late Abortion	1	25.94	1.89
Subjects	33	8.98	
Error	66	13.73	
Factor I			
$\tilde{\phi}_1$ - Control vs. Abortion	1	0.18	<1
$\tilde{\phi}_2$ - Early vs. Late Abortion	1	17.00	1.87
Subjects	33	248.53	
Error	66	9.11	
Factor L			
$\tilde{\phi}_1$ - Control vs. Abortion	1	2.37	<1
$\tilde{\phi}_2$ - Early vs. Late Abortion	1	2.11	<1
Subjects	33	17.19	
Error	66	5.32	
Factor M			
$\tilde{\phi}_1$ - Control vs. Abortion	1	32.96	2.54
$\tilde{\phi}_2$ - Early vs. Late Abortion	1	0.23	<1
Subjects	33	9.06	
Error	66	13.00	

ϕ $p < .05$, $\phi\phi$ $< .01$ $\tilde{\phi}$ - Orthogonal notation for "phi"

Appendix E (continued)

Orthogonal Analysis : Experiment I

Source	df	MS	F
Factor O			
$\bar{\phi}_1$ - Control vs. Abortion	1	5.67	<1
$\bar{\phi}_2$ - Early vs. Late Abortion	1	39.76	2.40
Subjects	33	14.60	
Error	66	16.60	
Factor Q_1			
$\bar{\phi}_1$ - Control vs. Abortion	1	0.02	<1
$\bar{\phi}_2$ - Early vs. Late Abortion	1	19.06	2.16
Subjects	33	10.47	
Error	66	8.83	
Factor Q_3			
$\bar{\phi}_1$ - Control vs. Abortion	1	13.77	1.68
$\bar{\phi}_2$ - Early vs. Late Abortion	1	3.31	<1
Subjects	33	10.50	
Error	66	8.21	
Factor Q_4			
$\bar{\phi}_1$ - Control vs. Abortion	1	3.06	<1
$\bar{\phi}_2$ - Early vs. Late Abortion	1	5.31	
Subjects	33	16.52	
Error	66	18.07	

ϕ $p < .05$ $\phi\phi$ $p < .01$ $\bar{\phi}$ - Orthogonal notation for "phi"

Appendix F

Alteration in Anxiety Score in Experiment II

	Control	Early	Late
	0.5	-1.0	-1.7
	-2.4	0.9	1.0
	11.8	-48.1	7.9
	-32.0	-10.7	-45.9
High	-6.3	5.3	21.2
Anxiety	-19.1	-46.3	-8.7
Group	28.3	-48.2	30.2
N = 12	-10.5	-54.0	14.2
	32.1	10.3	2.0
	38.5	24.2	36.9
	26.2	12.3	-11.1
	-25.8	-4.6	-7.6
	-25.2	-5.8	-31.0
	40.7	5.9	27.0
	30.7	16.9	15.6
	53.5	22.3	-8.5
Low	8.6	18.8	13.6
Anxiety	3.4	-19.7	-3.5
Group	53.8	-0.3	48.3
N = 12	63.4	53.8	48.4
	3.7	9.5	43.6
	11.4	25.3	54.9
	28.9	11.3	15.2
	0.9	4.5	39.7

Appendix G

Experiment III 16 PF scores (N = 31)

Factor	Preoperation Test	Deferred Followup
A	9.26	10.23
B	7.52	8.16
C	14.45	14.80
E	11.42	11.68
F	15.13	14.48
G	11.03	11.26
H	11.77	11.19
I	14.26	13.42
L	9.94	9.58
M	11.56	11.65
N	9.58	9.13
O	13.74	13.45
Q_1	9.70	9.45
Q_2	11.03	11.48
Q_3	10.35	10.84
Q_4	16.61	15.65
Second order factors		
Good adjustment-Anxiety	61.8	54.0
Introversion-Extroversion	44.0	46.0
Moody - Alert	51.0	52.0
Subdued - Independent	85.3	85.2
Neuroticism	57.9	48.0
Freedom from Accidents	36.3	44.0