

Ego and I.Q.: **What Can We Learn From the Frontal Lobes?**

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A re-vitalization of the nineteenth century speculation that the frontal lobes are concerned with an awareness of self is suggested by a comparative review of basic frontal lobe theory and Loevinger's ego development theory. Cognitive processes of planning, motivation, judgment and personal construct formation can be linked to frontal lobe functions. Standard I.Q. tests appear to have been insensitive to cognitive deficits arising from frontal lobe lesions in out-dated procedures of lobotomy and leucotomy. Application of Loevinger's (1970) ego development measurement to the study of frontal lobe patients is suggested as a step towards a clearer differentiation of ego and I.Q.

Early clinical accounts of the psychosurgical procedures of leucotomy and lobotomy typically made the claim that the procedures resulted in little or no intellectual impairment. To most of us, this claim was baffling because of the sizeable damage to the frontal lobes in those now-antiquated procedures. The standard leucotomy involved inserting a hollow needle with a wire loop at the end—known as a leucotome—into the anterior portions of a patient's frontal lobes. Once inserted, the leucotome was rotated, hollowing out a core of material approximately 1 cm. in diameter; this process was repeated six to eight times in each frontal lobe. A lobotomy was no less dramatic: using a blunt knife, the surgeon entered the lateral part of the frontal lobes and moved the knife back and forth in a sweeping action. The lobotomy was called "moderate, standard, or radical," depending on how far back the incision was made.

Modern psychosurgery is, of course, much more precise (e.g., the stereo-taxic techniques), as are the methods for identifying the more subtle cognitive deficits in personality functions associated with the frontal lobes (e.g., Halstead-Reitan and Luria-Nebraska batteries). In the early days of psychosurgery and until quite recently, however, standard I.Q. tests were used to detect intellectual deficits connected with leucotomy and lobotomy. Reports of loss of general intelligence, as measured by these tests, were in the minority in clinical papers on psychosurgery.

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From current evidence, we can say that standard I.Q. tests were not adequate for detecting frontal lobe dysfunction, although it is clearly a cognitive dysfunction which detracts in essential ways from human intelligence.

Before the end of the nineteenth century, basic theoretical speculation about frontal lobe functions in the human brain had already been formulated. What has come to be known as "frontal lobe syndrome" in modern psychiatry was first demonstrated in the case of Phineas Gage in 1848, related below. While not all frontal lobe lesions or disturbances are accompanied by the same cognitive deficits, nor to the same degree, the general syndrome presents the following: a lack of initiative; an inability to evaluate future actions in terms of past consequences; and an apparent disregard for social and emotional nuances in relating to others. The flouting of social conventions and lack of initiative for self-improvement often associated with frontal lobe syndrome, led some observers to call it a "loss of character."

The characteristics which mark the frontal lobe patient—whether clinically observed in such processes as aging or dementia, or surgically identified with frontal lobe lesions—are remarkably similar to the "impulsive" stage of ego development in Loevinger's (1970; 1976) ego development scheme. The person at this stage is self-indulgent, governed by whim and preoccupied with satisfying physical urges. Rules are seen as arbitrary exercise of power. The interpersonal world is highly oversimplified in terms of "nice to me" and "mean to me."

Ego Development

One current use of the term "ego development" concerns the earliest and most primitive manifestations of the self in the first three years of life. Normal autism is followed by a symbiotic unity of infant and parent, out of which the infant gradually distinguishes self and other. This process of psychological individuation culminates in a clear and enduring sense of "I" (e.g., Mahler, 1975).

The "psychoanalytic ego psychologists" also use the term, characterizing ego development as psychosexual adaptations resulting from the socialization of drives (Hartmann, 1939; Hartmann, Kris & Loewenstein, 1964). Of lesser interest to this group are the functions of the so-called "conflict-free" ego sphere: language, intelligence, perception, and synthesis of self and world.

Loevinger (1970; 1976), by contrast, regards the ego as the synthetic function of personality *par excellence*. She characterizes ego as point of

view, or perspective, that is, the consistent way in which an individual brings coherence to his/her experience. Loevinger's theory and conceptual scheme are primarily derived from empirical research using the sentence completion test for ego development (SCT). The connection between empirical data and conceptual scheme, established through the methodology for scoring the SCT (Loevinger & Wessler, 1970; Loevinger, Wessler & Redmore, 1970), has enabled Loevinger to define, in detail, the characteristics of ego development in adolescence and adulthood—investigating stages and transitional levels which had not been hypothesized from theory alone.

Insight into the development and functioning of the ego obviously comes from many areas of psychology. Freud's early thinking emphasized unconscious rather than ego functions in the personality. This early formulation of psychoanalytic theory to substantiate unconscious processes resulted in Adler's break with the psychoanalytic circle in 1911. Adler's (1956) concept of "life style" and his stressing of the unity and coherence of personality were understood by Freud to be incompatible with the psychoanalytic framework at that time. The concept of life style as an underlying structure in the moment-to-moment existence of the person can be understood as a precursor of Loevinger's use of the term "ego."

In *Beyond the Pleasure Principle* (1920), however, Freud introduced to psychoanalysis the outline of his ego psychology: ego mastery is achieved by actively repeating what has been passively experienced. An application of this principle is described in *The Ego and the Id* (1923): what parents have demanded of the child to curb his/her impulses, the child demands of itself. Closely related to this first principle of psychoanalytic ego psychology is another, stated in the essay "Mourning and Melancholia" (1917): interpersonal relationships become the models and contribute the formal elements to intrapersonal differentiation. That is, the stimulus and form of the differentiation of the ego come from interaction with others, especially significant others.

An important contemporary extension of psychoanalytic ego psychology, from the point of view of Loevinger's scheme, is the work of Loewald (1951; 1960; 1962). Loewald recognizes the existence of the person and the environment, but he denies the traditional dichotomy of ego and reality. He says:

The relatedness between ego and reality, or objects, does not develop from an originally unrelated co-existence of two separate entities which come into contact with each other, but on the contrary from a unitary whole which differentiates into distinct parts. (Loewald, 1951, p. 14).

This intricate process of the differentiating relationship of person and environment continues to be the core of ego development throughout life, as Loevinger and her co-workers have conceived the process on the basis of their research.

The interpersonal origin of the self is also the central feature of the work of Harry Stack Sullivan (1953). "The developmental history of the personality...is actually the developmental history of interpersonal relations," (Sullivan, 1953, p. 30). Sullivan's concept of "self-system," born of the anxiety in interpersonal relating, has many similarities with Loevinger's concept of ego.

Other theories which contribute to the conceptual scheme related to scoring the SCT for ego development include the work of Baldwin (1897), McDougall (1908), and Mead (1934), nineteenth and early twentieth century psychosocial theorists. Baldwin clearly articulated a series of stages in the development of the self, motivated primarily by the tendency to imitate. McDougall rejected Baldwin's assumption of imitation as the central psychological motivation for ego development and offered in its place the idea that development—at least moral development—is given in human nature. Initially, behavior is governed by immediate prospects of reward and punishment; but, in the final stages, morality is governed by an ideal which is often the individual's own, and at odds with group norms. Thus, the individual comes to a point of explicitly refusing reinforcement from the group for his/her ideals. Mead's sense of social self focussed on the idea that the individual learns to understand the roles and perceptions of others by enacting them in games and play. As a result of successive role-taking, the child develops not only an ability to act out specific roles, but a sense of a "generalized other" or a set of expectations for appropriate human behavior.

Perhaps because of her concern with measurement and her reticence to limit ego development to a description of infantile separation-individuation, Loevinger (1976; 1979) has conceptualized and investigated ego development in a way that provides a broad supplement to contemporary frontal lobe theory. The concept of ego as the synthesis of an interpersonal frame of reference, evolving in a predictable pattern which can be measured by changes in language, logic, purpose, and meaning can be compared with the theory that frontal lobe functions serve "navigational" or anticipatory purposes in the affective development of personality, as specified below.

The history of psychosurgery offers clinical evidence that our standard measures of I.Q. do not measure changes in frontal lobe functions that result from lesions. Ego development research offers further evidence

from correlational studies, using I.Q. measures and the SCT, that ego and I.Q. can be statistically differentiated in later adolescence and adulthood, but not in early adolescence or childhood (Loevinger, 1979; McCammon, 1980).

The ego development scheme or continuum of stages, derived substantially from research using the SCT, describes six major and two transitional stages in an invariant sequence. Each new stage is more complex and differentiated than the former. Each new one builds on and integrates those which have already occurred. Overall, the stages can be conceived as mapping a process of striving for greater coherence of the experience of self and world, especially self and interpersonal world. Loevinger (1976) claims that ego development is a synthesis of cognitive, interpersonal, and moral development. The titles or names for the stages indicate their predominant concerns (the names of transitional stages are in parentheses): Pre-social, Impulsive, Self-protective, Conformist, (Self-aware), Conscientious, (Individualistic), Autonomous, and Integrated. The Pre-social Stage, (based on Mahler's research on normal autism and symbiosis), is not investigated via the SCT; it is considered as a predecessor to the stages investigated however.

Because the ego development scheme is presented as an abstract conception of universal applicability, across age cohorts and cultures, specific references to age-related changes are avoided in the theory. Instead, the earlier stages are described in terms which are suitable both to children and to adults who have remained there. Obviously a conformist at the age of 10 and at the age of 30 are quite different, but the elements they share are the essentials of the conformist stage. The earlier stages in the scheme can be understood as a description of typical developmental stages for children, up to the transitional level termed "Self-aware," from Conformist to Conscientious stage. This transitional level is modal for adults in our society (Holt, 1979). Research evidence has tended to indicate that people stop developing at about the age of 21 (Loevinger, 1976). Consequently, the ego development scheme becomes a typology for differentiating adults, a single bipolar variable which depicts what most psychologists often think of as "individual differences."

Ego development theory can be criticized for claiming too much: for claiming that a full reading of character can be assessed in analyzing sentence completions for their structural or formal features. Critics claim that ego level is an artifact of I.Q. and/or verbal fluency and could be arrived at more accurately and economically by some better measure of intelligence, or by some behavioral indicator such as the number of words used to respond to a sentence completion stem. Neither word counts nor

I.Q. measures account for the variance of SCT scores across subsamples of different ages, occupations, and socioeconomic groups (Loevinger, 1979).

A major problem which has stood in the way of investigating the difference between I.Q. and ego, as measured by the SCT, is that I.Q. is not a construct, but an operation. The score on an I.Q. test cannot stand up to logical examination in the sense that it does not represent a particular construct of intelligence. Furthermore, I.Q. contributes to ego level in a substantial way in most samples and, when it is statistically partialled out, it takes with it enough of the variance to leave the ego development scheme somewhat flat. Since research has demonstrated that I.Q. differences cannot account for ego level differences across samples, we are left with the question of how to investigate the variance which is not shared by the SCT and the standardized I.Q. test.

Intuitively and practically, it seems obvious that a person can be at the self-protective level of development and still have a superior I.Q. The prototype of the hustler, for example, is founded on the very combination of cleverness and self-protective manipulation. The application of ego development methodology and theory to the investigation of frontal lobe syndrome may offer a new inroad to understanding the difference between the ego and I.Q.

Historical Background of Frontal Lobe Theory

What has come to be known as frontal lobe syndrome was first demonstrated in the case of Phineas Gage, a 25-year-old construction foreman in Vermont, who suffered a brain injury to the frontal area when an accidental explosion drove an iron tamping rod (13-½ pounds, 3-½ feet long and 1-¼ inches in diameter) through his left cheek and out the front side of his skull. Amazingly, Gage recovered from the accident. He was treated by John M. Harlow, a local physician, who described Gage's condition after recovery:

...His physical health is good, and I am inclined to say that he has recovered...His contractors, who regarded him as the most efficient and capable foreman in their employ previous to his injury, considered the change in his mind so marked that they could not give him his place again. The equilibrium or balance, so to speak, between his intellectual faculties and animal propensities, seems to have been destroyed. He is fitful, irreverent, indulging at times in the grossest profanity (which was not previously his custom), manifesting little deference for his fellows, impatient of restraint or advice when it conflicts with his desires, at times pertinaciously obstinate, yet capricious and vacillating, devising many plans of future operation, which are not sooner arranged than they are abandoned in turn for others appearing more feasible. (Valenstein, 1973, p. 303).

From cases like Gage and from neurological studies, Harlow, Starr, and Spencer, in 1894, described changes in character and behavior associated with injury to the frontal lobes as "loss of self-control," referring to the patients' inability to conform to moral and ethical standards which would have normally been considered requisite (Meyer, 1974).

In 1876 and 1878, Ferrier further specified, via experiment, what previously had been observed from injury. He removed the prefrontal cortex in monkeys, selected especially for their high intelligence and ability to concentrate. After ablations of the prefrontal area, he observed that the monkeys "remained apathetic and dull, or dozed off to sleep, responding only to sensations or impressions of the moment..." (Meyer, 1974, p. 566). Ferrier maintained that the monkeys had not lost their faculty of intelligence because they could still perform all the tasks they had previously performed—eating, grooming and other typical behaviors—but he suggested that they had lost the "faculty of attention."

In 1894, Flechsig proposed "consciousness of self" (Selbstbewusstsein) as the fundamental function of what he called the "frontal association area." Not much more advance was made in the study of the frontal lobes until the advent of psychosurgery in the United States in the 1930's. In 1936, Watts and Freeman introduced the procedure of leucotomy: the surgical attempt to sever the prefrontal cortical connections to the thalamus as a means to calming severely disturbed and disruptive mental patients. Unfortunately, much of the literature concerning the early practices of psychosurgery presents very little objective scientific information, as was documented by the National Commission for the Protection of Human Subjects of Biomedical and Behavioral Research which took ten years (1965-1975) to review the status of psychosurgery and to conduct an independent investigation of its effectiveness. In the 1977 report by the Commission it is concluded that relatively little is known about the effects and/or effectiveness of psychosurgery practices. Most procedures were developed and applied without research review or protocol. Until the 1970's there had been very few systematic attempts to evaluate post-operative gains or losses by investigators who were not themselves advocates of psychosurgery.

Based on lobotomy and leucotomy studies, Watts and Freeman defined frontal lobe function as "consciousness of the self and its attitude towards the future," combining Ferrier's notion of attention with the self-awareness idea of Flechsig. By 1950, Watts and Freeman had operated on over 1,000 patients themselves; later Freeman indicated that he had performed or supervised psychosurgical procedures on more than 3,500 patients. Watts and Freeman claim, in their reviews and follow-ups

on patients receiving such procedures, that the procedures resulted in emotional calming and in little or no intellectual impairment, as measured on standard I.Q. tests, such as the Binet and the Wechsler.

Following World War II, it is estimated that approximately 40,000 frontal psychosurgical procedures were performed in this country, typically of the leucotomy and lobotomy type (Valenstein, 1973). The majority of these were performed in the decade following 1945. The claims of Watts and Freeman were allegedly substantiated: the patients were generally described as better behaved after surgery and were reported to suffer no appreciable loss in I.Q. (some even improved on I.Q. tests from pre- to post-operative testing).

By the late 1950's, however, it was becoming clear to some observers of psychosurgical patients that, while I.Q. functions were not impaired in these people, something was amiss. Psychosurgery on the frontal and prefrontal areas of the brain resulted in some kind of cognitive or interpersonal deficit which was escaping measure by standard I.Q. tests. In 1948, Dr. Gosta Rylander of Sweden claimed that the major post-operative deficits from psychosurgery could not be assessed by standardized tests and did not show up in the statistics of case studies. Rylander claimed that it was necessary to live with the patients over a protracted period of time in order to assess the psychological dysfunction which accompanied psychosurgery. Rylander conducted long-term studies of lobotomized patients from which he reported that they "have shown changes in behavior of the well-known type, namely, tactlessness, emotional lability with tendencies to outbursts, extrovertedness and slight euphoric traits" (Valenstein, 1973, p. 310). This cluster of symptoms has since come to be known as frontal lobe syndrome, the diagnosis of which, in non-surgical cases, is typically accompanied by a suspicion of damage to the prefrontal cortex. From the 1950's on, then, the post-operative picture of the lobotomized or leucotomized patient presented a mix of several factors: emotional calming (compared to pre-operative agitation), typically no impairment of I.Q. functions on most of the standard tests, and a subtle shift in the patient's *character* that resulted in emotional lability and some problems with modifying present behavior according to past learning. The character deficits were subtle enough that they could be denied by the proponents of psychosurgery and usually escaped being measured by standard psychological tests, with some exceptions to be discussed below.

The character functions which are often disrupted in lobotomized or leucotomized patients can be understood as the ability to construe effective "personal constructs," of the sort described by George Kelly and

cited by Loevinger as similar to her idea of ego. Kelly's theory that a person "anticipates events by construing their replications" is based on the idea that "what governs the direction in which a person's behavior develops is the confirmation and disconfirmation of his predictions", (cited in Loevinger, 1976, p. 307). It is just this process of anticipation-confirmation-revision which appears to be disturbed in the frontal lobe patient.

Contemporary Frontal Lobe Theory

The literature on psychosurgery and the earlier neurological studies of the nineteenth century suggest that a cognitive process of "self-awareness"—or the ability to guide one's behavior by purpose and meaning—may be associated with frontal lobe functions. Contemporary neuropsychological theory provides some grounding for this possibility.

According to psychologist Walle Nauta, who specializes in the neuropsychology of frontal lobe functions, the frontal cortex is unique among the cerebral promontories because it "appears not to contain a single subfield that could be identified with any particular sensory modality, and its entire expanse must accordingly be considered association cortex", (Nauta, 1971, p. 167). The frontal cortex appears, then, to be re-processing or synthesizing the input coming from other areas of the cortex.

Nauta claims that frontal lobe functions contribute to reference points of feeling or affectivity which act as guideposts for complex behavior. He says:

...it would seem possible to envisage a pre-setting not only of exteroceptive processing mechanisms, but also of those mechanisms dealing with interoceptive information. Such a pre-setting could be thought to establish a temporal sequence of affective reference points serving as "navigational markers" and providing, by their sequential order, at once the general course and the temporal stability of complex goal-directed forms of behavior. (Nauta, 1971, p. 183).

Nauta's concept of "pre-setting" here is similar to Kelly's idea of personal constructs and Loevinger's idea of ego structure, the structural direction in which a person's character develops.

To give a basic picture of the anatomical location of the frontal cortex, one first has to visualize the frontal lobes of the brain as those parts which are anterior to the central sulcus or the deep dividing line between the front and back portions of the brain. These lobes are covered with neocortex which is divided into six layers. Among these layers of cortex is a type which is labelled "frontal cortex" per se, on the outermost side.

Most of our concern is with the frontal cortex and its prefrontal extension—these being different in size and topography between mammalian and other species. Nauta claims that the prefrontal cortex reaches different stages of development in different mammalian lineages. On the basis of cellular structure alone, he says that there are good grounds for believing that no non-primate homologue of the primate prefrontal cortex exists.

In humans and some of the primates, rather large areas of cerebral cortex in the frontal and temporal lobes are uncommitted at birth. During the early learning period of childhood, some of these convolutions are programmed for speech (usually on the left hemisphere for right-handed people) and the rest become “devoted to interpretation of present experience in the light of past experience” (Penfield, 1975, p. 19). These areas of the frontal and temporal lobes depend on early socialization and conditioning for their functional specialization. Some of these areas are not fully developed until early adolescence.

Worth noting here is the trend that has emerged in correlational studies of ego development and I.Q. which indicates that ego begins to be differentiated from I.Q., or becomes less confounded with I.Q., at about the same period as these last convolutions are finished being programmed. That is, we could speculate that coherence of ego does not distinctly emerge until those convolutions are clearly committed to their functions. In the same light, Piaget postulates that formal operational thinking and moral reasoning of the autonomous type are not fully developed until early adolescence. Where and/or how these indications of psychological development are related to frontal lobe specialization may be a problem worthy of further study.

What Nauta claims about the function of the frontal cortex—that it appears “not to contain a single sub-field that could be identified with any particular sensory modality, and its entire expanse must accordingly be considered association cortex”—is a description of integration. The frontal cortex seems to have as a major function the integration of input or stimuli from all other parts of the brain which it uses then to monitor or modulate other systems, such as the limbic system. This can be speculated because the frontal cortex receives afferent impulses or signals from all of the major sensory-processing areas of the cerebral cortex. Thus the frontal cortex integrates all exteroceptive sensory data that are re-presented via association. It is further distinguished by its efferent connections with the limbic system which is thought to govern feeling reactions. Of this connection between the frontal cortex and the limbic system, Nauta says: “It is tempting to speculate that the reciprocal

frontal-limbic relationship could be centrally involved in the phenomenon of *behavioral anticipation*, and elucidate the 'loss of foresight' that has so long been recognized as one of the most disabling consequences of massive frontal-lobe lesions" (Nauta, 1971, pp. 182-83). Nauta concludes that the frontal cortex may modulate the limbic system.

Contemporary neuropsychological theory suggests a unique neuronal feature of the frontal cortex which makes it a major candidate for being at least an analogue for ego process: it is in a reciprocal relationship with two major functional systems—the regions of the cerebral cortex which are involved in processing visual, auditory and somatic sensory information and the limbic system and its subcortical correspondents (in particular, the hypothalamus and associated structures). To say it another way, the frontal cortex is in a reciprocal relationship with the external environment (including all modes of sensory awareness), as represented by the cerebral cortex, and the feeling or emotional centers of the brain.

Speculations that specifically tie frontal lobe functions to the processes of planning, judgment, and motivation derive more from the clinical than the experimental research on brain functions. There is still much dispute about how much and what kind of associational work takes place in the frontal cortex. What has been described by clinicians as "frontal lobe syndrome" is disputed by some researchers who contend that the only deficits which are experimentally demonstrable in frontal lobe patients are of a perceptual nature.

A major difficulty in the way of determining the precise function of the frontal cortex, apart from its complex associational routes, has been the difficulty of localizing cerebral tissue damage in the frontal lobe area. As emphasized by Hans Leukas-Teuber, tumors in the frontal area are likely to have grown to considerable size before a patient is seen by a neurologist and can be reviewed for dysfunction. In such cases, it is extremely difficult to determine whether symptoms are complicated by more general brain impairment.

Most research on frontal lobe functions is carried out on patients who have experienced some kind of demonstrable damage to the frontal lobe area, resulting from sources as diverse as stroke and lobotomy. Performance of such patients on perceptual and motor tasks appears to show much variation, the characteristic deficits being in what generally can be described as "planned initiative" or "pre-setting of behavior."

Milner and Luria have successfully demonstrated a profound deficit on a lesser known psychologist test called the "Wisconsin modification of the Weigl card-sorting task." The task involves the patient being asked to sort 128 playing cards on the basis of any one of three arbitrary criteria —

color, shape, or number of figures on the cards. The patient is given no verbal indication as to which criterion is valid, but she/he is required to infer from the observer's signals of "right" and "wrong" responses. Frontal lobe patients show significant difficulty in deducing the required strategy *after* the initial strategy has been established. In other words, the frontal lobe patient has no problem inferring the initial category for sorting from the initial observer cues. When at some point, the cues change, however, the patient will usually perseverate in the original response category. Milner claims that this deficit cannot be attributed to loss of abstract thinking because such patients often say to themselves, "It has to be the color, the form, or the number," although they seem unable to change their response set once it has been established (cited in Nauta, 1971, p. 169). Similar difficulties in card-sorting tasks are cited in many studies, including those reviewed by the National Commission of Psychosurgery.

In other tasks which require an orderly sequence of separate steps, such as drawing complex figures, the frontal lobe patient may perseverate in an early phase or be side-tracked to behavior that would have been appropriate in another context. The patient in such a situation appears not to be dismayed by the "failure" to follow instructions or to reach the required goal. Luria sums up his conclusions about frontal cortex functions, based on 30 years of research:

They control the active state of the cortex, which is necessary for the accomplishment of complex tasks, and play an important role also in the execution of intentions that determine the direction of human activity and impart to the latter an elective and purposive character. (Pribram and Luria, 1971, p. 22).

Without the frontal cortex functions intact, the person appears to operate with a reduced or ineffective planned initiative. On certain complex tasks which require decision-making and judgment, the person can only carry out an initial set of "programmed" activities and is unable to modify the activities according to new demands of the environment.

Conclusions

Obviously, we cannot attribute anything as complex as the integrative process of ego to a particular region or functional area of a brain. The entire brain must be involved in such a process, and yet we can hypothesize which structures or functions are essential for this process of integration to be fully realized. It seems, at this juncture, extremely likely that the frontal lobes are functionally related to the processes of planning, deciding, motivation, judgment, and personal construction forma-

tion that are necessary for a fully developed and uniquely human sense of self.

The picture of a confused and aimless Phineas Gage—whose basic intellectual skills remain intact—suggests a loss of some especially “personal” intelligence that appears to emerge gradually as the human being interacts with others of the species. Loevinger calls this kind of intelligence “ego development” and has charted its course from its earliest presocial and impulsive stages to its final stages of highly differentiated and complex integration. The course of ego development cannot be explained by I.Q. intelligence. Especially at the highest levels, as demonstrated in a recent presentation by George Vaillant (unpublished lecture), higher I.Q. is not predictive of greater ego development or integration. Vaillant’s participants in the Grant Study at Harvard—all of whom must be considered to have been privileged educationally and superior in terms of health—showed no recognizable pattern of relationship between variance on I.Q. measures and variance on measures of ego development. This study can be understood as holding constant SES (which is highly correlated with I.Q.) by design, rather than by partialling out SES statistically. In such a case, when everyone in the study was essentially privileged in regard to educational and cultural sophistication, I.Q. cannot account for differences in life accomplishments or personal satisfaction. The SCT, according to Vaillant, was a much better predictor of these latter differences than were I.Q. tests.

Lending credence to a speculation about the distinct natures of interpersonal or ego development and I.Q. intelligence in adulthood is the clinical picture of the frontal lobe patient. Although this patient scores similarly on I.Q. measures pre- and post-operatively, something is amiss. What is this something? Could it be the type of interpersonal-cognitive functioning tapped by the SCT for ego development? Contrast the case histories of Phineas Gage and Luria’s famous patient presented in *The Man With A Shattered World* (1976). The latter, Zasetky, suffered profound damage to the temporal lobes and to his intellectual, sensory and motor functioning. He had no damage in the frontal lobes. Impressively, he was purposive and planful in his heroic struggle to reconstruct a personal point of view, a coherent perception of self and other. Whereas Gage appeared to lack the judgment, motivation, and personal construct formation we typically call “character,” Zasetky retained them.

The contrast of these two cases, in the face of the other evidence reviewed here, suggests the possibility that ego development represents a dimension of intelligent human functioning which can be discriminated from I.Q. functions. It is a dimension which demands the attention of

educators and policy makers, as well as researchers, because it seems to integrate the special complex knowledge of being a person-among-persons with the emotional or motivational factors that are essential for the continuing development of personhood.

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