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Psychological Type and the Matching of Cognitive Styles

As educators, we often find ourselves caught between a theoretical notion of individual differences and a practical notion of dealing with individual differences in our schools and classrooms. Although we may be aware of differences, it is not always clear how to translate that awareness into effective ways to get our students to achieve. This article examines Carl Jung's concept of psychological type as it relates to teacher, student, subject matter, and instructional alternatives. We believe Jung's work can serve as a guide to understanding how these factors interrelate and affect teaching and learning.

The Theory

Psychological type, to use Jung's (1921/1971)[1] term, represents the way we prefer to perceive and judge the information we encounter as we go through life adapting to situations. In Jung's scheme, psychological type is descriptive of what is now called learning style or cognitive style. Early in his career as a psychiatrist, Jung realized that while people were similar in many ways, there were also important differences. Working from his own clinical observations and from the work of others dating back to the second century, Jung formulated a psychological typology which is intended to characterize (as opposed to categorize) the fundamental styles that we use to deal with our life-encounters—cognitive style.

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Psychological type as *style* is analogous to differences among batters in a baseball game. Cursory observation during a baseball game reveals a variety of batting styles—left or righthanded, open or closed stance, bat held high or low, body crouched or erect, and others. These characteristic preferences represent style differences among hitters. However, these differences all occur against a background of commonality. All batters, regardless of individual style, have much in common. Batters stand within the limits of the batter's box, watch the ball, use a bat, etc. In other words, styles of hitting differ across the common process according to certain typical differences. Each style has its advantages; none is inherently superior to the others.

Jung saw that across the commonality of human behaviors there were classes of behaviors which were common to some of us and not to others. The typology Jung developed to characterize typical differences consists of two attitudes, *extraversion* and *introversion*; two perception functions, *intuition* and *sensing*; and two judgment functions, *thinking* and *feeling*. The attitudes of extraversion and introversion describe our basic stance in dealing with the things we encounter. Extraversion is indicative of those who are "outgoing" with their interest. The extravert, according to Jung, "thinks, feels, and acts in relation to the object" (p. 427). The extravert seems to have an overt supply of energy and appears anything but shy about dealing with environmental encounters.

Introversion is indicative of those who are more inwardly directed with their interest. The introvert,

according to Jung, "thinks, feels, and acts in a way that clearly demonstrates that the subject is the prime motivating factor" (p. 452). The introvert may appear more withdrawn or shy about dealing with environmental encounters. In our classrooms and schools, the extraverts appear as those students who are active, energetic, and involved in something most of the time. The introverts are those students who appear quiet and reserved, often going unnoticed amid school and classroom activity.

The functions of sensing and intuition are used in Jung's typology to describe how we prefer to perceive what we are experiencing. The intuitive tends to perceive information holistically, often losing sight of details in favor of seeing a world of possible meanings. Intuitives may appear to be imaginative, creative, or theoretical in their interests when at their best. They may also be seen as impatient, imprecise, or careless with details.

Sensing as a preferred way of perceiving information describes those who tend to deal realistically, observantly, and precisely with tasks. The sensing type is able to deal well with details and facts, preferring experience to theory. The sensing type does not deal as well with complicated situations, or with speculative situations which require seeing the world of possibilities.

Thinking and feeling represent two distinct modes by which we judge or make rational the information gained in perception. Judgments made in the thinking mode tend to be logical, analytical, and impersonal. Thinking types are often good at providing intellectual criticism, but sometimes seem cold and impersonal because of their abrupt, business-like manner. Thinking types like to solve problems by dealing with causal relationships and "truth," sometimes ignoring tact or the wishes of others.

Judgments made in the feeling mode tend to be oriented by values rather than logic. The feeling type is just as rational as the thinking type but prefers to judge information against a hierarchy of values. The feeling type appears as particularly thoughtful and considerate of other people and tends to relate to others in a sympathetic, personal manner. Whereas the decisions of the thinking type seem to be grounded in causality and logic, the decisions of the feeling type are grounded in the degree to which the information reflects consideration of the human dimensions involved.

In addition to basic understanding of the attitudes and the functions, we also need to understand the relationships between and among them. Jung observed that each pair of descriptors is a dichotomy. Introversion is the polar opposite of extraversion, intuition the polar opposite of sensing, and thinking the polar opposite of feeling. This means that introversion and extraversion cannot operate simultaneously. Likewise, intuition and sensing cannot function at the same time nor can thinking and feeling.

Therefore, the characterization of a preferred learning or cognitive style is indicated by using three descriptors: either extraversion or introversion, *and* either intuition or sensing, *and* either thinking or feeling. Each descriptor reflects our *preferred* style of "learning" within the attitude or function. From this, a general-level typology emerges consisting of eight psychological types.

1. Introvert-intuitive-thinking
2. Introvert-intuitive-feeling
3. Extravert-intuitive-thinking
4. Extravert-intuitive-feeling
5. Introvert-sensing-thinking
6. Introvert-sensing-feeling
7. Extravert-sensing-thinking
8. Extravert-sensing-feeling

Let us draw from the *Star Trek* series for examples of four archetypal characterizations using Jung's typology. Captain Kirk is extravert-intuitive-thinking; Mr. Spock is introvert-sensing-thinking; Dr. McCoy is introvert-intuitive-feeling; and Scotty is extravert- sensing-feeling. Without delving too deeply into the rationale for these characterizations, we can all probably think of similar characters whom we encounter as teachers and students. The Kirks are outgoing with their imagination and cooly logical in their judgments. Spocks, found often in science and math, revel in scientific experimentation and the logic of the computer. The McCoys we enounter seem to combine sentimentality with imagination, often remaining quiet and reserved until they encounter a value conflict. Scottys are hard-working, outgoing realists who prefer the hands-on experience of learning and enjoy mixing with wide varieties of people.

So far, we have considered the characterizations of cognitive style in Jung's scheme to consist of the general attitude (extraversion or introversion), a perception function (sensing or intuition), and a judgment function (thinking or feeling). The next dimension of the typology posits that we possess all four functions and that the relative predominance of one over the other determines type and affects behavior (see Figure 1). For example, the introverted-sensing-thinking type (Mr. Spock) also pos-

sesses the qualities of intuition and feeling. The relationship among the functions of an individual creates the individual's characteristic type. The capability to control each function and use it as a preferred ability for learning or adaptation depends on its position in the hierarchy of all four functions within a particular individual.[2] In other words, all of us have a preferred, dominant function, a first auxiliary[3] function, a second auxiliary function, and a third auxiliary function. This third auxiliary (the fourth function in the hierarchy) is inferior and least developed in contrast to the dominant, preferred function. This inferior or bottom function in the hierarchy is always the polar opposite of the dominant function. Just as our dominant function is our preferred mode of adaptation as well as the one we use with the most ability, our inferior function is preferred least and it is most problematic and frustrating when called to use.

Assuming Spock is an introvert-sensing-thinking type, we can characterize him in terms of the hierarchical order of all four functions (see Figure 2). To these writers, Spock seems to be archetypal of the dominant thinking type with first auxiliary function as sensing, second auxiliary as intuition, and inferior as feeling. In the real-life environment of the schools, this is the person who is like the previously mentioned description of Spock and who, like Spock, has difficulty dealing with the human dimension of the value orientation of the feeling function.

We need to note that extraversion and introversion as attitudes are seen best in connection with the dominant function. We can see extraversion or introversion as modifying the most preferred and most developed function in the hierarchy. For example, had the character of Spock been written as extravert-sensing-thinking, instead of introvert- sensing-thinking, his style would be visibly different. Rather than appearing as the quiet, detached, or aloof scientist, Spock's extraverted thinking qualities would be more like a highly involved manager of whatever business is at hand. From the viewpoint of an objective observer, this extraverted thinker would be seen as more overtly judgmental than the introverted thinker and more executive than contemplative.

Thus, psychological type is reflected in what we prefer to do and how we prefer to do it.[4] The preferences of psychological type are not only seen in how we prefer to learn but also in how we prefer to teach. For example, a sensing-thinking teaching style often is reflected in teaching methods which emphasize experimentation, hands-on experience, and demonstration, which are intended to lead the pupil to the application of important principles and concepts of the area of study. An intuitive-thinking style will emphasize theoretical concerns before the practical applications.

Few acts in the art of teaching seem to be free from engaging the preferences of psychological type. In general there is, in every classroom, a four-way interaction among psychological type of the student, the psychological type of the teacher, the demands of the particular instructional alternative in use, and the logical form of the subject-matter discipline or field being studied. In the sections that follow we will address this interaction.

However, before continuing, it is important to describe briefly the roles of instructional alternatives and subject-matter in the interaction. In Jung's theory, psychological type represents our hierarchy of preferred means for adapting to what we encounter in our environment. In this sense, everything we encounter makes demands on us for adaptation. Our successful adaptation to each encounter is a function of how well we meet the particular demands of the encounter. The nature of the object encountered plays an important role in how well we learn or adapt.

With this in mind, we need to consider that each subject-matter area has a particular form which lends itself more or less to psychological type preferences of each individual. Dewey (1933) in *How We Think* addresses well the relationship between the psychological process of thinking and the logical form of the subject being studied. All of us, as well as our students, have preferences for subject matter areas. Some of us were more drawn to social studies than to math, some to music and art more than science, some to English more than computer technology. The demands of the form of the subject-matter—whether we like it or not—relate directly to our preferences in psychological type. As well, within each subject-matter area, our students are faced with instructional alternatives which are either more or less congruent with the preferences of the psychological types. A lively class debate over the causes of the civil war may stimulate the extraverted-intuitive-thinking student but positively depress the introverted-sensing-feeling student.

In the sections that follow, we will examine some of the facets of the four-way interaction among teacher, student, subject-matter, and instructional alternatives. The intent is to illuminate the role of

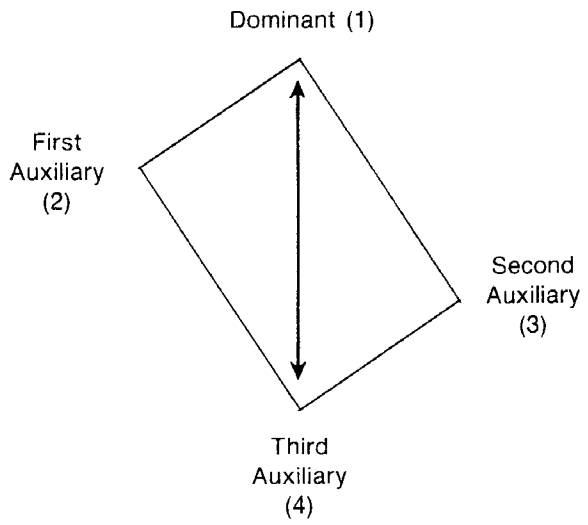

Figure 1. Relationships among the functions

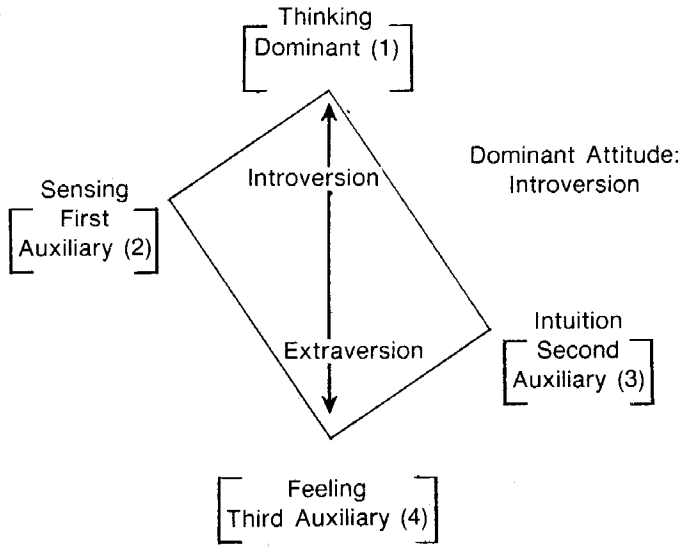

Figure 2. Diagram of Spock's psychological type: introverted thinking with sensation

psychological type as an indicator of typical differences in teaching style and learning style.

Educational Implications

1. Differences in psychological type between teachers and students can lead teachers to misunderstand learning styles of students.

Misunderstandings between two individuals can be greatest when their dominant functions are opposite, i.e., when one is a dominant thinking type and the other a dominant feeling type, or one sensing and the other intuitive. For example, the logical, detailed approach of a "sensing-thinking" teacher may be difficult for a more holistically oriented intuitive-feeling child to comprehend. The natural approaches that each uses in perceiving and decision making will be different. What each values and assumes to be most important to be learned or

discussed will be different. These values and assumptions are likely to operate unconsciously, so that as teachers, for instance, we may be tempted to project our learning styles onto students and to assume that all class members will learn better by approaching a lesson "our" way. Students whose styles are different from ours will likely be confused by the lack of congruence between our approach and their own natural approaches. Depending on how we differ from them, i.e., thinking vs. feeling, sensing vs. intuition, introversion vs. extraversion, students will react in varying degrees, either giving in to our approach or rebelling against it. The position of authority from which we operate may lead them to doubt the value of their own approach. If we are insensitive to a child's difference in style, the conflict and confusion may have damaging effects on the child's confidence and motivation, particularly if we decide arbitrarily that the child is "just not trying," doesn't care, lacks ability, is trying to be disruptive, and so on.

2. Conflicts in type can lead to difficulties in interpersonal communications among students and between students and teachers.

Persons strongly opposite in type can react negatively to each other. When the dominant functions of two people are opposite, it is also the case that the third auxiliary (inferior function) of one individual is the same as the dominant of the other. The third auxiliary is typically undeveloped, unskilled, and laden with commonplace concepts and values. We are often unconscious of the existence in ourselves of the operations of the third auxiliary. When forced to use these operations, we feel awkward and unsure of ourselves and avoid using them when possible. A typical example in the classroom is the dominant feeling student who has difficulty with analytic reasoning (thinking function) and who not only prefers to avoid it, but may discredit its value. Dominant thinking types, often awkward in human relationships, may try to avoid such relationships or will try to conduct their human affairs on a strictly logical basis. Analogous examples could be cited for sensing and intuitive types.

Since each of us experiences undeveloped qualities in *our* own third auxiliary, this inner experience tends to color our perceptions of that function as it operates in others. We assume that the function which is our inferior always operates in others in the same somewhat awkward, unskilled manner as it does in us. From this circumstance, we can be tempted to form prejudicial opinions toward those whose dominant function is the same as our inferior. This is particularly true if we feel inadequate while observing others operating in strength from their own dominant, which we experience as our greatest weakness. For example, dominant thinking types may be tempted to view feeling types as emotional, as "soft" toward people, etc., not realizing that it is their own inferior feeling function that has those characteristics, which they have most likely tried to repress. Mature feeling is *not* based upon emotions; in fact it can be very impersonal, but it always operates from a value position. Thinking types, however, will not likely perceive these mature qualities of the feeling function, since in fact *they* may seldom experience them. Rather, they may be offended by the strength which they sense in the mature feeling function of the other. Likewise, a dominant feeling type may find the analytic skills of the thinking type "barren"; the intuitive may find the sensing type too "buried in details"; the sensing type may find the intuitive too prone to "crazy, impractical" ideas. In each case, the accusation is more likely a reflection of the state of the person's own third auxiliary (inferior function), i.e., inferior thinking in a dominant feeling type *is* often barren, dominant intuitive types *do* often feel buried in details because of their undeveloped sensation, and the inferior intuition in the dominant sensing type *may* appear to that person to be prone to "impractical" ideas. However, none of these states is true if the respective function is well developed as a dominant or first auxiliary. These differences make it difficult for each person to perceive the meaning intended by the other, and often lead one to feel uncomfortable in the presence of the other.

3. Type may affect students' preferences for instructional alternatives.[5]

Sensing types prefer learning activities that involve direct experience, well-defined goals and expectations, and practical outcomes through well organized instruction. In contrast, intuitive types may prefer to deal with global concepts rather than facts, will be willing to read or listen to acquire ideas, and will prefer a more open instructional format. Thinking types will opt for logically organized instruction with a preference for lecturing and objective tests, will be more competitive in demonstrating achievement, will be more appreciative when rewarded for mastery, and will tend to be more persistent in achieving goals. Feeling types

will tend to value approval, personal support, and a sense of belonging. They will prefer group activities that involve harmonious relationships with others. They may need help in organizing material if logical principles of organization are to be used, but will be more adept at holistically organizing materials around their personal values or perspectives. Introverts will prefer to work on their own and to concentrate on developing their own ideas about topics. Extraverts will prefer group activities and projects.

4. Similarly, type will affect teachers' preferences for instructional alternatives.

Sensing types among teachers will emphasize specific skills, facts, and concrete outcomes and will focus students' attention on a controlled set of activities. Intuitives will be more wide-ranging in the presentation of ideas and information, will focus instruction on alternative approaches, will emphasize concepts more than facts, and will highlight speculations about possible meanings and interconnections among concepts. Thinking types will emphasize the logical structure of ideas and activities, will focus on content and large group processes such as lectures, with less time devoted to interactions with individuals. Feeling types will give priority to individual assessment, to individualization in instruction, and to small-group activities. Introverted teachers will tend to focus more on the ideas or content of instruction, will exercise more control in order to focus on predetermined materials, and may interact less with students individually. Extraverted teachers will be more naturally attuned to students' thinking and development and will be more likely to employ a wider range of activities and projects.

5. There is a relationship between psychological type and subject matter.

Individuals of varying types tend to be interested in different subjects. This is expressed by students through more intensive interest in some subjects than in others and, in later grades, by selecting themselves into some subjects and not into others. The same factors operate as prospective teachers select the fields in which they intend to prepare for teaching. For example, both among students and teachers, thinking types will be found more often in science and technical subjects, while feeling types will more often be found in the arts and humanities. Furthermore, student achievement and teacher performance are most likely maximized when type and subject are matched. It is very likely that teachers, particularly in self-contained elementary classrooms, will be tempted to devote more teaching time to subjects they prefer. Students certainly can be observed to devote more time to subjects that most likely match their type preferences. It is also likely that teachers with different type preferences may approach a more preferred subject differently from a less preferred subject.

6. Identification of the function related to a student's schooling problem can aid teachers in working with students having difficulties.

While we do not have space to elaborate on the many ways in which psychological type may affect learning, we can briefly suggest some illustrations. Problems in logical reasoning are clearly related to the thinking function. Individuals in whom feeling is a dominant function will have thinking as a third auxiliary (inferior function), and will tend to be weaker in analytic reasoning tasks. With other persons, thinking may be an auxiliary that is underdeveloped or in conflict with feeling, as in a dominant intuitive or sensing type with thinking and feeling as auxiliaries.

Dominant sensing types tend to give substantial attention and care to detail; they often read or reread test items or assignments carefully. In contrast, intuitives tend to be faster but less accurate as they more quickly grasp patterns or meanings, but often with less attention to detail. Slowness in test-taking or completing assignments may result from inferior or underdeveloped intuition. Errors with facts or observations may result from inferior or underdeveloped auxiliary sensing.

7. The first approach to students' learning problems should probably be through their strengths, i.e., through the dominant and/or first auxiliary.

Our first interest tends to move naturally and directly toward those activities that engage our dominant or first auxiliary function. If we can attract this attention-focusing power of our dominant function to a learning problem associated with a weaker auxiliary, then we may have the motivation to confront the problem and the patience to see it through. This suggests structuring learning activities in which the third auxiliary (inferior function) or less developed second auxiliary are necessary for completing a goal about which the dominant or first auxiliary

are excited. For example, dominant intuitives may be more prone to give attention to factual accuracy and careful consideration of details when engaged in "exciting" inventive work for which these qualities of sensing are necessary. Thus, it *is* possible for intuitives to become good spellers, good accountants, good organizers, good mechanics, carpenters, typists, and so on. But, they may need to work at these skills more intensively than a sensing type.

We are suggesting emphasizing the dominant function in dealing with a problematic area, and in restructuring the instructional environment to provide alternatives that meet students' dominant or strong auxiliary functions. These strategies are important, particularly for young children whose level of differentiation among the functions may be very low. In these cases attempting to work with a weaker auxiliary may cause even greater confusion in the child's mind. What may be needed is a focus on the dominant or primary auxiliary to bring these to a sufficient level of consciousness before moving to other functions.

8. Improvement in schooling may mean dealing with the third auxiliary (inferior function) as well as strengthening the dominant or auxiliary.

The third auxiliary (inferior function) has an emotional quality that can more easily result in defensive reactions. While we have suggested above that learning problems should be approached through the individual's strengths, there are times when one may not be able to avoid meeting the third auxiliary head-on. It is probably the case that teachers often inadvertently challenge a child's third auxiliary in the normal course of instruction. When this happens the results are predictable, ranging from inattentiveness to open resistance. It is important *not* to force a child into the emotional and often defensive posture that can be aroused through the third auxiliary. Indeed, in some children the third auxiliary can be seen to flare up when they first walk into the classroom, thence to lie in waiting for opportunities to send barbs toward the teacher or other students. Teachers, too, can be seen operating emotionally or dogmatically out of their third auxiliary when confronting students. Emotional reactions are often a signal that one's inferior function has been "pricked."

In spite of these cautions, however, one may still be faced with the need to help a child deal directly with the third auxiliary. For example, problems in analytic reasoning ultimately require an improvement in that skill. If thinking is the third auxiliary, one may make some progress by strengthening intuition or sensing as auxiliaries, or perhaps directly through dominant feeling by asking students to "reason" through value judgments. Eventually, however, there will need to be an increase in the conscious application of deductive and inductive reasoning if there is to be development of the analytic ability of the thinking function.

The third auxiliary operates at a concrete level where meanings are still closely embedded in the details of experience. These qualities suggest the importance of (a) a nonjudgmental approach by the teacher to tasks involving the third auxiliary, particularly during early efforts by students, (b) concrete, clearly illustrated instructions, (c) concrete demonstrations or models, and (d) careful feedback and encouragement.

At a practical level, we have in mind learning experiences that generally would (a) lead thinking types to process information holistically as well as logically and to incorporate values considerations in learning and communicating; (b) lead feeling types to incorporate logical analysis as well as values in decision making and to use logical processes in learning; (c) lead sensing types to be open to the possibilities as well as the realities of experience and to utilize imagery and hunches in learning; (d) lead intuitive types to perceive details as well as patterns, to consider present realities as well as possibilities, and to increase factual accuracy in learning.

Conclusion

This article has provided an introduction to the theory of psychological types and some major implications for understanding differences in teaching and learning styles. We believe the implications for practice and for fruitful research implicit in the theory are significant. We will close by illustrating some of this potential significance through brief references to some current research findings. First, type alternatives defined by the theory are not equally represented in the general population of school children. Extraversion and sensing are often cited as most common. Introversion and intuition are less common (Myers, 1981; Lawrence, 1982). Lawrence recommends developing teaching strategies for the majority group of extraverted-sensing children, and then building more individualized approaches for the smaller number of introverted and intuitive children.

Extraversion, sensing, and feeling appear to be prominent among teachers, particularly at the elementary level. It may be that intuitive persons, particularly those of intuitive-feeling orientation, tend to self-select themselves out of teaching. Thompson (1983) reports that intuitive-feeling teachers express a desire to make an impact on the development of children. They may find this more difficult to do in the more sensing-thinking atmosphere of schools. Huelsman (1983) found that while preferred learning styles in her sample were fairly evenly distributed among psychological type categories, preferred teaching styles were not. Teachers who report intuitive-thinking and intuitive-feeling as preferred learning styles tend to prefer teaching in sensing-feeling and sensing-thinking styles. This lack of congruity could be detrimental to teaching effectiveness and may be a factor in teacher stress, job dissatisfaction, and decisions to leave the profession.

Differences in teaching goals and planning related to psychological type have been identified. Thompson (1983) indicates that sensing teachers value role modeling as a teaching function. They feel it is important for teachers to set an example for students to follow. Intuitive teachers see themselves more as facilitators, as inspiring students to pursue their own development. With respect to planning, sensing-thinking and sensing-feeling teachers prefer to follow an existing curriculum in a linear fashion. Intuitive-feeling and intuitive-thinking teachers tend to focus on concepts and theories and to vary their sequence of material according to their own understanding and as classroom circumstances change. They tend not to follow a pre-set curriculum systematically.

Research findings such as these suggest that discrepancies in psychological type among teachers and students do exist. Our earlier discussion alludes to some of the outcomes of these discrepancies. We urge educators to take psychological type seriously into account in their efforts to understand the match between teaching and learning styles, and in their efforts to employ more successful instructional alternatives that are relevant to individual styles.

Notes

1. The book *Psychological Types* (Jung 1921/1971) includes in its appendix the following papers on psychological typology: "A Contribution to the Study of Psychological Types" (1913), "Psychological Types" (1923), "A Psychological Theory of Types" (1931), and "Psychological Typology" (1936).
2. With the addition of the hierarchical ordering of the functions we have established a psychological typology of cognitive style which consists of 16 types. This 16-character typology consists of eight combinations formed from the functions of intuition, sensing, feeling, and thinking in their hierarchical ordering from dominant to inferior position. When we remember that introversion and extraversion as general attitudes are to be included, the full 16-character typology is complete.
3. The functions are often referred to in the literature as "first, second, third, and fourth": first being the dominant, second being what we are calling the first auxiliary, third being the second auxiliary, and fourth being the inferior. We have chosen to use the terms first auxiliary and second auxiliary to distinguish more clearly between the middle functions of the hierarchy.
4. The two most commonly used instruments for the measurement of psychological type are the Myers-Briggs Type Indicator (MBTI) and the Gray-Wheelwright Jungian Type Survey.
5. Lawrence (1982) provides a more extensive discussion of the relation of psychological type and instructional alternatives as reviewed in items 3 and 4.

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