

THE RELATIVITY OF *INTELLIGENCE* IN PSYCHOLOGY AND ITS ADVERBIAL FUNCTION IN ORDINARY LANGUAGE

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ABSTRACT: Psychological interpretations of *intelligence* have varied considerably. Theoretical approaches have differed, among other things, with respect to the number, type, and level of abilities implied by the concept. Recent investigations have suggested, moreover, that people's conception of intelligence is, at least in part, culturally determined, depending upon one's country of origin or ethnic group. In the present paper, we suggest that this theoretical and cultural relativity of the concept is related to the logic of its use in ordinary language. An analysis of the use of *intelligence* in ordinary language indicated that the concept has an adverbial function, which characterizes an action as successful or well executed under certain conditions. In addition to this, the concept is used at different levels, functioning as an adverbial summary of an individual's actions in general or specific abilities. This adverbial function may be related to the theoretical relativity of *intelligence* found in psychology, since the concept may be used at various different levels of analysis. Considering that each culture or group may adopt different criteria to identify successful actions, the cultural relativity of intelligence is compatible with its use in ordinary language.

Key words: intelligence, conceptual analysis, ordinary language

Theoretical and Cultural Relativity of Intelligence

The identification of individual characteristics and abilities associated with *intelligence* has been the topic of a large variety of empirical and theoretical research. Some authors have interpreted *intelligence* as referring to a general characteristic that permeates all actions of an individual (e.g., Reed & Jensen, 1992; Spearman, 1927), whereas others have proposed that the mind is formed by different, and independent, more specific abilities, the number of which has varied from three (e.g., Sternberg, 1996) to seven (e.g., Gardner, 1993; Thurstone, 1938), up to 150 (Guilford, 1959). More recently, multifactorial, often hierarchical, models, which attempt to integrate general and specific abilities, have been

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proposed (e.g., Ackerman & Heggestad, 1997; Carroll, 1993). Independently of the number of abilities or characteristics involved, *intelligence* has been associated with individual differences in biological characteristics (e.g., Haier, Nuechterlein, Hazlett, Wu, & Paek, 1988; Reed & Jensen, 1992; Willerman, Schultz, Rutledge, & Bigler, 1992), elementary cognitive processes (e.g., Deary & Stough, 1996; Fagan, 2000; Hunt, 1978; Nettelbeck & Lally, 1976; Newell & Simon, 1972), and broad, less elementary, cognitive components (e.g., Piaget, 1952; Sternberg, 1977, 1985).

These different uses of *intelligence* illustrate the relativity of the concept in psychology, which has been interpreted as referring to phenomena belonging to quite different levels of analysis. Some of these different usages were pointed out by Howard (1993), who identified three different concepts of intelligence in psychology. The first concept would be related to general intelligence, “a biological difference among people which correlates with performance on virtually all mental tasks” (p. 31). A second concept, identified by Howard, describes a characteristic of behavior, when the word is used as an adjective rather than a noun. Intelligent behavior would be well-adapted behavior. The third concept would be *intelligence* as a set of abilities, the specification of which may vary considerably among different authors. Howard concluded that these three concepts are used in psychology and that much unnecessary controversy would be avoided if researchers were to specify which one of them they were using.

In addition to this theoretical relativity of the concept, there is a growing body of evidence indicating that people’s implicit theories of *intelligence* (cf. Sternberg, Conway, Ketron, & Bernstein, 1981) are influenced by cultural differences. According to Sternberg (2000), as different cultures value different things, the meaning of *success* depends on the culture. Each culture would then have its own stories of success, which would serve as models and exemplars for their children. If a given community places more value to interpersonal relationships than another one, the former would, more likely than not, hold a conception of intelligence that emphasizes social skills more than the latter. Recent research indicates, for example, that the conceptions of intelligence found in some Asian and African cultures place more emphasis on social skills than those in the United States (cf. Sternberg & Kaufman, 1998; Yang & Sternberg, 1997). Similar cultural differences were also identified in the United States when comparing groups of immigrant parents to American-born parents (cf. Okagaki & Sternberg, 1993). Some results also suggest that conceptions of intelligence may vary even in the same culture depending upon people’s pro-social or antisocial group (cf. Sternberg, 2000) or occupation (cf. Sternberg et al., 1981).

Despite these different theoretical interpretations, intelligence tests have been extensively validated and widely used for several different purposes. Empirical investigations have obtained significant correlations among performance in a wide range of cognitive ability tests, which have been interpreted as strengthening arguments in favor of a general trait that would explain intelligent behavior (cf. Jensen, 1998). This position has also received support from research showing nontrivial correlations between performance in intelligence tests and biological

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measures (cf. Vernon, 1993) and between test scores and performance in basic cognitive tasks (e.g., Deary & Stough, 1996; Fagan, 1996; Vernon, 1987). Recent research has also indicated that intelligence tests, when compared to other procedures used for personnel selection, are the best predictors of job performance (cf. Schmidt & Hunter, 1998). Differences in intelligent test scores between groups, especially between races, have been repeatedly reported in the literature and have produced much controversy concerning the adverse impact of intelligence testing (e.g., Ceci, 2000; Gottfredson, 2000; Hunter & Schmidt, 2000; Jensen, 2000; Reynolds, 2000).

How can such widely divergent theoretical positions be reconciled with such empirical findings, some of which have been extensively replicated? Why has the interpretation of intelligence varied so widely across theories and cultures? The answer to these questions may be related, at least in part, to the logic of the use of the concept in ordinary language which differs from its use in psychology.

Uses of Intelligence in Ordinary Language

As the vast majority of concepts employed in psychology come from ordinary language, where they find their “original home” (cf. Wittgenstein, 1953), an analysis of their original uses may help clarify aspects of their uses in psychology. When a concept is borrowed from ordinary language to any scientific language, it may carry with it connotations and meanings not necessarily intended by the, supposedly, technical use. An analysis of its original use may help then elucidate possible difficulties associated with such connotations that may even turn out to be unwanted by the new “scientific” use (cf. Harzem, 1986; Harzem & Miles, 1978; Holth, 2001; Miles, 1957; Oliveira-Castro, 2000; Oliveira-Castro & Harzem, 1990; Peters, 1958; Ryle, 1949, 1953).

When referring to ordinary language, the word *ordinary* is being contrasted, implicitly or explicitly, with scientific, technical, out of the ordinary, poetic, notational, esoteric, or archaic. *Ordinary* means common, colloquial, current, natural, known by everyone in contrast to expressions that only a few people know how to use, such as technical terms employed by lawyers, economists, philosophers, mathematicians, theologians, tennis players, and such like. There are no sharp boundaries between ordinary and non-ordinary and technical, for many expressions would not be easily classified. Expressions such as *offside*, *inflation* and *homicide* may occupy a middle land, whereas *bread*, *ion*, *friendship*, and *factor analysis* would be easily classified (cf. Ryle, 1953).

When referring to the ordinary use of an expression, however, *ordinary* is not in contrast with esoteric or specialized, but with non-stock or non-standard. The standard use of a screwdriver, that is, to loosen or tighten screws, can be contrasted with other non-standard uses such as to open cans or to hurt other people. A distinction between standard and non-standard uses of a tool or instrument, be it a common or specialized one, can usually be made. By the same token, common and technical expressions alike may be used in standard or non-standard ways. Some words, such as *of*, *have*, and *object*, do not have a clear standard use, whereas

others have few if any non-standard uses, such as *seventeen*. Non-standard uses of an expression are, for example, metaphoric, poetic, expanded, and restricted uses. At times, the philosophically interesting comparison is between the standard uses and some proposed, suggested, or recommended uses. Most analyses of the logic of the use of ordinary language concepts make comparisons between their standard uses in ordinary language with their revised or suggested uses in philosophical or scientific theories. The standard uses of the concept in ordinary language are those found in dictionaries, which we teach to foreigners and children (cf. Ryle, 1949, 1953).

Ryle (1949) presented one of the first and most comprehensive analyses of the logic of the use of psychological concepts in ordinary language. In that work, Ryle analyzed the use of *intelligence*, and associated concepts, and pointed out the distinction between *knowing that* (e.g., knowing that Paris is the capital of France) and *knowing how* (e.g., knowing how to play chess). Ryle associated the concept of intelligence (versus stupidity) to *knowing how* and the concept of knowledge (versus ignorance) to *knowing that*. Intelligent actions, according to this analysis, would be successful actions that are the exercise of the person's ability, in the sense of knowing how to do something well. This distinction has been often cited in the literature as parallel to the distinction between declarative and procedural knowledge (cf. Sternberg, 1996).

One of Ryle's (1949, chap. 2) main purposes was to demonstrate the mistake of the intellectualist legend, common in philosophical and psychological theories, according to which an action is considered to be intelligent only if the person follows the correct rules and recipes that specify which action must be executed. In other words, the intellectualist legend would argue that *knowing how* is always and necessarily preceded by, or based upon, *knowing that*. The main argument presented by Ryle to refute the legend, based on the thesis that the legend leads to an infinite regress, goes as follows. Considering that the act of choosing and applying any given rule may itself be characterized as more or less intelligent, in order for this act to be intelligent it would have to be preceded by an act of choosing the correct rules to choose rules, which itself could also be more or less intelligent. This series would have no end point and would generate an infinite regress. Ryle also called attention to the fact that good practice usually precedes the elaboration of rules about the practice (e.g., before Aristotle extracted the rules of formal logic, people already argued logically), and that the rules and recipes of many acts that we characterize as intelligent are not even known (e.g., the comedian does not necessarily know the rules of how to make a good joke).

According to Ryle (1949), in ordinary language, an action is described as intelligent when it is a successful exercise of the person's abilities or skills, occurring in situations that involve some degree of novelty and challenge. This last condition emphasizes that the mere repetition of well-established actions would not be described as intelligent, for it would be closer to what one might call a *habit*. As an exercise of an ability, the description of an action as intelligent implies that the action can, in principle, be repeated if the situation demands, that is, its success was not due to luck. The person must have been thinking about what he or she was

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doing, in the sense of paying attention to what he or she was doing. This is to say that it would be quite awkward to describe an action as intelligent and then assert that it was executed absent-mindedly.

Being related to the description of people's abilities, the concept of intelligence follows the logic of dispositional concepts, extensively discussed by Ryle (1949, chap. 5; see also Miles, 1957). One of the major characteristics of dispositional concepts is that they do not describe any specific event that is occurring at that particular moment, but describe relations among events, which can be formulated as "if. . . , then" statements. When an animal is described as ruminant, for instance, nothing is being asserted about any specific thing that the animal is doing at this particular moment. The description establishes some conditional relations among certain conditions and certain things the animal will do; in this case, it asserts that if the animal eats then it will ruminate. Although dispositional concepts do not report specific occurrences, their adequate uses are related to certain facts. The description of something as soluble is related to information about or observation of instances in which the thing dissolved when immersed in water. Such concepts summarize a set of past observations, relating conditions and events (e.g., eating and ruminating), and predict that such relations will hold in future occasions.

An important difference between dispositional concepts, such as ruminant, cigarette smoker, and soluble; and psychological concepts, such as vain, patriotic, and fond of gardening, is the level of determination of the occurrences that fulfill the if-then statement. In cases such as ruminant, only one type of occurrence is summarized and predicted by the concept (i.e., that the animal ruminated or will ruminate). In cases such as vain and patriotic, there is not one unique occurrence that fulfills the if-then statement, for several different acts, in several different situations, may characterize a vain or a patriotic person. They are polymorphous concepts (cf. Miles, 1957; Ryle, 1949). Moreover, most psychological concepts used in ordinary language do not have a determinate and closed list of occurrences attached to them; a vain person may do one or several of an indeterminate number of things, none of which alone is a necessary or sufficient condition to characterize all vain persons. This type of dispositional concept has been described as open, generic, or determinable, in contrast to cases like ruminant and soluble, which were described as closed, specific, or determinate (cf. Miles, 1957; Ryle, 1949).

According to Miles (1957), based upon Ryle's work, *intelligent*, as used in ordinary language, is a polymorphous and open dispositional concept. Describing someone as intelligent is a way of stating that the person is capable of doing a number of different things under certain situations. Making appropriate remarks in a discussion and being able to solve difficult crossword puzzles were two examples, of the open list of possible occurrences, cited by Miles. Moreover, according to Miles, *intelligence* is not, in its ordinary usage, the name of a thing, but is derived from the adjective *intelligent*.

Analyzing the concept in ordinary language, Derr (1989) reached quite different conclusions. This author concluded that *intelligence* is used to refer to an innate characteristic of individuals, and that there is a sharp distinction between the

use of *intelligence*, as an individual's characteristic, and *intelligent*, as applied to behavior. Still according to Derr, intelligent behavior is an achievement that is acquired, through the use of intelligence.

Why are such analyses of the usage of the concept in ordinary language so divergent? Is the noun derived from the use of the adjective, as proposed by Miles, or the adjective derived from the use of the noun, as proposed by Derr? If *intelligent* is a dispositional concept, what would be the occurrences that fulfill the if-then statement? The answers to these questions may be related to a characteristic of the use of the concept that, although hinted at by Ryle, was not explicitly stated by previous authors. To this we turn next.

Adverbial Function of Intelligence

In later works, concerned primarily with the analysis of *thinking*, Ryle (1979) pointed out that some verbs, which he called adverbial verbs, do not describe actions but, instead, some characteristic of actions. For instance, the description of a soldier as obeying or a student as paying attention does not give any information about what it is that they are doing. This description tells us that whatever it is that they are doing, they are doing it obediently and attentively. The soldier may be cleaning his weapon, or marching, or firing his rifle, or speaking on the radio. He may be doing any of these things obediently. The same applies to the student, who may be copying the material written on the blackboard, or trying to solve arithmetic problems, or listening to the teacher. The student may be doing any of these things attentively. Adverbial verbs, according to Ryle, do not specify any action that the person is executing. Their function is to characterize other actions, usually described by *action verbs*, which indicate what the person is doing. In this sense, adverbial verbs are parasitic to action verbs; that is to say, their meaning is in part dependent upon an action verb. One cannot without absurdity tell someone to obey or to pay attention without specifying what it is that the person must do. Neither could someone be described as obeying or paying attention without mentioning what the person is doing.

The use of the concept of intelligence in ordinary language seems to follow the same logic, for it has the adverbial function of characterizing the manner according to which an action is executed. An intelligent action could be almost any action that: (a) is well performed and successful, in the sense of following specific criteria of good performance in the task; (b) represents the exercise of certain ability of the individual, that is, good performance or results were not due to luck, for the individual can repeat actions of that sort; and (c) occurs in a situation involving some degree of novelty and challenge, that is, the action is not simply a repetition of a well-established performance, what differentiates an intelligent action from a habit. These characteristics can be applied to almost any action, such as playing chess, buying a house, making comments in social conversation, solving arithmetic problems, organizing a party, delivering a speech, or rearranging the furniture. All these actions can be executed more or less intelligently, according to success criteria that apply specifically to each task. Although some of these actions

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have more well-defined criteria of success and failure than others, compare for example *solving arithmetic problems* with *making comments in social conversation*; all of them require, in order to be characterized as performed more or less intelligently, some criteria for separating correct (or adequate) from incorrect (or inadequate) responses. In other words, the actions described as performed more or less intelligently belong to the vocabulary of capacity and ability words rather than that of tendency words. Saying that someone is affable, fond of fishing, or catholic, is a way of summarizing and predicting some things that the person usually does and is likely to do, that is, tendencies to behave in certain ways, but does not describe any kind of capacity or ability the person has. This is the reason why the assertion “he is affable but none too bright” is not a contradiction. In most contexts, there are no socially established criteria to judge the correctness or adequacy of one’s affability. People simply differ on this, and, although they can be more or less liked because of this characteristic, there are no established criteria concerning the ideal level of affability that we would teach to our children. In some contexts, however, as when someone is a political candidate, or in some extreme cases, as when a child does not even say hello to a visitor, some criteria may be brought up. But this does not eliminate the distinction between tendencies and abilities, it simply shows that the boundaries between the two are not very neat. “He is excellent in dealing with people” is a description that is probably related to being affable but which seems to imply more than that. It does imply that the person is successful in what he does, that he is capable of reaching some goals, such as minimizing personal conflicts, convincing people to do things, and such like. Besides the criteria of success and failure mentioned above, another major difference between capacities and tendencies, stressed by Ryle (1949), is this: when someone pretends to have a capacity the person is described as a charlatan, whereas someone faking tendencies is called a hypocrite. Intelligence adverbs apply mainly to the former.

These aspects that are characterized by *intelligent* are vague and dependent upon the specific context in which the expression is being used, as could be expected from a concept used in ordinary language (Harzem & Miles, 1978; Ryle, 1949; Wittgenstein, 1953). That is to say, the distinctions between success *versus* failure, ability *versus* habit (or tendency), and new *versus* old situations, contained in the adverbial function of the concept, do not have clear or well-defined boundaries. As a matter of fact, most expressions used in ordinary language are vague and context-dependent. There are no precise and clear cut distinctions, for example, between chair *versus* armchair, happy *versus* sad, honest *versus* dishonest, or mountain *versus* valley (when does the mountain end and the valley begin?). This lack of precision, however, does not reduce the usefulness of such expressions in ordinary language, since the adequate level of conceptual precision seems to depend on the context in which the expression is used. In most such contexts, people can tell the difference between chairs and armchairs, between happy and sad.

Another characteristic of the use of *intelligent* in ordinary language is that the expression can be used to qualify actions as well as individuals. John may be

described as more or less intelligent than Peter. In this case, the concept seems also to function as an adverb that qualifies the things that the individual does. When describing John as intelligent, the speaker may be asserting that he does several things well and successfully. John is good at several things. He may get excellent grades at school, particularly in mathematics. He gets along well with his teachers and can help his parents when they go shopping in the grocery. In all these situations, John is not much disturbed when obstacles and problems come up; he usually finds solutions for unforeseen events. The expression functions as an imprecise adverbial characterization of several things that John does, that is, it works as an “adverbial summary.” The expression does not, however, specify the kinds of things that John does well. David could also be described as intelligent despite the fact that he is successful at quite different tasks. David may be good at English, and not so good at mathematics. He may get along well with his classmates, although not too well with his teachers. He is excellent in sports and in music, and is not much fond of helping his parents. Then, describing someone as intelligent is a way of saying that the person knows how to do some things well without specifying what these things are. Some general and vague predictions are also implied by the concept, for one would expect from the person described as intelligent, when compared to other people, to be able to understand instructions easily, to learn things quickly, and such like. But, again, the description does not carry with it the specification of the abilities the person has.

When doubts are raised concerning whether or not Peter is intelligent, or whether Peter is more intelligent than David, then the specifications of their abilities are presented. The concept being vague, one may still question what abilities count as intelligence, arguing, for example, that mathematical abilities are more relevant than verbal or social ones, which would generate some discussion over the issue. And, as the concept of intelligence is value-loaded, that is to say, to be intelligent is a good thing, different persons may put more weight on activities they value more.

The concept may be applied at various intermediate levels of analysis, between the extremes of describing specific actions (e.g., John rearranged the furniture intelligently) or the person in general (e.g., John is intelligent). One common use is to refer to abilities in certain less general contexts, as when one asserts that John is very intelligent in dealing with numbers, or that he is excellent in dealing with people, or that he is very fast and efficient when making deals. Others may be outstanding in music or physics.

Miles (1957) concluded that the concept of intelligence, in ordinary language, describes a polymorphous (i.e., several different occurrences fulfill the if-then statement) and open (i.e., there is an open list of occurrences that may fulfill the if-then statement) disposition. Describing someone as intelligent would be a way of saying that the person is capable of doing a number of varied things from an open list of possibilities. Now, the adverbial function of the concept pointed out here suggests a somewhat different conclusion. The concept does not specify what the person is capable of doing, the person’s abilities; that is to say, not even a broad and vague specification is implied. It specifies, instead, the manner according to

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which the person does the things he or she does. Knowing that someone is intelligent gives no information concerning what kinds of things the person does in what kinds of situations. The only information conveyed by the description is that the person performs well when faced with novel and challenging situations. There is no reference, not even a very vague and indefinite reference, to what the person is capable of doing or what those situations are. It could be almost anything.

According to the present analysis, then, the concept does not function as a dispositional concept, as proposed by Miles (1957). A dispositional concept, as discussed earlier, would summarize and predict certain relations among certain situations and certain actions. The concept of intelligent does not specify what these situations or actions are. It simply implies that the person will perform well, without specifying in what kind of situation and, consequently, in what kind of task. But would not one expect certain performance from someone described as intelligent? Upon hearing that John is intelligent, for example, would not certain performance be expected? “You told me that he is intelligent but he cannot even solve simple arithmetic problems!” is a possible and apparently legitimate reaction from the listener. Although something such as “You told me that he is intelligent but he cannot even milk a cow!” would also be a legitimate reaction. Does the concept, or does it not, predict any performance?

These apparent contradictions may perhaps be elucidated by considering another characteristic of the logic of the use of the concept in ordinary language, which is the fact that the concept is highly dependent upon the context in which it is employed. When, in ordinary language, John is described as acting intelligently or as being intelligent, the context usually indicates the kind of situations and tasks that are implied by the assertion, that is, there are often implicit assumptions concerning the use of the concept. The context can be quite general, as when one is discussing performance at the university, in which case saying that John is intelligent is probably a way of asserting that he usually does well in academic tasks in general, or it can be a more specific context, related to specific tasks, as when one asserts that John is intelligent in the context of discussing performance in mathematics. The context may be any of a large number of possibilities, for one may discuss the efficiency of performance related to sports, politics, social situations, emotional and personal skills, and such like. Based upon these implicit assumptions, derived from the specific context in which the concept is employed, the concept may be interpreted as having a dispositional function. This is suggested by Miles (1957), for in that context it summarizes and predicts if-then relations of the type “if John takes that mathematics course he will probably do well.” The use of intelligence seems, therefore, to be highly context-dependent.

Although, as mentioned previously, the use of most ordinary concepts are context-dependent, some seem to be more dependent than others. For example, when someone is described as vain, which functions as an open dispositional term, certain actions and reactions are expected from that person in certain situations. It is true that they could be several actions and reactions from a long and open list, but one would expect some specific things, despite differences in the context in which the expression is used. A vain person is likely to be more upset with

criticism and more elated by compliments than other people, to frequently recollect personal successes and to forget personal failures, and such like. The same could be said of other psychological terms such as patriotic, avaricious, intellectual, or fond of gardening. This does not happen in the case of intelligence, which, depending upon the context in which it is used, may predict quite different kinds of actions and performance. Ryle (1979) pointed out that adverbial verbs (e.g., to obey or pay attention) are dependent of or parasitic to action verbs (e.g., to write or to drive) which they characterize, for it would not make much sense to describe someone as obeying without mentioning what it is that the person is doing obediently. By analogy, the concept of intelligent, having also an adverbial function, seems to be dependent of or parasitic to the contexts in which it occurs. As the order “Obey!,” without specification of what the person must do, is an incomplete order, the description “he is intelligent,” without indication of the context, is an incomplete description.

The analysis conducted by Derr (1989) also reached different conclusions than the present one. Derr found that, in ordinary language, intelligence is conceived as an innate intellectual capacity and that a sharp distinction is made between intelligence and intelligent behavior. The author presents two arguments to show that the concept refers to an innate capacity. The first one is based on the fact that we do apply the concept of intelligence to newborns, which would indicate, according to Derr, that intelligence is not learned from experience. According to the present analysis, the concept may be used to refer to newborns because it has an adverbial function, which may characterize almost any performance, including the deeds of infants. An infant that “performs” well, that is, learns things faster and with less effort than others, may be described as intelligent (although it seems more typical to say that the infant shows signs that he or she will be very intelligent in the future).

The other argument presented by Derr is based on the fact that *intelligence* is not included among things that we consider to be acquired, for it is awkward to assert, for example, that “John learned (or acquired) his intelligence while studying in France.” Part of the awkwardness in this statement may be due to the use of intelligence as if it were the name of an ability, in which case the sentence would be completed smoothly (e.g., John learned to speak French or to dance ballet while studying in France). The same awkwardness would be felt with other expressions that are not names of abilities, for example, obedience, vanity, or creativity. “John learned his obedience (or acquired his vanity) while studying in France” also sounds inappropriate. If used as adjectives (or adverbs) and as something that happens to the person, instead of something that the person does, these expressions may be used, without awkwardness, as things that may change. “John has been much more obedient (or vain) after returning from France” does not seem to hurt one’s ears. *Intelligent* can be used in similar ways, as when one asserts, for example, that “John seems much more intelligent after returning from France” or “John has not acted as intelligently as he used to.” Derr also recognized that intelligence can be developed, although he insisted that “we acknowledge that the child has intelligence prior to its full development” (1989, p. 115). There seems to

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be something awkward in this argument, since it would be very strange to assert that “John has much intelligence although it has not developed fully.” This is similar to the sentence “John is very tall although he has not grown much.” In these cases, it seems that the distinction being drawn is that between an intelligent person and a potentially intelligent person, or a tall person and a potentially tall person. No one would argue that a short, although potentially tall, person is truly a tall person. Therefore, according to the present analysis, the use of the concept of intelligence in ordinary language does not give support to the conclusion that intelligence is interpreted as an innate capacity.

The sharp distinction between intelligence and acting intelligently, pointed out by Derr, seems to follow from the conclusion that intelligence is an innate capacity. Based upon this conclusion, the author proposed that intelligent behavior is the result of the use of intelligence, which would explain why it is not contradictory to assert that someone with high intelligence may behave unintelligently in a particular situation. According to Derr, therefore, the expression *acting intelligently* is logically derived from the use of *intelligence*.

The present analysis points to different conclusions, since, as discussed previously, in ordinary language, someone who behaves intelligently is characterized as *intelligent*, who, in turn, may be said to have *intelligence* (cf. Miles 1957). In ordinary language, it is not contradictory to assert that an intelligent person may behave unintelligently due to the dispositional logic of the concept in a particular context. That is, although one could predict a good performance from John, who is viewed as quite bright, he did not fulfill our expectations. Something in the situation went wrong. He had other things on his mind, he could not concentrate; or he was too tired or too nervous. Under other circumstances he would perform perfectly well. If, however, John keeps behaving unintelligently, one would eventually question if he were as intelligent as announced. Therefore, according to the present analysis, the logic of the uses of *intelligence* and *behaving intelligently* is not different. Both have adverbial functions at different levels of analysis.

Adverbial Function and Uses in Psychology

The diversity of theoretical positions found in psychology may have been influenced, at least in part, by the adverbial function of the concept found in ordinary language. As the concept may be applied to almost any well-executed action or ability, it is not possible to specify a list of actions and abilities that would always be implied by the concept. These will depend on the context in which the concept is used, and may be things as varied as solving mathematical problems, grocery shopping, farming, or playing the piano. Almost any performance that includes success criteria may be described as done more or less intelligently. In addition to this, the concept may be used in quite different levels, sometimes to refer to individuals (e.g., John is intelligent), to specific abilities (e.g., John is very intelligent dealing with numbers), or to specific actions (e.g., John argued very intelligently during the meeting). According to this analysis, it is

not so much surprising to find, simultaneously, theories that interpret intelligence as the name of a general ability of individuals or the combination of several or many different abilities. Different authors seem to have emphasized different uses of the concept, all of which would be perfectly legitimate in ordinary discourse.

Some authors have presented general definitions of intelligence that are not incompatible to the adverbial function of the concept. This is the case when *intelligence* is related to the abilities necessary for adaptation to the environment (e.g., Sternberg, 1977). Considering that what is well-adapted behavior depends upon the situation, this definition is similar to the adverbial use in ordinary language, for it does not specify what kinds of things an intelligent individual does nor the kind of ability that is implied by the concept. Almost any kind of action may be well adapted, depending upon environmental conditions and the species. Of course, intelligence may not be equated to good adaptation since many things that may be considered well-adapted behavior would not deserve the title of intelligent behavior. For example, under normal circumstances, the habit of eating three meals a day may be well adapted but does not necessarily count as any impressive example of intelligence. Sternberg (1977) avoided this type of conceptual difficulty by interpreting *intelligence* as related to the necessary, but not sufficient, mental abilities of well-adapted behavior, such as the ability to learn and solve problems. Such abilities would then not be sufficient to well-adapted behavior nor would every exercise of the ability be necessarily well adapted (e.g., a very intelligent person may ruin his or her life by gambling at casinos). Moreover, the author also included in the definition the ability to change and shape the environment and to respond flexibly to challenging situations. This goes beyond the notion of adaptation and brings the definition closer to the use in ordinary language, where it is related to successful, well performed actions, occurring in novel and challenging situations.

Another point much discussed in investigations about intelligence is related to the adequacy and applicability of definitions and measures to different cultures and subcultures. Intelligent test results obtained by people from different racial, sexual, ethnic, and cultural groups have generated heated controversies in psychology and attempts to reduce their adverse impact (cf. Ceci, 2000; see also other articles in the special issue). Part of this problem may be related to the adverbial characteristic of *intelligence* in ordinary language. As mentioned previously, the concept has the primary function of characterizing any action as successful or well performed in new and challenging situations. Considering that what is viewed as “success” may depend upon cultural or group values, different cultures and groups adopt different concepts of intelligence. Therefore, one action that is considered intelligent for one group may be seen as foolish for another group.

In fact, there is a growing body of research suggesting that individuals belonging to different cultures or ethnic groups, or even having different professions in the same culture, hold different conceptions of intelligence (cf. Okagaki & Sternberg, 1993; Sternberg, 1997; Sternberg, 1999; Sternberg, 2000; Sternberg et al., 1981; Sternberg & Kaufman, 1998; Yang & Sternberg, 1997). The major conclusion stemming from such investigations, namely, that what counts as

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“success,” and consequently as “intelligent,” is relative to the values held by the group, is perfectly compatible to the use of intelligence in ordinary language. Any action may be considered intelligent, as long as it is well performed, according to certain criteria related to the task, the context, or the group, and occurs in situations involving some degree of novelty or challenge. *Intelligent*, in ordinary language, does not imply necessarily any specific ability or fixed sets of abilities. Comparing the conceptions held by different cultures and groups, Sternberg (2000) reached a similar conclusion, emphasizing that his position “is not wholly compatible with many extant theories of intelligence” (p. 163), which specify fixed sets of abilities. The author advanced a more flexible theory, according to which the behavioral manifestations of intelligence vary across contexts, even while the basic component information processes may remain the same across contexts (cf. Sternberg, 2000). The identification of such basic processes involves empirical questions that are not related to the use of the concept in ordinary language. There is nothing in the ordinary use that would discourage the search for regularities between “intelligent” performance and basic psychological processes or biological characteristics. One of the purposes of science is to investigate certain phenomena beyond everyday observations. Systematic and detailed observations, making use of special equipment and environmental conditions, can produce information about the phenomena that otherwise could not be obtained. Scientific languages, based on such investigations, might organize the new information by creating technical terms, which usually make much more refined distinctions than those found in ordinary language. The usefulness of this new technical term would of course need to be demonstrated and would certainly be evaluated by other researchers, who may or may not adopt it in their investigations of the phenomena of interest. Conceptual problems may arise, however, when one argues that this new technical, scientific term is what the ordinary term really means and should replace it.

In the particular case of *intelligence*, as pointed out by Miles (1957),

if a psychologist is accused in his definition of intelligence of doing extreme violence to ordinary usage, no important principle is at stake. All that he need do is to leave the word *intelligence* imprecise and invent a special technical term of his own. (p. 157)

Much confusion has been created, for instance, by identifying the results of IQ tests with the concept of intelligence. These tests may be quite useful for some specific purposes, such as partially predicting performance on certain jobs or at school, but this is not the way it is used in ordinary language. When a foreigner or a child asks what the word *intelligence* means, we do not give them a lecture about IQ tests, test validation, or speed of information processing. Everything else being equal, differences in average IQ tests scores between different ethnic groups should not be necessarily controversial. One major source of controversy stems from the use of IQ tests as part of selection procedures for academic purposes and job placements. Considering that significantly different average test scores have been obtained by different racial groups, the test is seen by many authors as biased, favoring individuals belonging to one racial group. This problem does not seem

directly related to the concept of intelligence, since any selection procedure that were to favor one group of individuals could be questioned on the same grounds. If personnel selection was based on rhythmic dancing and, let us say, African descendents scored better on such tests, other racial groups could question such practice.

The results from IQ tests may also become controversial when they are interpreted as measuring *intelligence*. This occurs, when, based on such results, one concludes that individuals from, let us say, Group A are more intelligent, in general, than those from Group B. Considering that *intelligent*, in ordinary language, may be applied to almost any task, this conclusion suggests that performance of individuals belonging to Group A will be better, in almost any task, than performance of individuals from Group B. The polemics and controversy surrounding such a conclusion should not be surprising, for it is an unverified empirical assertion derived from a nontrivial conceptual revision. The empirical assertion is unverified since the original concept implies that these individuals would perform better in almost any task, a fact which the researcher has not investigated. It is a conceptual revision since this use, which equates intelligence with IQ tests results, is much narrower than the standard use found in ordinary language. Much theoretical controversy would be dispelled if, instead of using the concept of intelligence, researchers were to create new, more precise technical terms to discuss the results from investigations using IQ-type tests, as recommended by Miles (1957). Some attempts of identifying different types of intelligence seem to point to this same direction (e.g., Gardner, 1993), for they do recognize that there are several different contexts and actions, different than IQ-test situations, to which the adjective *intelligent* may be attached. The observed correlation among different IQ tests, which has often been referred to as *g* factor, does not pose any problem to the position advanced here as long as the expression is not equated to *intelligence*. *G* factor is a technical term that requires some knowledge concerning IQ tests and statistics and is not likely to be found in dictionaries. It is an expression that the researcher would probably find some difficulties explaining its use to lay persons and children. Moreover, the announcement of a research stating that Race A shows lower *g* factor than Race B would not necessarily attract much attention. Much controversy would be expected, however, when researchers, based on such results, assert that individuals belonging to one race are more intelligent than those belonging to the other. The usefulness of the *g* factor concept needs to be demonstrated and tested by itself, without the conceptual support of *intelligence*. If *g* factor measures can predict well for school and job performance, for example, it may be very useful for selection procedures, social policies, and so on. The relationships between *g* factor measures and cognitive or biological measures should be then interpreted in the light of new technical terms, and, if replicated and explicated, could be included in coherent theories concerning some human abilities. *Intelligence*, the ordinary language expression, might eventually disappear from scientific vocabularies. In other fields there are many examples of ordinary language expressions that have been substituted by more technical terms. Popular classifications of trees, animals,

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and types of soil, for instance, have been replaced, in scientific analyses of such phenomena, by technical terms used in botany, zoology, and geology.

Therefore, according to the use of *intelligence* in ordinary language, which is also in accordance with findings from cross-cultural investigations, results from traditional, standardized, intelligent tests should be interpreted cautiously, considering the tasks that were evaluated, and cultural, contextual values. Clearly stating the context in which the concept is used in this case may perhaps avoid much controversy; some of them are based on conceptual revisions of the use of the term in ordinary language. Each culture has its own criteria to identify intelligent individuals on the basis of their good performances on those tasks that are valued by the group. If someone considered to be very intelligent in that group does not perform well on traditional tests, the group will, more likely than not, reject tests results, keeping their old and well known ordinary concept of intelligence. In other words, *intelligence*, in ordinary language, is dependent upon the context in which it is used, the culture being probably the most general context of all.

References

- Ackerman, P. L., & Heggstad, E. D. (1997). Intelligence, personality and interests: Evidence for overlapping traits. *Psychological Bulletin, 121*, 219-245.
- Carroll, J. B. (1993). *Human cognitive abilities: A survey of factor-analytic studies*. New York: Cambridge University Press.
- Ceci, S. J. (2000). So near and yet so far: Lingering questions about the use of measures of general intelligence for college admission and employment screening. *Psychology, Public Policy, and Law, 6*, 233-252.
- Deary, I., & Stough, C. (1996). Intelligence and inspection time: achievements, prospects, and problems. *American Psychologist, 51*, 599-608.
- Derr, R. L. (1989). Insights on the nature of intelligence from ordinary discourse. *Intelligence, 13*, 113-118.
- Fagan, J. F. (2000). A theory of intelligence as processing: Implications for society. *Psychology, Public Policy, and Law, 6*, 168-179.
- Gardner, H. (1993). *Multiple intelligences: The theory in practice*. New York: Basic Books.
- Gottfredson, L. S. (2000). Skills gaps, not tests, make racial proportionality impossible. *Psychology, Public Policy, and Law, 6*, 129-143.
- Guilford, J. P. (1959). Three faces of intellect. *American Psychologist, 14*, 469-479.
- Haier, R. J., Nuechterlein, K. H., Hazlett, E., Wu, J. C., & Paek, J. (1988). Cortical glucose metabolic rate correlates of abstract reasoning and attention studied with positron tomography. *Intelligence, 12*, 199-217.
- Harzem, P. (1986). The language trap and the study of pattern in human action. In T. Thompson & M. D. Zeiler (Orgs.). *Analysis and integration of behavioral units* (pp. 45-53). Hillsdale, NJ: Erlbaum.
- Harzem, P., & Miles, T. R. (1978). *Conceptual issues in operant psychology*. New York: John Wiley & Sons.
- Holth, P. (2001). The persistence of category mistakes in psychology. *Behavior and Philosophy, 29*, 203-219.
- Howard, R. W. (1993). On what intelligence is. *British Journal of Psychology, 84*, 27-37.

- Hunt, E. B. (1978). Mechanics of verbal ability. *Psychological Review*, 85, 109-130.
- Hunter, J. E., & Schmidt, F. L. (2000). Racial and gender bias in ability and achievement tests: Resolving the apparent paradox. *Psychology, Public Policy, and Law*, 6, 151-158.
- Jensen, A. R. (1998). *The g factor*. Westport, CT: Praeger.
- Jensen, A. R. (2000). Testing: The dilemma of group differences. *Psychology, Public Policy, and Law*, 6, 121-127.
- Miles, T. R. (1957). Contributions to intelligence testing and the theory of intelligence. *British Journal of Educational Psychology*, 27, 153-165.
- Nettelbeck, T., & Lally, M. (1976). Inspection time and measured intelligence. *British Journal of Psychology*, 67, 17-22.
- Newell, A., & Simon, H. A. (1972). *Human problem solving*. Englewood Cliffs, NJ: Prentice-Hall.
- Okagaki, L., & Sternberg, R. J. (1993). Parental beliefs and children's school performance. *Child Development*, 64, 36-56.
- Oliveira-Castro, J. M. (2000). The negative function of "doing in the head" and behavioristic interpretations of private events. *The Mexican Journal of Behavior Analysis*, 26, 1-25.
- Oliveira-Castro, J. M., & Harzem, P. (1990). Level of aspiration and the concept of goal. *The Mexican Journal of Behavior Analysis*, 16, 41-53.
- Peters, R. S. (1958). *The concept of motivation*. London: Routledge & Kegan Paul.
- Piaget, J. (1952). *The origins of intelligence in children*. New York: International Universities Press.
- Reed, T. E., & Jensen, A. R. (1992). Conduction velocity in a brain nerve pathway of normal adults correlates with intelligence level. *Intelligence*, 16, 259-272.
- Reynolds, C. R. (2000). Why is psychometric research on bias in mental testing so often ignored? *Psychology, Public Policy, and Law*, 6, 144-150.
- Ryle, G. (1949). *The concept of mind*. London: Hutchinson & Co.
- Ryle, G. (1953). Ordinary language. *The Philosophical Review*, 62, 167-186.
- Ryle, G. (1979). *On thinking*. Totowa, NJ: Rowman & Littlefield.
- Schmidt, F. L., & Hunter, J. E. (1998). The validity and utility of selection methods in personnel psychology: Practical and theoretical implications of 85 years of research findings. *Psychological Bulletin*, 124, 262-274.
- Spearman, C. (1927). *The abilities of man: Their nature and measurement*. New York: Macmillan.
- Sternberg, R. J. (1977). *Intelligence, information processing, and analogical reasoning: The componential analysis of human abilities*. Hillsdale, NJ: Erlbaum.
- Sternberg, R. J. (1985). *Beyond IQ: A triarchic theory of human intelligence*. New York: Cambridge University Press.
- Sternberg, R. J. (1996). *Cognitive psychology*. New York: Holt, Rinehart and Winston.
- Sternberg, R. J. (1997). The concept of intelligence and its role in lifelong learning and success. *American Psychologist*, 52, 1030-1037.
- Sternberg, R. J. (1999). A triarchic approach to the understanding and assessment of intelligence in multicultural populations. *Journal of School Psychology*, 37, 145-159.
- Sternberg, R. J. (2000). Implicit theories of intelligence as exemplar stories of success: Why intelligence test validity is in the eye of the beholder. *Psychology, Public Policy, and Law*, 6, 159-167.
- Sternberg, R. J., Conway, B. E., Ketron, J. L., & Bernstein, M. (1981). People's conception of intelligence. *Journal of Personality and Social Psychology*, 41, 37-55.

THE RELATIVITY OF INTELLIGENCE

- Sternberg, R. J., & Kaufman, J. C. (1998). Human abilities. *Annual Review of Psychology*, 49, 479-502.
- Thurstone, L. L. (1938). Primary mental abilities. *Psychometric Monographs*, 1.
- Vernon, P. A. (Ed.) (1987). *Speed of information processing and intelligence*. Norwood, NJ: Ablex.
- Vernon, P. A. (Ed.). (1993). *Biological approaches to the study of human intelligence*. Norwood, NJ: Ablex.
- Willerman, L., Schultz, R., Rutledge, J. M., & Bigler, E. D. (1992). Hemispheric size asymmetry predicts relative verbal and nonverbal intelligence differently in the sexes: an MRI study of structure-function relations. *Intelligence*, 16, 315-328.
- Wittgenstein, L. (1953). *Philosophical investigations*. New York: Macmillan.
- Yang, S., & Sternberg, R. J. (1997). Taiwanese Chinese people's conceptions of intelligence. *Intelligence*, 25, 21-36.

