



PERGAMON

New Ideas in Psychology 18 (2000) 241–259

www.elsevier.com/locate/newideapsych

NEW IDEAS IN
PSYCHOLOGY

Commentary on Vygotsky's criticisms of *Language and thought of the child* and *Judgement and reasoning in the child*[☆]

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It is not without sadness that an author discovers, 25 years after its publication, the work of a fellow author who has died in the meantime, when that work contains so many points of immediate interest to him which should have discussed personally and in detail. Although my friend A. Luria kept me up-to-date concerning Vygotsky's sympathetic and yet critical position with respect to my own work, I was never able to read his writings nor to meet him, and in reading his work today, I regret this profoundly, for we could have come to an understanding on a number of issues.

E. Hanfmann, who is one of Vygotsky's best successors, has kindly asked me to comment on the reflections of this distinguished author concerning my first works.¹ I thank her very warmly for this but also confess some embarrassment, for while Vygotsky's book appeared in 1934, those of mine which he discusses date back to 1923 and 1924. On thinking over the question of how to carry out such a discussion in retrospect, I have however found a solution that is both simple and instructive (at least

*Note added to Piaget's manuscript: Professor Piaget wrote these comments after reading in manuscript Chapter 2 and extracts from Chapter 6 of Vygotsky's book. The reference is to the English translation of Vygotsky's *Thought and language* (1962).

Translated by Leslie Smith from a pamphlet by J. Piaget, "Commentaire sur les remarques critiques de Vygotski concernant le *Lagage et la pensée chez l'enfant et le Jugement et le raisonnement chez l'enfant*".

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All notes are due to the translator except those due to Piaget which are marked *(for example, 23*).

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¹ Piaget is referring to his two first books on children's thinking, mentioned in the title of the present paper and published in French in 1923 and 1924, respectively, in apparent disregard of his book *Recherche* (Piaget, 1918) and some 40 published papers in biology. See Vidal (1994) for discussion of the latter and Smith (1993, p. xiii) for a breakdown of Piaget's publications.

for me), namely to ascertain whether what I have done since then confirms or invalidates Vygotsky's criticisms. The answer is both yes and no: on certain issues I find myself more in agreement with Vygotsky than I would have been in 1934, while on other issues I now have better arguments for answering him than would previously have been the case.

PART 1

We can begin with two separate questions both of which relate to Chapter 2 of Vygotsky's book, one concerning egocentrism in general and the other concerning egocentric language. Vygotsky, if I correctly understand him, does not agree with me over the notion of intellectual egocentrism in the child, but he does recognize the existence of what I call egocentric language² which he sees as the point of departure of internalized language which develops later and which, in his view, can be used for both autistic and logical purposes. Let us then take up these two questions separately.

1. Cognitive egocentrism

The main problem raised by Vygotsky is basically that of the adaptive and functional nature of the activities of the child — and of every human being. On this point I certainly agree with him in the main; all I have written (after my first five books) on the *Origins of intelligence* as the sensory-motor level and on the genesis of logico-mathematical operations through actions makes it easy for me today to locate the beginnings of thinking in a context of adaptation which has a more and more biological sense.

² *Language*. This term is usually, but not always, translated as *speech* in the 1962 English version of this paper. There are two reasons for using *Language*. One is that this term appears in the English translations of Piaget's *Language and thought of the child* as well as in Vygotsky's *Thought and language*. The second is that Piaget never denies that young children speak to other people. But he does deny that the language used by young children in speaking to other people satisfies the criteria applicable to objective communication. It is in this sense that egocentric language is not social, namely that it fails to match the minimum conditions of successful communication. Piaget expressly notes in the next paragraph but one of the present paper that adaptation, of which human communication is taken to be a specific instance, is not always successful, citing systematic errors as a principal case of incomplete adaptation. In his *Sociological studies* (Piaget, 1977/1995, Chapters 2–3), Piaget identifies a set of conditions whose satisfaction is, in his view, required by successful communication. The distinction between a process or activity and its successful outcome is also central to the first postulate of the equilibration model discussed by Piaget (1985a), Section 1). Since *language* and *thought* appear in the titles of works by Piaget and Vygotsky, it is worth recalling that the German *Gedanke* (*thought*) is used in the sense of *proposition* by one of the founders of modern logic (Frege, 1967). Thus the issue addressed by Piaget and Vygotsky concerns propositional identity in communicative exchanges: is one and the same proposition used in a self-identical way by both partners through an exchange? The issue is further discussed by Smith (1995a). See also Notes 24 and 53 below.

And yet to say that every exchange between the child and his environment tends towards adaptation is not to say that this adaptation is successful from the outset. It is necessary to guard against an excessive bio-social optimism into which Vygotsky sometimes seems to fall. In fact there are two possible limits on any adaptive effort.

(1) The subject may not yet have acquired or constructed the instruments or organs of adaptation for the accomplishment of certain tasks, because the construction of such instruments is sometimes very long and difficult. This is the case with logical operations whose first equilibrated systems are not completed³ until the age of seven or eight years (see *The child's conception of number*, *The child's conception of space*, etc.).

(2) Adaptation is an equilibrium between an assimilation of objects to action-structures and an *accommodation* of these structures to the objects, where such structures may be inborn, or may be under construction through action, or may be already formed though the progressive organisation of actions. It can always happen that any such equilibrium satisfactory with the result that the effort towards adaptation may lead to systematic errors.

Such systematic errors are found at all levels in the hierarchy of behavior. In the field of perception, for example, which passes as the one in which adaptation is most successful, nearly every perception embodies its share of “illusion”. After studying for 20 years the evolution of these systematic errors from childhood to adulthood, I have just written a book on *The mechanisms of perception* in which I have tried to trace back these varied effects to general mechanisms based on centration in looking⁴ thus raising problems which are very close to those of egocentrism. At the level of affective life, a great deal of optimism would be required to believe that our elementary, interpersonal feelings are always well adapted and that reactions such as jealousy, envy, vanity, etc., which are doubtless universal, do not equally reveal different forms of “systematic errors” in the individual’s affective perspective.⁵ In the domain of thought, the whole history of science from geocentrism to the Copernican revolution, from the false absolutes of Aristotle’s physics to the relativity of Galileo’s principle of inertia and to Einstein’s relativity, etc. shows that centuries are required to be free (and then only partially) from “systematic errors” due to illusions arising from the immediate point of view as opposed to “decentred” systems.⁶

The central idea, then, that I have tried to express by means of the term intellectual *egocentrism* (no doubt a bad choice) is that progress in knowledge occurs neither as simple addition nor as additive stratification, as if richer knowledge came along merely to augment weaker knowledge, but that this progress rests equally on the

³ *S'achèvent*. The development of a structure is stated to have two phases: preparation and completion. It is a strict consequence of this claim that there are always earlier and multiple forms of all levels of thinking manifest well before the ages stated. See also Piaget (1960, p. 14).

⁴ *Centration du regard* is translated as *fixation of centration* in *The mechanisms of perception* (Piaget, 1969, p. 78). However, Piaget’s point is that egocentrism is instantiated in perceptual activities, for example in looking at an object. Note that the French edition of *The mechanisms of perception* was published in 1961 just prior to the present reply to the English publication of Vygotsky’s book.

⁵ See Piaget (1981).

⁶ See Piaget and Garcia (1989).

continual recasting and correction of earlier points of view through a process which is as retroactive as it is additive. This process consists in the endless correction of earlier “systematic errors” or those which arise along the way. Now this process of correction seems to obey a well-defined law of evolution, which is the law of *decentration*. A gigantic effort in decentration was required, even by small child as shown in my account (accepted by Vygotsky) of the development of the notion of brother, in the understanding on the part of a boy who has a brother that this brother has himself as a brother as well and that this notion therefore depends on a completely reciprocal relation, not on an “absolute” property.⁷ Similarly (in recent studies not available to Vygotsky), the understanding that one road can be longer than another which ends at the same point, thus separating the (metrical) notion *length* and the ordinal notion *far*, requires the “decentration” of thought which is initially centered on the end-point alone and the construction of objective relations between the starting-point and end-point.⁸

It is precisely to designate this initial failure in decentration that I have used the word *egocentrism*. It might have been better to say simply centrist, but since initial centristations are always relative to one’s own action, I said egocentrism whilst at the same time specifying that this was a matter of intellectual, cognitive and unconscious egocentrism with no relation at all to what in ordinary language is called *egocentrism* (hypertrophy of self-consciousness). Cognitive egocentrism, as I have tried to make clear, stems from non-differentiation between one’s own and other possible points of view and in no way at all from an individualism which precedes relations with other people (as in the position taken by Rousseau which has occasionally been imputed to me, a surprising misapprehension which Vygotsky to be sure did not share).⁹

Once this point is clarified, it becomes evident that egocentrism so defined goes way beyond social egocentrism, to which we shall return later in connection with egocentric language. Specifically, my studies on *The construction of reality in the child* have led me to observe quite systematic forms of egocentrism at the sensory–motor level: for example, sensory–motor space, which at its outset consists in a plurality of spaces (buccal, tactile-kinaesthetic, etc.) centered on one’s own body, at about 18 months, through a decentration truly comparable to a Copernican revolution, space becomes a singly homogenous container in which all objects are situated, including one’s own body.¹⁰

Let us turn, then, to what most troubles Vygotsky in my notion of egocentrism: its relationship to the autism of Bleuler and to Freud’s “*Lustprinzip*”. On the first point, Vygotsky, who is a specialist on schizophrenia, does not deny, as some of my French critics do, that a certain amount of autism is normal for all people, which my teacher

⁷ The reference is apparently to Vygotsky (1986, pp. 158, 193). See also Piaget (1928, Chapter 2, Section 3) and Piaget, Henriques and Ascher (1992, Chapter 7).

⁸ See Piaget (1960, p. 79) for discussion of the child’s notion of far.

⁹ J. J. Rousseau’s claim in *Emile* (1974, p. 71) that “childhood is the sleep of reason” is compatible with Piaget’s account of the development of rational thinking during childhood. Yet *Emile* is also, and somewhat inconsistently, attributed mature intellectual capacities such as understanding a fable (p. 80). In Piaget’s view, children wake up to reason gradually with minimal, but never zero, rational abilities and knowledge during the earliest years.

¹⁰ There are differing interpretations of Piaget’s claim that development during infancy embodies a Copernican revolution, which are discussed by Smith (1987).

Bleuler also admitted.¹¹ He finds only that I have over-emphasized the resemblances between egocentrism and autism without bringing out the difference sufficiently, and in this he is certainly right. But if this is what I did, it is because these resemblances, which Vygotsky does not deny, seemed illuminating to me in the explanation of the genesis of symbolic games in children (see *Play, dreams and imitation in childhood*), where that “non-directed and autistic thought” which Bleuler speaks of and which I tried to explain in terms of a predominance of assimilation over accommodation in the child’s early play is often manifest.

As for the “pleasure principle” which Freud locates genetically before the “reality principle”, Vygotsky is again right when he reproaches me for having accepted this over-simplified sequence too uncritically.¹² The fact that all behavior is adaptive and that all adaptation is always some (stable or unstable) form of equilibrium between assimilation and accommodation permits us simultaneously (1) to account for the precocious manifestations of the *Lustprinzip* by means of the affective aspect of the frequent predominance of assimilation and (2) to vindicate Vygotsky’s reservations when he maintains that adaptation to reality always goes hand in glove with both need and pleasure (since even when assimilation predominates, it is always accompanied by some form of accommodation).

On the other hand, I cannot follow Vygotsky when he assumes that once having separated need from pleasure with respect to their function of adaptation to reality¹³ (which I think all the same I never did, or at least quickly corrected: see *The origins of intelligence in the child*¹⁴), I found myself obliged to conceive of “realist” or objective thought as independent of concrete needs, as pure thought which seeks out proof solely for its own satisfaction. On this point, all of my subsequent work on the genesis of intellectual operations through action itself and on the genesis of logical structures through action–coordination sufficiently demonstrates that I do not separate thought

¹¹ An available text in English is Bleuler (1924).

¹² The reference is apparently to Freud (1929). See Vygotsky’s comments (1986, pp. 37–39) on the implications of this commitment for an account of the development of rational thinking.

¹³ The reference is apparently to Vygotsky (1986, p. 38). But it is not clear that Piaget’s position is the one here imputed to him. In the very first paragraph of chapter 1 of *Language and thought of the child*, Piaget (1922) raises the question “what are the needs which a child tends to satisfy when he talks?” Note that Piaget’s answer is not summarized until the end of the companion text (see the footnote to *Judgment and reasoning in the child* [Piaget, 1928, p. 199]). In the later text, Piaget’s answer is that “the social need to share the thought of others and to communicate out own with success is at the root of our need for verification. Proof is the outcome of discussion ... We have therefore given it the name of egocentric, which indicates that this type of thought is still autistic in its structure but that its interests tend not merely toward organic or ‘ludistic’ satisfaction as in pure autism, but towards intellectual adaptation as in adult thought” (pp. 204–205; my amended translation). The point is that human needs may have an emotional and non-rational origin in the mind (cf. Freud’s account of the psyche) and so become manifest as pseudo-rationality (cf. Pareto’s account (1963) of “residues” to which Piaget makes reference [1995, Chapter 1] and at the outset of Section 4 in this paper). Yet successful communication is dependent on rational norms to the extent that it is objective. The question posed by Piaget about the child’s need to communicate concerns how exactly rationality takes precedence over subjectivity in human communication.

¹⁴ In his *Origins of intelligence in the child* (1953), Piaget claims that a need, such as a need for repetition (p. 32), is also endowed with value by a subject whose need this is (p. 43), where any need is ultimately defined as assimilatory activity (p. 408).

from action. It took me some time to see, it is true, that the roots of logical operations lie deeper than, linguistic connections and that my early study showed a preoccupation with thought at the level of language.¹⁵ This leads us to the second point.

2. Egocentric language

There is no reason for cognitive egocentrism, characterized by preferential unconscious centration or, as we have always more simply put this, characterized by “non-differentiation of points of view”, not to have a similar application to inter-individual relationships, in particular to those which are conveyed through language. To take an example from adult life — one which has indeed been experienced by all psychologists — every novice teacher discovers sooner or later that his first lectures were incomprehensible because he was talking with respect to his own point of view, only gradually and with difficulty realizing that it is not easy to place oneself in the point of view of students who do not know what he knows about the subject matter to be taught. Here’s a second example: the whole art of discussion consists principally in knowing how to place oneself in the point of view capacity, discussion is useless — as indeed it often is, even among psychologists!¹⁶

It is for this reason that in trying to study the relations between thought and language from the standpoint of cognitive centration and decentration, I have tried to see whether there is an egocentric language which is distinct from cooperative language in the strict sense. In my first book *The language and thought of the child* (I have since regretted publishing this book first, for I would have been better understood had I begun with *The child’s conception of the world*, which was then in preparation), I devoted three chapters to this problem.¹⁷ In the second of these chapters, I studied conversations and especially discussions between children in order to bring out the difficulties which they experience in going beyond their own point of view. In the third chapter, I tried to provide evidence for this outcome through a little experiment on children’s mutual understanding of causal explanation. To clarify what are for me crucial findings, I then presented in the first chapter an inventory of spontaneous language used by children with each other, trying to distinguish the contribution, on the one hand, of monologues and “collective monologues” and, on

¹⁵ Piaget stated that his initial studies of children’s thinking were limited due to an over-reliance on linguistic criteria (Piaget, 1947; for a review, see Smith (1993), Section 11). A similar criticism appears in Piaget’s “Autobiography” (1952b).

¹⁶ This ironical remark has a counter-part in the claim made by Vuyk (1981) that Piagetian research has often been marked by a “dialogue of the deaf”.

¹⁷ Piaget is here referring to the three opening chapters of the first edition of his book, which was initially published in French in 1922, namely: “The functions of language in two children aged six” (Chapter 1); “Types and stages of conversation of children between the ages of four and seven” (Chapter 2); “Understanding and verbal explanation between children of the same age between the years of six and eight” (Chapter 3). In the third French edition, published in 1948, a new chapter was added, “The measure of egocentric language in verbal communication between the adult and the child and in verbal exchanges between children”, appearing the Chapter 2 in the third edition French edition in 1948 but as Chapter 6 in the third English edition (1959).

the other, of adaptive communication, whilst cherishing the hope of finding in this way a kind of measure of verbal egocentrism.

But, and this at first sight was surprising though now and with hindsight explicable, all the opponents (and they are legion!) of the notion of egocentrism chose (almost) exclusively to attack the first chapter without seeing the connection with the other two and therefore, as I have increasingly come to believe, without understanding the meaning of this notion! One critic, who set out to show that I was wrong, went so far as to take for a criterion of egocentric language the number of propositions in which the child talks about himself, as if one could not talk about oneself in a way that is not egocentric. In an otherwise excellent paper on language which appeared in Carmichael's *Manual of child psychology*, D. McCarthy drew the conclusion that the long debates on this subject have been useless without, however, in any way giving an explanation of the real import of the notion of verbal egocentrism.¹⁸

Before returning to Vygotsky, I should like to set forth myself what seems to me to remain significant in the positive and negative evidence gathered by my few “followers” and many opponents.

1. The measurement of egocentric language has shown that there are very great environmental and situational variations, so that contrary to my initial hopes we do not possess from this a valid measure of intellectual egocentrism, not even of verbal egocentrism.¹⁹

2. The phenomenon itself, whose frequency in relation to children at different developmental levels we had set out to test, as well as its decline with age, has not been invalidated because it has seldom been understood.²⁰ Viewed in terms of distorting centrations followed by decentration on one's own action, this phenomenon has turned out to be more significant in the study of actions themselves and their interiorization in the form of intellectual operations than in the field of language. It still remains possible, however, that a more systematic study of discussions between children, and especially of behavior, accompanied by language, directed upon verification and argumentation may furnish valid metrical indices.

This long preamble has seemed necessary to bring out how much I respect Vygotsky's position on the issue of egocentric language, even though I cannot agree

¹⁸ The reference is to McCarthy (1963). The critic to whom Piaget refers may have been H. Baker to whom McCarthy (p. 566) attributes the view that “as children grew older they devoted less time to talking about their own activities”.

¹⁹ The limitation here imposed by Piaget on his own position appears to be due to Vygotsky's criticism (1986, pp. 28–34, 55). Note, however, that Piaget stated both that there may be “no coefficient of any constancy” (1959, p. 37) in his first book and that “there is still an enormous portion of his thought that is incommunicable” (1928, p. 209).

²⁰ The limitation in Note 19 due to Vygotsky is denied by Piaget (1995, p. 308) to invalidate his position, since what Vygotsky has left unexplained is “primitive social non-coordination”. Vygotsky (1986, pp. 158–159) shows his commitment to primitive social non-coordination when he states that there are multiple developmental sequences corresponding to the formation of scientific (non-spontaneous) and spontaneous concepts. It is Piaget's contention that the distinction between spontaneous and non-spontaneous concepts, which Piaget notes in Part II of this paper below has been taken by Vygotsky from Piaget's work, is an explanandum, not an explanans.

with him on all points. First Vygotsky did realize that a real problem was involved, and not merely one of statistics. Second, he himself verified the facts in question, as opposed to suppressing them through measurement artefacts; his observations on the frequency of egocentric language in children when their actions meet with difficulties and on the decline of this type of language when interior language is constituted are of great interest. Third, he put forward the new hypothesis that ego-centric language is the point of departure for the interiorized language of the more developed subjects, specifying that interior language could serve both autistic ends and logical thinking. I find myself in complete agreement with these hypotheses.²¹

On the other hand, what I think Vygotsky still failed to appreciate fully is egocentrism itself *qua* obstacle to the coordination of viewpoints and to cooperation. Vygotsky reproaches me correctly for not emphasizing sufficiently from the outset the functional aspect of these questions.²² Granted, but I did emphasize this later on. In *The moral judgment of the child* I studied children's collective games (marbles, etc.) and found that children, before the age of seven years, do not know how to coordinate their rules during a game, so that each one plays for himself and all win at the same time without realizing that it is a "match". R.F. Nielsen, who studied collaborative activities (building together, etc.) found *in the field of action itself* all the characteristics which I have emphasized in relation to language.²³ Thus there exists a general phenomenon which it seems to me Vygotsky has neglected.

In short, when Vygotsky concludes that the early function of language is that of global communication and that this language later becomes differentiated into egocentric and "communicative" language, I believe I agree with him. But when he then maintains that these two forms of language are equally socialized and differ only in function. I cannot go along with him because the word *socialization* is then ambiguous: if an individual *A* mistakenly believes that an individual *B* thinks the way that *A* does, and if *A* fails to understand this difference between the two points of view, this is, to be sure, social behavior in the sense that there is contact between the two. But from the perspective of intellectual cooperation, such behavior is unadapted.²⁴ It is this perspective which bears upon the only problem which has concerned me but which does not seem to have interested Vygotsky.

In his fine study on twins, R. Zazzo formulates the problem clearly.²⁵ For him, the difficulty in the notion of "egocentric language" arises from a confusion of two meanings which he feels I should have separated: (a) language incapable of rational reciprocity and (b) language that is "not meant for others". But, from the standpoint of

²¹ The three claims to which Piaget commits himself are made by Vygotsky (1986, pp. 33, 35, 55, respectively).

²² The reference is apparently to Vygotsky's (1986, pp. 55–56).

²³ R. F. Nielsen. *La sociabilité chez l'enfant*, Delachaux et Niestlé.

²⁴ The distinction mentioned in Note 2 is relevant to *socialization*. Piaget has consistently stated that social experience is pervasive from the cradle to the grave, but this is not to say that all social experience is uniformly effective (1995; see pp. 278 and 88, respectively). A comparable claim is made about social intervention by Van de Veer and Valsiner (1994, p. 6).

²⁵ R. Zazzo. *Les jumeaux, le couple et la personne*, tome. II p. 399.

the socialization of thought and intellectual cooperation (which alone interested me), this amounts precisely to the same thing! As far as I know, I have never spoken of language “not meant for other”, which is quite ambiguous in that I have always recognized that the child thinks he is talking to others and making himself understood. My view is simply that in egocentric language the child talks *for himself* (in the sense in which a lecturer may speak “for” himself alone, even though he naturally intends his words of the audience). Zazzo, citing a passage of mine which is actually quite clear, answers me seriously that the child does not speak “*for*” himself but “*according to*” himself.²⁶ Granted! Let us replace “for himself” with “according to himself” in all of my writings. I still think this would change nothing in the only valid meaning of egocentrism: the absence of decentration in social relationships as well as in others. Moreover, my claim (and I will come to this at the end of this paper) is precisely that cooperation — at the level of cognitive relationships between individuals — teaches us to speak “according to” others and not simply “according to” our own point of view.

PART II

My comments on the second part of Vygotsky’s reflections on my work, in his Chapter 6, will be simpler, because I believe I am much more in agreement with him on these points and, mainly, because my later books, which he did not know, answer just the questions he raises, or most of them.

3. Spontaneous concepts, school learning, and scientific concepts

It was a real joy for me to discover from Vygotsky’s book the way in which he approves of my having distinguished, for study purposes, between “spontaneous” and “non-spontaneous” concepts one could have feared that a psychologist, intent on the problems of school learning much more than we are, might have tended to underestimate in spite of himself the contribution of continuous construction shown in the child’s intellectual activity during development.²⁷ It is true that when Vygotsky later charges me with having over-emphasized this distinction, I said to myself at first that, really, he was taking away from me what he had just granted.²⁸ But when he states his criticism more explicitly, saying that non-spontaneous concepts, too, receive an “imprint” of the child’s mentality in the process of their acquisition and that an “interaction” of spontaneous and learned concepts must therefore be admitted, I once more felt in complete agreement with him.²⁹ There is in fact a complete misunder-

²⁶ Pour (*for*) and selon (*according to*). The reference may be to Piaget (1959, p. 100). Note the pointed use of *for* as the first word of the second sentence in this paragraph.

²⁷ Vygotsky (1986, p. 152) commits himself to some version of the distinction drawn by Piaget.

²⁸ The reference is apparently to Vygotsky (1986, p. 154).

²⁹ The reference is apparently to Vygotsky (1986, p. 154).

standing on the part of Vygotsky when he thinks that from my point of view the child's spontaneous thought must be known at close quarters by educators so as to get to know better "the enemy to be beaten".³⁰ Yet in all of my strictly pedagogical writings, whether old or recent, I have on the contrary insisted that education could gain a great deal, much more than ordinary methods do at present, from a systematic utilization of the child's spontaneous intellectual development.³¹

But instead of discussing in the abstract these (few, though essential) points where Vygotsky seems to have understood neither my intentions nor my ideas, let us start with those that seem to me to reveal our fundamental agreement. Vygotsky concluded from his reflections on my earliest books no doubt without suspecting that this was exactly my research-program³² (I already had in hand, before the publication of these books, as whole study in manuscript written in 1921 on the child's operations of numerical correspondence³³), namely that the essential task of child psychology was to study the psychological formation of scientific concepts by following in sequence the process "before our eyes". Since that was my project, my works on *Language and thought*, *Judgment and reasoning*, *The child's conception of the world*, etc. were to serve as no more than an introduction. In collaboration initially with A. Szeminska and especially with B. Inhelder, I later published a series of studies dealing expressly with the development of the concepts of number, physical quantity, movement, speed and time, space, chance, the induction of physical laws, and the logical structures of classes, relations and propositions — in short, with most of the fundamental scientific concepts.³⁴

Let us see what these findings disclose about the basic questions concerning the relations between spontaneous development and school learning, questions over which Vygotsky believes he is in disagreement with me, though actually he differs with me only partly and not in the sense that he imagines but rather in the opposite sense.

As a specific example, let us take the teaching of geometry. In Geneva, in France, etc. such teaching has three characteristics: (1) it begins late, usually at about the age of 11, unlike arithmetic, which is taught from about the age of seven; (2) from the outset it is specifically geometrical or even metrical without first going through a qualitative phase in which spatial operations would be reduced to logical operations, applied to the continuum; (3) it follows the historical order of discovery — Euclidean geometry is taught first, projective geometry much later, and topology only at the end (at University). Yet it is well known that modern theoretical geometry takes its departure from topological structures, from which by parallel methods both projective

³⁰ The reference is apparently to Vygotsky (1986, p. 157).

³¹ *Encyclopédie française*, article *Education nouvelle* and *Le droit à l'éducation dans la collection des Droits de l'homme* (Unesco) respectively. [The former is translated as "The new methods" in Piaget (1970) and the latter as "The right to education" in Piaget (1976).]

³² Piaget's early views about the study of psychology are evident in his contribution to the Sainte-Croix 1922 conference. They are discussed by Smith (1993), Section 7) and by Vidal (1994, Chapter 8).

³³ In fact, Piaget published two papers on children's thinking in 1921 and another in 1922 (see Smith *Necessary knowledge*, 1993). The former pair deal with children's understanding of transitivity and of class inclusion, whilst the latter 1922 paper deals with numerical understanding in children.

³⁴ For a comprehensive inventory of these and similar texts, see Archives Jean Piaget (1989).

structures and Euclidean structures can be derived. Moreover, it is known that theoretical geometry is based on logic, and finally there is an increasingly close connection between geometrical considerations and algebraic or numerical ones. If, as Vygotsky proposes, we now examine the development of geometrical operations in children,³⁵ we find that it takes a course much closer to the spirit of theoretical geometry than to that of traditional school teaching: (1) the child constructs his spatial operations at the same time as his numerical ones with mutual interaction (there is, in particular, a notable parallel between the construction of number and of the measurement of continuous quantity); (2) the child's first geometrical operations are essentially qualitative and entirely parallel to his logical operations (order, inclusion, etc.); (3) the first geometrical structures which the child discovers are essentially topological in nature, and it is from these that he builds up, but in a parallel fashion, elementary projective and Euclidean structures.

From such examples, which could be multiplied, it becomes easy to derive the answers to Vygotsky's criticisms. In the first place, he reproaches me for viewing school learning as not essentially related to the child's spontaneous development.³⁶ Yet, to my mind, it should be clear that it is not the child that should be blamed for the eventual conflicts, but the school, unaware as it is of the use it could make to pupils' spontaneous development which it should reinforce by satisfactory methods, and not inhibit spontaneous development, as it often does. In the second place, the main error made by Vygotsky in his interpretation of my work, in this domain, is that he believes that, for me, adult thought, after various compromises, gradually "replaces" child thought through some sort of "mechanical abolition" of the later.³⁷ Actually, today I am more often blamed for interpreting spontaneous development as tending of its own accord toward the logico-mathematical structures of the adult as its predetermined ideal.³⁸

All this raises at least two problems, which Vygotsky formulates, but in the solution of which we differ somewhat. The first concerns the "interaction" of spontaneous and non-spontaneous concepts.³⁹ This interaction is more complex than Vygotsky claims. In some cases, what is transmitted through education is well assimilated by the child because it represents an extension of some spontaneous construction with consequential acceleration in development. But in other cases, educational transmission intervenes too early or too late, or in a manner that precludes assimilation

³⁵ See Piaget and Inhelder (1956) and Piaget et al. (1960).

³⁶ The reference is apparently to Vygotsky (1986, pp. 175–176, 186–197, 206–208).

³⁷ The reference is apparently to Vygotsky (1986, p. 187).

³⁸ Piaget has in mind a maturational interpretation according to which successive levels emerge spontaneously with advancing age during childhood in disregard of his own constructivist interpretation. Yet the latter interpretation is prominently as evident in Piaget's *Recherche* (1918) as in Piaget et al.'s *Morphisms and categories* (1992). Disregard of a constructivist interpretation in favor of a maturational interpretation is pervasive. A clear example is in Brainerd (1978) where Piaget's own preferred interpretation is stated to be 'minor' unlike Brainerd's preferred "maturational" interpretation which is accorded centerstage.

³⁹ The reference is apparently to Vygotsky (1986, p. 207).

because of a mismatch with spontaneous construction. In that case, the child's development is impeded, or even deflected into barrenness, as so often happens in the teaching of the exact sciences.⁴⁰ Therefore, I do not believe, as Vygotsky seems to do, that new concepts, even at school level, are always acquired through adult didactic intervention. This may occur, but there is a much more productive form of instruction: the so-called “active” schools endeavour to create situations that, while not “spontaneous” in themselves, evoke spontaneous elaboration on the part of the child, if one manages both to spark his interest and to present the problem in such a way that it matches the structures he has already formed.⁴¹

The second problem which is really an extension of the first on a more general level, is the relation between spontaneous concepts and scientific notions as such. In Vygotsky's system, the “key” to this problem is that “scientific and spontaneous concepts start from different points but eventually meet”.⁴² On this point we are in complete agreement, if he means that a true meeting takes place between the sociogenesis of scientific notions (in the field of the history of science and in the transmission of knowledge from one generation to the next) and the psychogenesis of “spontaneous” structures (influenced, to be sure, by interaction with social, familial, scholastic, etc., contexts), and not simply that psychogenesis is entirely determined by the historical and ambient culture.⁴³ I think that in putting it thus I am not making Vygotsky say more than he did, since he admits that spontaneity makes some contribution to development. It remains now to clarify what that contribution is.

4. Operations and generalization

It is on this question about the nature of spontaneous activities that there is perhaps some divergence between Vygotsky and myself, but this difference is merely an extension of the one we noted concerning egocentrism and the necessity for decentration to ensure progress in development.

With respect to the *décalage* in the onset of awareness, we are very much in agreement, except that Vygotsky does not believe that absence of awareness is a residue of egocentrism. Let us look at the solution he proposes: (1) the late development in the onset of awareness is simply the result of the well known “law” according to which the onset of awareness is simply the result of the well known “law” according to which the onset of awareness and control appear only at the end point of the development of function; (2) the onset of that awareness is at first limited to the

⁴⁰ See also Piaget's “Twelfth Conversation” in Bringuier (1980).

⁴¹ For discussion of “active learning” in the sense of intellectual activity, see Piaget (1970, p. 163). An interesting question arises about the extent to which Piaget's use of intervention is different from that due to Adey and Shayer (1994).

⁴² The reference is apparently to Vygotsky (1986, p. 192).

⁴³ See Piaget (1995, p. 92) for the major distinction between heteronomy due to social conformity (such as a chant *Ein Volk, ein Reich, ein Fuhrer*) and autonomy due to creative thought (such as mathematical proof than $1 + 1 = 2$).

results of actions and only later extends to “how”, i.e. to operations.⁴⁴ Both assertions are entirely correct, but they merely state the facts without explaining them. Explanation begins when it is understood that a subject who is centered on his own actions has no reason for becoming aware of anything other than their results; decentration, on the other hand, in which an action is compared to other possible actions and particularly to those of other people, leads to an onset of awareness of “how” and to operations.⁴⁵

This difference in perspective between a simple linear analysis like Vygotsky’s and an analysis based on decentration is even more evident with respect to the principal motor of intellectual development. It seems that, on reading Vygotsky (though of course I do not know the rest of his work⁴⁶), the principal factor is to be sought in the “generalization of perceptions”, and that process is in itself sufficient to bring mental operations into consciousness.⁴⁷ We, on the other hand, in the series of works mentioned above on the spontaneous development of scientific notions, have come to the view that the central factor is the very process of constructing operations *qua* interiorized actions becoming reversible and coordinating themselves into over-arching structures subject to well-defined laws (whose variety is considerable). The progress of generalization is then nothing but the result of this elaboration of operational structures, and these structures derive not from perception but from action in its entirety.⁴⁸

Vygotsky himself was close to such a solution when he held that syncretism, juxtaposition, insensibility to contradiction, and other characteristics of the developmental level which we call today “pre-operational” (rather than “pre-logical”), were due merely to “the lack of a system”.⁴⁹ It is really the construction of systems which provides the deepest underlying characteristic of the child’s attainment of levels of logical reasoning. But these “systems” are not simply the product of generalization: they are multiple and differentiated operational structures whose elaboration can today be followed in sequence.⁵⁰

A small example of this difference in our points of view is provided by Vygotsky’s comment on class inclusion.⁵¹ In reading it, someone could say that the child

⁴⁴ The reference is apparently to Vygotsky (1986, pp. 162–170).

⁴⁵ See Piaget, *The grasp of consciousness* (1977) and *Success and understanding* (1978) for an elaboration of this claim. Instances of defective translation in both texts are discussed by Smith (1981), notably with respect to the title of the 1977 text.

⁴⁶ See Van de Veer and Valsiner (1991, 1994).

⁴⁷ The reference is apparently to Vygotsky (1986, pp. 203–204).

⁴⁸ See Smith, “Introduction to *Sociological studies*” (Smith, 1995a, pp. 12–19). “The social construction of rational knowledge” (Smith, 1996) and “Universal knowledge” (Smith, 1995b) for discussion of the twin claims (i) knowledge develops from action and (ii) progress is marked by the formation of over-arching structures.

⁴⁹ The reference is apparently to Vygotsky (1986, p. 205). This list of properties of children’s thinking has its basis in Piaget’s *Judgment and reasoning in the child* (1928, Chapter 5).

⁵⁰ Reading *structures* for *systems*, compare Piaget’s remark: “it is therefore for the observer to find out whether structures do exist and to analyse them” (1973, p. 46).

⁵¹ The reference is apparently to Vygotsky (1986, p. 198).

discovers inclusion by a combination of generalization and learning: in learning to use the words *rose*, and then *flower*, the child first juxtaposes them, but it is sufficient to generate the generalization “all roses are flowers”, and to discover that the converse is not true, to realize that the class of roses is included in the class of flowers. Having studied such problems at first hand,⁵² we now know how much more complex the question is. Even if a child asserts that all roses are flowers and that not all flowers are roses, he is unable to conclude until reaching a certain level that there are more flowers than roses. To gain access to this inclusion extensionally, a child has to construct an operational system such that A (roses) + A' (non-rose flowers) = B (flowers) and such that $A = B - A'$, hence $A < B$. The reversibility of this system is a necessary condition of inclusion.

In have not discussed up to this point, in this commentary, the question of socialization as a condition of intellectual development, although Vygotsky raises it several times. In my present point of view, this question no longer arises for me in its past form because the focus on operations and decentration tied to the construction of operational structures puts the issue in a new light. All logical thought is socialized because it implies the possibility of communication between individuals. But such interpersonal exchange proceeds through correspondences, unions, intersections and reciprocities, which are still operations. Thus there is identity between these inter-individual operation.⁵³ The conclusion to draw is therefore that operational structures which are spontaneously constructed during the course of intellectual development are in essence the structures of action coordination. Such coordinations are prior to the actions of individuals or to coordination between actions of different individuals, and so to cooperation.

Translator's Note

[1] Most of Piaget's work was published initially in French (Archives Jean Piaget, 1989). The present paper has been one apparent exception since it was initially published in English, appearing as a separate pamphlet with a note (Piaget, 1962):

Comments on Vygotsky's critical remarks on *Language and thought of the child* and *Judgment and reasoning in the child*.

Professor Piaget wrote these comments after reading in manuscript Chapter 2 and excerpts from chapter 6 of Vygotsky's *Thought and language*. His

⁵² See Piaget (1952a, Chapter 7) and Inhelder and Piaget (1964).

⁵³ A similar claim is made by Piaget (1995, p. 94): “a ‘proposition’ is by definition an act of communication at the same time as its communicative content contains an operation carried out by an individual: the grouping resulting from the equilibrium of individual operations and the grouping expressing exchange itself are constituted together, and are only two aspects of a single reality” (p. 94). Note that both such diverse philosophers as the Rationalist Immanuel Kant (see Korner, 1969, Chapter 12) and Positivist Rudolf Carnap (1967, Section 66) provide testimony to the acceptable nature of Piaget's position. See also Note 2 above.

comments were translated from the French by Dr Anne Persons; the translation was revised and edited by E. Hanfmann and G. Vakar.

MIT Press published Piaget's reply as a separate pamphlet, coinciding with the English publication of the first edition of Vygotsky's (1962) *Thought and language*. There are two points to notice. One is that Piaget's pamphlet was written in French, not English. The other is about Vygotsky's limited knowledge of Piaget's work, and equally Piaget's limited knowledge of the work of Vygotsky. In their Translators' Preface, Eugenia Hanfmann and Gertrude Vakar stated (Vygotsky, 1986, p. vii):

Of Piaget, Vygotsky knew only his first two books. In a separately published pamphlet*, Piaget relates his development since the early 1930s to Vygotsky's work, with which he was not acquainted in detail until the present translation was made available to him (circa 1961)... *Jean Piaget, *Comments on Vygotsky's Critical Remarks*, Cambridge, the MIT Press, 1962.

[2] Both Piaget's (1962) pamphlet and Vygotsky's (1962) text have been republished. The former was reprinted — in English — in a Genevan journal (Piaget, 1979). The second English edition of Vygotsky's (1986) text contained excerpts from Piaget's pamphlet. But these excerpts do not amount to the whole English — text. Further, they are excerpts from the 1962 English translation.

[3] In fact, a version of Piaget's original paper has been published in French (Piaget, 1985b), stating:

These “Comments”, written in French by J. Piaget and translated into English by Anne Parsons, were published in English as an appendix to the first English editions of Vygotsky's book *Thought and language*. They were re-published, still in English, in the journal *Archives de Psychologie*, Editions: “Medecine et Hygiene”, Geneve 1979, vol. XLVII, No. 183, pp. 237–249. There was a note to say: Professor Piaget wrote these comments after reading in manuscript chapter 2 and extracts from chapter 6 of Vygotsky's book. The “Comments” are published here for the first time in French, based on a typed copy made available to us by MIT Press. © MIT Press, Cambridge (USA). Piaget's footnotes are indicated by an asterisk (my translation).

[4] The present new translation is based on this French text. It has been made for several reasons:

(i) *Inaccessible text*

The first English version of Piaget's pamphlet was still-born, since it appeared as a pamphlet and not as a book. The justifiable interest in the work of Vygotsky had the consequence that Vygotsky's (1962) book was given almost complete precedence over Piaget's (1962) pamphlet. Further, Piaget's pamphlet has long been unobtainable and its republication (Piaget, 1979) was probably lost on Anglophone developmentalists. Whilst the neglect of Piaget's reply to Vygotsky is understandable, it is hardly justifiable. The new translation is intended to improve access to Piaget's text.

(ii) *Piaget on Vygotsky*

Vygotsky's criticisms of Piaget's work are well known — in fact, they are almost as well known as Piaget's reply is unknown. One consequence is the wide-spread belief that Vygotsky's criticisms are important and decisive, amounting to a refutation of Piaget's account of egocentrism. To be sure, Vygotsky's criticisms are important and Piaget acknowledges this in his reply to Vygotsky, and elsewhere (Piaget, 1995, chapter 9). Whether they are decisive criticisms is quite another matter. One aim of this new translation is to clarify certain issues which are likely to be relevant to the evaluation of this dispute.

(iii) *Piaget's account of culture and society*

Many developmentalists are interested in Vygotsky's work on the grounds that Vygotsky has something to say about social and cultural issues over which Piaget is believed to have little or nothing to say. The recent publication of *Sociological studies* (piaget, 1995) could show that, notwithstanding the evident merits of Vygotsky's position, Piaget's own account is distinctive. The present translation is complementary to Piaget's (1995) account.

(iv) *Piaget – Vygotsky Centenary*

The centenary of the births of both Jeans Piaget (1896–1980) and Lev Vygotsky (1896–1934) is in 1996. Publication of the present translation is timely since it is directed upon the views of the two principal founders of developmental psychology.

Translation Addendum: June 2000

The important distinction between the sense and meaning (reference) of a word was well known to Vygotsky (1994, pp. 239, 243, 318). Thus

(1) the victor at Jena

and

(2) the vanquished at Waterloo

are evidently different in sense and yet refer to one and the same man (Napoleon). The important question behind Vygotsky's (1994, p. 229) use of this example concerned the mechanism responsible for conceptual development, such as the advance in uses of language in the expression of both factual and logical relationships. This striking example is due to Husserl, no doubt due to the influence of Frege who used his own famous example

(3) the Morning Star

and

(4) the Evening Star

whose senses are different and yet whose reference is one and the same planet Venus (both Husserl and Frege are discussed in Smith, Dockrell & Tomlinson, 1997,

pp. 6–9). The question asked by Vygotsky can be clarified through Frege’s epistemology since Frege had pointed out that the “cognitive value” of

(5) The Morning Star is the Evening Star

which is presumably based on empirical (factual) discovery is different from the “cognitive value” of

(6) The Morning Star is the Morning Star

which is an analytic (logical) truth. Frege realised that all knowledge acquired by the human mind is mediated by human thinking. Frege regarded logic as the formal science of truth, which could serve to “break the power of the word over the human mind” (quoted in Smith, 1999b). It is at least arguable that Vygotsky (1994, p. 163) had a comparable view when he remarked on the “unity, but not the identity, of higher and lower psychological functions”. Indeed, Vygotsky (1994, p. 166) cited with approval the distinction drawn in Goethe’s *Faust* between

- in the beginning was the word
- in the beginning was the deed

The first is an allusion to the opening of John’s gospel, and Vygotsky explicitly rejected this in its application to child psychology. Thus it was Vygotsky’s view that action is the source of knowledge. And it is exactly this view which Piaget (1918, p. 116) had set out in his first book, *Recherche* (though see footnote 15 in this translation) in that “action combines facts and norms”. As all the world knows, one of Piaget’s main aims was also to show in his empirical studies, firstly, that language is not the source of knowledge and, secondly, that action is just such a source.

There is reasonable evidence that Piaget learned about the work of Frege whilst he was still a student at school and university in Neuchatel (Smith, 1999a). There are in fact a series of parallels between the (theoretical) epistemology of Frege and Piaget’s developmental epistemology (Smith, 1999b, c) which are summarised in an AEIOU (autonomy, entailment, intersubjectivity, objectivity, universality) mnemonic. In the translation, autonomy is invoked in footnotes 20 and 43; entailment (modal knowledge) in footnote; intersubjectivity in footnote 2; objectivity is presupposed by footnote 34, and universality is presupposed in footnote 50. Using the model set out in *Recherche*, Piaget’s account set out to chart the combination of psychological facts and epistemological norms in the development of knowledge.

Piaget and Vygotsky are widely recognised as giants of developmental psychology. Even so, Piaget regarded his work as a contribution to developmental (genetic) epistemology. And Vygotsky’s work was evidently informed by epistemology, as the example above shows. An epistemological interpretation of their several contributions has yet to be systematically undertaken with special attention to cognitive development. This is quite an oversight. If “cognitive development” means anything, it means the development of knowledge. And epistemology is the theory of knowledge.

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