Chapter Three: Literature Survey

A selection of studies that have used the functional method of double stimulation in a number of ways but which do not diverge too greatly from the original is presented here: my coverage of these studies is selective and is not intended in any way to be representative or exhaustive.

I discuss these studies briefly in chronological order, starting with the 1940s but excluding the work of Hanfmann and Kasanin (1937; 1942), and of Vygotsky (1934/1986), as these works have already been dealt with at length earlier in this paper and in the attached Appendices.

In the 1940s, Eugenia Hanfmann presented findings in a talk to the American Psychological Association on her study conducted using the “Ach-Sakharov Test”, where she notes that “the concept-formation test may prove to be another good instrument for revealing significant personal patterns in approach to problems” (1940, p. 515). The published paper of this study of 64 adults yielded two main types of approaches – the ‘thinking’ or ‘conceptual’ subjects and the ‘perceptual’ subjects. The ‘thinking’ subjects preferred to ‘think out’ rather than touch or handle the test material, and showed a preference for using shape as a basis for grouping – and were often frequently disappointed with the solution when they found it. The perceptual subjects, on the other hand, manipulated the test material, by touching and looking at them, and getting ideas about how to solve the problem from this physical engagement with them. These subjects were not dissatisfied with solution as it was a process of discovery for them; however, they favoured colour and size.

The perceptual group solved the problem in nearly half the time, but Hanfmann advises that this result should not be taken to mean that a perceptual approach is necessarily more efficient than a thinking or ‘conceptual’ approach. This is because the ‘perceptual’ group favoured size, and size is one of the factors in arriving at the solution, whereas shape, favoured by the ‘thinkers’, is not.

Further, concordant and discordant patterns in performance were found in both groups, where concordance is a harmonious combination of thought and perception, and discordance is where they are at odds with each other. The concordant group performed better in terms of efficiency, and were less ‘emotional’ or frustrated during the experiment. Hanfmann’s study also found that women were more likely to use the ‘perceptual’ approach, and that higher levels of education correlated with the use of the ‘conceptual’ or thinking approach.

Hanfmann concludes her paper by viewing her findings as requiring further work and that studies which consider intellectual performances in relation to people’s personalities is productive and worth continuing; the Vigotsky Test is “a very sensitive instrument for determining the degree of ability for abstract logical thinking, because only subjects who possess this ability in a high degree can solve the problem through a series of logical steps in a systematic insightful way” (1940/41, p. 316).

In the 1950s, Semeonoff and Laird’s (1952) work involved the use of the ‘Vigotsky Test’ “in connexion with a war-time ‘Special Service’ selection procedure” and was further used in a number of subsequent, military-related studies. They attempted over a number of years to provide quantitative scoring for the ‘Vigotsky Test’, such as different scoring for clues from Hanfmann and Kasanin’s procedure and graded categories for how the subjects proceeded in solving the problem of the blocks. These authors used numerals on the bottom of the blocks, and the subjects were asked to explain the principle used in solving the problem: they argue very strongly that if researchers are interested in more than just intelligence testing and intellectual capacity, if they are interested in how a subject “uses what he has, how he applies himself and adjusts himself to a problem, surely one will set
unnecessary limits to the field available for study if one clings to the traditional test methods which,
by their very construction, make it extremely difficult, if not impossible, to find out anything definite
about a subject’s test performance until he has actually completed it?” (Semeonoff & Laird, 1952, p.
101). Semeonoff and Laird also point to the valuable findings related to behaviour patterns yielded
by detailed recordings of subjects with the ‘Vigotsky Test’, and further, that Laird’s work with it
“threw up numerous others – distinctive ways of absorbing fresh clue information, particular ways of
reacting to blockages and prolonged failure, individual differences in range of alternative hypotheses,
varying tendencies to discard or to retain faulty hypotheses, amount and nature of accompanying
verbalization, etc” (1952, p. 101). They conclude their paper by stating that the ‘Vigotsky’ test
“affords ample opportunity for the study of the processes rather than the products of conceptual
thinking, and as such it offers valuable or even indispensable supplementary material to the results of
orthodox intelligence testing” (Semeonoff & Laird, 1952, pp. 101-102).

In 1968 Stones and Heslop conducted a meticulous study with primary school children in the
United Kingdom. The main finding of Stones and Heslop’s study of 60 children between the ages of
six years and six months to eleven years and six months was that ability to sort the blocks correctly
(and to transfer) was associated more with verbal ability than with age or non-verbal ability. Stones
and Heslop report that this relationship confirms Vigotsky’s contention that concepts are formed
through more than just the interaction of associations.

Stones and Heslop (1968) administered both the Simplex Group Intelligence Scale and the
Raven’s Progressive Matrices prior to the study, and, since details on transference from Vygotsky
were sketchy, Stones and Heslop developed five well-thought-out extension tests. They also found
evidence of pseudoconceptual thinking in some of their subjects who were able to solve the problem
of the blocks even though they only had a ‘vague notion’ of the principles involved – and that this
‘inadequacy’ would probably go unnoticed in more structured, school-like environments.

An issue that I do need to raise, however, is that what is not clear in the transference tests of
Stones and Heslop is how the children classified the other objects and pictures. For example, in the
extension tests, it is not clear if the children were using mnemonics of some kind (i.e., the remembered
positions of the sorted blocks in the four corners of the board) or not. If, for example, the sorted
(and resorted) blocks had been positioned as depicted below, it is not clear from Stones and Heslop’s
paper whether the children followed this placement in helping them to remember which of the labels
referred to what:

```
      |          |          |
cev blocks | bik blocks |
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```
      |          |          |
mur blocks | lag blocks |
```
```
      |          |          |
cev building | bik building |
```
```
      |          |          |
mur building | lag building |
```
```
      |          |          |
cev man | bik man |
```
```
      |          |          |
mur man | lag man |
```
```
      |          |          |
cev tree | bik tree |
```
```
      |          |          |
mur tree | lag tree |
```

I believe this question is important in relation to the pilot studies I conducted, where with the
resorting of the blocks, I deliberately put the sample mur block into a different corner. When asking
my subjects to ‘think aloud’, they admitted to being ‘helped’ by remembering where on the board the
sorted blocks lay, and that this helped further to ‘anchor’ in remembering what the nonsense words
referred to when asked to discriminate between all four at once.
However, Stones and Heslop do write that in the fifth of the extension tests, “the ability to state the defining attributes of a concept is the acid test of conceptual thinking” (p. 270) and that this aspect was the most difficult for the subjects, where 36 of a maximum possible 240 correct answers was obtained (Stones & Heslop, 1968, p. 268). It is just possible that in the process of the four preceding transference tests, these served to consolidate the newly acquired words in the minds of the subjects.

In 1970, Elisabeth Stones conducted further work with the method of double stimulation using blocks labelled cev, bik, mur, and lag, and another set of blocks without labels with the intention of establishing whether the level of verbal ability was the crucial factor or not in the formation of concepts. Her study concluded that, language proficiency aside, the labels do in fact facilitate the formation of new concepts. However, the questions I raised about her earlier work with Heslop above regarding mnemonics in transference tests still apply. Before concluding her paper, Stones touches on those studies (for example, Semeonoff and Trist (1958) who used numbers), and others that used abstract designs which could have produced the same result: she argues that, be this as it may, the nonsense syllables duplicate the circumstances in which children find themselves when they learn the word meanings and referents of the adult speech community.

I would, however, add my own observation regarding the language of the subjects in Semeonoff and Trist’s (and Laird’s) studies: it is possible that military personnel are used to referring to divisions and squadrons in numerical terms, so the use of numbers/numerals has, for them, a different slant that civilians do not so readily have. In the speech community of the military, then, the use of numbers for the blocks could serve a similar purpose to nonsense syllables, although the name “Twenty-Third Squadron”, for example, does not have a descriptive or semiotic function.

This being said, however, as Stones’ (1970) study clearly shows, a higher level of verbal ability, when faced with a concept-learning situation that does not have verbal referents, is not as successful as it is when they are present.

Wadsworth Denney’s (1972) work investigated procedural differences relating to the work of both Inhelder and Piaget, and Vygotsky, and a variety of subsequent studies. Although she claims her procedure with the blocks is ‘similar’ to that of Vygotsky’s approach, I believe that her departure from it is too far from the original method to be even ‘maximally similar’. However, the argument she presents about young children’s ability to infer the part of speech of a nonsense word from its position in a sentence is of value: bias regarding shape or colour of the blocks could be introduced unwittingly by the researcher who uses the nonsense words as adjectives or nouns. This use of the nonsense words could lead young children to focus more on shape rather than colour because noun and shape labels are more often used in English than are colour labels. Whilst colour and shape are not important in solving ‘Vygotsky’s Blocks’, I took heed of this finding of Wadsworth Denney’s, and in my pilot studies and in the research itself, consistently referred to ‘cev’ blocks, ‘lag’ blocks, and so on. I also found this use of the nonsense words to be consistently used in Hanfmann and Kasanin’s work, where the subject is told that this block, for example, “is called mur”, and the subject is asked to pick out all of the blocks that they think “belong to this kind” (Hanfmann & Kasanin, 1937, p. 535).

The 1980 studies include a remarkable paper entitled Saussure and Vygotsky via Marx, where Genevieve Vaughan (1980/81) draws comparisons between the langue and the parole of a linguistic system with that of an economic one. She brings together meaning, money, labour, and culture, and provides an insightful discourse of Vygotsky’s framework on conceptual development which covers the langue of four ‘mutually exclusive signifiers’ and the parole of coming to understand what certain
culturally significant and relevant concepts mean. She also is of the opinion that two processes of polarisation are required for concept formation, where the first is between the sample as an equivalent and the other blocks as relative, and where the second is between the relevant and the non-relevant characteristics of the sample as well as those of the other blocks.

A second 1980s study by Cameron and Davidson (1981) has, for me, a confusing element, and one of value. The confusing element relates to the way in which study was conducted by focusing on ‘verbal labels’ per se and not on the crucial aspect that solving the problem posed by the blocks is not merely ‘facilitated’ by verbal labels: it is a process of coming to understand what the labels mean. The method of double stimulation is not a study of classification facilitated by labels — classification of the blocks is merely the vehicle used to reveal the conceptual processes in coming to understand what the labels mean and being guided by them. The valuable element of this study is that it validates ‘in part’ certain of Vygotsky’s ‘contentions’: the trend in development from syncretic to complexive to conceptual modes of operating was found, where their subjects aged 8 and 11 years old demonstrated a predominance of complexive behaviour.

In the 1990s, several studies — Bacalarksi (1996) and Tuomi (1998) — analyse or adapt the method of double stimulation to computer environments. Bacalarksi’s tentative analysis looks at how novice users become more adept at using and understanding computers and she uses Vygotsky’s findings on the paths to conceptual thinking for this analysis. She maintains that most users, compared to experts, are at the pseudoconceptual level, and that time and further developments are required before users achieve ‘adulthood’ as computer-literate users. Tuomi’s paper is about an adaptation of the method of double stimulation in collaborative environments in the setting of a large mobile telephone manufacturer, and concludes that Vygotsky’s theoretical framework provides better explanations for both individual and collaborative learning in corporate enterprises than do other kinds of models. A further study in the 1990s conducted by Portes, et al., (1997), is a sophisticated and meticulous study using a variant of the method of double stimulation in terms of semiotic uptake in a ‘teaching experiment’ for the examination of metacognitive concept formation in parent-child interaction. The semiotic mediation provided by parents and the nature of the task are investigated in a microgenetic research situation using this approach inspired by the method of double stimulation which explores the movement between the inter- and the intrapsychological planes within the zone of proximal development.

In the 2000s, Fuad Topić’s paper traces the development of the “Vygotsky Test” in a way different to that presented here, and notes that the procedure can still be used to identify conceptual thinking (or lack of it) in clinical analysis as part of a battery of other psycho-diagnostic tools.

To conclude this chapter I have chosen to present a discussion by Wertsch (2000) because although the paper is a commentary on Gal’perin’s perspectives dealt with in one of the main papers in the journal, Wertsch presents a view of Vygotsky that brings matters full circle for me. Wertsch (2000) writes that there are two aspects to Vygotsky’s thinking that have led him, on several other occasions, to refer to Vygotsky as an “ambivalent rationalist” (Wertsch, 2000, p. 104). Like Gal’perin and Davydov, Vygotsky’s view of the direction of human cognition seems to be taken as one directed towards ever-increasing levels and abilities for abstract rationality. “Rational reflection and rational self-regulation” writes Wertsch, about the direction that this views takes, “are assumed to be the teloi of human development” (2000, p. 104).

Wertsch explains that Vygotsky’s position in this respect is to be found in his writing about conceptual development from the syncretic and subjective heaps to complexive thinking, unstable as
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it is in its attempts to be objective, to the mimicry and functionality of pseudoconcepts, and finally towards true concepts, based on the stable foundations of objectively derived meanings and connections between things. Wertsch points the reader to Chapters 5 and 6 of *Thinking and Speech*, where Vygotsky provides an account of conceptual development based on his empirical studies with the “Vygotsky blocks” and his studies of child-adult interaction “in formal instructional settings where abstract rationality is privileged” (2000, p. 104).

But then, Wertsch notes, a “funny thing happens” after the end of Chapter 6 and the beginning of Chapter 7, because Vygotsky begins to quote poets and writers and writes about situated, highly contextualised speech issues, as in the ‘sense’ and ‘abbreviation’ of word meanings and word usage. Wertsch believes that this shift in orientation by Vygotsky “reflects a deep ambivalence and wonderment” about “what it is to be human” (2000, p. 105).

This shift allows Vygotsky to take in both abstract rationality and the other dimension of human consciousness, that of aesthetic appreciation, or of imagination, where this second dimension is not ranked any lower than abstract reasoning because it is “simply a qualitatively different side of mental life” (Wertsch, 2000, p. 105). By citing romantics and poets and writers, and by taking account of the views of the enlightenment, the rationalist persuasion, Wertsch notes that Vygotsky explored these two aspects of human consciousness in relative isolation from one another, but that:

No one has found a very satisfactory answer to the puzzle of how to integrate these two teloi of human nature or the two theories of meaning [cf. Taylor, 1985] associated with them. The point is simply that unlike many psychologists, Vygotsky made room for both aspects of human consciousness and in the end vacillated between them in his writings. (Wertsch, 2000, p. 105)

Wertsch concludes his commentary on the Gal’perin paper of Arievitch and Stetsenko by advancing the idea that the work of these two writers leads, among other things, to questions regarding how to portray or characterise the source of Vygotsky’s ambivalence about rationality “and how the two sides of human consciousness that he envisioned can be understood in a more overarching system” (Wertsch, 2000, p. 106).

Wertsch’s discussion leads to back my fascination with Vygotsky’s work in general and with his Blocks. I am awed at the flood of Vygotsky’s ideas springing alive with the turning of each page, for how his argument and evidence break down complicated processes into the niceties of detail, and yet are sometimes written in a language that appeals to the poet in me, to cite but two examples:

Like a biblical tribe that longed to multiply until it became countless like the stars in the sky or the sands of the sea, a diffuse complex in the child’s mind is a kind of family that has limitless powers to expand by adding more and more individuals to the original group. (Vygotsky, 1986, p. 118)

Consciousness is reflected in a word as the sun in a drop of water. A word relates to consciousness as living cell relates to a whole organism, as an atom relates to the universe. A word is a microcosm of human consciousness. (Vygotsky, 1986, p. 256)

Vygotsky is, for me, for these reasons, a man for all seasons.