Vygotsky, education, and teacher education

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Abstract

The work of Vygotsky is widely used in teacher education and other education-related literature, in discussion of sociocultural perspectives, and in relation to themes such as second language acquisition, the teaching of mathematics, and approaches to teaching and learning. Much of this work gives the impression that Vygotsky's work is unproblematic. This paper challenges that view. It is argued that Vygotsky's descriptions of learning and teaching draw on sociocultural themes but that the theoretical account he proposed to explain those descriptions is disputable. The possible implications for thinking about child development, learning, teaching, and teacher education are then considered.

Introduction

Vygotsky's work is often brought forward as a theoretical underpinning for certain approaches to learning and development, including teacher learning and development, as noted by Smagorinsky (2011, 3) – see for example, Ghassemzadeh (2009), Fani and Ghaemi (2011), Stephen (2010), Ellis (2010) and Castro-Félix & Daniels (2018). It has been suggested that 'it would be helpful for teachers to get inspiration from Vygotsky's ideas' (Bekiryazıcı 2015, 914). According to one publisher, Vygotsky is one of '10 learning theorists every trainee teacher must know' (Sage Publishing n.d.). Vygotsky is also one of the most prominent names in sociocultural and socio-constructivist perspectives (Hedges 2014, 56) and in the application of such perspectives to themes such as second language acquisition in general (Drury 2013, 358) and in learning the use of adverbs in particular (Rezaee and Azizi 2012). Vygotsky's name is also used to justify approaches to, for example, the teaching and learning of mathematics in Singapore (Seng 2000) and elsewhere (Crawford 1996; Kinard and Kozulin 2008; Mok and Morris 2001). It is Vygotsky to whom teachers and teacher educators often turn in order to attempt to justify and supposedly explain certain approaches to child development, teaching, and learning – one such approach of increasing significance in the context of schools in England is reciprocal reading (or reciprocal teaching) (McAllum 2014, 26); another approach in educational research associated with Vygotsky's work is Cultural-Historical Activity theory (CHAT); see, for example, Fleer (2016) and Roth and Lee (2007). Vygotsky's name, and terms such as 'appropriation', 'scaffolding', and the 'zone of proximal development (ZPD)', are often found in education-related contexts – see, for example, Arshad and Chen (2009), Eyler (2015), Jolliffe and Waugh (2017), and Titcombe (2017). These examples make the point that many terms associated with Vygotsky have passed into standard use with little

indication that they are, or could be, problematic (Gillen 2000, 183-4) or insensitive to different contexts (Lee and Tseng 2008, 185-6). Our argument in this paper is two-fold: first, to highlight why we consider aspects of Vygotsky's work to be problematic and, second, to challenge the use made of Vygotsky's formulations (and, in particular, the zone of proximal development) at least insofar as they are often characterised in literature about children's learning and teacher education. The confines of one article do not permit a systematic analysis of all Vygotsky's works but we suggest that many in teacher education refer to Vygotsky, and most especially to the zone of proximal development, without a full understanding of Vygotsky's theoretical position. Many educators, we suggest, are particularly prone to the slippage between empirical work and Vygotskian theory that is the focus here.

Vygotsky – some preliminaries

There are several problems facing the reader of Vygotsky's work. One problem is that the publication dates are often misleading. Vygotsky died in 1934, yet many publications of his work have publication dates after his death. In addition, what is familiar as a single published work is sometimes an edited collection of work written at different times and so a single date of publication can be misleading. Another problem is that his work is read by most in a translated version. Cole (2009), for example, highlights some of the issues he considers arise from the translation of the Russian terms *obuchenie* and *uchenie*, how these words relate to terms such as instruction, learning, and development, and some of the contextual factors involved. Similarly, Yasnitsky and van der Veer (2016) discuss complexities associated with translating terms associated with consciousness, mind, cognition, meaning, and sense. They

comment that, for an English-speaker:

> the implied interconnections [between many words and expressions] that exist for
> the Russian speaker are typically obscured by the language and cultural traditions
> of its use, and remain, thus, 'lost in translation'. (Yasnitsky and van der Veer 2016,
> 236)

As a result of these different traditions, and of the various translations of Vygotsky's work, it is difficult to be sure of the nuances of Vygotsky's writing, and how it developed over time (Yasnitsky 2011b, 54). As a consequence, although, according to Yasnitsky, 'Vygotsky's *Thinking and speech* is typically presented as the last and most mature of his works, as some kind of summary of all his theoretical work and a scientific testament to his students, followers and future generations of psychologists' (Yasnitsky 2011b, 56-7), it does not, as a whole, reflect the last phase of Vygotsky's theory of this period, and may not represent Vygotsky's views accurately, for reasons explained by van der Veer and Zavershneva (2018, 102). In addition, it also has to be borne in mind that not all of Vygotsky's work has been published or translated (van der Veer and Yasnitsky 2011), and that not all of those works that *have* been published were intended for publication by Vygotsky (Yasnitsky 2011b, 54). For these reasons, even to attribute to Vygotsky a theoretical position characterised by terms such as sociocultural, social constructivism, or cultural-historical is, suggests Yasnitsky (2019, 1-2), fraught with difficulties. How Vygotsky's work may have developed had he lived longer can only be a matter for speculation.

The sheer volume and complexity of the many editions and varying translations of Vygotsky's work means that it is impossible in one paper to examine the whole corpus of his work – a point made by others: see for example, Gillen (2000, 185-6). It is also relevant to highlight that some chapters in the collected works of Vygotsky were

student notes from lectures Vygotsky gave (see Chaiklin 2003, 44). In addition, the authorship of some of the published works is disputed (Yasnitsky 2011a, 425), and concerns have also been expressed by some about the heavy editing of Vygotsky's work in the process of translation (see Gillen 2000, 187). A further difficulty facing the reader of Vygotsky is that Vygotsky can sometimes use words with a special meaning (Chaiklin 2003, 51-2), a point to which we will return. Allied to the fact that Vygotsky 'is very much adored and admired by his self-appointed followers and advocates worldwide' (Yasnitsky 2019, 1), there are then good reasons for approaching Vygotsky's work with caution.

Turning now to references to Vygotsky made by those in education, various researchers and practitioners have used his ideas and concepts in different ways and, without doubt, their knowledge of Vygotsky's theories varies. Some engage with the challenges of Vygotsky's work – see, for example, Jones (2009). In teacher education, as elsewhere (Dafermos 2016, 27), many references to Vygotsky are to *Mind in Society* (Vygotsky 1978) and the 1986 version of *Thought and Language* (Vygotsky 1986). These two sources have had, according to Gillen, 'an overwhelmingly prominent influence… [albeit] with regrettable consequences' (Gillen 2000, 186). For example, it is these two sources to which Ellis (2010) refers, as does Nurfaidah (2018), and it is one or other of these two sources that are used in Pugh and Duffy (2006, 206) which lists only *Mind in Society* in the reference list, and Palaiologou (2008, 123), where *Thought and Language* is the only Vygotsky text listed in the reference list. Given that *Mind in Society* was 'by admission of its four editors, "constructed" from bits and pieces of the text of Vygotsky and his associates' (Yasnitsky 2019, 4), it could be argued that to base any use of Vygotsky's work on this source, let alone a critique, is problematic. For this reason, we also draw on the *Collected Works* of Vygotsky (Vygotsky 1987, 1998a,

1998b, 1998c, 1998d) to highlight aspects that we believe are important elements of Vygotsky's approach.

Vygotsky: Theory and practice

We turn now, cautiously and mindful of the caveats already expressed, to consider Vygotsky's view of language and, in particular, his notions of internalization and abbreviation. These notions have been subject to a detailed critical examination elsewhere (see, for example, Newman 2018). One aspect of the approach Newman adopted in critiquing Vygotsky's work was to distinguish clearly between the observations Vygotsky made, and the explanation or theory that he proposed to account for them, and we shall adopt the same approach here.

Theory

Vygotsky's methodology reveals that he is seeking explanations for what he terms 'the higher forms of behavior' (Vygotsky 1978, 61); it is Vygotsky's view that 'child psychology until recently lacked a proper scientific conception of the nature of higher mental functions' (Vygotsky 1998c, 34). Vygotsky makes a distinction between viewpoints in psychology concerning descriptions of 'an object's current features and manifestations' (Vygotsky 1978, 62), which he terms the phenotypic viewpoint, and those genotypic or explanatory, where 'a phenomenon is explained on the basis of its origin rather than its outer appearance' (Vygotsky 1978, 62). For Vygotsky, the aim is analysis that is explanatory as opposed to descriptive (Vygotsky 1978, 65) – a point also made by Chaiklin (2003, 46). Three principles form the basis of this approach: the first of these is the principle 'analyzing process, not objects'; the second is 'explanation versus description'; and the third is concerned with the 'problem of "fossilized

behavior"' (Vygotsky 1978, 61-5). For him, the first principle means that what should be of concern to the psychologist is the process of the development of a psychological function rather than the end product's external characteristics. In his view, the second principle puts emphasis on the underlying developmental genotype of psychological functions rather than their external manifestations. This helps the psychologist distinguish those psychological functions that are in appearance the same yet have a different explanation or origin, or vice versa (Vygotsky 1978, 62). As to the third proposition, on Vygotsky's view, 'so-called automated or mechanized psychological processes' (Vygotsky 1978, 63) should be studied in terms of their development and not in terms of their final automated appearance if lower psychological functions are to be distinguished from higher ones. As Vygotsky put it: the aim is to find 'a correct conception of the intellectual crisis and maturation that are the content of the development of thinking in the adolescent' (Vygotsky 1998c, 29).

Chaiklin characterises Vygotsky's work as being concerned with child development when he wrote, citing Vygotsky (Vygotsky 1998d, 189) within his comment, that:

> Vygotsky formulated several requirements or criteria that should be satisfied by a model of child development. First, the model must be explanatory, rather than descriptive. More specifically, the model should be organized by substantial principles that can explain development 'as a single process of self-development'…Second, the model should consider the whole child, as an integral person. Third, childhood should be divided into periods, such that each period is characterized in a principled and unified way. (Chaiklin 2003, 46)

This approach leads Vygotsky to draw a contrast between 'experimental psychology' (Vygotsky 1978, 61) or 'object analysis' (Vygotsky 1978, 62) on the one hand, and 'developmental psychology' (Vygotsky 1978, 61) or 'process analysis' (Vygotsky 1978,

62) on the other. The former is concerned with 'the analysis of an object' (Vygotsky 1978, 61) and the latter with the underlying process. This distinction is important argues Vygotsky, because it is a mistake to think that

> every object …[is] phenotypically and genotypically equivalent…[because] if the true principles of its construction and operation were expressed by its outer manifestation…, then everyday experience would fully suffice to replace scientific analysis. Everything we saw would be the subject of our scientific knowledge. (Vygotsky 1978, 63)

In regard to what Vygotsky terms 'fossilized behavior', here argues Vygotsky, what we can sometimes see are types of behaviour that result from

> automated or mechanized psychological processes which, owing to their ancient origins, are now being repeated for the millionth time and have become mechanized. They have lost their original appearance, and their outer appearance tells us nothing whatsoever about their internal nature. Their automatic character creates great difficulties for psychological analysis. (Vygotsky 1978, 63-4)

Thus is established in Vygotsky's argument a clear distinction between the external manifestation and the internal processes, with no assumption that the former is a guide to the latter.

One key aspect of Vygotsky's *theoretical* account is the notion of the developmental continuum. Vygotsky argued that higher level psychological functions are acquired through processes that form a continuum from external speech to inner speech, thought and motivation. This continuum has been detailed elsewhere (Berducci 2004; Newman 2018) and so here we will draw on Newman (2018, 354-5) to briefly summarise the main components of what Berducci highlights as the microgenetic continuum, as this is concerned with the transition from a less to a more capable individual (Berducci 2004, 332) and so is relevant to the particular concerns of this

paper. It is worth noting in passing that Berducci does not claim that all aspects Vygotsky's complete developmental continuum are microgenetic. He writes:

> Vygotsky's complete developmental continuum comprises four stages: phylogenetic (transformation from ape to human), sociohistorical (primitive to modern), ontogenetic (child to adult) and microgenetic (less to more capable individual). Between each pair of stages, a qualitative jump is evident. (Berducci 2004, 332)

It is clear then that Vygotsky considered the continuum a central process in the development of individuals from childhood to adult life.

Vygotsky claims that at the earliest stages of the development of thought and speech in the human child, an analogy can be drawn between human children and chimpanzees in that they have natural biological abilities which enable them to react to stimuli (Vygotsky 1986, 80). Here, thought and speech are biological, based on an 'innate, natural form of behaviour' (Vygotsky 1986, 94); they are 'preintellectual' and 'prelinguistic' (Vygotsky 1986, 83). However, Vygotsky continues, after about two years, the child comes to have 'the first dim realization of the purpose of speech' (Vygotsky 1986, 82). Thus, considers Vygotsky, the child has moved onto the developmental continuum and is participating in External Speech (Berducci 2004, 337). From here the child moves along the continuum, to Written Speech at one end and, through External Speech, to Private Speech (sometimes termed Egocentric Speech), and then, in turn, to Inner Speech, Thought, and Motivation at the other. For Vygotsky, this movement along the continuum involves internalization and abbreviation, and, in Vygotsky's view, the different components of this continuum are not different things but different aspects of one and the same thing (Berducci 2004, 337). Thus, on Vygotsky's argument, internal processes can be directly observed in external processes

(Berducci 2004, 344-5) and, 'in Vygotsky's system, inference is unnecessary to access another's inner world; rather, a transformed version avails itself' (Berducci 2004, 345).

What is the evidence for this continuum? If we accept the assertions of internalization and transformation, then the external aspects of the continuum necessarily provide evidence of the inner aspects. Acceptance of this link is seen when Vygotsky writes:

> We may consider it to be an experimentally established fact that habits and associated mechanisms do not act without system, automatically, chaotically …. [but] that they all really are induced to activity only as subordinate points in some general structure … within which they acquire their functional significance and their sense. (Vygotsky 1998b, 8)

However, if we do not accept the assertions of internalization and transformation (and, as we shall see, there are good grounds not to do so – see also Yasnitsky (2019, 9-12)), then, remarkably, there is no evidence of the inner aspects of the continuum. As has been argued elsewhere (Newman 2018, 356-7), Vygotsky has used his observations of children learning to *infer* the existence of the supposed inner modes of Private Speech, Inner Speech, Thought, and Motivation, and the

> attempted resolution of this problem, namely that the inner modes are transformations of the outer modes and can thus be seen directly … merely assumes the continuum that it is meant to justify. (Newman 2018, 357)

This, some counter, is because all mental functions are necessarily inferred (van der Veer and Zavershneva 2018, 103), a view with which we will take issue shortly. On the same lines, Lawrence and Valsiner argue (although qualifying their remark with the word 'mostly') that this view of mental functions poses methodological problems:

> Clearly any study of internalization/externalization processes poses complex methodological challenges—of how to analyze the constructive nature of processes that are mostly invisible to external observers, and how to look into the role of time entailed in these processes. (Lawrence and Valsiner 2003, 748)

Lawrence and Valsiner (2003) set out to present 'an account of basic internalization/externalization processes as the vehicle by which socio-cultural meanings are turned into personal sense systems' (Lawrence and Valsiner 2003, 723). They believe that:

> Taken together, the theoretical account and the empirical example emphasize both the primacy of the social and the cyclical personal processing by which the mind constructs personal meaning out of the social. (Lawrence and Valsiner 2003, 748)

However, their claim that such personal meanings can be accessed, albeit in a limited way, by people being able to express their thinking (for example, by writing, or by verbalising responses) (Lawrence and Valsiner 2003, 738) merely assumes the point at issue. In addition, the argument that all mental functions are necessarily inferred and that there can therefore be no evidence for the continuum runs counter to Vygotsky's notion of transformation, the assertion of which was an attempt to eliminate the need for inferring. Here again, the paper by Lawrence and Valsiner provides no evidence of how social meanings are 'transformed' into 'personal meanings' (Lawrence and Valsiner 2003, 747), nor is the difficulty clarified by Vygotsky's description of inner speech and its relation to external speech (Vygotsky 1986, 249-51).

We turn now to the second strand of our argument, namely that as indicated in our introductory remarks, such difficulties with Vygotsky's theoretical perspective do not always find expression in the literature on Vygotsky's work as it relates to education, including teacher education. The assumption seems to be that either there are no difficulties or that, notwithstanding any difficulties, his work is important because of

the practical implications it has for teaching. With this in mind, we turn now to consider one of the most popular notions in education-related uses of Vygotsky's work - the zone of proximal development.

Practice

The zone of proximal development is, it would seem, the aspect of Vygotsky's work most often used in book about education (Robson 2006, 28), together with the allied notions of the 'more knowledgeable other' and scaffolding. Let us take as a first example of this the case of teacher development (Kuusisaari 2014) and teacher collaboration or as Kuusisaari puts it, teachers 'at the zone of proximal development' (Kuusisaari 2014, 46). According to Kuusisaari, 'The Vygotskian approach is the theoretical basis of this study, and it emphasizes the importance of collaboration in learning' (Kuusisaari 2014, 47). We read that 'Vygotsky's (1978) concept of the zone of proximal development (ZPD) offers a theoretical approach to the research of teacher development in this study' (Kuusisaari 2014, 47), and that 'The broad theoretical framework of this research is the use of ZPD as a tool for understanding the process of collaborative knowledge creation' (Kuusisaari 2014, 47).

Let us take as a further example an article concerning children's education which claims to offer a 'conceptual model … based on Vygotsky's (1978) sociocultural theory and the related notions of zone of proximal development (ZPD) and assisted learning' (Morcom 2014, 18). Morcom draws on a qualitative study of the social practices in two classrooms involving social and emotional aspects of learning. In her examination of the social interactions of teaching and learning, Morcom brings forward evidence to argue that both verbal and non-verbal language are important, that rules and behaviours are sometimes modelled and sometimes taught explicitly, that sometimes

learning is from peers, and that discussion can also be valuable (Morcom 2014, 24-8). Morcom argues that 'individuals can be members of multiple communities, therefore having access to a variety of sources from which to make meaning …to generate shared understandings about how the community operates' (Morcom 2014, 20). In all, Morcom considers that teachers 'are well placed to create a supportive learning environment and promote positive relationships through scaffolding social and emotional learning' (Morcom 2014, 18). She argues that 'teaching is conceptualized as relational and occurs within a social and cultural context' (Morcom 2014, 18) and where (Morcom here draws on work by Kovalainen and Kumpulainen) 'norms, values, rules, roles and relationships are socially constructed' (Kovalainen and Kumpulainen 2007, 141, cited by Morcom 2014, 18). She concludes: 'Each social practice developed apprenticeship, guided participation and appropriated ways of participating' (Morcom 2014, 28).

As a third example, and along the same lines, Shabani (2016, 9), extending the notion of the ZPD to adults and teachers' professional training, argues that an 'important feature highlighted … [is] the superiority of Vygotsky's sociocultural theory over the existing ones because it takes into consideration almost all the relevant factors essential for teacher development including *cognitive*, *affective*, *social*, and *contextual*'.

At this point, it is relevant to note that the uses made with reference to the zone of proximal development vary. Chaiklin (2003, 41-2) provides a useful summary of some popular interpretations, suggesting that there are, first, those who take it to refer to a range of tasks or skills view; second, those who emphasise the adult or peer interaction; and third, those who emphasise the properties of the learner and their willingness to learn. We can see evidence of these approaches in the books to which reference has already been made and in further instances. Palaiologou for example, writes that the ZPD can be seen as a zone in which children can master certain skills:

'with the help of a more mature or skilled peer or an adult, the child can master these skills' (Palaiologou 2008, 24); Nutbrown and Clough (2014) consider that the ZPD is 'a cornerstone of present-day pedagogy where children work together in groups' (p.56), whilst Pugh and Duffy (2006) argue that the ZPD gives a 'focus on the next steps in teaching and learning' (p.99).

From sources such as these, it seems that some regard the zone of proximal development as central to Vygotsky's theorising, and Vygotsky's work as central to their own ideas on education. Yet it is our contention that these views are inappropriate. Our reasoning is as follows. First, it has been argued that Vygotsky himself did not see the zone of proximal development as either important or as an original aspect of his work (Gillen 2000, 184), let alone as a central theme uniting different aspects of that work (Gillen 2000, 192). Second, the uncritical attribution of the zone of proximal development to Vygotsky ignores the evidence that it is not an idea that originated with Vygotsky (Yasnitsky 2019, 5). Third, it has been argued that Vygotsky wrote very little on education (Gillen 2000, 184) and that what little he did write has probably not been read by many of those who claim support for their views on education from Vygotsky (Gillen 2000, 184). Fourth, as Smagorinsky (2011, 4-5) argues, pointing to work by Wells (1999), the notion of the ZPD is often used to justify forms of teaching that he considers are incompatible with Vygotsky's theory taken as a whole (Smagorinsky 2018, 253). A further point worth consideration is that the ZPD needs to be seen as part of Vygotsky's wider work (Chaiklin 2003, 42-3); it is not about learning *per se* but links to his wider notion of development (Vygotsky 1998c, 29).

Let us examine the zone of proximal development (ZPD) more carefully. The ZPD arises from a set of observations that Vygotsky described thus:

Having found that the mental age of two children was, let us say, eight, we gave each of them harder problems than he could manage on his own and provided some slight assistance: the first step in a solution, a leading question, or some other form of help. We discovered that one child could, in cooperation, solve problems designed for twelve-year-olds, while the other could not go beyond problems intended for nine-year-olds. The discrepancy between a child's actual mental age and the level he reaches in solving problems with assistance indicates the zone of his proximal development. (Vygotsky 1986, 187)

This is important because it places the notion of the ZPD on the evidential side of Vygotsky's argument, not on the theoretical side. Vygotsky's empirical work on zones of proximal development cannot be regarded as providing evidence for the assumed or inferred continuum. Instead, what we have is a statement of the obvious (and arguably 'banal' (Gillen 2000, 194) or 'trivial' (Yasnitsky 2019, 4)) point that other children and adults can sometimes 'directly or indirectly have a positive influence on the child' (Gillen 2000, 194).

A reading of Kuusisaari's article referred to above along the lines suggested reveals, as is to be expected, that it provides no evidence whatsoever of Vygotsky's theoretical constructs. The observations that social support and collaboration are important (Kuusisaari 2014, 46-7), that bringing teachers together creates 'the social context for collaboration' (Kuusisaari 2014, 47) and that it can be helpful to consider both verbal and non-verbal interactions (Kuusisaari 2014, 47) are observations which do not, and cannot, provide evidence for the theoretical constructs of the Vygotskian account. Rather, they show examples of how we do learn and come to understand new meanings. The term 'zone of proximal development' is thus seen as a description of practice, based on observations, and as a reminder that we and others often solve problems and learn more with assistance than we could alone (Newman 2018, 358). There is, however, no need to invoke, as Morcom does in the second example to which

reference has been made above (Morcom 2014, 18; p. 28), a Vygotskian theoretical perspective. Thus, again as to be expected, the ZPD and scaffolding cannot be taken to be synonymous concepts: 'Vygotsky… never offered scaffolding as a pedagogy' (Smagorinsky 2018, 253). We can however 'understand scaffolding as part of wider apprenticeship activity systems' (Morcom 2014, 28) *not as a result of Vygotsky's theoretical account* but as a result of the ways in which we learn and where scaffolding is reinterpreted as one approach, divorced from Vygotsky's theory, to describe how certain behaviours (verbal and non-verbal) can be taught and learnt. Contrary to Morcom's view, the notions of ZPD and assisted learning are not part of Vygotsky's (1978) sociocultural *theory*, and Vygotsky's theory does not 'offer a conceptual framework to research collaborative learning in an elementary classroom community' (Morcom 2014, 28).

Teacher education and professional development: Vygotsky reconsidered

What is significant for our purposes here is that Vygotsky drew our attention to what seem to be more or less obvious aspects of how we learn; the sorts of things open to any keen observer. These include, for example, the observation, that we can often learn more, and do more, when given assistance by a more knowledgeable other, and that in learning, 'imitation is indispensable' (Vygotsky 1986, 188). Here, however, we must recall the fact that Vygotsky, in developing his theoretical account, is giving a new meaning to this term based on the idea that, according to Chaiklin:

> A person's ability to imitate, as conceived by Vygotsky, is the basis for a subjective zone of proximal development. (The objective zone exists through the social situation of development.) Imitation, as used here, is not a mindless copying of actions … Rather Vygotsky wants to break from a copying view, to give a new

meaning to imitation – reflecting a new theoretical position – in which imitation presupposes some understanding. (Chaiklin 2003, 51-2)

Chaiklin (2003, 53) cites Vygotsky thus:

> If I am not able to play chess, I will not be able to play a match even if a chess master shows me how. If I know arithmetic, but run into difficulty with the solution of a complex problem, a demonstration will immediately lead to my own resolution of the problem. On the other hand, if I do not know higher mathematics, a demonstration of the resolution of a differential equation will not move my own thought in that direction by a single step. To imitate, there must be some possibility of moving from what I can do to what I cannot. (Vygotsky 1987, 209)

This is an attempt to address what has elsewhere been termed the 'paradox of knowledge' (Gilroy 1993, 128). How will the learner be able to recognise something when he or she does not know what it is? The reader is referred elsewhere for a fuller treatment of this aspect (Gilroy 1993; Newman 1999). We, however, contend that Vygotsky's attempted resolution of this supposed paradox presupposes the psychological structure, rather than revealing it. The following quotations make this clear:

> Vygotsky wants to break from a copying view, to give a new meaning to imitation – reflecting a new theoretical position – in which imitation presupposes some understanding of the structural relations in a problem that is being solved (Chaiklin 2003, 51)

> The crucial assumption is that imitation is possible because (a) maturing psychological functions are still insufficient to support independent performance but (b) have developed sufficiently so that (c) a person can understand how to use the collaborative actions (e.g., leading questions, demonstrations) of another. (Chaiklin 2003, 52)

In other words, the theoretical aspects are assumed. This approach has been robustly

criticised by Malcolm (1971), a critique we recommend to the reader.

Let us return to the ordinary meaning of imitation. One writer reports that his most enduring memory of being introduced to Vygotsky and the zone of proximal development was that it struck him as 'a set of common sense ideas that might provide a possible explanatory framework for PBL [problem-based learning]' (Harland 2003, 264). In other words, the descriptions associated with the so-called ZPD can once more be seen as arising from the empirical observations of teaching and learning, and the notion of a zone of proximal development can be seen as a label or description of those everyday practices rather than as part of the theoretical constructs that Vygotsky inferred. This emphasis on the observational aspects can also be seen elsewhere see, for example, Khaliliaqdam (2014, 896), Warford (2011, 257) and Stephen (2010, 20-1). The observations in these and similar accounts (see, for example, Khatib and Ahmadi Safa 2011; Mitchell, Myles, and Marsden 2013) are however not evidence supporting Vygotsky's theoretical account but they do offer support for a Wittgensteinian reinterpretation of such observations (see Newman 2018), a reinterpretation capable of showing how 'mutual bridging of meaning' (Stephen 2010, 26) can be developed.

We may turn here to consider some of the models that Shabani gives concerning teacher professional development. He points to work by Dreyfus and Dreyfus (1986) and Tsui (2003) to suggest that we can distinguish five stages in the professional development, from being a novice through to being an expert. The actions of a novice are 'guided by rules and a set of objective facts and features related to the skills …[and] …there is little consideration for the context of the actions' (Shabani 2016, 4), but the novice, after 'getting some experiences in applying the rules in real situations … [begins] to recognize situational elements that they need to consider from their actions' (Shabani 2016, 4) to become an advanced beginner. The next stage is that of becoming

competent, 'able to cope with an overwhelming amount of information and assess the situations and distinguish important from unimportant information' (Shabani 2016, 4). Proficiency follows; at this stage practitioners 'are able to act without conscious deliberation since they can recall similar situations in the past and the course of actions taken that were proved effective' (Shabani 2016, 4). The final stage is that of becoming expert (Shabani 2016, 4) where

> performance is marked by effortlessness and fluidity guided by intuition. Skills become part of experts. There is no need for conscious decision-making or problem-solving unless a novel situation is encountered. (Shabani 2016, 4)

Shabani highlights different activities that can be useful, including training, observation, mentoring, inquiry and action research and so on, and also makes the point that such development includes non-verbal language (i.e. behaviour) as well as verbal language (Shabani 2016, 3). All these are consistent with the approach based on Wittgenstein and language-games outlined by Newman (1999, 157-81), where we may regard a beginning or novice teacher as someone who is playing relevant language-games with only a limited understanding of the rules, where opportunities are beginning to be explored for the rules of each language-game to be made explicit, and where they begin to develop their playing and understanding of ones new to them to develop first, competence, and then expertise. Thus develops a bridge between a novice-expert view of professional development and sociocultural theory.

Conclusion

One reason why Vygotsky's work has become and remains popular amongst educators is that his work, at least to some, still 'makes sense with respect to current interests and practices' (Glick 1992, 559). In addition, it could be argued that the empirically-

oriented ideas rooted in Vygotsky's thinking helped steer developmental and educational psychology away from a mostly internal, isolated-child view of development that was inherently linked to deficit interpretations and stereotyping of various sorts (van der Veer and Zavershneva 2018, 102), and towards a view of learning as collaborative and social (Shabani, Khatib, and Ebadi 2010, 244), and where the ZPD is seen as the activity in which instructed learning leads development. In particular, the ZPD perhaps gained popularity towards the second half of the twentieth century as Vygotsky's work became more widely known and seen as an alternative to the once popular Piagetian naturalistic conception of child development (Dafermos 2016, 29). In the immediate context of the school or classroom, these considerations highlight the importance of collaborative learning and teaching, of giving children (and others, including beginning teachers) opportunities to observe, listen, copy, discuss, and work with more knowledgeable others, including role models and peers (Wentzel and Watkins 2002). For its supporters, Vygotsky's approach implies pedagogic optimism and an ethos of commitment: the pedagogic interaction can be innovatively reorganised and developed in ways that even children with severe learning difficulties can be helped – see Meshcheryakov (1979). For us, these are important aspects of Vygotsky's legacy. However, we believe that there are fundamental difficulties with Vygotsky's theoretical approach and that uncritical references to his work made by many in education, and in teacher education, need to be reassessed.

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