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"It is through others that we become ourselves." A study of Vygotskian play in Russian and Irish schools.

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Abstract

50 years after publishing his seminal work on play and its role in child development, Vygotskian theory is still highly influential in education, and particularly in early years. This paper presents two examples of full integration of Vygotskian principles into schools in two very different settings. Both report improvements in learning and in well-being, and exemplify the theory-practice-theory cycle, highlighting the development of new theoretical constructs arising out of putting theory firmly into practice. In both settings, the positive results have come from years of effort, in which school personnel who may have been skeptical at first, have been inspired by the impact of adopting Vygotskian play on the children they teach. The Northern Ireland study shows that at least some of the Golden Key principles (mixed-age play and enhanced home-school links) translate perfectly into very different cultural-historical contexts.

Key words: Vygotsky, Play, Early Years, Golden Key Schools, Integrated Play Program (IPP)

Introduction

In order to celebrate the 50th anniversary of the first Russian publication of Vygotsky's paper: "Play and its role in the mental development of the child", this article provides a critical exploration of Vygotsky's principles in practice. It combines an observational study of a school in the Vygotsky-inspired Russian Golden Key program, with a critical exploration of the

application of two Vygotskian principles to the entire early years unit of a school in Northern Ireland. The aim is to link theory and practice via their dialectical relationship (Unger, 2005). In doing so, we explore the translation of Vygotskian theory into practice, which allows the theory to become practical once more, and from the subsequent practice new theoretical constructs may emerge. This dialectical relationship, and theory-practice cycle, benefits and extends both theory and practice through a continuous process of "collaborative invention and creation" (Taguchi, 2010, p.xiv).

The past 50 years have embraced political and cultural upheaval in both countries, which has impacted strongly on education, perhaps dominated in Russia by the break-up of the Soviet Union and in Northern Ireland by the Troubles (1968-1998). The introduction of Perestroika in Russia during the 1980s provided an opportunity in Russia for the development of innovative educational programs (Robbins, 2010). One such development was the Golden Key program of schools, led by Elena Kravtsova (Lev Semenovich Vygotsky's granddaughter), Gennadi Kravtsov, and their colleagues at the Vygotsky Institute of the Russian State University for the Humanities. Approximately 30 Golden Key Schools were established since 1989, following the principles of Lev Vygotsky and the on-going research and theories of cultural-historical psychology. The Vygotsky Institute offers summer schools to provide opportunities for English-speaking participants to learn about Vygotsky's work, current thinking and advancement of his work in Russia, and how it has been implemented in the Golden Key Schools. Authors 1 and 2 attended two of these summer schools, which provided opportunities to attend lectures by the Vygotsky Institute and Golden Key School colleagues, participate in a week-long immersion course at a Golden Key School in Belaya Kalitva (Southern Russia), and to present and discuss Vygotskian research with scholars and practitioners from around the world. It is beyond the scope of this paper to describe fully the Golden Key program [for more details, see Kravtsov (2010)], but it will focus on key concepts,

their implementation in Golden Key schools, and how they provide a foundation for teaching and learning. The authors draw from direct observations in the Golden Key School, and later describe the introduction of two key Vygotskian principles across the early years' unit of a Northern Irish primary school, inspired by the Golden Key schools in Russia (Doherty, 2013).

Summary of the Golden Key Program

The Golden Key program developed from consideration of the work of several programs and scholars, including Swedish kindergartens, the English nurturing system, Rudolf Steiner's anthroposophy and the Waldorf pedagogy, in combination with the seminal work on child development and learning carried out by Lev Vygotsky, his co-workers and his followers. The founders of the Golden Key Schools (during the early 1990s) were themselves students of the actual followers of Vygotsky. Elena Kravtsova's teacher was A. V. Zaporozhets (student of Vygotsky), and Gennadi Kravtsov was a student of Daniil El'konin (Vygotsky's colleague).

The main principles of Golden Key schools are based on the idea that humans utilise both basic, natural mental functions and cultural higher psychological functions. The key Vygotskian criticism of traditional theories of play was that they did not embrace the holistic nature of play (Vygotsky, 2016). Kravtsova and Maximov (2014) distinguished classical (traditional) from non-classical (primarily Vygotskian) psychology, in that the former separates, dissects and studies in isolation. Non-classical psychology, on the other hand, constructs, creates and designs, as it includes the genesis of higher psychological functions. From a non-classical standpoint, play is holistic, and cannot be studied outside children's cultural-historical development, which includes their relationships with other people.

The fundamental, organizational features of the "Golden Key" program are based around five principles, which together serve to develop both the social and individual aspects of development, whereby deep social learning leads to individual intellectual development.

Firstly, they adopt mixed age, as well as single age-group teaching, which allows the older children to reflect their own learning by helping younger children, who, in turn, benefit from learning from people closer to their own age and stage (Doherty, 2012). Second, the schools are organized (for 3 – 10 years old children) around family principles, including active parental involvement. The idea is that without the involvement of each family, the teacher is helpless. Thirdly, lessons are centred on 'events' which are highly meaningful to the children and engage their emotions. Subsequently, each lesson follows a 'plot' relating directly to the event. Kravtsov uses the metaphor for such an 'event' as a child or person wanting to swim. "After floundering in the water, we somehow need to hold out and swim. After that first step, we can start to learn various strokes, and only after that process can we begin to master different swimming styles, such as the breast-stroke, crawl, back-stroke, etc. This process is now reflected and built upon consciously, which can later become a cultural skill" (Kravtsov, 2010, p.67).

The fourth principle of Golden Key schools is the interaction and interdependence of education and development, so that 'lessons' for younger children are not structured in the same way as those for older children. Learning takes place within the 'zone of proximal development', a construct attributed to Vygtosky's work.

The fifth and final principle of Golden Key schools is 'paired pedagogues', in which some of the teaching is enacted by more than one teacher. Typically, one acts as a traditional 'teacher' whilst the second acts in an 'under' role by, for example, asking naïve questions which are answered easily by the children – sometimes this teacher has not been present earlier and is asking children to explain (and therefore reflect) their learning; other times the second teacher takes on the role of a 'fool', acting silly and requiring multiple corrections of her / his poor attempts to keep up. Beggs, Murphy and Kerr (2009) carried out similar work using

puppets, as opposed to adults, acting in the same role as the 'under' teacher and found that children were eager to correct the puppets at every occasion.

The first two of these principles (mixed-age play and enhanced home-school links) were adopted for implementation in the early years unit of the Northern Irish primary school, on the basis that they fitted well with the school aspirations for development. Play, which was previously age-segregated and which was predominantly emphasised in the school context only, became integrated across age groups (from 3-6 years), and across the learning contexts of home and school, via the Integrated Play Program (IPP). Doherty (2013) explained how the IPP combined the two principles: 'mixed-age play' and 'enhanced home school links'; which were envisaged as 'cultural tools' that held the potential to promote child development through the creation of individualized zones of proximal development (ZPD) (Vygotsky, 1987). These two principles facilitated the pedagogical collective, comprising teachers, classroom assistants, parents, children and Doherty, to put aspects of Vygotskian theory into actual practice.

The cultural-historical context: Golden Key school in Belaya Kalitva

The Golden Key School under observation is situated in Belaya Kalitva in the Rostov region of Southern Russia, close to the border with Ukraine. The disintegration of the Soviet Union in the late 1980s/early 1990s, and consequent collapse of national planning in favour of the introduction of markets for industrial goods, caused significant shock waves in many small industrial cities such as Belaya Kalitva (Population: 43,651)[1] as they made the transition to a market economy. The bedrock industry for Belaya Kalitva was aluminium production. As guaranteed orders from the old Soviet system contracted, so did production. The resulting unemployment had catastrophic social consequences, including high rates of alcoholism. Belaya Kalitva had survived on the industrial wages of employees of the aluminium factory,

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[1] 2010 All-Russian Population Census - Vol 1: Federal State Statistics Service, 2011

and taxes levied by local government paid for services such as health and education. During transition to a market economy there was a collective sense of loss as citizens saw Soviet structures being dismantled. The state could no longer be relied on to provide work, accommodation, health and education. It was against this cultural-historical backdrop that the first Golden Key School in the Rostov region was established. The goal is to create a new form of community in the school, which models an image of the earlier Russian peasant culture, whereby a child was born into, and raised by a community, or a village. The Golden Key schools offer a culture of strong communication between everyone in the school to mimic the figurative image of the erstwhile peasant communities.

The cultural-historical context: Northern Irish primary school

The modern city of Derry is almost 400 years old. It was established after the Elizabethan conquest of Ulster on confiscated land awarded to a consortium of London companies who attached the prefix London to the original Irish town name. The London companies built a walled city on the west bank of the River Foyle. The walls are still intact, making it one of the few surviving walled cities in Europe. The walled city has enormous historic and symbolic significance for Unionists. It was the most north-westerly English outpost in Ireland and withstood a famous siege in 1689 by the Irish army of the Catholic English King James II. Now the walled city is on the border of the Irish Republic with all roads leading to County Donegal. Native Irish were not allowed to live inside the walls so settled outside on bog land now known as the Bogside.

Fifty years ago Derry was at the epicentre of the Troubles which some would say began in Derry with a civil rights march in 1968. Derry was governed by the minority Unionist population who controlled the city council from the historic Guildhall of the London companies. The majority nationalist population wanted reform of the council and political

changes in N.I. The British army was first deployed on the streets of N.I. in Derry in August 1969 after days of serious disturbances between the people of the Bogside and the 90% Unionist police force. The IRA in Derry, which emerged in 1970 to try to force British troops out systematically bombed the historic city for 20 years. Many streets were reduced to rubble. In the 1970s there was almost daily rioting and shooting between the British army and the IRA and stone throwing youths. Over the worst years most of the Unionist population left the walled city and its surrounding districts which are now called 'Cityside' and moved across the River Foyle to what is called the Waterside. Currently the Cityside is over 90% Catholic and nationalist. The city is now divided not only geographically but also socially, politically and religiously by the River Foyle. Manufacturing in Derry was predominantly based on textiles especially high quality shirt making. By the 1960s this industry was dying due to competition from India and the Far East. The result was massive unemployment. Attempts to replace the textile industry with modern high tech industry have largely failed. There is widespread unemployment and poverty.

The study was completed in a small urban school located in inner-city Derry. Unlike the majority (75%) of schools in Northern Ireland, this school had a preschool department on site with which the school worked very closely. It is located in an area of very high deprivation with 39% of children receiving free school meals. During the study the school served approximately 200 children ranging in age from three to eleven years, with more than 50% being in the Early Years (3-6 years). Approximately 25% of pupils required additional support with aspects of their learning. All early years staff were involved in the research. Six teachers and 15 classroom assistants made up the school team. All of the teachers had less than 10 years teaching experience. The classroom assistants all worked within the Early Years classes, and were identified as key players in the progression and development of the research.

The school offers an optional program of extended schooling for all children. Thus the school day runs from 08:30am until 3:00pm. Most children remained for the entire duration of the extended schooling. The school ethos behind the offering of such a program was in relation to the high levels of deprivation. It viewed the extended school day as permitting children to experience more frequent and valuable playful interactions with peers and with adults in a safe, supportive environment. Staff, parents and children worked with the researcher in planning and implementing the integrated play program (IPP), and were continuous evaluators and assessors of its progress. The IPP employed play across the preschool and foundation stage of primary school (3-6 years) and across learning contexts (home and school).

Theoretical basis of learning in Golden Key schools

Three key inter-related Vygotskian concepts appeared to underlie children's learning in the Golden Key schools, which help to develop the school community such that children are oriented in a productive learning environment which also fosters a high level of well-being. These are: holistic play, the zone of proximal development, and cultural mediation.

Holistic play

There is a vast amount of literature about play in school, much of it debating whether the focus should be on teaching academic skills or engaging young children in make-believe play as a developmental activity. Bodrova and Leong (2007) suggest there is a false dichotomy between play and academic skills when considered from a Vygotskian perspective. In a new translation of Vygotsky's seminal work on play (Vygotsky, 2016)) it can be seen that Vygotsky considers play with an imaginary situation as something "essentially new, impossible for a child under three; [years of age] it is a novel form of behaviour in which the child's activity in an imaginary situation liberates him from situational constraints" (reference later). The Golden Key School

in Belaya Kalitva caters for children between three and 10 years of age. Imaginary situations are created with the help of teachers to provide incentives and motives to promote children's engagement.

From observations and lectures by Vygotsky scholars, it was considered that Vygotsky maintained further that creating an imaginary situation in play is a means by which a child can develop abstract thought and that imaginative play is a precursor to academic learning. In summary, play (Murphy, 2012):

- helps children develop the ability to self-regulate their physical, social and cognitive behaviours by the use of 'rules' in their games
- places restraints on a child's actions and forces them to practise self-regulation
- helps children develop abstract thinking via the use of objects, e.g. toys, props, clothes, in make-believe play. Such a use of objects for pretend, rather than real-life purposes serves as a bridge between sensory-motor manipulation of objects and fully developed logical thinking, when the child can manipulate ideas in their heads.
- helps children to separate the 'meaning' of the object from the object itself, using various props e.g. to drive a block on a carpet as is it were a truck (gives the block 'truckness') acts as a precursor to abstract thought.

The best kind of play to develop abstract thought is where children use unstructured and multifunctional props, as opposed to those which are realistic. The former type of props strongly promote language development, e.g. a cardboard box may serve first as a shop, then as a school, then as home. Repeated naming and renaming in play can help children to master the symbolic nature of words, which leads to the later realisation of the relationship between words and objects, and then of knowledge and the way knowledge operates.

This type of play is not often seen in the classroom in many schools today – most three-to-five year old children are playing like toddlers, just manipulating objects, such as sand and water, and not engaging significantly with other children.

Vygotsky's perspective on play connecting it to the social context in which a child is brought up suggests that adults and older children should also be involved to enable the younger children to model both roles and the use of props. Vygotsky promoted the notion that play, as learning, should lead development, as opposed to the more accepted one of development leading learning or play. Veresov (2004) discussed learning that takes place in or within children's play. He uses the Vygotskian example of a child playing with a stick by using it as a horse. The child will learn about the object (stick) and its objective physical properties, but will also decide whether such properties allow or prevent the stick from becoming a horse. If the object does not suit the play task, the child will stop playing with it. Veresov, in the same article, posits that learning in play is a movement from the field of sense to the field of meaning; that "sense finds a suitable object, that is, sense objectifies itself" (p.13). He exemplifies the sense meaning dimension using a teacher-child two-part vignette in which the teacher first asks the child to suppose he has two apples, then gives one to someone and asks the child how many apples he now has. "Two" replies the child, and on further questioning, he tells the teacher that he has two because he never gives his apples to anyone else. In the second part, the teacher asks the same child to suppose that someone else has two apples and gives one to him – she asks how many apples will the other person now have. The child replies "one" and explains they would have one each. Veresov (2004) argues that the task is the same (a calculation of 2-1=1), but that the sense of the task must be in the child's zone of proximal development.

Vygotsky theorists point towards empowering children through play. For example, when modelling a situation in play involving, say, an imaginary parent or teacher or grocer or doctor, the child becomes in Vygotsky's terms "a head taller" (Vygotsky, 1978). Vygotsky himself suggested that play creates a ZPD of the child:

> This kind of subordination to rules is quite impossible in life, but in play it
> does become possible; thus, play creates the zone of proximal development

of the child. In play a child is always above his average age, above his daily

behaviour; in play it is as though he were a head taller than himself.

(Vygotsky, 2016, page number comes later)

In nursery and primary school, a Vygotskian perspective presupposes that teachers promote

role-play and imaginary play in learning for children throughout the school to further the

development of abstract, conceptual thought. There is less focus on individual play with objects

and more on collective play, preferably involving older children who can model both roles and

the use of props for the younger ones.

Research and theory development on play from the Vygotsky Institute has taken

Vygotsky's ideas about the importance of play and constructed a sophisticated understanding

of its development and how it supports a child's learning and development (see Kravtsova and

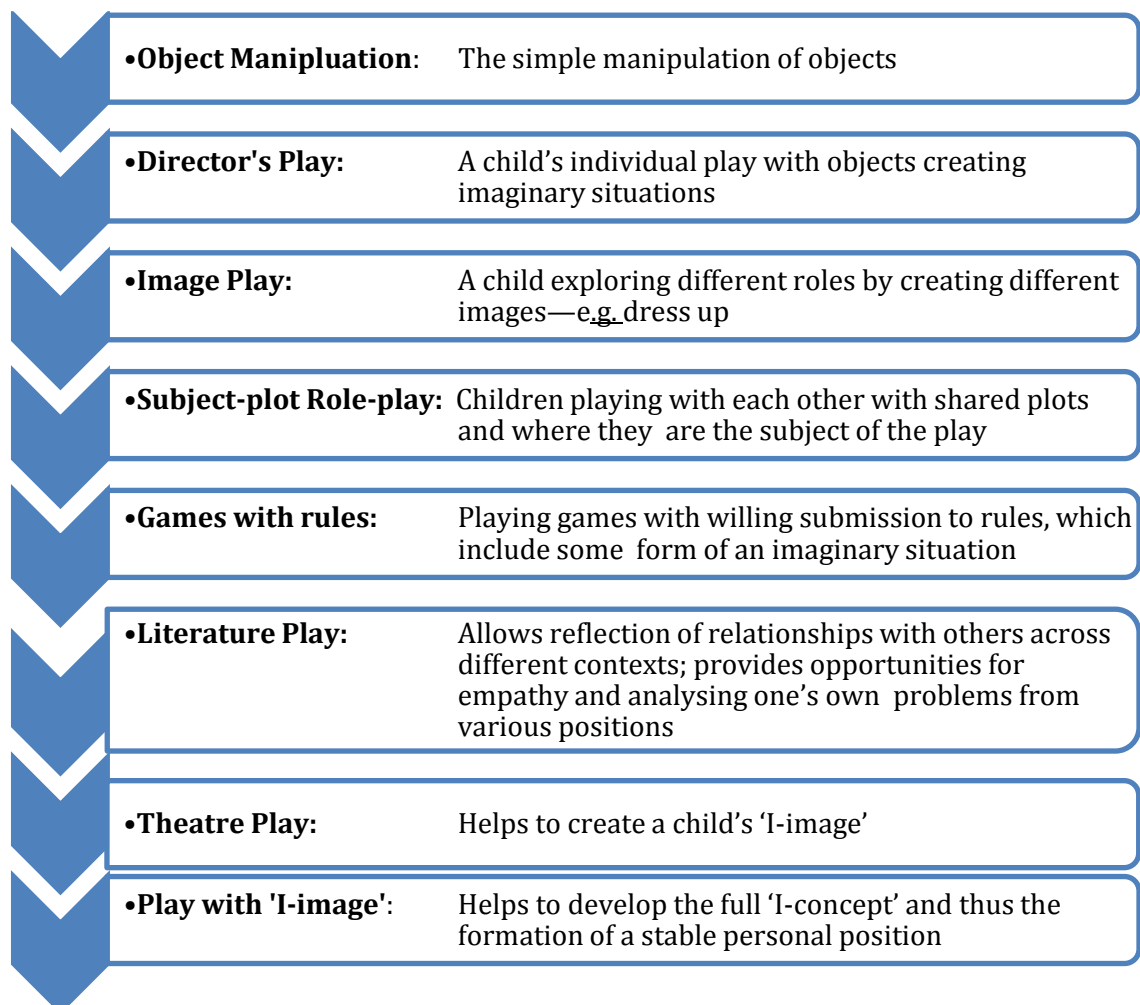Maximov, 2014). Figure 1 summarises the key ideas.

•Object Manipluation:	The simple manipulation of objects
•Director's Play:	A child's individual play with objects creating imaginary situations
•Image Play:	A child exploring different roles by creating different images—e.g. dress up
•Subject-plot Role-play:	Children playing with each other with shared plots and where they are the subject of the play
•Games with rules:	Playing games with willing submission to rules, which include some form of an imaginary situation
•Literature Play:	Allows reflection of relationships with others across different contexts; provides opportunities for empathy and analysing one's own problems from various positions
•Theatre Play:	Helps to create a child's 'I-image'
•Play with 'I-image':	Helps to develop the full 'I-concept' and thus the formation of a stable personal position

Figure 1: The Development of Play

A most important aspect of play is that children create an imaginary situation. Vygotsky described this: "I think that in finding criteria for distinguishing a child's play activity from his other general forms of activity it must be accepted that in play a child creates an imaginary situation*"* (Vygotsky, 2016, page number later). He continued to discuss the importance of the imaginary situation and stated that:

> From the point of view of development, the fact of creating an imaginary situation can be regarded as a path to developing abstract thought. I think that the rule-making connected to this leads to the development of actions, on the basis of which the division between work and play becomes established – a division which is encountered as a fundamental fact at school age.
> (Vygotsky, 2016, p later)

A child's understanding of, and ability to, distinguish effectively between the imaginary situation and the real context is important in the development of abstract thought. Vygotsky ends his discussion by arguing how this develops into an understanding of external reality and thought:

> At school age play does not die away, but permeates the attitude toward reality. It has its own inner continuation in school instruction and work (compulsory activity based on rules). All examinations of the essence of play have shown that in play a new relationship is created between the semantic field– that is, between situations in thought - and real situations.
> (Vygotsky, 2016, p later)

The Golden Key curriculum and pedagogy is developed with the understanding that adults can and should have an important role in promoting play that supports development. A significant portion of the school day at a Golden Key school is centred on preparation for an *event* or *happening*. Preparation for an event includes an integrated approach to all areas of the curriculum around the theme or story of the event. Teachers help create an imaginary context for the children to engage in. The observed 'event' in Belaya Kalitva Golden Key School was

presented to the children by giving them an encoded letter from a wolf. The children engaged in activities throughout the week culminating in an event on the last day consisting of the presentation of the wolf's story including the performance of the story with music, dance, costumes, and dialogue.

Zone of proximal development

From a Vygotskian perspective, development is the result of the intertwining of the natural and cultural worlds. Development proceeds through a series of successive stages that are unified, principled and holistic (Chaiklin, 2003). Each stage is characterized by the development of a specific higher psychological function[2] and a 'leading activity' to master this function, for example: play, as a leading activity, leads to the development of the higher psychological function of memory. Play in cultural-historical theory is a distinct phase in child mental development. It is described as the leading activity for young children (typically 3-7 years). Vygotsky identified play as the precursor to academic learning, which is the leading activity of the next stage of childhood (Kravtsova, 2010).

Vygotsky viewed development as a revolutionary or transformational process. He employed the idea of all processes being present at all times, but being "on the stage" and leading at different periods to highlight the complexity of development (1983, p.145). The process of development contains not just "evolutionary but also revolutionary changes, regression, gaps, zigzags, and conflicts," (Vygotsky, 1997, p.221). The child, according to Vygotsky, will experience periods of rapid development but will also experience tensions and struggles as they interact with their environment. For Vygotsky,"psychological functions are given in the form of social relations which are the source of the origin of these functions and

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[2] 'Higher psychological functions' are also referred to as 'higher mental functions' in cultural-historical theory

their development within humans" (1998, p.473). Social interaction, therefore, is the root of cultural development.

Vygotsky claimed that in social interaction with others a second level of mental functioning, above the initial biological level of functioning, becomes evident. In the initial biological or "actual level of development", the child's ability to independently solve learning tasks can be observed. The second level that becomes evident in social interaction is known as the "potential level of development". It relates to what the child can do in cooperation with more competent others. Therefore within any social interaction a child has two simultaneous levels of development in relation to mental structures and functions (Veresov, 2004). The distance between these two levels is what Vygotsky termed the zone of proximal development (ZPD).

The ZPD comprises essential elements required for development to take place. The first of these focuses on the interaction between real and ideal form (Murphy, 2015). The environment is not just a setting for development, but rather is the source of development (Bredikyte, 2011). In the environment there are ideal models and images of development. These ideal forms are "an invitation for the child to act, to respond and to enter into a dialogue" (p.25). They influence and affect the child's actual levels of development, in that at the start:

> … the supreme, ideal form that should appear at the end of development already exists. The supreme, ideal form directly interacts with first steps made by the child on the way of development of this initial... form. The highest originality of child's development consists in this [interaction], in contrast to other types of development...
>
> (Vygotsky, 1984, Vol. 4, p. 395 (cited in Veresov 2004, p.9))

As the child interacts with these ideal forms, they appropriate them, reflect upon them, master them, and they become transformed into the real form of the child's own behaviour. This was instrumental to the mixed-age principle employed within the Northern Ireland study.

A second element of the ZPD is 'buds of development'. These are the abilities and functions that are in the process of maturation within the ZPD. The ZPD focuses on the future development of the child and what they are currently in the process of developing, rather than examining what has already been learned.

Vygotskian imitation, or emulation, is a third element of the ZPD. Imitation in the Vygotskian sense requires observing something, understanding it, and the consequential appropriation of the material to suit the subjective learner. Imitation can be used as a device to gauge where the child's ZPD is in developmental terms. If a child can imitate an ability or action then this ability or action is budding within the child's developmental state and a ZPD can then be created to advance this ability.

A fourth element of the ZPD, the unity of affect and intellect, refers to emotional engagement in the learning and development process. Without emotional engagement, learning does not take place. Regression within the ZPD means that the learner takes a step backwards in their development but this step back then permits greater depth and width of understanding and following this, development proceeds once again.

The ZPD was a focal theoretical construct throughout the theory-practice cycle in the Northern Ireland study. Vygotsky specifically referred to the ZPD in child play. Vygotsky (2016, p later) stated that:

> …play creates the zone of proximal development of the child. In play a child is always above his average age, above his daily behaviour; in play it is as though he were a head taller than himself. As in the focus of a magnifying glass, play contains all developmental tendencies in a condensed form…

The ZPD could be described simply as all the interactions that need to take place for development to proceed from one stage to the next. The 'driving force', or 'tension' required to *drive* development is referred to in Vygotskian literature as the *social situation of development*

(SSD) which describes a child's need to move forward in terms of their current relationship with the social environment surrounding them (Kravtsova, 2010).

Cultural Mediation

Whilst it is a common observation that children learn from adults and other children, it is less obvious how this happens. Vygotsky suggested that the child appropriates cultural tools and ways to use them; the child interacts with the environment via the mediation of cultural agents. The child is the subject, not the object of learning.

The main cultural tool, according to Vygotsky, is language, which can be thought of as a sign system. Vygotsky noted the importance of cultural mediation of these sign systems in humans, which does not occur in animals. For instance, in the everyday activity of eating, animals of a particular species all eat in the same way, whereas in humans, the way a person eats strongly reflects the culture in which they were raised and there are many, many different ways in which humans consume their food. Vygotsky argues that cultural mediation is just as important in the consideration of how, and indeed what, children learn.

In terms of learning, the 'mediator', for example language, carries *meaning and sense*, as well as functioning as a tool, and must therefore be *interpreted* by the child (Zinchenko, 2007). Through this interpretation, the child contributes to the culture, and continues this contribution in many ways throughout his or her life.

The use of language, ZPD, and imaginary play support a child's mediation with the culture as they develop in the context of their family, school, local culture, and global environment. The Golden Key curriculum and pedagogy support this mediation through the deliberate creation of opportunities for children to actively engage with culturally significant events. Children may explore fairy tales, help an imaginary hero return home from another country, participate in national celebrations, or perform traditional dances. The juxtaposition

of the real and imaginary helps children understand the world they live in and as they reach school age develop academic skills and knowledge. The success of the Golden Key Schools (for example, the school we visited in Belaya Kalitva) recorded high rates of college attendance by children who had attended their school, and a zero rate of alcoholism among its graduates. These longer-term outcomes were significant in a town which suffered extremely high rates of alcoholism, especially among young people, and provides support for the value of the cultural-historical perspective of development and learning.

The practice of learning in Golden Key Schools

Most learning is centred on 'events'. The event witnessed by the authors at the start of the week was the arrival of a letter, delivered directly to the classroom (for more detail, see Murphy, 2012). This letter was from a wolf (teacher dressed as a wolf), desperately seeking help from the children to find his fairy tale – he had jumped out of the book and could not remember to which tale he belonged. A series of activities was based around finding 'clues' from which, eventually, the children could determine the correct tale for the wolf. Such activities, some of which were carried out in mixed-age groups involving older children helping younger ones, and other age-specific activities based on areas such as mathematics, science, verbal and spatial reasoning, geography, comprehension, history, and drama, etc, were enacted over the period of a week. Children were fully engaged and many of the skills they demonstrated in enacting the traditional curricular requirements (such as mental arithmetic, compositional writing and logical reasoning) were considered by the author to be advanced for the children's age groups. They seemed to be working "a head taller than themselves" (Vygotsky, 2016, p later) in the quest to find the wolf's tale. Experiments, hands-on experiences, readings and discussions during between the ages of 3-10 years are considered foundational to true scientific (academic)

thought, especially when children are encouraged to *theorize* on their experience of observed phenomena, and all were observed during the week.

In addition to the 'events', learning is directed towards orienting children in the world. Their learning takes place within the context of four 'super-concepts', which define all human activity. All human activity takes place in a certain SPACE (or place), at a certain TIME, uses particular SUBSTANCES (materials) and involves conscious REFLECTION. All learning for children is oriented within this framework of concepts, and each year there is a focus on one (for all children), even though all are addressed simultaneously to some extent.

Space

When children start at the age of three, space is the first focus. They are 'oriented' first in a group space within the room, then in their own space within that group. They begin their exploration of space by working with the teachers to "set up" the room. Children bring in artefacts from home, including photographs and small ornaments, which are placed on each child's table area, and thus link the school context with the home context. Older children then take the younger ones around the school and gradually introduce them to the whole school and all who work there, including the other teachers, catering and cleaning colleagues. Early work with maps includes showing how to find other rooms in the school. When children are totally familiarised with the school, they reflect on this learning by inviting parents, and relatives to the school and children give them a tour of the school and its community. The 'place' orientation continues as children develop by orienting themselves in the 'space' between home and school, then in the local area and so on. We observed in every classroom a set of large wall maps, superimposed on each other, so that children can orientate in the 'place' of all their learning; behind a map of the town was one of the province, behind this a map of Russia, then Europe and so on until the maps at the back were of the cosmos.

Teachers support children's ongoing exploration of space by creating imaginary journeys connected to the event that serves as the core of the lesson. These multi-age imaginary expeditions provoke many opportunities for children to engage in learning in a wide ZPD.

Not all the explorations are clearly distinguished from other investigations of the children's world during their real and imaginary interactions with space. However, throughout the inquiry about the world in which they live the development of their process skills also crosses the "academic" lines. Solving the story of the wolf may include specific science problem-solving skills or the use of similar, for example, observation, communication, and analytical skills to decipher a letter as to help the wolf find a location on a map. The development of these skills naturally supports future academic understandings and skills in all the subject areas. A fundamental assumption in this curriculum is that the experiences with space, both local and distant through imagination and story combine to provide an orientation of the world that is important in the child's future generalization of theory and understanding of relationships of elements of the natural world.

Time

Similarly, children are oriented within the concepts of time, materials and reflection. Figure 2 shows a timeline, which children constructed as a 'time-based' activity for their own classroom. Their timelines start with the beginning of life, and children can orient their science learning in time using this. For instance, they can mark the times when dinosaurs roamed the earth, the discoveries of fire, the wheel, the solar system, electricity and the moon landing. They can use the timeline to visualize life spans of large trees, humans and elephants and to consider themselves in relation to older members of their family, ascendants and younger members. During the study of time the school creates a "time machine" and during their "time travel" they become aware of great scientific discoveries. They realize there was a time before

electricity was harnessed and explore a time with no cars and where horses and candles were used instead of cars and electric lights. The goal is to help children experience, in imaginary play situations, life before these discoveries. The time machine also "takes" children to the future—allowing children to use their spacecraft to travel to planets, solar systems, and galaxies. Through their imaginary travel, they investigate the cosmos and compare it to Earth. For example, children may compare the pressure, temperature, and length of a day on Venus, to Earth. The placement of the present day in terms of their cultural-historical context is viewed as important to allow and facilitate the children's mediation within their world and in turn promote development. As with the children's interaction with space, the imaginary and real interaction with time, by a multi-age group and with the support of teachers, provokes development and foundational (both real and imaginary) encounters with science concepts.
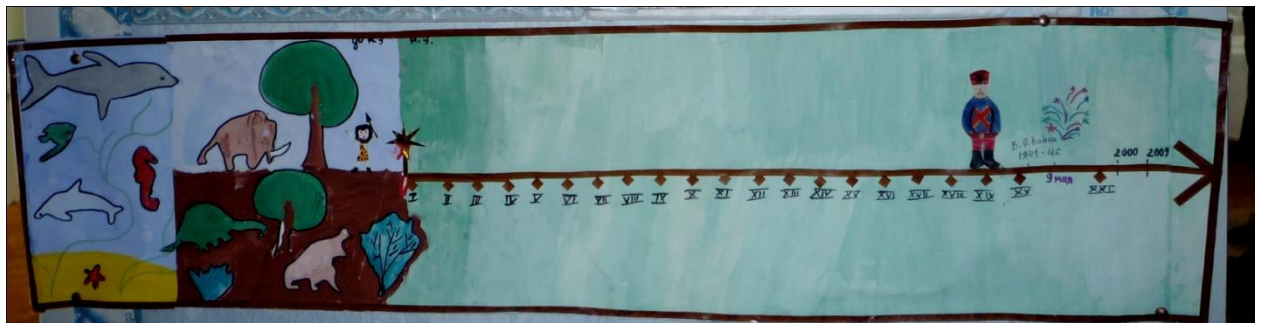

Figure 2. Timeline to help children orient their science learning in 'time.'

Substance

In relation to the 'substance' concept, children use materials in different ways depending on their age. Early exploration of materials is important for speech development. As children get older they focus on manipulating a wide variety of materials and theorizing on these experiences to arrive at logical explanations of phenomena. Vygotsky maintained that children at elementary level need to be encouraged in such activities for learning, which are vital for the later development of conceptual thought within the concepts constructed by generations of

scholars. For example, the world of science has its own 'culture' based on specific scientific tools such as signs and symbols, into which children will be encultured mainly at a later stage of their development when they are taught by scientists or by teachers who have a good knowledge of science. The early theorizing about children's observations of phenomena is also how children become oriented within a framework of 'reflection.' They are invited to present their ideas to other children and their teachers and to listen to and incorporate other ideas into their own reflections.

Reflection

The concept of reflection encompasses conscious awareness of the world and children's 'place' in it, as well as reflecting learning from older to younger children and vice versa. In addition, Vygotsky was interested in reflecting ideas and stories from the inside out or back-to-front to test children's understanding. For example we observed Golden Key teachers using reflection by, inviting them to write a story, such as Cinderella, in which the heroine is the villain. We use a similar process in teacher education in asking pre-service teachers to design the worst possible lesson plan and use it as a mirror it to write a good lesson plan.

These four themes support the experiences and development of the children through intentional play experiences, learning leading development in the ZPD, and cultural mediation. A significant concept is that the development of these four themes is for the group rather than for individual children at a certain age. Holzman (1997) discusses the four themes at the Golden Key Schools:

> It is important to emphasize that it is not the child's year … being referred to, but the multiage group's year ... The organizing principle (the philosophical structure) of this alternate educational model is the ongoing development of the group as *it creates itself as a group* that is developing and changing. To me, this focus on the group … allows for the "good learning" that the Golden Key documents for all its children. (Holzman, 1997, p.90)

The value of imaginary experiences and fully implementing the ZPD with learning leading development, combined with the understanding that development is also a process of cultural mediation rather than primarily a biological process, characterises Golden Key schools. At the same time it validates many pedagogical approaches which research has supported and opens the door to investigate some interesting ways of thinking about providing science experiences for children from age 3-10 years. These innovative and theoretically grounded approaches to create learning experiences in children's zone of proximal development, to make use of imaginary experiences (play), and to help children connect with and learn from their culture and history, provide rich opportunities to bring new insights and ways of thinking about teaching and learning in a variety of contexts.

Integration of Golden Key principles in Northern Ireland

Doherty (2013) described the methodology and findings from the implementation of the IPP by a Northern Irish school over a three-year period. The process was iterative and developmental, involving constant adjustments, continually interposing theory and practice. This resulted in the development of a new theoretical construct: *home-school family pedagogy* (HSFP), arising out of problem-solving methods applied during the implementation of two Golden Key constructs; mixed-age play and enhanced parental involvement. HSFP essentially describes pedagogy that comprises teachers adopting parent-style roles in school-family play sessions and vice-versa during play at home (Figure 3):
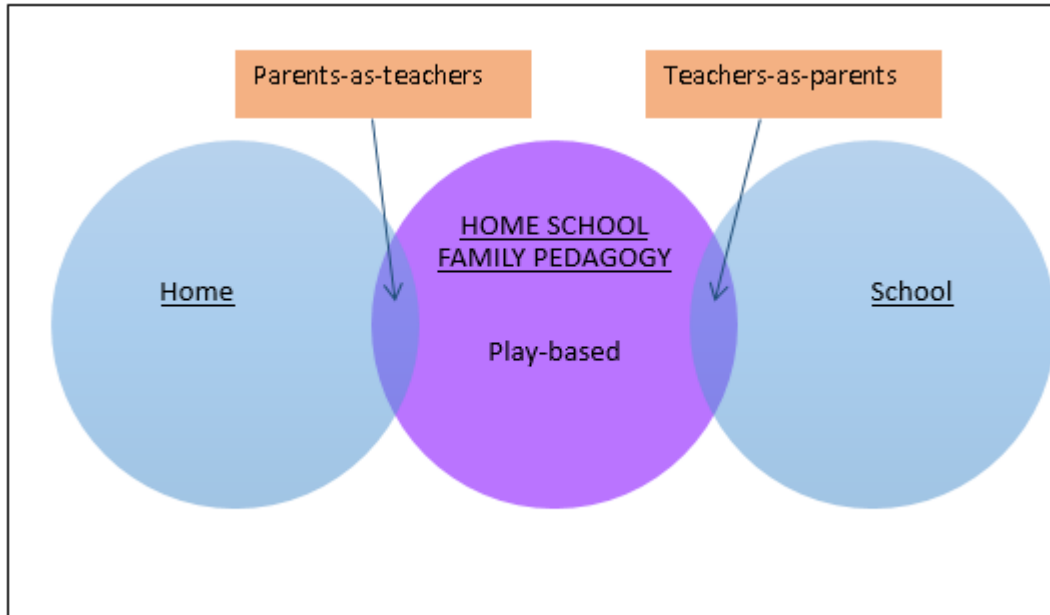
Figure 3. A Home School Family Pedagogy

This powerful construct appeared to create an ethos whereby learning was facilitated by improved social interactions, which were stimulated by new social situations of development that implied trust, care and respect between participants. Indicative quotes from participant groups illustrate some of the experiences they discussed (Doherty, 2013). In the first, a parent describes her daughter's use of 'cousin' for a child in her school family play group:

> *Tracey keeps talking about her big cousin Cathy in P1 [age 5-6]. They're not cousins.* (p. 230)

A classroom assistant gave her commentary on children's play interactions:

> *The big ones took on like nearly a mothering role over the wee ones didn't they? You could see them doing wee silly things - it wasn't even that they were teaching them academic skills, they were teaching them how to put on your jumper, how to put on your coat, how to clean your nose.* (p. 223)

Here a child describing her concern for a younger school-family member:

> *I was holding Abbie's hand 'cos I didn't want her to get hurt 'cos she was scared at times with all the bigger ones.* (p. 224)

And a teacher relating her experience of mixed-age play:

> *[Mixed-age family play] developed a sense of community within the school; the children all get to know each other, they're all looking out for each other, the older ones almost feel like they're taking the younger ones under their wing and so when they see them in the canteen, when they see them in the playground and stuff, they know their names and they're playing with them.*
> (p. 153)

The value of the term "family" extended beyond the participants and outwards to the entire school community and ethos. As this school developed the HSFP, interaction within the school became more positive, more caring and more developmentally focused. Through the use of HSFP in education, schools can potentially remove negative, preconceived notions of schooling and introduce an approach to education in which the school and the home are intertwined in an ethos of equality and care and where interaction is less intimidating. The positive environment for learning which the HSFP created in this school aided in forming better school relations but was also potentially, positively influential on children's rates of learning and development (Figure 4 illustrates mixed-age play). In addition, with the creation of HSFP, a more continuous and progressive play-based early years education provision was made possible. Through HSFP, children can experience a more holistic and joined-up early learning experience, and the construct could be used as a basis for developing Early Years Units or Centres where early years education could be the sole focus.

Figure 4. Peer teaching and learning in the garden centre

Four years after completion of the study, the Northern Irish primary school still provides the IPP, offering children mixed-age family play every day. Parents continue to be a core participant group in the setting and staff still work with a mixed-age range of children, with a focus on leading and developing play skills. The enhanced home-school links has continued for families with children who have special needs, as the logistics were difficult without the researcher mediating the process.

Conclusion

This article draws from two diverse settings that have attempted whole scale integration of Vygotskian theory and practice within play in early years education. The results are on the whole highly positive in terms of learning and well-being. Our experience in Northern Ireland benefitted from seeing a Golden Key school in action, and was supported fully by the school principal. The work was not funded externally; school staff were inspired by hearing about the Golden Key school and were driven to make the IPP work, despite many problems at the start

(see Doherty, 2013). Theory-into-practice-into theory is a cycle, which is powerful as long as the theory is sound and the practice is receptive and critical. Fortunately, Vygotskian theory has proved itself over and over again in practice. Our work provides one more small example of this, but one which can have global implications.

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