Культурно-историческая психология

Cultural-Historical Psychology

———————————————

№ 4 — 2010

Предлагаемый вниманию читателя новый номер журнала содержит научные статьи участников Первой международной летней школы для аспирантов и молодых ученых ISCAR «Методология культурно-исторического исследования: переосмысление прошлого ради будущего», прошедшей в Московском городском психолого-педагогическом университете (МГППУ) с 20 по 24 июня 2010 г. при поддержке Международного общества культурно-деятельностных исследований (ISCAR) — крупнейшего международного научного сообщества, содействующего развитию междисциплинарных теоретических и практических исследований социальных, культурных и исторических аспектов человеческой деятельности. В ее работе приняли участие ведущие европейские специалисты в области культурно-исторической психологии: К. Понтекорво (Италия), Г. Рюкрим (Германия), Г. Дэниелс (Великобритания), П. Хаккарайнен, М. Бредиките и Н. Н. Вересов (Финляндия), Л. Ф. Обухова, В. В. Гуружапов (Россия). Презентации своих исследовательских проектов осуществили молодые ученые со всего мира (Бразилия, Мексика, Австралия, Сербия, Китай, США, Великобритания, Швейцария, Нидерланды, Россия).

В ходе работы школы центральными темами стали: развитие ключевых понятий культурно-исторической психологии и теории деятельности в трудах российских и зарубежных ученых, теоретические и методологические особенности прикладных культурно-исторических исследований, поддержка совместных проектов, развитие системы научно-практического обмена и академической мобильности.

В совместной статье профессора Римского университета «La Sapienza» (Италия) К. Понтекорво и профессора Университета Ньюшатель и Лозанны (Швейцария) Ф. Аркидьяконо представлены результаты исследования развития детских суждений в дискуссионном общении. На примере анализа рассуждений детей в разных социальных ситуациях авторы показывают значимость вербальной коммуникации в процессе детского развития в семье и школе.

В рубрике «Дискуссии и дискурсы» представлена статья профессора В. В. Рубцова, профессора А. А. Марголиса и профессора В. А. Гуружапова, в которой рассматриваются вопросы организации учебного процесса в начальной школе с позиции основных принципов психологической теории деятельности, в связи с чем остро ставится проблема подготовки педагогических кадров. В статье анализируется содержание стандартов начального образования и стандартов подготовки учителей младшей школы в Российской Федерации.

Проблеме необходимости методологического и парадигмального переосмысления современной психологической науки посвящена статья профессора Берлинского университета (Германия) Г. Рюкрима. Автор анализирует актуальность концептуальных основ культурно-исторической психологии и деятельностного подхода в условиях развития современной информационной среды.

Исследователи Университета Оулу (Финляндия) профессор П. Хаккарайнен и М. Бредиките затрагивают в своих работах тему анализа переходных периодов детского развития с точки зрения предложенного Л. С. Выготским метода генетического эксперимента. В статье П. Хаккарайнена представлен опыт исследования смены ведущей деятельности при переходе к школьному обучению у детей дошкольного возраста в условиях совместного взаимодействия в смешанных группах. Дополняя этот анализ, М. Бредиките в своей работе предлагает подробный анализ формирования условий развития, роли психологических орудий и творческой активности в процессе совместной детской групповой деятельности.

В своей статье профессор МГППУ Л. Ф. Обухова предлагает читателю обратиться к работам П. Я. Гальперина с позиции современного исследователя. В первой части работы автор прослеживает развитие идей Л. С. Выготского в исследованиях и научных представлениях П. Я. Гальперина, а во второй раскрывает суть формирующего метода ученого на примере экспериментального исследования развития научных понятий у детей.

Анализ основных понятийных концептов культурно-исторической психологии в их связи с процессом развития предложен в работе профессора Н. Н. Вересова (Университет Оулу, Финляндия). Автор акцентирует внимание на освещении методологических основ организации экспериментальных исследований в рамках культурно-исторического и деятельностного подхода.

В статье сотрудника Университета Гумбольдта (Германия) М. Контоподиса представлен опыт использования методов развития рефлексивного самосознания в образовательной практике. Опираясь на работы Л.С. Выготского и М. Фуко, автор анализирует результаты исследования развития рефлексии у девушек в профессиональных училищах для отстающих и социально неуспешных молодых людей.

Совместная статья двух молодых бразильских ученых А. М. Родригеса и К. Р. ДеМаттоса посвящена анализу основ научного обучения. В статье представлен подробный сравнительный анализ подходов к этой проблеме в работах ряда зарубежных исследователей и в работах ученых, принадлежащих школе культурно-исторической психологии и деятельностного подхода.

В своей статье мексиканская исследовательница М. М. Микалко анализирует развитие счетных знаний у детей культуры Майя с точки зрения культурно-исторического подхода. Автор предлагает вниманию читателей исследование особенностей развития и обучения детей со сформированной двадцатизначной системой счета в традиционных школах.

Аспирант Университета Хельсинки (Финляндия) Д. Рителла описывает опыт использования деятельностного подхода при изучении применения программного обеспечения в процессе совместного планирования и взаимодействия школьных учителей, акцентируя при этом внимание на вопросах формирования позиции присутствия и ощущения социального окружения в условиях виртуального общения.

В статье аспирантки Мюнхенского университета (Германия) А. Карстен представлен опыт анализа письменной речи как познавательной и коммуникативной деятельности, описывается исследование письменной речи, включавшее стадию самоанализа со стороны самого субъекта деятельности.

Австралийская исследовательница Л. Хокинс освещает в своей работе проблему модификации признанного метода экспансивного цикла обучения, разработанного в рамках деятельностного подхода Ю. Энгестрёмом, как метода организации научно-исследовательской деятельности в связи с необходимостью создания систематического подхода в планировании исследований для научных руководителей.

В. В. Рубцов, А. А. Марголис

The issue of the journal presented below contains scientific articles by participants of 1ˢᵗ ISCAR Summer School for PhD Students and Young Scholars «Cultural-Historical Research Methodology: Rethinking the Past for the Future» which took place on 20—24 June 2010 in Moscow State Psychology and Pedagogy University (MSUPE) with support from International Society of Cultural and Activity Research (ISCAR) — the largest international scientific society promoting development of interdisciplinary theoretical and practical research of social, cultural and historical aspects of human activity.

The leading European specialists in cultural-historical psychology took part in the Summer School activities. They are: Clotilde Pontecorvo (Italy), Georg Rückriem (Germany), Harry Daniels (Great Britain), Pentti Hakkarainen, Milda Bredikyte and Nikolai Veresov (Finland), Liudmila Obukhova, Viktor Guruzhapov (Russia). Young scientists from the whole world — Brazil, Mexico, Australia, Serbia, China, USA, Great Britain, Switzerland, Netherlands, Russia — presented their research projects.

In the work of the Summer School the central subjects were: development of key concepts of cultural-historical psychology and activity theory in the works of Russian and foreign scholars, theoretical and methodological features of applied cultural-historical research, support of joint projects, developing a system of scientific and practical exchange and academic mobility.

The joint article by C. Pontecorvo, Professor of «Sapienza» University of Rome (Italy), and F. Arcidiacono , Professor of University of Neuchatel and Lausanne (Switzerland), presents the results of a research dedicated to development of children's reasoning in argumentative communication. Analysis of children's discussions in different social situations serves an example which helps the authors show the importance of verbal reasoning in the process of children's development within family and school.

The article by Professor V. Rubtsov, Professor A. Margolis and Professor V. Guruzhapov is presented under the heading «Debate and Discourse». The paper deals with the organization of the educational process in elementary school from the perspective of the basic principles of psychological activity theory in connection with which the problem of training teachers is posed. In the article the content of the standards of primary education and standards of training elementary school teachers in Russian Federation is analyzed.

The need for methodological and paradigmatic rethinking of modern psychology is a problem examined in the article by G. Rückriem, Professor of Berlin University. The author analyzes relevance of conceptual basis of cultural-historical psychology and activity approach in the current conditions of developing medium and digitalization.

Researchers from Oulu University (Finland), Professor P. Hakkarainen and M. Bredikyte, touch upon the subject of analyzing transition periods of children's development from the viewpoint of Vygotsky's genetic experiment method. The article by P. Hakkarainen presents experience in research of change of leading activity during transition in preschool age in conditions of joint interactions in variegated groups. Adding to this work, M. Bredikyte suggests thorough analysis of forming of conditions for development, the role of psychological tools and creative acts in the process of joint collective activity of children.

In her article L. Obukhova, Professor of MSUPE, suggests the reader to rethink the scientific works of P. Galperin from the view point of the modern researcher. In the first part the author analyses the development of Vygotsky's concepts in Galperin's studies and scientific ideas, and in the second part — reveals the essence of the genetic method suggested by this scientist with the help of the example of experimental study of scientific concepts in childhood.

Professor N. Veresov (Oulu University, Finland) in his article suggests his analysis of basic concepts of cultural-historical psychology in their connection to development process. The author focuses on methodological basis of organizing experimental research in the framework of cultural-historical and activity approach.

The article by M. Kontopodis (Humboldt University, Germany) presents experience in application of reflective self-consciousness development methods in educational practice. With reference to works of Vygotsky and Foucault the author analyzes results of research of reflection development in young women in vocational schools for unsuccessful in their school careers and socially challenged young people.

A joint work by two scholars from Brazil, A.M. Rodrigues and C.R. DeMattos, is dedicated to analyzing the basis for science education. In this article they present a thorough comparative analysis of different approaches to this issue in the works of foreign researchers and in the works of researchers belonging to cultural-historical and activity schools of psychology.

M. Mendez, a researcher from Mexico, presents in her article an analysis of numeral knowledge development in children of Maya culture from the viewpoint of cultural-historical approach. She suggests a research of distinctive features of development and education of children with established vigesimal numeral system in traditional schools.

The article by a Ph.D. student from Helsinki University (Finland), D. Ritella, describes experience in implementation of activity approach to studying of software application in the process of collaboration planning and interaction between school teachers, with emphasis to development of «presence» position and sensing the social environment in the conditions of virtual communication.

The article by a Ph.D. student from University of Munich (Germany), A. Karsten, presents experience in analyzing written speech both in cognitive and communicative activity. The article describes research of writing speech which included a phase of self-analysis by the subject of activity.

The work of L. Hawkins, an Australian researcher, covers the problem of modification of a well-known «expansive learning cycle» method which was developed by Y. Engestem in the framework of activity approach. Modification concerns this method as a method for organizing scientific research activity in connection with a necessity to create a systematic approach to research planning for scientific supervisors.

V. Rubtsov, A. Margolis

Теория П. Я. Гальперина — становление новой отрасли психологии

Л. Ф. Обухова

доктор психологических наук, профессор МГУ им. Ломоносова, заведующая кафедрой возрастной психологии факультета психологии образования МГППУ, действительный член РАЕН

Теория П. Я. Гальперина — научная система, которая включает в себя решение ряда теоретических и прикладных проблем общей (генетической) психологии. П. Я. Гальперин разработал новое понимание предмета психологии, ввел новый метод исследования психических процессов, построил целостную систему развития психики в фило- и онтогенезе. Теория П. Я. Гальперина позволяет ставить и по-новому решать фундаментальные проблемы психологии — соотношение обучения и развития, роль действия в психическом развитии ребенка, плюсы и минусы метода срезов и метода планомерного формирования умственных действий. Эта теория — образец подлинно научного мышления в области психологии, и ее изучение формирует представление о ценности последовательной и строгой теоретической мысли исследователя; теория вносит существенный вклад в развитие культурно-исторической теории.

Ключевые слова: общая (генетическая) психология, ориентировочная деятельность как предмет психологии, метод поэтапно-планомерного формирования умственных действий, оперативная схема мышления.

Если бы мне выпала честь написать вступление к книге П. Я. Гальперина «Лекции по психологии», отправной точкой послужило бы предисловие Л. С. Выготского к книге А. Ф. Лазурского «Психология общая и экспериментальная» (1924).

Текст П. Я. Гальперина, так же как и книга А. Ф. Лазурского, состоит из лекций, прочитанных студентам одной из высших школ. Первая публикация лекций П. Я. Гальперина и третье издание учебника А. Ф. Лазурского вышли в свет после смерти их авторов. Оба руководства написаны «с исключительной простотой, ясностью и доступностью изложения». Для своего времени книга А. Ф. Лазурского, по словам Л. С. Выготского, дала школе «руководство к курсу психологии». В наше время стать новым руководством к курсу психологии предназначено посмертной публикации П. Я. Гальперина. Ее анализ позволяет заметить и подчеркнуть, насколько далеко психология ушла вперед и как глубоко она вникла в суть изучаемых ею психических процессов. Она в лучших своих образцах воплощает предсказания, предчувствия, прорицания Л. С. Выготского.

В предисловии к книге А. Ф. Лазурского Л. С.Выготский писал: только такая научная система, которая покажет биологическое значение психики в поведении человека, которая точно укажет, что психика вносит нового в реакции организма и сможет объяснить психику как факт поведения, только такая система может называть себя научной психологией.

Она будет «теснейшим образом связана с философией, представляющей объединенную теорию научного знания, а не со спекулятивной философией, предшествующей научным обобщениям». В то время (1924) Л. С. Выготский подчеркивал, что такая система еще не создана. Сегодня мы можем сказать, что такая научная система была построена Петром Яковлевичем Гальпериным во второй половине XX в.

В его теории есть ответ на вопрос об объективном признаке, критерии психического, в ней показана функция психики в поведении субъекта, проанализированы ситуации, когда психика не нужна, и ситуации, для которых психическая регуляция поведения становится биологически необходимой. В теории П. Я. Гальперина раскрыто психологическое содержание поведения и показана роль предметного действия в развитии психики. Его теория включает в себя понятие о предмете психологии, учение о методе исследования психических процессов, концепцию эволюции психики. В ней выстроена система психических процессов, где каждый психический процесс представлен как специфическая, не сводимая к другим психическим явлениям форма ориентировки субъекта в проблемной ситуации.

Эта теория широко применяется в школьном и профессиональном обучении, в психодиагностике и коррекции психических процессов. Однако высокая эффективность применения теории П. Я. Гальперина в сфере образования затмила другие ее стороны,

что привело к редукции ее подлинного значения. Произошло сведе́ние данной теории к концепции поэтапного формирования умственных действий и понятий. В наше время эта концепция плодотворно развивается в педагогической психологии, что привело к созданию новой дидактики, отраженной в работах Н. Ф. Талызиной и ее сотрудников.

Другая форма редукционизма проявилась в том, что большинство авторитетных психологов видели в теории П. Я. Гальперина просто одну из концепций интериоризации. Но даже в редуцированном виде как педагогическая теория, как концепция поэтапного формирования умственных действий или как концепция интериоризации учение П. Я. Гальперина не могло быть адекватно воспринято учеными, если они не сотрудничали непосредственно с Петром Яковлевичем, не вели эксперименты под его руководством.

Всем известно, что основные положения его теории никогда не публиковались в полном виде. Они передавались устно на лекциях, уточнялись, пояснялись, углублялись в устных беседах. Вспоминается, как студент-первокурсник философского факультета Александр Цыпко, известный теперь политолог, всем своим существом внимал Петру Яковлевичу, буквально не отходя от него, задавал ему множество вопросов в перерыве между лекциями. Так же относились к П. Я. Гальперину многие другие люди, для которых психология, к сожалению, не стала профессией.

Что касается профессионалов в области психологии, многие из них выступали с резкой критикой в адрес теории поэтапного формирования умственных действий — наиболее известной части учения П. Я. Гальперина. Так, С. Л. Рубинштейн считал, что учение П. Я. Гальперина относится к числу теорий односторонне и потому неверно подчеркивающих роль внешних факторов в детерминации психических способностей. Неверно думать, — писал он, — что всякое умственное «действие» имеет свой прототип в материальном действии; также неверно думать, что «обязательным условием возникновения умственного действия является обращение к «соответствующему» материальному действию, которое оно в умственном плане «воспроизводит» или из которого оно исходит» [7, с. 222]. По мнению С. Л. Рубинштейна, характеристика познавательной деятельности как ориентировочной связана с тенденцией оттеснить характеристику познавательной деятельности как деятельности аналитико-синтетической.

В 1972 г. А. Н. Леонтьев записал в своем дневнике «Замечания на брошюру П. Я. Гальперина «Введение в психологию», что П. Я. Гальперин в своем тексте игнорирует ряд фундаментальных вопросов, неудобоваримых для его подхода, игнорирует альтернативные взгляды на ряд проблем. «Мое общее заключение о данной рукописи, — писал А. Н. Леонтьев, — состоит в том, что без надлежащей переработки издавать ее нецелесообразно». Издание 1976 г., в котором были учтены некоторые замечания А. Н. Леонтьева, снова вызвало массу критических замечаний. По воспоминаниям А. А. Леонтьева, вскоре после выхода книги между

А. Н. Леонтьевым и П. Я. Гальпериным имел место обстоятельный, нелицеприятный разговор, посвященный книге; разговор состоялся по инициативе А. Н. Леонтьева, у него дома [5, с. 259—262; с. 285—286].

Однако при абстрагировании от субъективных, эмоциональных аспектов научного взаимодействия ученых того времени явствует, что у Петра Яковлевича не было никаких посягательских замыслов. В действительности он разрабатывал новое направление в психологии, в котором психические процессы рассматриваются с точки зрения их происхождения, строения и функции.

Не только в жизни, но и в науке «лицом к лицу лица не увидать». И может быть поэтому А. Р. Лурия усматривал в теории П. Я. Гальперина лишь формирование школьных навыков. Хотя он и его ученики, и среди них Л. С. Цветкова, в работе по восстановлению психической деятельности при мозговых поражениях опирались на идеи П. Я. Гальперина.

То что особенно волновало психологов того времени по отношению к теории П. Я. Гальперина, можно перечислить в виде вопросов, поставленных А. А. Смирновым на втором съезде психологов в 1963 г.: необходимы ли все этапы при усвоении любых умственных действий, на всех ступенях обучения, для всех возрастных групп учащихся, для школьников с разными уровнями развития способностей? Необходима ли с самого начала строгая регламентация всех операций, какие должны выполняться учащимися, чтобы данное действие было усвоено? Не выработает ли жесткое управление каждым шагом практической и мыслительной деятельности школьника, всеми его операциями привычку действовать только по указке? Не повредит ли это развитию самостоятельности, активности учащихся? Не задержится ли из-за этого умственное развитие учащихся?

В 60-е гг. в дискуссиях устно и письменно Петру Яковлевичу приходилось постоянно разъяснять, что предметное действие не сводится к действию с вещами; что умственное действие и умное действие — не одно и то же; что надо различать умственное действие и образ этого действия; что нельзя смешивать материальное и практическое действие; что предметному действию с самого начала не присущи такие свойства, как разумность, сознательность, обобщенность, — они должны быть сформированы.

Излишне напоминать, что дифференциация понятий — один из основных критериев развития научного мышления. П. Я. Гальперин строил новую психологическую теорию, и для нее необходима была разработка точных научных категорий. Л. С. Выготский предсказывал в предисловии к книге А. Ф. Лазурского, что со временем «весь научный аппарат эмпирической психологии будет пересмотрен, переконструирован и создан заново в новой психологии». В работе «Исторический смысл психологического кризиса» он подчеркивал, что психологический язык современности недостаточно терминологичен. Это значит, что психология не имеет еще своего язы-

ка. В ее словаре конгломерат из трех сортов слов: слова обиходного языка, которые отличаются неточностью, метафоричностью, многосмысленностью; слова философского языка, которые представляют собой главный источник смутности и неясности в психологии; слова и формы речи, заимствованные из естественных наук, они служат прямо для обмана, так как психолог научным словом прикрывает ненаучное понятие.

Ни в одном руководстве по психологии нет такой дифференцированной характеристики образа, которую дает П. Я. Гальперин в своей научной системе. С его точки зрения, образ — это явление объекта субъекту; образ не дан в самонаблюдении, образ — продукт умозаключения. Образ сам не действует, а открывает перед субъектом поле возможного действии. Образ — субъективен, ограничен, это определенный способ видения; в образе открывается значение вещей.

Но что такое «значение вещей»? Как это можно понять? П. Я. Гальперин не оставляет и эти вопросы без ответа: значение — это свойства вещи, с которыми мы должны были бы считаться, если бы действовали с этой вещью непосредственно. Он подчеркивает далее, что образ и физическое изображение — не одно и то же; образ невозможен без деятельности субъекта. Деятельность по восстановлению оригинала на основе черт изображения и приводит к построению образа; образ — характернейший элемент психики, но не вся психическая жизнь; в поле образов существует ориентировочная деятельность. В такой характеристике образа нет ничего лишнего, в нем с поразительной простотой указано самое необходимое, без чего дальнейшее продвижение в понимании предмета психологии просто невозможно.

П. Я. Гальперин делал нечто большее, чем было видно научному сообществу. Он создавал новое направление в психологии, новую отрасль нашей науки, которую сегодня уже можно назвать общей (генетической) психологией.

Эта отрасль психологии изучает становление и развитие психических процессов. Она имеет свой предмет: все психические процессы изучаются как различные формы ориентировочной деятельности, выполняющие свою специфическую функцию в регуляции поведения. У этой науки есть свой метод — построение психического явления с заранее заданными показателями. Она не ограничивается описанием психологических феноменов и за внешней картиной протекания психических процессов стремится выявить внутренние механизмы психических явлений. В ней представлена эволюция психики, рассмотрена предистория человеческой психики, качественная грань между психикой животных и психикой человека, итоги антропогенеза, особенности психики первобытного человека, факторы развития психики ребенка, проанализирована структура предметного действия в качестве единицы анализа развития психических процессов и многое другое. П. Я. Гальперин построил систему, в которой все психические процессы рассматриваются в том особом качестве,

которое интересует психологию как науку о развитии психики.

В области психологии развития система такого масштаба по своему научному значению может быть поставлена на одном уровне с теорией Л. С. Выготского и теорией Ж. Пиаже. Сопоставление этих трех теорий в нередуцированном виде — задача будущих историков психологии. Сейчас отметим только, что идея ориентировки есть и в работах Л. С. Выготского. Однако в соответствии с научными взглядами своего времени Л. С.Выготский отождествлял ориентировку и внимание. Он считал, что функция и структура ориентировки могут служить диагностическим принципом при определении способности ребенка к обучению и, следовательно, к развитию. Л. С. Выготский показывал на примере, что глубоко умственно отсталый ребенок (в степени идиотии) не способен фиксировать свой взгляд на объекте и поэтому он не способен к обучению. Ребенок-имбицил способен фиксировать объект, у него есть пассивное внимание и он в некоторой степени способен к обучению. Умственно отсталый ребенок в степени дебильности способен к активной фиксации объектов в поле восприятия, но он не способен выйти за границы наличного перцептивного поля. Если Л. С. Выготский связывал ориентировку с функцией внимания, то П. Я. Гальперин показал, что все психические процессы — это различные формы ориентировочной деятельности субъекта в различных проблемных ситуациях, в различных задачах, с разными средствами и орудиями их решения.

Известно, что Л. С. Выготский придавал большое значение речи в формировании высших психических функций. Не отвергая этой идеи Л. С. Выготского, П. Я. Гальперин показал, что основой любого психического процесса служит предметное действие субъекта, психологическим механизмом которого является ориентировка. Она имеет сложную структуру и включает в себя образ ситуации действия, образ исходного объекта действия, образ конечного результата, образ самого действия и его ключевых моментов и, наконец, качество средств и орудий для выполнения действия. Успех действия в целом и качество психического процесса, который формируется на ее основе, зависят от полноты ориентировки.

Идея формирующего метода в психологии также принадлежит Л. С. Выготскому. Но П. Я. Гальперин разработал этот метод в деталях и использовал в различных экспериментальных ситуациях, в том числе и для анализа фактов и теории Ж. Пиаже.

Работа по методу П. Я. Гальперина — всегда исследование, которое позволяет раскрыть новые стороны изучаемого психического процесса и дополнить первоначальные представления о структуре самого метода.

На примере формирования у детей простой системы научных понятий рассмотрим логику самого процесса построения нового знания в применении его к решению задач.

Конкретным объектом цитируемого исследования послужило понятие «давление твердых тел».

Согласно теории П. Я. Гальперина понятие — это отвлеченный, абстрактный образ предмета. Его формирование осуществляется благодаря действию по исследованию и, в частности, по распознаванию объекта. Такое действие должно быть вооружено соответствующими критериями — признаками формируемого понятия, которые выделяются и тут же четко и рельефно записываются на рабочую карточку. Благодаря действию соотнесения признаков понятия с предложенным заданием устанавливается принадлежность объектов к данному понятию.

В этом исследовании понятия использовались не только для распознавания явлений, но и для решения задач. Чтобы решить задачи на давление твердых тел, недостаточно установить принадлежность явления к одному из понятий. Для решения такой конкретной задачи нужно построить отношение между известными понятиями; только формула этого отношения $P=F/S$, связывающая понятия F, S, P в одну простую систему, позволяет перейти к вычислительной операции или к соответствующему выводу. Поэтому основным вопросом данного исследования стало выяснение, какие новые действия предполагает применение простой системы понятий к решению задач.

Для эксперимента, подобно тому как это было во всех других работах П. Я. Гальперина и его сотрудников, необходима карточка. На ней записываются признаки понятия, и благодаря этому их не нужно заранее запоминать. Однако в условиях формирования одновременно нескольких понятий содержание ее становится шире, так как карточка включает в себя их определения. Понятия на карточке расположены в последовательности их логического выяснения, и, таким образом, перед ребенком выступает вся система понятий в целом. Карточка благодаря записанным в ней признакам понятий выполняет функцию орудия, с которым ученик подходит к анализу задачи. Она выражает позицию ученика по отношению к задаче, которая дана ему первоначально во внешней материализованной форме. Лишь через ряд известных последовательных этапов эта внешне представленная позиция превращается в «непосредственное видение» отношений между вещами.

Задачи, при решении которых испытуемый использовал понятие «давление твердых тел», были тщательно подобраны. Среди них простые задачи на вычисление; простые задачи, похожие на примеры с отсутствием одного из условий; задачи простые, но имеющие лишние условия; задачи составные, но либо с полным набором условий, либо с наличием лишних условий, либо с отсутствием одного из необходимых условий; испытуемым предлагались также задачи, в которых условия были выражены в скрытой форме.

В эксперименте проводилась поэтапная отработка действия с понятиями, причем на каждом этапе испытуемые решали задачи всех перечисленных типов.

В начале эксперимента предполагалось, что достаточно иметь точные определения понятий, записанные в карточке, чтобы затем, применяя их к тексту задачи, без ошибок находить в нем соответствующие данные. Опыт показал, что для решения задач со сложной предметной ситуацией этого недостаточно. Испытуемый, руководствуясь карточкой, обращался к числам, вместо того чтобы анализировать ситуацию, о которой говорится в задаче. Отсюда стало ясно, что для решения задач испытуемому надо не только иметь существенные признаки формулы, которые он соотносит с материалом, но и уметь видеть в содержании предъявляемой задачи конкретную ситуацию. Поэтому в дальнейшем ходе эксперимента от испытуемых требовалось восстановление фактической ситуации по тексту задачи путем ее изображения на рисунке. Только после этого испытуемые должны были анализировать ее с помощью системы понятий, указанных на карточке.

Оказалось, что, во-первых, изображение бывает условным, тогда рисунок схематичен и выражает готовый ответ, в то время как сам анализ задачи был проведен в уме. Во-вторых, изображение бывает формальным, в этом случае материализуется только отдельное, прямо указанное условие задачи, а не вся действительность, которой это условие принадлежит; такое формальное изображение не может привести к правильному решению задачи. В-третьих, для безошибочного решения необходимо, чтобы изображение восстанавливало все существенные черты ситуации; для этого сначала испытуемый должен с помощью вертикальных линий разделить текст задачи на смысловые части, каждая из которых выражает одно сообщение, а затем последовательно изобразить их. Законченное изображение должно быть такого качества, чтобы с ним можно было работать, не обращаясь больше к тексту задачи (рис. 1).

З а д а ч а . «Лыжник весом 67 кг / встал на лыжи/ длиной 2 м / и шириной 10 см / каждая/. Какое давление оказывает он на снег/, если обе лыжи / весят 3 кг/?»
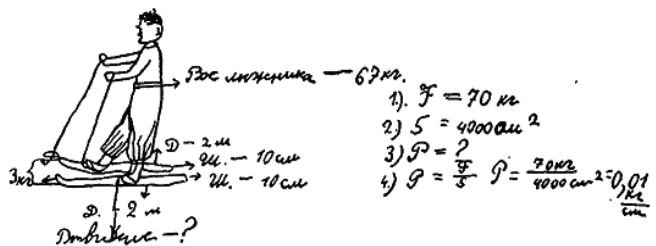

Рис. 1. Изображение становится полноценным условием анализа задачи

Когда дети научились полностью восстанавливать объект действия — физическую ситуацию задачи — и анализировать ее с помощью понятий, указанных на карточке, возникла новая проблема — перевести действие в план громкой речи без изображения.

Можно ли, вместо того чтобы ситуацию задачи изображать на рисунке, просто рассказать о ней? У слабых учеников рассказ следует за текстом задачи, но не выделяет структуру ситуации. Чтобы решить задачу, приходится снова возвращать испытуемого к изображению ситуации. Введение логического плана решения (Какой вопрос ставится в задаче? Что нужно знать для ответа на вопрос? Что для этого указано в задаче? Как выполнить решение?) также не обеспечивало решения всех задач без опоры на изображение ситуации.

Анализ результатов эксперимента показывает, что в процессе применения признаков понятия к изображению ситуации стихийно происходит их конкретизация. Однако лишь некоторые испытуемые пытались выразить словами это частное значение понятий. Во время последующих занятий испытуемых специально просили изменить правило (определение F, S, P), внося в него конкретные данные. Действие с признаками понятия должно было состоять не только в отнесении определения к частному случаю, но и в новом выражении общего правила соответственно этому случаю.

Сначала ход анализа повторял порядок карточки и нередко отвлекал испытуемых от основного вопроса задачи. В последующих экспериментах анализ начинался с того пункта карточки, который непосредственно отвечал на вопрос задачи. Однако переходя в речевой и далее в умственный план выполнения действия, испытуемые снова начинали делать ошибки, которые они уверенно исправляли, обращаясь к изображению.

Таким образом, ни рассказ о графическом изображении ситуации, ни логический план, ни указанные дополнения в методике не обеспечивали решения задачи в речевом плане без опоры на изображение. У этих испытуемых выпадало какое-то существенное звено при переходе в план «громкой речи без вещей».

Как показали наблюдения за ходом решения задач, ученик, который имеет перед собой правильный рисунок, выделяет в нем моменты, существенные для ответа на вопрос. Когда же перед испытуемым лежит текст задачи, он снова действует только с непосредственно указанными в нем условиями и не учитывает ту предметную действительность, о которой говорится в задаче. Значит, можно думать, что действие, которое испытуемый производит на основе изображения и которое не переносит в план «громкой речи без предметов», заключается в выделении всех существенных для решения задачи сторон предметной действительности.

Следовательно, необходимо научить испытуемого учету всех существенных сторон проблемной ситуации и при наличии ее графического изображения, и без него. Для этого в новом эксперименте на этапе действия с изображением испытуемых учили сознательно выделять и внешне материализованно закреплять все существенные для решения черты ситуации.

Испытуемым предложили такой прием: «Показывая на рисунке все предметы, оказывающие силу давления, объединяй ее составляющие и обводи их кругом». Таким же образом: «Показывая площадь опоры, поставь на изображении большую точку у каждого места опоры. Перерисуй рядом полученный круг с точками и заполни его исходными данными. Обозначь стрелкой направление давления» (рис. 2).

З а д а ч а. Определить давление, оказываемое табуреткой, на которой сидишь, на пол (36 кг, 2 кг, 5 кв. см).
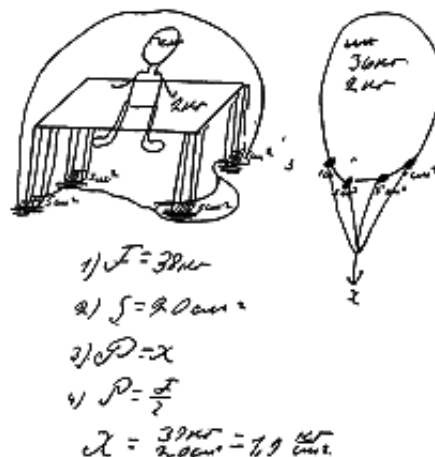

Рис. 2. Построение оперативной схемы мышления

Так создавалась схема, которая выражала содержание задачи, и вместе с тем порядок ее исследования. Она выделяла и закрепляла общие, существенные, соответствующие формуле моменты ситуации. Схема представляла собой объект анализа в преобразованном виде: рассеянные места опоры она сближала; силу давления, состоящую из отдельных компонентов, объединяла. С созданием такой схемы все компоненты задачи были полностью материализованы и четко выделены. На рис 3 изображена оперативная схема к следующей задаче.

В цех привезли станок весом 3 т. Он опирается на пол двумя подставками: одной — размерами 40×80 см и другой — размерами 50×100 см. На станок положили деталь весом 10 кг, опирающуюся на станок головкой площадью 200 кв. см. Определить давление станка с деталью на пол.
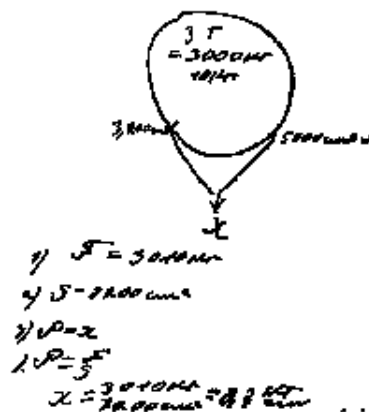

Рис. 3. Оперативная схема мышления

После схематизации решение задачи выполнялось очень быстро. Схема эта оказалась общей для решения всех задач на данную тему. Она позволяла перевести действие из материализованного плана в план «громкой речи без изображения», а из плана громкой речи действие вместе с его схематизированным объектом переводилось в план «внешней речи про себя», т. е. уже в собственно умственный план.

Из данного исследования следует, что в процессе применения понятий к решению задач в дополнение к уже известному о процессе формирования понятий необходимо выделить следующие моменты.

1. Признаки понятия не исчерпывают его содержания. Подлинный объект понятия — функция, которую выполняют соответствующие предметы, и признаки понятия принадлежат именно ей.

2. Вещи и их функции гораздо богаче того содержания, которое становится объектом понятия. Однако это содержание обязательно должно быть выделено и отделено от вещей в виде пространственной схемы, выражающей отношения объектов, которые соответствуют этому понятию.

3. Схема всегда стоит между предметом и понятием, без ее построения невозможно формирование полноценных понятий. Схема служит орудием нашей ориентировки по отношению к любым объектам соответствующей области.

4. При решении задач необходимо восстановление предметной ситуации в ее существенных для решения чертах.

5. Схематизация этой ситуации, благодаря чему она становится доступной для переноса в речевой и далее в умственный планы.

6. Разделение в связи с этим этапа материализованного действия на две последовательные части — обычного изображения и изображения схемы.

7. Изменение хода анализа задачи, который должен идти от вопроса задачи к системе понятий, от нее — к восстановлению предметной ситуации, далее — к выделению ее существенных черт (схематизация), затем — к заполнению элементов этой схемы на основе конкретных данных задачи и, наконец, к решению задачи по формуле.

Таким образом, при применении системы понятий к решению задач порядок работы усложняется, но это не отменяет установленной последовательности поэтапной отработки нового действия.

Проанализированный вариант использования метода планомерно-поэтапного формирования нового для ученика знания показывает, что главное условие успешного применения данного метода — изменение позиции самого исследователя. Экспериментатор, строя по этому методу новый психический процесс, не ограничивается простым наблюдением результата выполнения испытуемым того или иного задания, как это бывает при проведении срезовых исследований. От констатации разнообразных явлений психической жизни он должен перейти к выявлению и созданию условий, обеспечивающих формирование психического процесса с заданными свойствами. Понятие такого полноценного процесса определяется не субъективным желанием экспериментатора. Напротив, оно обусловлено определенными объективными требованиями системы задач, которые испытуемый должен решить с помощью формируемого психического процесса. Сила этого метода состоит прежде всего в разработке объективной системы требований к конкретному психическому процессу и системы условий, обеспечивающих выполнение этих требований.

Работа с помощью этого метода кропотлива, трудна, но увлекательна. Она ведет к новым открытиям.

Как подчеркивал П. Я. Гальперин, «самое важное и трудное в поведении — это правильно ориентироваться в обстоятельствах, требующих действия, и далее правильно ориентировать свои действия» [3, с. 268—269]. По его словам, в познании себя и овладении собою люди ждут помощи от психологии помощи правильно учиться и учить, как разобраться в том, чего можно ожидать и на что не следует надеяться, как не оказаться в неожиданных и крайних ситуациях.

Завершить это сообщение хотелось бы словами из сборника статей Макса Планка «Единство физической картины мира», которые Петр Яковлевич цитировал и которые также можно отнести к развитию в историческом времени его собственной теории.

«Описанный здесь ход исторического развития хорошо иллюстрирует тот факт, который на первый взгляд может показаться странным. Великая научная идея редко внедряется путем постепенного убеждения и обращения своих противников, редко бывает, что "Саул становится Павлом". В действительности дело происходит так, что оппоненты постепенно вымирают, а растущее поколение с самого начала осваивается с новой идеей — пример того, что будущее принадлежит молодежи» [6, с. 188—189].

Сейчас мы можем только предположить, что в 1924 г. молодой П. Я. Гальперин не прошел мимо публикации Л. С. Выготского, и она как общая схема уже на бессознательном уровне направляла его научные поиски на протяжении всей жизни.

Литература

1. *Выготский Л. С.* Собр. соч.: В 6 т. Т. 1. М., 1980.
2. *Гальперин П. Я., Обухова Л. Ф.* Процесс решения задач и проблемы формирования полноценного объекта действия в уме // ДАПН РСФСР. 1961. № 2. С. 73—77.
3. *Гальперин П. Я.* Психология как объективная наука. М., 1998.
4. *Гальперин П. Я.* Лекции по психологии. М., 2002.
5. *Леонтьев А. Н.* Философия психологи. М., 1994.
6. *Планк М.* Единство физической картины мира. М., 1966.
7. *Рубинштейн С. Л.* Проблемы общей психологии. М., 1973.

Galperin Theory — Establishment of a New Branch in Psychology

L. F. Obukhova

Doctor of Psychological Sciences, Professor, M. V. Lomonosov Moscow State University, Head of the Develpmental Psychology Chair, Department of Education, MSUPE, full member of RANS

Galperin theory is a scientific system, which includes the solution of a number of theoretical and applied problems of general (genetic) psychology. Galperin has developed a new understanding of the subject of psychology; he has introduced a new method for studying mental processes and has built an integrated system of mental development in phylo- and ontogenesis. Galperin theory allows us to pose and re-address the fundamental problems of psychology - the interrelation of education and development, the role of action in the mental development of children, the pros and cons of the cross-section method and the method of systematic formation of mental actions. Galperin theory is an example of an authentic scientific thinking in psychology and its study forms a representation of the value of consistent and rigorous theoretical thinking of the researcher. Galperin theory makes a significant contribution to the development of cultural-historical theory.

Keywords: general (genetic) psychology, orientation activity as a subject of psychology, method of stage wise-systematic formation of mental actions, operational scheme of thinking.

References

1. *Vygotskii L. S.* Sobr. soch.: V. 6 t. T. 1. M., 1980.
2. *Gal'perin P. Ya., Obuhova L. F.* Process resheniya zadach i problemy formirovaniya polnocennogo ob'ekta deistviya v ume / DAPN RSFSR. 1961. № 2. C. 73—77.
3. *Gal'perin P. Ya.* Psihologiya kak ob'ektivnaya nauka. M., 1998.
4. *Gal'perin P. Ya.* Lekcii po psihologii. M., 2002.
5. *Leont'ev A. N.* Filosofiya psihologi. M., 1994.
6. *Plank M.* Edinstvo fizicheskoi kartiny mira. M., 1966.
7. *Rubinshtein S. L.* Problemy obshei psihologii. M., 1973.

Psychological tools and the development of play

Milda Bredikyte

Ed. D., Associate Professor, Department of Education, Oulu University (University Consortia of Kajaani)

Such theoretical concepts of cultural-historical theory as psychological tools, creative developmental acts and cultural development is introduced. The concepts are used in the analysis of empirical study of specifically designed play-promoting environment — playworld [15]. The environment has been constructed having in mind Vygotky's idea of genetic experiment, but instead of one higher mental function the whole activity system (joint play activity) is promoted. Individual creative acts take place in collective activity. A case study is presented, which reveals developmental trajectory of the child and specific conditions of individual creative acts.

Keywords: psychological tools, creative act, play development, genetic experiment, playworld, "ideal" forms of behavior, dialogical drama with puppets, initiative behavior.

Introduction

In societies supporting children's play and regarding childhood as a fundamental period of human life there appears the problem how to support play. Often the support means a positive attitude towards play and acceptance of children's involvement in play activities. In western societies virtual materials, toys and props are offered to children in abundance. Children's spaces are often overfilled with materials produced for «play support». Materials and props do not accomplish their purpose. A general positive attitude towards play does not help to discern what plays are better than others and how to develop children's play.

Behind positive attitudes there is an assumption that play has a specific function in human development. But it is necessary to specify this function and find out appropriate methods of strengthening it. In traditional play theories developmental impact of play is not explicated in concrete terms. Play is supposed to have developmental value in any form and thus actively promoted. Attempts to demonstrate what concrete results play may bring with are often based on the evaluation of cognitive learning results attained in play. In this case the real developmental potential of play is lost. We claim that play has more potential as the tool of changing the self of participants in play (as a psychological tool).

Vygotsky did not write extensively about play, but indicated some essential aspects of play and its impact on child development. Developmental potential of play is connected first of all to the development of imagination and symbolic competence. These characteristics are results of the whole playtime during several years. We can even talk about similarities between play and artistic creativity in adult life. Vygotsky [25] argued that in play children create a symbolic reality like real artists do. He concluded that play is imagination in action and prototype of any artistic creativity. This connection is based on the syncretistic (holistic) character of play, which is also a necessary precondition for all artistic creativity.

We think that creative aspects of play are more important than learning concrete knowledge and skills. We suppose that creative acts carried in play using cultural tools are important factors promoting children's development. The main focus in our study is on creative moments and interpretations in children's play and not what concrete phenomena from their environment they reproduce in the play process. Adults cannot directly program children's creativity. We can rather talk about adults' provocations for creativity and change of self. Provocations should have a close kinship with play, which means that they should have an aesthetic form (drama, story, narrative, music etc.).

Cultural and psychological tools in playworlds

We may describe children's play as creative interpretation of their cultural environments. In other words children are not directly copying and reproducing phenomena of the environment in their play. Cultural-historical psychology has interpreted creativity of play by emphasizing the sense making dominance of play [26]. This makes possible the disentangling of characteristics of objects and phenomena and their creative recombination (pretending) in an original way [7]. In any case play is carried out using different cultural tools, which may be directed to the personal self of the players. In other words cultural tools are transformed to psychological tools, which regulate children's psychological processes. Creativity exposed in play activity is a serious challenge in scientific research because concrete products seldom can be analyzed.

Play has an important function in the development of self-regulation. Play ideas, imaginary situations and roles as psychological tools replace external stimuli and control is shifted internally. The imaginary situation

frees the child from the impulses of the present situation. Vygotsky explained the transition of control using the concept of intention: «Intention is a type of process of controlling one's own behavior by creating appropriate situations and connections» [24, p. 211]. In child-initiated pretend play all participants jointly construct appropriate situations and there is a level of joint negotiated intentions. Control of behavior is established by creating play rules. Vygotsky argues that there is no play in situations where no rules are present. «Only actions that fit the rules are acceptable in the play situation» [26, p. 82]. Play rules are different from ordinary social rules, which normatively regulate cultural practices. The children negotiate about the rules and regulate their play behavior. These rules have an affective character and obeying rules brings satisfaction.

Joint play requires flexibility and creative imagination, but it is at the same time the space for developing them further. Vygotsky [23, p. 123] offers a counter example about lacking imagination in his works on defectology: «We saw that the zero point of imagination...appears in the following way — the individual is in a state where he is unable to abstract himself from a concrete situation, unable to change it creatively, to regroup signs to free one's self from under its influence». An unwritten conclusion is that creative people are more adept at manipulating psychological tools and at adapting to their environments than less creative. Children's play age has sometimes been called «the time of unlimited creativity» [4].

An attempt to analyze the use of cultural and psychological tools is made by El'konin jr. [8] who proposed the concept of «creative act» as a unit of analysis in his study of developmental phenomena. A creative act has special potential and forms a turning point in developmental processes. A truly human act is an act of *cultural co-creation*, not a form of consumption of culture and cultural products. Only productive action can be called a developmental act. *The product of a developmental act irreversibly changes the environment and the subject or actor of the activity.*

We are interested in creative acts and the development of self in play and other activities where children assimilate sense and meaning of human activities. El'konin [7] argues that the didactic role of play is limited, because its specific functions are different. According to him «Role-playing is an activity within which the child becomes oriented towards the most universal, the most fundamental, meanings of human activity» (p. 24). In his diaries El'konin [6] writes that play is not a process of mastering the forms of human activity or social roles, but rather the *contents of moral norms.* Thus role-play can be understood as the overall process of mediation of meanings and purposes of human activity.

Some researchers claim that the most accessible cultural tools containing models of relations among people are folk tales and traditional fairy-tales. In educational practice today a story or fairy tale is often regarded merely as an example — a material to show the correct way to relate to the realities of life. Experimental studies and practical everyday observations have proved that children while knowing how they should behave nonetheless are unable to demonstrate such behavior in real life situations. Mastery of helping behavior in an imaginary play situation did not lead directly to the mastery in normal daily setting [21].

Fairy tales do not directly reflect reality. On the basis of a lexical-semantic analysis Tsiv'ian concluded that, although a fairy tale may be considered one of the most accessible kinds of text, this does not mean that it is semantically simple. The semantics of a fairy tale is very complicated — it contains a «complete system modeling the world» [22, p. 212]. Semantic analysis of a story led Tsiv'ian [22] to reconstruct the archetypical features of the plots of fairy tales and to establish a mythological model of the world described in terms of a system of universal semiotic oppositions (one's own and that which is not one's own, external and internal, near and far, etc.). Propp [20] also showed that the role of everyday life in the fairy tale has been overestimated and that reality is not directly reflected in folklore. Folklore is an interpretation of reality conceived in totally different categories from our own. It is always a transformation of a particular aspect of reality.

What happens when a story is read or told to the child? According to El'koninova [10] «work» is the correct term for describing the complex internal activity of a child. A traditional story is centered on the main character and is focused on resolving the main character's personal fate. Identifying himself with the hero, the child grasps the text's hidden semantics that is conveyed through the actions of the main character. The sense of actions «is singled out by the child not through mental inferences and thought operations, but through a direct emotional relation to the main character, through participation in the events in the story» [9, p. 41].

Zaporozhets & Neverovich [29], Strelkova [21] have shown that while listening to the story a child follows the actions of the main character with his «inner eye» — «living through» (soperezhivat') and assisting (sodeistvovat'): he literally experiences all the events physically and emotionally. Recordings of autonomic nervous reactions accompanying listening to a story have also confirmed this [29].

Zaporozhets [28] points out that one of the most important changes taking place at preschool age is the development of an **ability to act mentally in imaginary circumstances** (an imaginary situation according to Vygotsky). Vygotsky describes how this process develops from the creation of imaginary situations in pretend play, Zaporozhets analyses it further describing how listening to a fairy tale supports the child's movement from symbolic actions with symbolic objects in imaginary sense-fields to imaginary actions (but real feelings and emotions) in the imaginary fairy tale space. Clear composition, dramatic events and rhythmical movement of the events help the child to step into the circle of imaginary circumstances and assist mentally the heroes of the story. The young child doesn't want and is

not yet able to take the position of an outside observer, says Zaporozhets. Vygotsky [25], Flerina [11], Kudriavtsev [13, 14] and others state that a young child is always «inside» the events he is painting or telling.

In pretend play the child has to create imaginary situations, symbolic objects and actions (which are still real actions) in order to maintain pretending. The narrative of a fairy tale helps the child to create an imaginary reality, maintain and feel it, enabling the child to act. The result of this process «is making his own story — i. e., assimilating and comprehending its sense». This requires time, practice and sensitivity from the adult.

A decisive factor is that the child has an opportunity to live through and assist (soperezhivat) the hero in carrying out heroic deeds. Is it equally possible when listening to the story, observing the story dramatization or participating in the dramatization? Results from experiments with short stories presented to groups of six-year-old normal and intellectually retarded children show that dramatization and personalized presentations of the story clearly enhanced the understanding of retarded children. There were no differences between the different modes of presenting the story to normal children [1].

El'koninova and El'konin jr. made a psychological analysis of the fairy tales relying mainly on the works of Lotman, Propp, Tsiv'ian and others and came to the conclusion that *initiative relationship to the world* is presented in fairy tales. The subject in a fairy tale is the subject of a deed (in Bakhtin's sense), the initiator of an action — creative act (in El'konin's sense). The fairy tale is shaped to test *initiative* behavior.

El'koninova's [9, 10] experiment is an attempt to follow the development of creative acts in play activity. According to her a «*developmentally challenging play is not possible without giving a real shape for the ideal form of human relations presented in folk tales*». In her experiment she followed the way in which children between three and seven play out stories familiar to them, keeping to a canonical plot. At the beginning the story was read to the children and they were asked to dramatize the story together with an adult. Only those children who wanted to take part in the dramatization participated in the play sessions. In all 60 kindergarten children from 4 to 7 years took part in the experiment.

The main conclusion was that the preschool children are not able to construct the whole structure of a classical folk tale in their joint play. Children between the ages of 4 and 5.5 managed the task best.

«A vivid enactment of an integral story plot, *during which alone samples of initiative can be tested*, becomes possible when a child not only intuitively understands that what happens in make-believe is indeed make-believe but also, at the same time believes in the reality of the story. Younger children cannot play out the part of a story completely because for them it is too real; 6—7-year-olds are not able to do this because for them the story is too make-believe. An integral and vivid enactment of a story occurs at about the age of 5 because children of this age are best able to establish a balance between their experience of the reality of the story and

their experience of the make-believe quality of what takes place in the performance» [10, p. 86].

El'koninova concluded that in make-believe performances the child acquires the experience of being a subject, he senses initiative through overcoming behavioral stereotypes and through restraining impulsive actions. Initiative requires some self-definition from the child and it marks the beginning of changes of his consciousness.

Child as the subject of joint activity

Traditional folk tales represent culturally accepted — «ideal» forms of behavior. They do not directly reflect reality, but express particular attitudes towards the world and cultural values. Hughes [12] suggests that stories may be called units of imagination and understanding.

An adult personifies «cultural» or «ideal» forms of behavior for the young child. Even if the child already is able to perceive such cultural forms as music, rhythm, rhyme, sounds, colors, shapes, forms, etc. he has no access to them without an adult. The adult is a mediator of culture for the child. When the adult introduces to the child such cultural forms as folk songs, folk tales, folk art, the child gradually can find his «independent» path to the world of culture. This makes possible to «compare» ideal cultural forms with everyday life situations and start creating subcultures.

According to Lotman [17] young children approach all artifacts actively not just observing and contemplating. They start touching, moving, exploring. When dealing with objects and actions the child has an example — an adult who is modeling the «ideal» forms of behavior. But with cultural human values the situation is more complicated. Adults do not necessarily represent the models of «ideal» or «right» behavior.

We can conclude that the construction of self starts at the crossroads of at last three lines: (a) subjective — what I want to do; (b) everyday, «realistic» — how others (adults and peers) behave; and (c) cultural, «ideal» — how to behave correctly (morally). This contradictory situation can be the **starting point of a creative or developmental act**.

Bozhovich studied personality formation and claimed that the act is the unit of studying personality. The concept of an act is different from the concept of an action (which does not necessarily include internal motivation) and activity. «An act always presupposes a special type of activity in the subject. It is accompanied by a competition among motives and the making of a decision, although in many cases this competition is not consciously perceived by the individual» [3, p. 32].

In this connection we can talk about co-creation of a new culture. Creative acts are dually oriented: to the change of the world of objects and of the acting subject. In the construction of self the mechanism of role taking is important. Simultaneous presence of two positions (»me as myself» and «me in a role») creates the challenge of comparing and reflecting one's own

self. By taking a role the child constructs a mirror for self-change using stories and narratives as a psychological tool.

Story as a psychological tool of self development

We think that E'lkoninova's experimental approach can be elaborated. The subject himself in a situation of free choice should carry out creative acts. Adults cannot directly teach or guide creative acts. We strongly support Mikhailov's [19] favorite expression «the human soul doesn't know mediators». Readiness for creative acts matures in different activities, partly guided by adults, and adults serve as models of creative acts.

We believe that dramatization of a story together with an adult cannot be called play in the true sense of the word; it looks more like «practicing» initiative behavior (in El'konin's sense). Also the claim that «samples of initiative» can be tested only during «a vivid enactment of an integral story plot» is not convincing. The purpose of plat staging seems to be artificial for the children and we can't make any conclusions about their ability to carry out or get the sense of «heroic deeds». «Concerted actions» with adults hardly can be called creative acts. But we agree that this is one of the possible ways to help the children to «grasp» the sense and meaning in human relations depicted in tales.

In our experiment [2] the children were able to «play out» the whole structure of a well-known folk tale in joint activity, but only with the help of an adult. In our opinion they carried out such activity because it was «a puppet theatre presentation» for other children. Playing the role of an actor — giving a puppet theatre presentation of their favorite folk tale — was the children's main activity; the fairy tale was a secondary but necessary means to achieve the main goal.

It is crucial for the development of joint play that children have a possibility to follow drama or puppet performances of traditional folk tales. We observed how they later used some of the episodes during independent play. We believe that children are able to perceive the moral of heroic behavior on a general level, and grasp the model or a «net» (setka) [16], which they can use for encoding the behavior of other people and later of their own. The way in which they will behave depends on their life experiences, «moral feelings, convictions, worldviews» Bozhovich [3, p. 85].

The «experimental» setting for creative play

Our basic principle of constructing the play environment is the continuous enrichment of children's experience with cultural content. We offer the children new narratives — stories and new cultural forms of activity. Egan [5] writes that story form makes information effectively meaningful and gives a feeling of safety. It is important that young children are constantly provided with new experiences. They are offered opportunities to take part in creative activities such as storytelling, dramatizations, puppet performances, building playworlds including painting, music/singing, movement/dancing etc.

Organization of the environment and activities

The experimental development of play has taken place at Oulu University campus in Kajaani, Finland since 2002. Our site is a club of children's creative play. Approximately 62 children (0—6 years) from 30 families have attended the laboratory for creative play over the six years. The club's activities form a part of early childhood education. Once a week a group of 15—20 children (between the ages of 3 months and 5 years) attend the club for creative play and participate in specific activities with the university students. Children come with their parents and stay for 4 hours. During each session a music teacher and a university teacher/ researcher are also present.

We call our curriculum *the play generating narrative curriculum.* Planning is based on field notes and video observations of previous days. Researchers and students discuss and plan the curriculum and schedule of all activities and later the students are responsible for the practical implementation of the planned activities with the children. Children's participation in any activity is voluntary. Children's creative interactions with different materials and activities, with other children and adults create contexts for their development and meaningful learning. Adults take an active part in children's play using different methods and strategies.

All activities are recorded on video with several cameras. Besides video records we obtain four types of reports from each play session. Student's field notes are used as an important resource for analyzing and interpreting play sessions. Their experiences of direct participation in play enable us to capture the inner state of an adult player in addition to the changes in children's participation.

We have used the Dialogical Drama with Puppets (DDP)* method [2] as our main tool in working with the children. Basic components of the DDP method are:

• Narratives: traditional folk tales, fairy-tales, fiction, self created stories

• Puppet performance (can be dramatization) of a story

• Dialogical form of the activities: main purpose of the DDP method is to involve the child in a dialogue initiated by the teacher and, by letting him watch the adult, encourage him gradually to join in or otherwise take part in the activity.

---

* Dialogical drama with puppets (DDP) is one of the methods for fostering creative activities in preschool age. The DDP method is based on creative or developmental drama, which is defined as «an improvisational, non-exhibitional process-centered form of drama... The primary purpose of creative drama is to foster personality growth and to facilitate learning of the participants...» (McCaslin, 1982, 6).

Analysis of creative acts
in the play environment

Our experimental environment provokes children to creative acts, but we cannot plan the exact time of their appearance. The same can be said about the content and context of these acts. Everything depends on the children's interpretation of created situations and possibilities. As in spontaneous play situations the time span between some impressive event and its reflective use in play can be quite long as was shown in the analysis of children's use of stories told to them [27]. A typical feature for thinking in complexes is that events and impressions are combined without adult logic, which makes it even more difficult to see certain elements or causal chains in play activity.

In some cases we can identify a clear connection between our «provocation» (a story, game, puppet performance) and children's joint play, drawing or other form of narrative expression. One example is the story of a three-year-old girl presented in drawing. The girl participated in the students' story performance of *Little Red Riding Hood* and the small children's circle game Watchdog. After these activities she asked for paper and started to draw her own story. In her drawing she made a huge watchdog, which could protect people from the attacks of the mean bad wolf.

Our «provocations» are based on careful observation of children's earlier activities. We have formulated hypotheses on children's «zone of creative development». Themes and forms of narratives are selected bearing in mind the interests children have and how we could enrich and enlarge them. The second feature of «provocations» is that they are presented using creative methods. Students should demonstrate creativity to the children in different forms. The students' emotional involvement is a critical feature in their presentations. The presentation should invite the children to join the activities or go further in their own joint activity.

A clear connection between play provoking activities and children's joint play is not sufficient evidence on creative acts. Every child has his own life world and experiences outside our play environment. Creative acts have their roots in children's life outside our control. We can offer with the provocative environment a channel for finding appropriate forms of expression for creative acts. In a way we as researchers have to reconstruct children's creative acts and our role as provokers. For this purpose we have tentatively elaborated a set of criteria for the identification of creative acts and their relation to the construction of self in a multiage group of children. We have to keep in mind that co-construction of creative acts differs greatly depending on the age of the child and children's joint construction of these acts takes always place in small subgroups, although the whole group usually participates in «provocations».

The concept of a creative act should be revised and redefined in the contexts of children's pretend play. We think that play and pretending creates a specific environment for experimentation, which always is new to children. This may seem a paradoxical claim, because children are using elements from their environment. But the essence of play is not external similarity with real life. It is more important to know how the experience of being someone else is constructed using real life phenomena as tools. An important aspect in children's creativity is self-change.

We would like to define creative acts in concrete play situations as moments of the appearance of qualitatively new phenomena in play. Often adult provocations or disturbances in children's play cooperation are behind these moments. Thus in most cases a creative act is not an individual phenomenon, but a collective unanticipated creation. Methodologically catching these moments requires a construction of favorable environments and follow-up study of play. Children are not consciously changing themselves in play or acquiring new traits, but participating in play activity, which challenges them to confront their momentary real self. Adults may have a role of a helper who can reveal what the children's play behavior looks like and reinforce new features.

We suppose that the first step of self-change is taken in play activity and the child has to become a different person in play situations before his real self can change. This means that the child feels himself a different person. In the following section we will analyze changes in the participatory trajectory of one child in our experimental play environment.

Lucas

He has attended our club for three years. In autumn when the observation period started he was five years and two month and at the end eight months older. Lucas is very independent, possesses a strong character with clearly expressed traits of individualism and perfectionism. He is very curious, eager to learn reading, writing, and arithmetic. He loves to work in the handicraft center with paper, scissors and glue, drawing and cutting figures, painting large pictures. He decides what he wants to do, all his activities are purposeful and usually productive: he likes to create something that he can show to his parents and students, and then take home. During the last two years he did not make close contacts with the other children and has preferred to play with students, with his younger sister or by himself. Three questions have bothered Lucas' mother: (1) Lucas always wants things to be done his way and gets very angry if someone doesn't agree, (2) he doesn't play with other children, (3) he doesn't start a new activity until he is sure that he will manage it well. According to the mother the boy needs a push and support at the same time. Last spring when a new brother was born Lucas became more stubborn, angry and impatient.

The following table describes his participatory trajectory in five first puppet story performances given by the students. The story was the folk tale «Turnips», which students customized by introducing new chara

ters and events. Lucas' favorite character of the puppet story was «Pööpöti» — the millipede.

Immediately after the fifth puppet performance all the children ran to the art area to paint a rural landscape of the story. Lucas kept on painting and conversing with children and a student for about 20 minutes. First time he was able to carry out a personal conversation with Nora during the story performance and painting together. He was not nervous and angry when a younger girl came to paint close to him and added some details on the house he was painting! Later he enjoyed painting with a boy. Conversations with the students were most important to him, but he could also get into contact with the other children. We draw the conclusion that Lucas' behavior had *irreversibly changed*; he looked like a totally different person. He was really an active participant and fond of the activities.

The puppet story performance organized by Lucas

During the last club meeting Lucas started alone to collect all decorations, puppets and props from the previous students' puppet performances and invited Nora to play with him. He suggested they should make a plan and then invite all the mothers and other children with a bell. «The performance is starting!» he announced. When people arrived he explained to them in detail where they should sit and how to behave.

The main features in the puppet show were:

• The whole performance took 14 minutes. Lucas was peacefully playing with Nora for the first time; he did not lose his temper, was not shouting or fighting, and was really flexible.

• He organized the whole show by himself because <u>he wanted</u> to make it to everybody. He realized that he couldn't do this alone and invited Nora to play with him. They were doing well, and understood each other without words (especially at the beginning).

• They managed to create a relatively «good» story with a beginning, dramatic events and an end. They improvised on the spot without rehearsing or adult help.

• They demonstrated different skills, such as playing different roles, changing voices, playing several roles at a time, listening to each other, interacting and constructing the story plot through the dialogues. At the same time they observed the audience and made comments on their behavior («You have to follow the show and not talk to each other»).

• The improvisational character of the show revealed the fact that the name of the show was clear at the end. Lucas announced: «The name of the show is Pööpöti's nightmare».

We can conclude that Lucas' participatory trajectory changed from resistance and indifference to self-initiative as is illustrated in the following chain: ***resistance —» raising interest—» careful observation —» active participation —» leadership and organization of the activity***

Discussion

We argue that the development of psychological tools in play requires creative (developmental) acts accomplished by individual children and at the same time «inside» this activity other children are able to carry out developmental acts. The adults act as mediators between culture and children's creative acts when they present stories to the children and later participate in joint play-worlds. The adults first present creative acts through stories, then model them in play-worlds and later create or support the «developmental» situation in play. Narratives (stories presented to the children) are the main source of play.

In our research site adult participation in joint activities creates the space and environment supportive for developmental acts. The concept of creative act should be revised and redefined in the contexts of children's pretend play and early learning. We define creative acts in concrete situations as *moments of the appearance of qualitatively new phenomena in children's activity*:

1. Catching these moments requires the construction of appropriate environments and follow-up study of play and learning.

2. In most cases a creative act is not an individual phenomenon, but a *collective unanticipated creation*.

3. Children are not consciously changing themselves or acquiring new traits, but participating in joint activity, which challenges them to confront their momentary real self.

4. Often adult and peer *provocations or confrontations* are behind these moments. Adults may have a role of a helper who can reveal what the children's behavior looks like and reinforce new features.

The main *prerequisites* for creative acts are: (1) rich and long experience of participation in «cultural activities» together with adults and other children. Appropriate activities are e.g. storytelling, puppet pre-

Table 1

Lucas' participation trajectory in puppet performances

	Session number				
	1	2	3	4	5
Time of performance (min.)	11	10	8	6	7
Participation	Resistance (L stands)	Focused attention, (L sits)	Concentrates, Keenly observes (no talk)	Comments, Responds to students' questions	Suggests next steps, gives advice
Emotional involvement	Angry expressions	Smiles now and then	Smiling to other kids	Happy mood	Personal relation

sentations, dramatizations, creative drama, painting, drawing, modeling, making puppets and other play props from different materials; (2) rich environment of challenging materials and self-made play things, but not ready made toys and games.

Creative acts are provoked by *crisis situation*. In most observed cases a particular kind of irritation, feeling of uncertainty and dissatisfaction precedes creative acts. We may call this «agonies of creation». Creative acts should be carried out by the subject himself in a situation of free choice without obvious adult guidance or pressure.

Prerequisites for creative act are:
• Self organized and self performed activity (if an adult is participating, he has a role of a helper)
• Time (most of observed cases lasted from forty minutes to two hours)
• Self-chosen and arranged «special» spaces (for example a house «built» behind the couch or under the table; a castle in creative drama center, etc.).

Creative act is a challenge to the adult because it always is a surprise. As a rule, truly developmental «movement» starts when cognitive learning task (from adult point of view) has been accomplished and the teacher is ready to leave. Creative acts cannot be planned in advance; the adults have to be in a state of «constant openness». Some indicators of creative ac are:
• Child becomes active and carries out «his own» activity
• Child starts to lead the activity
• Child becomes spontaneous and flexible, flow experiences can be observed.
• Child acts on a higher level compared to his usual play behavior.

A necessary prerequisite for creative act is a sensitive and flexible adult participation. In this case the adult may support and sometimes «bring» the child to the accomplishment of a creative act. Often this doesn't happen because adults design «realistic learning goals». Creative acts are more often observed during children's «free play». We argue that adults may even resist creative acts. They are «afraid» of spontaneous and «free flow» mood of child's creative activities because they are not able to «control» them. Such activities often are not valued in educational institutions. Only very skillful and creative teacher understands and supports independent creative activities of children. Creative act in the classroom is one of the indicators of creative educational environment and pedagogical guidance.

References

1. *Belopol'skaia N. L.* Ocenka kognitivnyh i emocional'nyh komponentov zony blizhaishego razvitiya u detei s zaderzhkoi psihicheskogo razvitiya // Voprosy psikhologii. 1997. № 1. P. 19.

2. *Bredikyte M.* Vaidybinis dialogas su lelemis (VDL) — vaiku verbalines kurybos aktyvinimo metodas [Dialogical drama with puppets (DDP) as a method of fostering children's verbal creativity] (Unpublished doctoral dissertation in Lithuanian), Vilnius Pedagogical University, Lithuania, 2000.

3. *Bozhovich L. I.* Developmental phases of personality formation in childhood (III) // Journal of Russian and East European Psychology. 2004. Vol. 42. № 4.

4. *Davydov V. V., Kudryavcev V. T.* Razvivayushee obrazovanie: teoreticheskie osnovaniya preemstvennosti doshkol'noi i nachal'noi shkol'noi stupenei. 1997. 1.

5. *Egan K.* Children's minds, talking rabbits, and clockwork oranges. N. Y., 1999.

6. *El'konin D. B.* Izbrannye psikhologicheskie trudy, [Collected Psychological Works. Vol. 1]. M., 1989.

7. *El'konin D. B.* Psikhologija igry [The Psychology of Play] (2nd ed.). M., 1999. (Original work published 1978).

8. *El'konin B. D.* Vvedenyje v psichologiju razvityja [Introduction to Developmental Psychology]. M., 1994.

9. *El'koninova L. I.* The Object orientation of children's play in the context of understanding imaginary space-time in play and in stories // Journal of Russian and East European Psychology. 2001. Vol. 39. № 2.

10. *El'koninova L. I.* Fairy-tale Semantics in the Play of Preschoolers // Journal of Russian and East European Psychology. 2001. Vol. 39. № 4.

11. *Flerina E. A.* Razvitie detskogo izobrazitel'nogo tvorchestva pod vlijaniem uchebno-vospitatel'nogo rukovodstva/ In: Trudy Vserossiiskoi nauchno-prakticheskoi konferentsii po doshkol'nomu vospitaniu. M., 1949.

12. *Hughes T.* Myth and education / In: K. Egan & D. Nadaner (Eds.) Imagination & Education (30—44). Milton Keynes, UK, 1988.

13. *Kudriavtsev V. T.* The sense of human childhood and mental development of children. [Smysl chelovecheskogo detstva i psihicheskoe razvitie rebionka.] M., 1997.

14. *Kudriavtsev V. T.* Psychology of the developmen of a man: basics of the cultural-hystorical approach, part I [Psihologia razvitia cheloveka: osnovanija kul'turno-istoricheskogo podhoda.] Riga, 1999.

15. *Lindqvist G.* The Aesthetics of Play: A Didactic Study of Play and Culture in Preschools. Stockholm, 1995.

16. *Lobok A. M.* Antropologija mifa [Antropology of the myth].Yekaterinburg, Russia, 1997.

17. *Lotman Yu. M.* Kukly v sisteme kul'tury [Puppets in the system of culture] / In: Ob iskusstve [About Art]. S.-Pb., 1998.

18. *McCaslin N.* (Eds.) Children and Drama. N. Y., 1981.

19. *Mikhailov F.* Izbrannoe [Selected works]. M., 2001.

20. *Propp V.* Morfologia volshebnoi skazki [Morphology of a fairy tale]. M., 1969.

21. *Strelkova L. P.* Uslovija razvitija empatii pod vlijaniem hudozhestvennogo proizvedenija [Conditions for the development of empathy under the influence of a literary work]/ In: Razvitie social'nih emotsyi u detei doshkol'nogo vozrasta [Development of social emotions in preschool-age children]. M., 1986.

22. *Tsiv'ian T. V.* K semantike prostranstvennyh elementov v volshebnoi skazke [On the semantics of spatial elements in a fairy tale]: In Tipologicheskie issledovania po fol'kloru [Typological studies of folklore]. M., 1975.

23. *Vygotsky L. S.* The collected works of L. S. Vygotsky, vol. 2 (R. W. Rieber & A. S. Carton, eds.). N. Y., 1993.

24. *Vygotsky L. S.* The collected works of L. S. Vygotsky, vol. 4 (R. W. Rieber, ed.). Whole volume: The history and development of higher mental functions Self control

Conclusion: Further research; development of personality and world view in the child. N. Y., 1997.

25. *Vygotsky L. S.* Imagination and creativity in childhood // Journal of Russian and East European Psychology. 2004. Vol. 42. № 1.

26. *Vygotsky L. S.* Play and its Role in the Mental development of the Child (C. Mulholland, Trans.): In M. Cole (Eds.) Soviet developmental psychology. White Plains, N. Y., 1997.

27. *Wolf S. A., Heath S. B.* The braid of literature. Children's worlds of reading. Cambridge, MA, 1992.

28. *Zaporozhets A. V.* Izbrannye psikhologicheskie trudy. T. 1. [Collected Psychological Works, Vol. 1.] M., 1986.

29. *Zaporozhets A. V. & Neverovich J. Z.* Razvitie social'nyx emotsyi u detei doshkol'nogo vozrasta. [Development of social emotions at preschool age children.] M., 1986.

Психологические средства и развитие игры

Милда Бредиките

Ed. D., доцент факультета образования Университета Оулу (университетский консорциум г. Каяни)

Вводятся такие теоретические понятия культурно-исторической теории, как психологические средства, творческие акты развития и культурное развитие. Данные понятия используются при анализе эмпирического исследования, в котором специально была разработана среда, содействующая игре, — игровой мир [15]. Окружающая среда была сконструирована учитывая идеи Выготского о генетических экспериментах, но в данном случае рассматривалась вся деятельностная система (совместная деятельность игры) вместо одной высшей психической функции. Индивидуальные творческие действия совершаются в коллективной деятельности. Представлен анализ индивидуального случая, в котором показана траектория развития ребенка и определенные условия отдельных творческих действий.

Ключевые слова: психологические инструменты, творческое действие, развитие игры, генетический эксперимент, игровой мир, «идеальные» формы поведения, диалогическая пьеса с куклами, инициативное поведение.

Development of reasoning through arguing in young children

Clotilde Pontecorvo

Ph.D., Professor Emeritus in Psychology of Education, Head of the Faculty of Social and Developmental Psychology, Rome University «La Sapienza»

Francesco Arcidiacono

Ph.D., Institute of Psychology and EducationUniversity of Neuchâtel

The aim of this paper is to analyze how young children reason during argumentative conversations in different educational settings. According to the Vygotskian and socio-cultural perspective, we assume that the child's thought is developed through discourse, especially during learning processes involving peer interactions and adult-guided discussions. In this paper, we present and qualitatively analyze some of our empirical data collected in order to show the relevance of narrative processes during argumentative activities involving young children in educational contexts. Firstly, we refer to counter-factual reasoning as the argumentative strategy used by preschool children in disputes about narrative. We show some specific spatial-temporal features, mainly linked to a need of generalization and logical bases (i.e. authority of sources, rituality of situations, and plausibility of consequences). Secondly, we analyze how during family conversations children use practical reasoning that derive from parental discourses about norms and directives. Finally, we present a case in which reasoning through arguing is applied in school to teach history to primary school children. Implications of reasoning among children in different educational settings are discussed in order to highlight the relevance of argumentation in school and family activities.

Keywords: Vygotskian perspective; socio-cultural perspective; reasoning; argumentation; preschoolers' narratives; family conversations.

1. Theoretical frame

For researchers who embrace socio-cultural theoretical framework — who thus acknowledge the interactional root of higher psychic functions [22; 24; 57] and conceive cognitive growth as a progressive mastering of participation in sociocultural activities [42; 43] — the exploration of cognitive processes in their spontaneous contextual occurrings [26] constitutes one of the most intriguing and challenging enterprise.

Cognitive development and learning are not seen as taking place within individual' mind rather as processes of improving contribution to interactional activities [41]. It follows that the basic unit of analysis cannot be the isolate novice. It is the whole activity, including not only all the participants but also the cultural artifacts they make use of, that becomes the focus of researchers' analysis.

Within socio-cultural perspective a special attention is devoted to the semiotic tools people use in accomplishing cognitive activities as these cultural resources not only facilitate but always *shape* the unfolding of the very same activities [59]. A crucial, powerful role is thus attributed to language [56] and it is suggested to define development itself as a progression through a complex set of culturally shared and socially supported *language-games* [18]. For instance, understanding mental states of others, false belief or deceit in children can be a matter of learning the appropriate cultural language-games for intentional behavior in their internal logical sequence.

The role of language, when it is conceived as an historical product whose meaning is closely linked with its use [60] cannot be separated from the overall socio-cultural knowledge. Children learn progressively a complex set of relations between contexts of use and linguistic features. Linguistic knowledge is embedded in socio-cultural knowledge, and at the same time values, rules, habitus, concepts are acquired through language. This process has been called by Ochs and Schieffelin *language socialization* [31; 50] and thus it includes both socialization *through language* and socialization *to use language*. This process is never completed and never ends [27]: every interaction is potentially a socializing experience inasmuch members of a social group are socializing each other by negotiating and sharing situational meanings [38; 39].

The theoretical assumptions we have sketched so far have the implication that development and education have to be approached as social constructions, to borrow Edwards' words «as social practices, in which becoming competent, achieving understanding, being educated and so are matters of how people get *counted as* that» [8, p. 63]. Such a methodological approach can help the elaboration of a psychological perspective that aims at understanding how development-and-education, in

their social, cognitive, and linguistic features take place within a culture.

We found in conversational analysis [1; 4; 13; 44; 45; 46; 48; 55] a powerful tool for a cultural and discursive approach that is offering means adequate to the presentation and explanation of human behavior and of its development. In using conversational analysis approach and thus exploring actual talk-in-interaction we are not dismissing our psychological interest in understanding how children practice cognitive operations. Indeed our choice for studying family or school interactions is not random; rather it is driven by the fact that these are the major settings in which children's socialization and development occur.

In line with the language socialization research trends [25; 30; 49] our study explores first how young children (between four and five years of age) begin to be socialized to a particular type of *language-game* or *procedure of reasoning*, the argumentative discourse, which can be found both in preschool setting of telling and explaining a story and in the family context of dinnertable conversation and, later on, in practicing history learning within a primary school setting.

We will start with an analysis of a preschool speech event [16] describing its main features in terms of structural organization of the activity, modalities of participation, discursive devices or procedures of reasoning. We will then turn our focus on the family context of dinner conversation. Adopting a comparative look we will try to single out similarities and peculiarities of the two speech events.

In general, through this study we aim at showing once again the inherently discursive and cultural nature of cognitive activities. Furthermore, we aim at throwing light on how the cognitive development actually unfolds within everyday socialization activities.

2. General features of the preschool and the family contexts

Family and school are surely the two most prominent *loci* of young children linguistic and cognitive socialization. However, there are several differences between the two contexts. In what follows we focus our attention on some general structural and discursive characteristics that are relevant for our study:

Families included in our research are composed by two parents and at least two children (one of them between 3 and 5 years of age). In the preschool setting we observed a group of 12 children of the same age (about 5 years old) with one teacher.

It is well known that schools and kindergardens can be characterized by a typical type of *speech exchange system* [58]. Sinclair and Coulthard [51] have described it as the IRE triplet: teacher's questioning, children's answering and teacher's evaluation. However, within the preschool speech event that we examined the teacher did not enact this pattern of traditional teaching. She has been trained for undertaking a new innovative curriculum and she violates the IRE sequence as she

seldom evaluates children's turns, rather she often repeats, recycles or rephrases them.

Both parents and teachers have the common dominant aim of educating, i.e. socializing children, but they differ in the priorities and in the tools they use. If the general mechanisms of interaction do not differ too much, a difference is due to the fact that children's accountability — that is the need to give account — is in the family linked to «doing» and to the possible negative consequences of actions, while in school is more linked to knowing, and then to the cognitive contour of activities: paying attention, answering, remembering, giving cognitive explanation, and so on.

3. Exploring the preschool speech event

In the preschool setting we focused our attention on a narrative activity children are recurrently engaged in. It consists of two different narrative phases: in the first phase small groups of four children were read a fairy tale by the teacher (the story of «Mascia and the bear» by Lev Tolstoj, see Appendix 1). The reading was then interrupted at crucial points and the children' group were asked to predict how story would continue. It followed a discussion about the story immediately after the listening-guessing. In this second phase the teacher led the discussion by asking children: a) to explain the intentions and the motives behind the actions of the characters in the story; b) to evaluate what other actions might be plausible given those motives; c) to evaluate the cleverness of the story protagonist and her adversary. A general collective discussion, guided by the same teacher) concluded the school experience.

Appendix 1: The story of Mascia and the bear

This is the story summary: Mascia went with her friends to the wood. She got lost and she found a small house in which a bear was living: the bear compelled her to stay with him. She would like to run away from the bear and she asked him to bring a basket full of fritters to her granparents' house. The bear offered to do it for her. She prepared the basket and told him not to open it: «I will climb up the oak tree and I will check on you from there!». While the bear went outside to look if it was raining. Mascia hid in the basket. During the way, when the bear stopped, Mascia said to him: «I saw you. Do not stop, go on!» So they arrived at the grandparents' house. When they were near by, the dogs barked because of the bear's scent. The bear was frightened and ran away. Mascia was free!

3.1. The narrative activity

3.1.1. Contrasting hypotheses and co-constructing reasoning

The narrative activity has from its start a strong hypothetical flavor. Children vivaciously suggest various alternative ways the story might develop. Different narrative versions emerge and a vivid discussion unfolds:

Others hypotheses are criticized and new versions are counter opposed. This clashing of perspectives triggers a collective reasoning whereby children attempt to resolve discrepancies and, eventually, sketch a meaningful story-line towards events. Furthermore, faced with the need of defending their positions and undermining others', all the participants have the opportunity for exercising their argumentative skills and for improving their capacity of handling narrative materials.

Appendix 2 : Transcription symbols

.	falling intonation
?	rising intonation
!	exclaiming intonation
,	continuing intonation
-	abrupt cut-off
:	prolonging of sounds
ABC	high tone (capital letters)
[	simultaneous or overlapping speech
( )	non-transcribing segment of talk
(( ))	comments added by the transcriber

The following excerpt (see Appendix 2 for the transcription symbols used in the excerpt) illustrates the unfolding of narrative thinking:

Excerpt 1

Teacher: Come ha fatto a scappare da dentro — dalla casetta dell'orso?

How could Mascia flee from within — from the bear's house?

Fabiola: Stava a vedere se pioveva, allora lui, il cestino era aperto, allora lei, zacchete! se ficca dentro, però cosi- e in testa ce mette le frittelle. ma se e grande *((Mascia))* se rompe el cestino però !

he was looking whether it rained, then, the basket was open, then she zacchete! *(Italian onomatopoeia))* **she slips in, but so- and she puts the fritters on her head. but if she is big the basket will break down!**

[...]-

Walter: Perché se Mascia era come noi o come te poteva rompe' il cestino uguale, perché il cestino sarà cosi o cosi *((piccolo))*

Because if Mascia was like us or like you she could have broken the basket because the basket was so and so ((little))

Sabrina: Il cestino era grande, se no non ce metteva neanche le frittelle. Ce n'ha messo tre o quattro o cinque o sei!

The basket was big, otherwise she could not even put the fritters in it. She has put three or four or five or six!

Fabiola: O sei! Almeno dopo il cestino: ciacchete!

Or six! At least after the basket: ciacchete *((onomatopoeia that means «crashing down»))*

Walter: See, cosi il sei è più grande, sei chili pesa, no? Co' le frittelle, cosi ce se mette Mascia che pesa almeno sette chili e quello se sfascia tutto. Sette chili, quaranta chili!

Yee, so six is bigger, it weighs six kilos, doesn't it? With the fritters, so Mascia puts herself that weighs at least seven kilos and that *((the basket))* **will all crash down. Seven kilos, forty kilos!**

The few turns just presented show the complexity of narrative activity and how it is jointly accomplished. Fabiola, who is the first in answering to the teacher's question, provides her narrative version by constructing what Bruner has defined a *dual landscape* [2] and by switching back and forth between the *landscape of action and the landscape of consciousness*. Her narrative is rather complex as it considers both the protagonists' actions and their thoughts and feelings. Furthermore, at the end of her contribution she adds her own perspective as narrator. As Bruner has pointed out [2], the landscape of consciousness illuminates protagonists' doings and offers to the audience the narrator's understanding and interpretation of events.

Also the other children's subsequent contibutions wander through the dual landscape thereby deploying and enriching their collective reasoning.

It is worth noting that the narrative activity children are engaged in allows for different perspectives to be put forward and negotiatied. Different plots can be followed and, insofar as they respect the criteria of internal consistency, they can all be considered equally possible and acceptable.

This is the crucial educative value of narrative activity: narrative activity not only organizes experience and imbues it with meaning. At the very same moment narrative activity illuminates experience it also reveals that a multiplicity of interpretive frames for organizing experience are possible [28; 5; 29]. Therefore, narrative activity promotes plurality and cultivates critical thinking. It encourages comparisons among different perspectives and understandings; it brings different voices into dialogue without aiming at making of them a unison chorus.

In delineating differences between family and preschool settings we are not assuming context as a well-defined, pre-existing variable that can be isolated before studying the actual conversation. Rather, we are referring to a discursive-constructed notion of context as a participants' category. Context should be empirically evoked, according to Schegloff only by attending to what the participants themselves make relevant, through the whole of their linguistic and non-linguistic actions, since *«the search for context properly begins with the talk or other conduct being analyzed»* [47, p. 197].

3.1.2. Hypothetical and counterfactual reasoning

In fact, children's collaborative reasoning, rather than emerging from mutual agreement, is realized through oppositions and explanations along a counterfactual line. Going back again to Fabiola's turn in excerpt 1 it is possible to point out that the girl after having put forward her hypothesis formulates herself a possible objection: it wouldn't work if Mascia was too big. In *«grande»* (=big/grown-up) the two notions of size and age collapse and children discuss both aspects together, focusing on the combined weight of Mascia and of the fritters. In this brief sequence it is possible to observe the typical use of conditional forms from which negative effects can be derived. Fabiola and afterwards other children use them as the more compelling forms

when they want to deny an alternative hypothesis produced by another participant.

However, it must be pointed out that challenges, oppositions, counter-proposals do not prevent reasoning to unfold. Rather, it is evident that just this opposing hypotheses, the accounting activity it triggers and the seeking for consensus allow children to reach collectively an articulation of reasoning far more complex than the one each of them would achieve alone. In other words, through contrasting perspectives they are co-constructing higher level of reasoning.

After some insistence on the point of the combined weight of Mascia and of the fritters, the children shift their collective attention on the question of age, which becomes the object of another piece of articulated dispute.

Excerpt 2
Fabiola: Ma Mascia è piccola!
But Mascia is (a) little (child)!
Sabrina: C'ha tre anni! Forse.
She's three…maybe.
[…]
Walter: Se c'aveva cinque anni vol di' che era poco intelligente.
Invece c'ha tre anni è tanto intelligente. Però se c'aveva,
If she was five years old it means that she was not clever enough. Instead if she is three year old she is very clever; But if she was,..
Teacher: Perché se c'aveva tre anni era tanto intelligente, se c'aveva cinque anni era poco intelligente? Invece se c'ha d-
Because if she was three she was very clever, if she was five she was not clever enough? Instead if she was t-
Walter: No, me so' sbajato. Se Mascia aveva tre anni come fa a esse intelligente se è piccola. Ancora non sa le idee, je le deve di' la nonna...
No, I was wrong. If Mascia was three how can she be clever enough, because she is too young. She doesn't know her ideas yet, the grandmother has to tell her them...
[…]
Teacher: Se se...?
If..if?
Sabrina: Te che ne sai quanti ce n'ha de anni mica c'è scritto?
How do you know how hold she is? It's not written down.
Walter: E che te ce lo sai? Che te lo sai quanti ce n'ha? Dai dimmelo quanti ce n'ha, dimmelo!
And what do you know about it? How do you know how old she is? Tell me how old is she!
Fabiola: C'ha cinque!
She's five!
Walter: Beh, dimmelo quanti c'ha!?
Well tell me how old she is
Sabrina: Se se c'era scritto ce lo leggeva la maestra.
If it was written down, the teacher would have read it to us.

This excerpt shows that children's reasoning deploys through casting possible negative consequences of different hypothetical conditions (e. g. Walter's turn: if Mascia is too young, she cannot be clever enough to be able to flee away) and through using counterfactual forms (e. g. Sabrina's turn: you cannot say how old she is because it was not written, given that if it was written down the teacher would have read it to us).

Hypothetical and counterfactual constructions are rather complex patterns of reasoning that can be found not only in narrative activity across contexts but in scientific practices as well. As philosophers of science [9; 19] have pointed out, scientific knowledge thrives on challenging matters of fact, on refusing certain theoretical assumptions and on replacing them with others considered more accurate and adequate. Moreover, sociologists of science [11; 21] have revealed that scientific theories, as well as stories, are narratives and, rather than being the product of the work of an isolated researcher, hidden within his/her laboratory, they are outcomes of interaction among different scientists and diverse perspectives. Thus, narrative activity socializes children not only into prototypical narrative thinking -with its meaning-making force- but also provides the rudiments of scientific reasoning and practice, as Einstein said*.

Last but not least, it can be observed that narrative activity, insofar as it encompasses the challenging, defending and redrafting of alternative narrative versions, promotes meta-cognitive thinking and cultivates meta-linguistic ability as participants often step outside the storytelling for questioning elements of the story and then differently re-contextualizing them and as they treat others' telling as versions of the story.

3.1.3. Categorization as a situated rhetorical activity

Excerpt 2 reveals another crucial aspect of reasoning and arguing activities: the process of categorization. The children discuss the meaning of the categories of piccolo and grande. Not only the temporal and spatial dimensions are concurrently evoked and contrasted; within each dimension categories' boundaries (i. e. when one should be considered grown-up) are questioned and negotiated.

These aspects show that categorization rather than being an abstract cognitive process is a situated interactional activity [15]. Categorization is something *we do* in social context in order to perform social actions — persuading, blaming, accusing, etc. [7]. Approaching categorization as a social practice allows us to understand why categories are flexible, have not fixed boundaries and not unequivocal membership demarcations. Categories are rhetorically handled to accomplish very different social action and they take meaning from the context of contingent use.

In excerpt 2 it is possible to appreciate how even young children are able to strategically activate and handle category systems: they use the fact that the cat-

---

* It is reported that to a mother who asked Einstein how she could train her 3-years-old child to scientific reasoning, he answered: «telling stories». And then to a repetition to same mother question, he answered «telling more stories».

egories piccolo and grande have not unique semantic contents and do not imply well defined sets of features, as a resource for justifying and sustaining their clashing positions about bear's intelligence and achieve agreement and consensus.

4. Preliminary conclusions

Our analysis of the preschool activity has single out three fundamental aspects of children's reasoning:

1) It is highly co-constructed: children's narrative activity is spontaneously co-authored and multi-voiced. Children's clashing positions are never simply juxtaposed but are negotiated, transformed and often blended in new reasoning paths.

2) It unfolds through complex argumentative patterns; overwhelmingly, hypothetical format and counterfactual structure are used.

3) It is rhetorically shaped: participants make use of refined discursive strategies and rhetorical moves for achieving agreement and consensus.

These three features of children's reasoning in preschool setting are surely closely linked with the particular narrative activity of reconstructing Mascia and the Bear story tale children are engaged in. As a matter of fact, several studies have already shown that narrative activity in a wide range of human contexts is overwhelmingly co-constructed [32; 36]. Moreover, it often stimulates hypothetical thinking [34] and it constitutes a privileged tool for cognitive and linguistic socialization [23; 35; 37].

Furthermore, we would argue that these important elements of children's reasoning are also prompted and reinforced by the work the teacher performs within this collective activity: she did not follow the traditional IRE sequence but, through reformulations and repetitions of children's contributions she played the role of catalyst of children's discussion. From an educational view, thus, we would suggest that narrative activity and peer group discussions are activities to be promoted and cultivated in preschool setting. It becomes interesting now to turn our attention to the family setting to see whether, in what extent and where the features of children's reasoning in preschool setting are also present in family dinner conversations.

5. Exploring family dinner talk

Do children learn to argue before they go to school and when can we say that they are learning? How are they socialized to the discursive tools and the rhetorical devices of everyday reasoning?

In trying to answer to these questions we have analyzed family dinner conversations with very young children's (from 3 years old) participation. In particular for the present study we have focused our attention on the narrative and the argumentative sequences in which children are engaged as ratified participants (regardless whether talking or just listening) [12].

5.1. Joint narrating

Indeed also in family dinner conversations there is a remarkable amount of narratives. Previous research [53] has shown that narratives are spread throughout all the various speech activities participants commonly accomplish in conversing at dinnertable (i. e. remembering, planning, jokes' telling, disputes, etc.). Regardless the reasons why narratives are told they are overwhelmingly co-constructed. Remarkable studies on the activity of storytelling [14; 17] have shown that since their very beginnings narratives are interactional accomplishments: The launching of the narrative can be performed by the would-be teller, who both provides the topic of the storytelling and candidates her/himself as the teller of the story. It is however necessary a «go ahead» response from the audience for having the narrative actually unfolded.

Narratives may be also *other-solicited* and/or *other-initiated*: A speaker prompts the production of a storytelling introducing a referent for the narrative and selecting the prospective teller. However, an uptake from another participant is necessary in this case as well. Not only narratives' openings but also their actual unfolding (and the closings as well) are overwhelmingly collectively carried out. This is true not only when there is agreement and harmony between the co-tellers of the storytelling; even when speakers don't share the same view on the reported events the narrative is most of the time co-constructed through quick turn's exchanges, oppositions of descriptions, negotiation of remembering.

In sum, as well as in preschool context, in family conversation narrative activity is overwhelmingly co-constructed. Therefore, children by participating in family narratives acquire the conventions of story telling, the discursive devices for narrative constructing the reality [3] and last but not least they practice different forms of participations in collective activities.

In comparison with the preschool context, we have observed that in family narratives participation roles' are more flexible and often exchanged: within the same storytelling not only the role of narrator is shared and passed among participants, children included; also challenging moves such as problematizations, critiques, refusals are performed by all the members of the family. This observation resonates with Ochs and Taylor's [33] suggestion that *social familiarity* encourages complex reasoning. The two authors have analyzed American dinner conversations revealing that during such *«hectic, seemingly chaotic»* speech events complex cognitive processes are accomplished (ibid., p. 44): *«Where participants know one another well, they may be less hesitant to express uncertainty or perplexity over the problematic affairs in the narration and more open to invite the help of others in explaining the narrated events. Where participants know one another well they are able within limits to enter into the other's telling of events and reconfigure the other's version without dissolving the relationship»* (ibid., p. 43).

This aspect has a remarkable educative implication: familiarity among children and between teachers and

children is not only to be pursued as it offers to all the participants a positive emotive milieu for their everyday experience but also because it encourages complex cognitive processes. Often, unfortunately, arenas of formal education neglects to cultivate this very quality. On the contrary, we would suggest that educators, and preschool teachers in particular, should assume social familiarity as one of their primary aims. Familiarity grows through practices of social interaction and dialogue, namely through group activities of different kinds, such as the one we have examined in previous paragraph.

5.2. Rules' violation and negative consequences

Family narratives and preschool storytelling have in common their collaborative accomplishment but they present relevant distinctive features. In fact, we did not find in family narratives the kind of articulated hypothetical and counterfactual procedures we found in the pre-school narrative activity.

This might lead to the conclusion that hypothetical and counterfactual reasoning are peculiar of school setting (or at least are not significantly present in family talk). However, if we do not limit our analysis to narrative sequences but we turn the attention on argumentative sequences that as well frequently occur in family dinner conversation this conclusion is immediately contradicted.

We have noticed that in some kinds of argumentative sequences — e. g. when parents address to children explanations on *life rules* or when they justify their prescriptions or proscriptions, in general when an account for violations of the normal is either requested or provided, etc. — a similar procedure of reasoning/discursive device of the one we have documented in children's pre-school narrative activity frequently occurs:

If you do not do X the negative event Y will occur
   If you do non-X the negative event Z will occur
In what follows we present example of such a procedure:
Excerpt 3

Nacchi family. Participants: DAD: Giancarlo, 45 years; MUM: Gaia, 44 years; Daughters: Ludovica, 14 years; Irma, 10 years; Antonia, 3 years 6 months (Antonia looks tired and is not eating)

Mum: senti. ma hai ancora tanto sonno? poi ti faccio dormire in braccio a me. Va bene?

listen are you still very sleepy then I'll let you sleep in my arms. All right?

Antonia: no:: [dormo nel letto].

no:: [I'm going to bed]

Mum: [eh si amore] eh si però devi dormire presto non facciamo come l'altra volta che ti sei addormentata a mezzanotte e poi ti senti male d'accordo?

[eh yes my love] eh yes but you must sleep soon let's not do what we did last time when you fell asleep at midnight and then you feel sick all right

In this excerpt the 3 and half years old girl disdains mother's offer to start sleeping in her arms. Antonia's refusal is both accepted and counter-claimed by the

mother with a *si però* (*yes but*) and then with an articulated warning: Antonia has to sleep soon without waiting until late as she did another time, when at the end she felt sick. So sleeping late is constructed by the mother as the cause for Antonia's sickness. The warning has the typical form of showing the negative consequences of a possible misbehavior.

The informative relevance of negative assertions brings us directly in the core of the narrative activity. Indeed negative episodes have a crucial role in narrative as they have very often the function of initiating events from which the main plot of the narrative develops [20]: Problematic events interrupt the normal situation described in the setting [52]. Without a negative or problematic event we would not have any type of narrative. Indeed the normal flow of events is not reported, it is not the object of a narrative, not even in the ordinary family conversation.

We would like to suggest here that the conditional structure and negative format we found in family discourse resemble the hypothetical and counterfactual pattern we found in children preschool discourse. Therefore, when children enter school they could have already been exposed to some complex patterns of reasoning. Within a domain of *practical reasoning* they experience the discursive devices that will recur within other speech activities in other contexts (i.e. the kindergarten classroom).

However, there is more to say: in family conversation children not only listen and assimilate certain patterns of reasoning and discursive devices but they are given or win the chance to actively perform and practice these very same devices. In the following excerpt, rather astonishingly the complex strategy of enunciating the negative consequences of something that the other has done or wants to do in order to let him or her understand the underlying rule to be followed, is performed even by a four-year-old girl, Luisa:

Excerpt 4

Minelli family. Members: DAD: Matteo, 38 years; MUM: Paola, 37 years; Son: Luca, 10 years 9 months; Daughter: Luisa, 3 years 10 months (Luca has just tried to serve himself the water from the bottle by handling up with one finger. The bottle risks to fall on the table)

Mum: ***((she addresses a critical frown at Luca))***
Luca: che ho fatto?
what have I done
Mum: non lo sai che hai fatto Luca?
don't you know what you've done Luca?
Luca: no.
no
Mum: va bene la prossima volta te lo facciamo capire meglio con uno schiaffone.
ok the next time we'll make you understand it better with a big slap
Dad: visto che continui a fare lo stupido.
as you continue to act stupidly

Luisa: guarda non si fa non si ri non si dice cosi al fratellino me lo ha spiegato la nonna.

look you don't do i, you cannot do it, you cannot speak so to the nice little brother, grandma explained it to me *((sighing excitedly))*

(3.5)

Mum: fratellino perché ci fa disperare versa l'acqua con un dito.

nice little brother because he drives us to despair he pours out the water with one finger

Luisa: non è vero. adesso glielo spiego io:.

it's not true now let me explain it to him

Mum: eh spiegaglielo.

eh explain to him

Luisa: Luca cosi non si fa perché la bottiglia se la versi con un dito=non si fa perché si può cadere il bicchiere con tutta la bottiglia. Capito?

Luca you don't do it so because if you pour it out the bottle with one finger you can't do it because the glass with all the bottle can fall down. Did you get it?

Luca: *((vertical headshakes))*

In this excerpt the four-year-old Luisa performs effectively the language-game of education: she (i) uses a conditional form (*«if you pour...»*), (ii) displays possible negative consequences (*«the glass with all the bottle can fall down»*), (iii) ends with a tag question (*«did you get it?»*). Her intervention is surely courageous as she reproaches her parents for the rough linguistic expressions they used in scolding her brother. However, her explanatory and rhetorical abilities are so sharp that parents remain wordless and Luca has to give his consent to her!

5.3. Categorization and other rhetorical devices

Within the discursive context of rules' violation and rules' statement children are often requested to account for their acts. In accounts, rules are negotiated and differently interpreted; exceptions are invoked and denied [10]. In order to perform effectively this activity rhetorical skills and persuasive ability are necessary. Therefore, in family dinner conversation children can learn and practice the rhetorical devices with the patterns of reasoning that they will be usefully using in other social contexts, i. e. in the classroom discussions.

As an example we present here a brief excerpt of family conversation in which the same categories of *piccolo* and *grande* we commented on before (see excerpt 4) are activated and differently used by participants:

Excerpt 5

Traverso family. Members: Dad; Mum; Daughters: Carla, 7 years; Federica, 4 years.

Carla: dovremmo eliminare tutti i pupazzi. darli ai poveri. regalarli. Pupazzi che sono in buona salute, li regaliamo.

We should eliminate all the puppets. Give them to the poor people. Give them away. We had to give them away the Puppets that are in good health

[...]

Federica: ma io ci voglio giocare

But I want to play with them

Carla. Eh Federi ma ora tu sei grande. Hai cinque anni mo.

Eh Federi but you're grown-up now. You're five years old.

Federica: ma io ci gioco lo stesso. Vero mamma?

But I play with them all the same. Isn't it true mum?

In this excerpt the older daughter Carla, in order to obtain her younger sister's agreement in giving away all the puppets, cunningly tells her that she is grown-up now. Carla knows that Federica wants to be considered *grande* and she attempts to take advantage from the implication of this attribution (when one is grown-up one doesn't play anymore with puppets). As a matter of fact, Federica does not agree with her sister as regards the puppets' destiny but she does not refuses the attribution she has been addressed: even though she is grown-up now she nevertheless wants to continue to play with puppets!

In sum, in this excerpt, the two daughters give different meanings and implications to the same category of *grande* for achieving their opposite goals.

Another profoundly rhetorical speech activity is the description of events. In everyday conversation the way events are reported does not depend only on one's own knowledge and experience but also on other elements such as the reasons why the episode is told, the recipients of the storytelling, etc.

6. Developing arguing competencies in primary school context and in subject matter learning

Since argumentative discourse is a language game [60] of collective reasoning that can be used in various speech activities across a variety of contexts, we add a fast exposition about learning historical reasoning in classroom collective discourse.

6.1 The study: historical events

Thirty children (mean age: 9 years, 5 months) attending the 4th grade of primary school (Rome, Italy) were involved in group discussions (5 children each) considering historical problems.

The task proposed to children was the following text by Ammiano Marcellino: *A. M. is a Roman writer of the 4th century. In his description he says that the Huns had habits similar to beasts. First question: What do you think he meant? Was he right or wrong? Discuss it with your classmates and write down the reasons that could cause him to think in this way and whether you agree with him or not.*

The aim was to show if and how children in a social situation can practice peculiar epistemic procedures characteristic of historical reasoning. Three levels were considered: a) frame of discourse; b) reasoning

sequences; and c) idea units. The systems of categorization involved a) argumentative operations: means of constructing and supporting the reasoning [54]; claim, justification, concession, opposition, counter-opposition; b) epistemic operations: particular historical content means of definition, categorization, predication, evaluation, appeal to (analogy, authority, etc.).

Excerpt 6

Locating a document in its historical context: challenging the authenticity of the source

Talk sequence	Argumentative operation	Epistemic operation
Filippo 18.1 now I would like to say 'we do not agree' why?	Claim	(recycle the task)
Paolo 19.1 I do not much agree because A.M.,	Claim	Predication. On one's own claim
19.2 I've changed my idea from what I said before	Claim	Predication. On one's own claim
19.3 I don't think A.M. lived at that time	Claim	Appeal to a necessary condition of the source's authenticity
19.3a *to write history you must have lived at the same time as the event*	*Implicit justification*	
19.4 it seems difficult he can have written this document	Justification	Predication on the implausibility of a necessary condition
19.5 because there were not many pens and paper	Justification	Appeal to material conditions
19.6 or, I mean, I don't think A.M. is right	Claim	Evaluation of author's claim
19.6a *he cannot have written this text*	*Implicit claim*	
19.7 these are my impressions	Claim	Predication on own claim
19.8 and even if A.M. had written this document in ancient times	Claim Counterfactual strategy initiating	Predication on the source authenticity
19.9 but it must be seen how he succeeded in looking at them	Claim	Appeal to a necessary condition (eyewitness)
19.10 since they had very bestial habits	Justification	Appeal to data from the source
19.11 so they could even kill him	Justification	Appeal to a consequence of source's data
19.11a *thus either it is false that they were bestial or it is false that he had lived at that time and had seen them*	*Implicit claim Counterfactual strategy initiating*	
Nicola 20.1 right! what Paolo said is right	Claim	Predication on 19.1
20.2 because he could not have lived at that time	Claim	Appeal to a necessary condition
20.3 also because I think that if he had lived in those times, in the Middle Ages	Claim Counterfactual strategy initiating	Predication on time contemporaneity
20.4 not everyone could have, let's say, in the Roman times and so not everyone could write	Justification	Appeal to socio-cultural context (scarce diffusion of writing)
20.5 and they could not produce a description of people with such anomalous laws	Justification	Appeal to socio-cultural context
20.6 I think that no one could have done this description then	Claim Counterfactual strategy ending	Predication on cultural impossibility
Filippo 21.1 instead, I think something that perhaps does not fit in	Claim	Predication on own claim
21.2 that is, I mean partly agree and partly I don't agree	Claim	Predication on own claim
21.3 because when A.M., well, he could easily have been killed	Justification	Appeal to a consequence for the author of data from the source
21.4 or he could have had some problems in seeing, in getting in touch with the Alans or Huns	Concession	Categorization of the author as member of the people of the source
21.5 because either he was an Alan or a Hun	Claim	Predication on the source's untruth
21.6 or what he has written is somewhat false	claim	
Paolo 22.1 I think at that time they could not read and write	Justification	Appeal to a necessary condition (lack of instrumental abilities)
22.2 thus it was very hard for A.M. to have written that document	Claim	Predication on the improbability of attribution of the source
Nicola 23.1 because, if he had written on these sheets of paper, on sheets of paper	Claim Counterfactual strategy initiating	Predication on the possibility of the material production

Talk sequence	Argumentative operation	Epistemic operation
23.2 I think that, at this time, the sheets would already have turned to dust	Justification	Appeal to time as reason for the source's material deterioration
23.3 in short, as time goes by, the sheets turn to dust	Justification	Appeal to time as reason for the source's material deterioration
23.4 two or three thousand years have passed, I believe	Justification	Appeal to the amount of time
23.4a *source is not authentic*	*Implicit claim*	
23.5 so the sheets wouldn't have been found any more, they would have been turned to dust	Claim Counterfactual strategy ending	Appeal to the consequences of time passing on the source
Filippo 24.1 it could easily have been written on a stone, for instance	claim	Predication on alternative procedures (other materials on which the source was written)
24.2 or remnants of huts might have been found	Claim	Predication on alternative procedures (other sources)
24.3 and they would prove naturally, in the building, perhaps in the way it was used, how they used it	Justification	Appeal to material aspects of the socio-cultural context
Nicola 25.1 I think that if he had written it on a stone	Opposition Counterfactual strategy initiating	Predication on the possibility of the condition (writing material)
25.2 they couldn't have written that is written there everything, everything	Justification	Appeal to data from the source (amount of information)
25.3 simply because writing on stone is not the same as writing on paper	Justification	appeal to a general principle
25.4 thus I think that all this news would not have been understood, in short do you understand?	Claim Counterfactual strategy ending	Predication on the quality of source's information
25.4a *but since they are understandable*	*Implicit justification*	
25.4b *thus the source is false*	*Implicit claim*	

Group discussions are situations of «cognitive apprenticeship» [6]: reasoning is both a situated and a distributed action. The social negotiation activity on history topics is carried out with children autonomous groups in the absence of teacher and it differs from the talk about narrative that was guided by the teacher as it can be seen in the Excerpt 5 [40].

References

1. *Atkinson J., Heritage J.* (Eds.) Structures of Social Action: Studies in Conversational Analysis. Cambridge. 1984.

2. *Bruner J.* Actual minds, possible worlds. Cambridge, 1986.

3. *Bruner J.* Acts of meaning: Four lectures on mind and culture. Cambridge, 1990.

4. *Button G., Lee J.* (Eds.) Talk and social organization. Philadelphia, 1987.

5. *Capps L., Ochs E.* Constructing panic: the discourse of agoraphobia. Cambridge, 1995.

6. *Collins A., Brown J. S., Newman S. E.* Cognitive apprenticeship. Teaching the crafts of reading, writing and mathematics / In: L. B. Resnick (Eds.) Knowing, learning, and instruction: Essays in honour of Robert Glaser. Hillsdale, 1989.

7. *Edwards D.* Categories are for talking: on the cognitive and discursive bases of categorization // Theory & Psychology. 1(4). 1991.

8. *Edwards D.* Sacks and psychology // Theory & Psychology, 5, 1995.

9. *Feyerabend P.* Against method: outline of an anarchistic theory of knowledge. Milan, 1975.

10. *Garfinkel H.* Studies in Ethnomethodology. N. Y., 1967.

11. *Gilbert G. N., Mulkay M.* Warranting scientific beliefs // Social Studies of Science. 12. 1982.

12. *Goffman E.* Relations in public: Micro-studies of the public order. N. Y., 1971.

13. *Goodwin C.* Conversational Organization Interaction between Speakers and Hearers. N. Y., 1981.

14. *Goodwin C.* Notes on story structure and the organization of participation / In: J. Atkinson, J. Heritage (Eds.) Structures of Social Action: Studies in Conversational Analysis. Cambridge, 1984.

15. *Goodwin C.* Professional vision // American Anthropologist. 96 (3). 1994.

16. *Hymes D.* Models of the interaction of language and social life/ In: J. Gumperz, D. Hymes (Eds.) Directions in sociolinguistics: the ethnography of communication. N. Y., 1972.

17. *Jefferson G.* Sequential aspects of storytelling in conversation / In: J. Schenkein (Eds.) Studies in the organization of conversational interaction. N. Y., 1978.

18. *Jost J. T.* Toward a wittgensteinian social psychology of human development // Theory & Psychology. 5. 1995.

19. *Kuhn T.* The structure of scientific revolutions. Chicago, 1962.

20. *Labov W.* Language in the Inner City: Studies in the Black English Vernacular. Philadelphia, 1972.

21. *Latour B., Woolgar S.* Laboratory life. Beverly Hills, 1979.

22. *Leont'ev A. N.* Activity, consciousness and personality. Florence, 1977.

23. *Lucariello J., Nelson K.* Remembering and planning talk between mothers and children // Discourse Processes. 10. 1987.

24. *Lurija A. R.* Cognitive development. Its cultural and social foundations. Cambridge, 1976.

25. *Ochs E.* Talking with children in Western Samoa. Language in Society. 11. 1982.

26. *Ochs E.* Culture and language development: Language acquisition and language socialization in a Samoan village. Cambridge, 1988.

27. *Ochs E.* Misunderstanding children / In: N. Coupland, H. Giles, J. Wieman (Eds.) Handbook of Miscommunication. Clevedon, 1990.

28. *Ochs E.* Narrative / In: T. A. van Dijk (Eds.) Discourse as structure and process. London, 1997.

29. *Ochs E., Capps L.* Narrating the self //Annual Review of Anthropology. 25. 1996.

30. *Ochs E., Pontecorvo C., Fasulo A.* Socializing taste // Ethnos. 61 (1—2). 1996.

31. *Ochs E., Schieffelin B. B.* Language acquisition and socialization: three developmental stories. In R. Shweder, R. LeVine (Eds.) Culture theory: Mind, self, and emotion. Cambridge, 1984.

32. *Ochs E., Taylor C.* Science at dinner / In: C. Kramsch, S. McConnell-Ginet (Eds.) Text and context: cross-disciplinary perspectives on language study. Lexington, 1992.

33. *Ochs E., Taylor C.* Science at dinner / In: C. Kransen & S. McConnell-Ginet (Eds.) Text and Context: Cross-Disciplinary Perspectives on Language Study. Lexington, Mass., 1995.

34. *Ochs E., Taylor C., Rudolph D., Smith N.* Storytelling as a theory-building activity // Discorse Processes. 15. 1992.

35. *Orsolini M., Pontecorvo C.* Children's talk in classroom discussion // Cognition and Instruction. 9. 1992.

36. *Pontecorvo C., Amendola S., Fasulo A.* Storie in famiglia. La narrazione come prodotto collettivo // Età Evolutiva. 47. 1994.

37. *Pontecorvo C., Fasulo A.* Learning to argue in family shared discorse about the past / In: L. B. Resnick, C. Pontecorvo, R. Säljö, (Eds.), Discorse, Tools and Reasoning: Situated Cognition and Technologically Supported Environments. Amsterdam, 1997.

38. *Pontecorvo C., Fasulo A., Sterponi L.* L'apprendistato reciproco nell'interazione familiare // Ikon. 36. 1998.

39. *Pontecorvo C., Fasulo A., Sterponi L.* Mutual Apprentices. The Making of Parenthood and Childhood in Family Dinner Conversation // Human Development. 44. 2001.

40. *Pontecorvo C., Girardet H.* Arguing and Reasoning in Understanding Historical Topics. Cognition and Instruction. 77 (3—4). 1993.

41. *Resnick L. B., Levine J. M., Teasley S. D.* (Eds.) Perspectives on socially shared cognition. Washington, 1991.

42. *Rogoff B.* Apprenticeship in thinking: Cognitive development in social context. N. Y., 1990.

43. *Rogoff B., Lave J.* (Eds.) Everyday cognition. Cambridge, 1984.

44. *Sacks H.* Lectures on Conversation. Cambridge, 1992.

45. *Sacks H., Schegloff E. A., Jefferson G.* A Simplest Systematics for the Organization of Turn-Taking for Conversation // Language. 50. 1974.

46. *Schegloff E. A.* Reflections on language, development, and the interactional character of talk-in-interaction / In: M. H. Bornstein, J. Bruner (Eds.) Interaction in Human Development. Hillsdale, 1989.

47. *Schegloff E. A.* Repair after next turn: the last structurally provided defense of intersubjectivity in conversation // The American Journal of Sociology. 97. 1992.

48. *Schenkein J.* (Eds.) Studies in the organization of conversational interaction. N. Y., 1978.

49. *Schieffelin B. B.* The Give and Take of Everyday Life: Language Socialization of Kaluli Children. N. Y., 1990.

50. *Schieffelin B. B., Ochs E.* Language Socialization across Cultures. Cambridge, 1986.

51. *Sinclair J. M., Coulthard R. M.* Towards an analysis of discourse. London, 1975.

52. *Stein N. L., Glenn C. G.* An analysis of story comprehension in elementary school children / In: R. Freedle (Eds.) New directions in discourse processing. Norwood, 1979.

53. *Sterponi L.* Narratives and Speech activities: A functional perspective on family dinner storytelling. Manuscript. 1997.

54. *Toulmin S.* The uses of argument. London, 1958.

55. *Valsiner J.* Editorial: Discourse complexes and relations between social sciences and societies // Culture & Psychology. 1. 1995.

56. *Vygotskij L. S.* Though and Language. Cambridge, 1962.

57. *Vygotskij L. S.* Mind in society: The development of higher psychological processes. Cambridge, 1978.

58. *Wells G.* Revaluating the IRF sequence: A proposal for the articulation of theories of activity and discourse for analysis of teaching and learning in the classroom // Linguistics and Education. 5. 1993.

59. *Wertsch J. V.* Culture, communication, and cognition: Vygotskian perspectives. Cambridge, 1985.

60. *Wittgenstein L.* Philosophische Untersuchungen [Philosophical Investigations]. Oxford, 1958.

Развитие мышления посредством аргументации у детей раннего возраста

Клотильда Понтекорво

Ph.D., почетный профессор психологии образования, руководитель факультета социальной психологии и психологии развития Римского университета «La Sapienza»

Франческо Аркидьяконо

Ph.D., профессор Института психологии и образования Университета Ньюшатель

Целью данной работы является анализ хода рассуждений детей младшего школьного возраста во время аргументированных дискуссий в различных учебных заведениях. Согласно положениям Выготского и социально-культурного подхода, мы считаем, что развитие мышления ребенка осуществляется на основе дискурса, особенно во время учебного процесса, в котором также происходят взаимодействие между сверстниками и дискуссии под руководством взрослого. В данной статье мы представляем и качественно анализируем часть наших эмпирических данных, собранных с целью показать уместность нарративных процессов при дискуссиях (спорах) при участии детей младшего школьного возраста в образовательном контексте. Во-первых, мы говорим о контрафактивном рассуждении, используемом детьми дошкольного возраста в качестве аргументированной стратегии в спорах о нарративе. Мы приводим некоторые конкретные пространственно-временные характеристики, которые в основном связаны с необходимостью в обобщении и в логических основаниях (т. е. авторитет источников, ритуальность ситуаций и правдоподобность последствий). Во-вторых, мы анализируем, как во время семейных разговоров дети используют практические рассуждения, которые происходят, из родительских дискурсов о нормах и правилах. В заключение мы приводим пример, в котором рассуждения через аргументацию применяются в школе при преподавании истории детям младшего школьного возраста. Обсуждаются процессы рассуждения у детей в различных образовательных учреждениях, и подчеркивается их роль и значимость в школе и семейных мероприятиях.

Ключевые слова: подход Выготского, социально-культурный подход, рассуждения, аргументация, нарративы дошкольников, семейные беседы.

Digital technology and Mediation — a Callenge to Activity Theory

Georg Rückriem
Dr. of Psychological Sciences, Vice-Rector, Professor, Berlin University of Arts

In spite of their differences Vygotsky and Leontiev equally confine to speak about mediational means and neglect to reflect on the medium which makes an object being a means. Vygotsky lived at the end of the «Gutenberg galaxy». He was not able to even notice the emergence of digital technology. Leontiev certainly lived in the years of emerging digitalization technology but he was still far away from that widely spreading out impact of computers on our daily life today. It is therefore no judgement about personal limitations when we say that Vygotsky and Leontiev really could not reflect neither on digital technology nor on its revolutionary importance as a new leading medium of a new age or society. Activity theory in its basic structure depends on book culture but does not notice this dependency, because of its loss of adequate concepts. Activity theory cannot escape its own theoretical limits and methodological constraints. For the time being, however, that is during ongoing transition processes, we are still forced to deal with the epistemological and communication theoretical structures of book culture because such an anachronism is rather unavoidable to the transition processes in all present societies. But activity theory is urged to test seriously its common grounds or interfaces with new emerging sciences like media history and media science and to check their specific potential in modelling the new forms of information processing and communication systems if it aims to be still functional in the future of the Digital Age.

Keywords: Activity theory; cultural-historical psychology; culturology; media theory; media history; culture; digital technology/digitalisation; artefacts; instruments; means; objects; tools; medium; mediation; communication; myths of book culture; periodisation; media formation.

Yrjö Engeström, one of the best known theorists of present activity theory, wrote under the heading «mediation as a key»:

«It is somewhat amazing that in the recent theoretical discussion concerning the concept of activity, very little attention is paid to the idea of mediation» [3, p. 28].

That is a correct balance, indeed, and therefore Engestrom is also right calling the idea of mediation «the first prerequisite for any fruitful elaboration» when reflecting the importance of digital technology and its impact on the societal life as a whole. Even more important, however, is the emphasis, which characterizes the underlying theoretical understanding.

Mediation is not only a key, as Engestrom writes, it ought to be said: mediation is the key! From this point of view it is clear — though still not yet obvious — that the global process of digitalizing and digitalized mediation of every aspect of human practice and activity is the hardest challenge activity theory have ever met. I therefore accepted with great pleasure the proposal to speak about digital technology as a challenge to activity theory.

At first let me confirm that I do not intend to explain in great details what terms like «digital technology» or «web 2.0» or «New Media» exactly mean. Although I think that you certainly meet very similar differences in knowing and practical competencies concerning those «New Media» in your country as we do in ours, I suppose that all of you know what phenomena like e.g. facebook, youtube or other forms of social bookmarking are alike, since dealing with new technical devices within teaching and learning in higher education is a special object of your investigation long since, as far as I know.

But I think it being absolutely necessary to make clear what we are talking about, if we reflect on mediation and the Vygotskian or the activity theoretical approach to mediation in particular, leaving aside for the moment the differences between Vygotsky and Leontiev.

I'll therefore start first with some remarks on cultural-historical psychology and its model of mediation and try to analyse its structure and functioning.

In a second step I shall turn to Leontiev and describe the different model of mediation in activity theory. (The distinguishing between cultural historical psychology and activity theory is intentional as we will see later.)

With my last step I shall focus on the two theses which I like to present to you:

First — what is not really surprising after all — neither cultural-historical psychology nor activity theory is by itself able to solve the challenging task of mediation put by New Media or digital technology.

Second: Expanding the concept of mediation by means of media theory and media history, and reflecting activity theory from a historian's point of view we can recognize transformatory potential of digital technology equal to the revolutionary quality of book printing which formed a global culture and lasted for centuries.

I
Cultural historical psychology and its model of mediation

Vygotsky — strictly following the terminology of behaviorism* at the beginning of his career — puts a third factor into the scheme of stimulus-response, an auxiliary or «mediating stimulus», mediating between subject and object. This construction allowed him to use the methodology of both physiology and behaviorism and at the same time to integrate it into his instrumental psychology. The third factor still was a kind of stimulus, but a stimulus of its own, an artificial stimulus, an instrument to mediate between man and nature. Using «tools», originally serving to control other humans, now in order to control himself, man became aware of himself, and so freed himself from the determinism of nature.

That was the meaning of mediation in cultural-historical psychology. The intellectualization of behaviour by mediatisation made a difference between «inferior» (or «natural», «rudimentary», «primitive» or «elementary») and «higher» («artificial», «complex» or «instrumental») forms. Deciding factor of the difference is «its new, specific stimulus-response-relation»: While the lower forms are «totally determined» by immediate stimulation, the basic characteristics of higher forms consist in «self stimulation, that is in creating and using artificial mediational means and in controlling ones own behaviour by those means». In social life man created the most complicated systems of psychic communication, «without which labour activity and the whole social life would be impossible». To Vygotsky the most adequate means to psychic self-regulation are signs, language and scripture in particular. Signs are historical and societal both in origin and function. They come from the history of culture and served initially as «means of communication, means of influencing other humans» and later as «instruments of human activity»:

«These means of social communication therefore constitute the basis for the forming of those complex psychic relations, which emerge, when these functions come to be individual, that is the behaviour of a person» [27, p. 330].

From this point of view Vygotsky expresses his well known «genetic basic law of cultural development»:

«Every function in the child's cultural development appears twice: First, on the social level, and later, on the individual level; first, *between* people (*interpsychological*), and then inside the child (*intrapsychological*)» [24, p. 57].

* All translations into English by the author.

This is the origin of using signs as mediating instruments, that is, as a solution of the problem of mediation in psychology, which Vygotsky himself called «instrumental psychology» and which later on was called «cultural-historical psychology» when the origin of those instruments ought to be emphasized.

But, considering Engestrom's transformation of Vygotsky's concept of mediational means into «mediational artefacts» — or «instrumentality» [2, p. 19] — it should be added, that Vygotsky in 1930 certainly speaks of «psychic tools», but just one year later he used the concept of sign (and more later the concept of meaning only). He rejects explicitly the identification of tool and sign, and even criticizes the subsumption of tools (as a means of labour) and sign (as a means of communication) under the same concept of «artefact» [25, p. 152, 154].

He sharply and explicitly criticized Claparede, Dewey, Wundt and Ernst Kapp, a then well known German philosopher of techniques, for their literal use of «intellectual tools», «psychic tools» or «language as a tool of thinking» and so on. He solely agreed with a metaphorical use and emphasized: The basis of any analogy between tool and sign is their mediating function only [25, p. 152—153]. Vygotsky's point is: tools and artefacts are no psychic phenomena at all!

What does that mean?

It means that Vygotsky distinguishes between the two forms of internal and external activity, and therefore consequently between two forms of mediational means — tools of the external activity, and signs/symbols of the internal activity. In doing so he insisted clearly in his genuine psychological interest, that is, in psychic processes and their specific form of mediation. Referring to the analogy of signs and tools or inner and outer activity respectively he took care to find an interface to dialectical and historical materialism.

But he sharply, even gruffly denied the simple attempts of his ideological enemies to walk off with the problem by sheer deduction from dialectical or historical materialism or even from the economic categories of «Capital»:

The theory of dialectic materialism cannot possibly be applied directly to psychology no more than to history and sociology. [...] Just as history is sociology in need of a mediating special theory of historical materialism, to show, of which particular importance to the respective groups of appearances the abstract laws of dialectic materialism are. For the same reason the up to now not yet existing but essential theory of a psychological materialism as a mediating science is required, which could explain, how the abstract guidelines of dialectic materialism have to be applied to a given section of appearances» [27, p. 251—252].

Unfortunately Vygotsky was unable to realize this program of a meta-theory between historical materialism and psychology. Nevertheless he seemingly speaks with words of modern media theory, when he depicts the effects of a leading medium on individual and social systems:

The use of psychological instruments «changes the complete course as well as the entire structure of psychic functions» [27, p. 310]. «The use of mediational means [...] restructures the total psychic operation through and through» [25, p. 155]. «Culture creates specific forms of behaviour, modifies the activity of psychic functions, builds new layers within the developing system of human conduct» [25, p. 60, 155].

But it is advisable to read carefully and not misunderstand his rather vague use of notions like «instruments», «mediational means» and «culture». Taking into account the technological hierarchy of tool — machine — automat — computer we quickly become aware of the fact that Vygotsky mentions just tools, that is the lowest level of that hierarchy only. You will not even find the word «machine» in his writings, let alone automat or computer, digital technology respectively which he actually could not know. As for the epistemic hierarchy of data — information — knowledge — meaning we can realize that he refers on knowledge and meaning only, that is seemingly on the higher levels of this hierarchy. But we must not ignore the fact that his understanding of knowledge and meaning actually meant language and scripture, that is, the semantic systems of the book printing society. He acknowledged only two mediational means: natural and artificial, exactly like we know from the myths of book culture. And equally like that he saw scripture as the decisive divide, which separates one epoch of human mankind from the other, «namely barbarism and civilization» [25, p. 127]: The lacking contact with the Middle European «culture» of the book society was considered the main cause for «primitive» thinking. As to the Middle Asia expedition of Luria and its assessment by Vygotsky therefore Van der Veer/Valsiner write:

«They interpreted cultural differences in developmental terms and considered literacy and rational, abstract, scientific thinking as the highest achievements of human thinking» — «In the eyes of Vygotsky and Luria the access to (western) culture allowed the Uzbek population to make 'a leap of centuries' (Luria)» [20, p. 251—253; 21].

Also another and anything but unimportant one of the above mentioned myths of the book culture, I mean the linear understanding of history, is typical to Vygotsky, as can be shown by a last example. Reflecting the issue of periodization of consciousness in his essay on «The socialistic transformation of man»*, he quoted Trotsky (as he did already before) for his view of «super man». Trotsky distinguished between «primitive man» and «modern type» of man which he conceived as a transition to the «forming of a new type of human» in communist society. According to Vygotsky the transformation will finally be realized by mastering not only psychic processes but all functions determined by human nature, and so finally by learning to consciously restructuring even the «biological organization» of man onto a kind of superman. The linea-

rity of thinking is obvious. What is changing is the form of behaviour from direct to mediated, and the volume of the conscious behaviour: from mastering the psychic to even mastering the physical processes. All this is an effect of mediational means which at any time remain equal. Their form is irrelevant, only their function is important.

It is obvious that this theoretical framework is obliged to book culture and to printing as leading medium — although this is anticipation for the moment. Insofar we can describe this model of mediation as finally unhistorical. At any rate, because of its dependence of the old leading medium it can hardly serve as an adequate instrument in order to grasp the emerging new leading medium and to understand the full range of present systemic meaning of digital technology.

II
The model of mediation in activity theory

To Leontiev, however, the problem of mediation was still not solved. He clearly followed Vygotsky supposing, that the mediatedness of human relations with the world marks the peculiarity of humans [8, p. 459], and he also accepted the mediating function of signs: *Sign is what matters*» [8, p. 451].

On the other hand he criticized Vygotsky — very early indeed — because of his understanding signs/meanings being means of mediation which could not be questioned. Leontiev's argument was: As far as the origin of signs/meanings cannot be explained, their emergence and function remains restricted to social, more precisely: linguistic, communication, resulting in:

«*Consciousness is a product of linguistic, actually of mental interaction*» [8, p. 457], in other words: «The social mind [determines] the personal and the personal mind determines the social» [8, p. 325].

That means, Vygotsky's solution of the problem of mediation ends in a circular reasoning like «classical French sociologies» [8, p. 459]:

«Society effects on men and man effects on society» [8, p. 325]**.

To Leontiev this conclusion, however, meant to psychology «an affirmation of rather exactly that [American] *culturology*»***, which could not be vindicated from the point of view of historical and philosophical materialism:

«The history of consciousness joins [in that theory] only with the history of the social mind, and not with the material history of society», for «only those cultural-historical facts prove to be determinant» [8, p. 459]****.

Leontyiv preferred an alternative solution. Instead of stalling with linguistic communication as the only mediating entity and thus considering the word a «Demiurge»***** of consciousness, he suggested to

* *Vygotskij L. S.* Socialističeskaja peredelka čeloveka. In: VARNITSO 1930, vol. 9—10, p. 36—44.
** See for the identical formulations in numerous texts: Leontiev 2005; 249; 257; 259; 331; 459.
*** See Leontiev 1982, 79 ff.
**** See Leontiev's criticism of the American culturology, 1982, 79—80.
***** See Leontiev 1982, 235; 2005, 247, 276.

explore, «what stands behind communication» [8, p. 325]. «Behind» linguistic communication, however, stands only the material activity itself.

«Vygotsky's thesis that consciousness is a product of the child's linguistic communication on condition of his activity in respect of its surrounding objective reality thus has to be reversed: The child's consciousness is product of its human activity in relation to the objective reality, which takes place on condition of speech, of linguistic communication» [9, p. 304]*.

His applicatory experiments in Char'kov yielded, that the appropriation of a meaning did not result in communication, but «originally from the child's external activity with material objects and in cooperative interaction» [10, p. 138]. In Leontiev's approach the formula subject — activity — object took the place of the formula subject — sign — object.

This had consequences. The object now appeared twice: first, as a material artefact and then as a mediational means of activity. Thus the tool concept lost its Vygotskyan function, because:

• Human activity is object-oriented ever since. «The term ‚activity without object' is senseless» [10, p. 85].

• The mediating object appears either as a tool or a goal or a motive of activity, according to the «status of structure within the system of an activity». Only within this system «objects can obtain the quality of stimulus', goals and tools. Taken out of this system, they lose those properties» [10, p. 108].

• The nature of tools «as a matter of course is not psychic» [11, p. 18], in fact they are «a material artefact, in which just procedures and operations and precisely not actions, not goals crystallize» [10, p. 106]. That is true to all human tools, which are objectifications of operations», so as well «the words language, which comprise by their meaning the way of their use, and so finally the logical and mathematical laws and formulae» [11, p. 18].

• Consciousness «is not the only existing, only possible, only imaginable form of psychic reflection» [8, p. 443]. Every human activity is mediated by psychic reflection that is by an internal activity, having the same structure as external activity. Therefore, «the in its form internal activity, emerging from the external practical activity», cannot be separated from it, «but remains in principle and even mutually connected with it» [11, p. 18].

On the one hand this point, to fetch back the mediating reflection into the material activity and to genetically explain it by activity itself, rendered superfluous the immediate interiorization of the mediational means by communication according to Vygotsky, and thus avoided the intellectualization. But on the other hand this caused a new form of immediacy between activity and consciousness. Leontiev solved this problem by a strict historical analysis whose results were published in his famous periodization «Problems of the development of the psyche». The central outcome of this book is the

difference between «reflection *within* activity» and «reflection *as* activity» [13, p. 131].

Based on this assumption Leontiev formulated his own «basic law» of practical activity hurrying ahead and reflection lagging behind [13, p. 157].

Consequently Leontiev began, to reformulate from this point of view all of the concepts of Vygotsky: consciousness, higher psychic functions, genesis of speech, emergence and mastering of scientific concepts, and learning.

He of course then met the same problem as Vygotsky: the exigency of a philosophical foundation of his assumptions. In a posthumously published manuscript Leontiev explicated his understanding of Vygotsky's proposal for a psychological materialism:

«The philosophical issue of consciousness has to be distinguished from:

A. the issue of societal consciousness and

B. the issue of the consciousness of (societal) man.

The first is the subject of analysis of the historical sciences, of historical materialism.

The second is the subject of psychology» [8, p. 443].

And once more he repeats:

«Consciousness belongs to the nature of man — to the real subject of consciousness.

Taken in its relationship to objective reality, it has to be reflected by philosophical science — epistemology, logic (‚query of truth'); taken in its relationship to social life («considering the objective societal consequences»), it has to be reflected by sociology; taken in its relationship to the materializing life of men, it has to be reflected by psychology.

That means: *The theory of consciousness is necessarily a subject of psychology, but by no means does not and may not coincide with the theory of consciousness of Diamat or Histomat. To substitute psychological, that is concrete scientific assumptions on consciousness by epistemological assumptions or by assumptions of historical materialism is crassly erroneous*» [8, p. 444].

But he held, that psychology could achieve its scientific assumptions *within the framework* of historical materialism only, because it was the only way to give reasons for activity as an explanatory principle.

Although Leontiev in reconstructing the genesis of consciousness resorts to speech and in attempting to explain the emergence of speech harks back to gesture and «kinetic speech» both as independent media, which are not identical with labour** and develop actually in co-evolution***, monism coerced him into denying this meaning and subordinating gesture and speech to labour. Even though he occasionally concedes, that «the appearance of phonetic language was a revolution» [8, p. 475, 481], and that written speech «together with book printing» transformed into one of the most important, even «predominant form of human speech» and thus into «a capacious creative power» [8, p. 481], such

---

* In short: «Neither meaning, nor consciousness is the base of life, but life is the base of consciousness.» (Leontiev 1982, 98).
** See Leontiev 2005, 241f, 251f, 263, 283f.
*** Speech, «which emerges together with the development of labour». (Leontiev 2005, 267.)

appreciations finally remain accidental*. It does not mean, that Leontiev would have accepted either phonetic speech or printing like leading media in the sense of media history. He in fact affirms Giesecke's argument indirectly:

«Modern book cultures tied "intrinsic", "true" information to human consciousness and gave to linguistic-conceptual knowledge a virtually absolutistic power on other, «inferior» forms of informations» [6, p. 78].

Clearly, Leontiev focused on a «general psychology» only [9], which in itself had no need for a historical observation of itself. In describing the real history of the psyche he therefore inevitably switched to the method of historical materialism, in other words, to the identification of activity and labour. Obviously his division into periods of historical structures of consciousness equals the well known periodization of societal labour: The phase of «primitive integrated» consciousness, not yet separated into external and internal or practical and mental activity (manual and mental work), was followed by the phase of «disintegrated», that is class consciousness (ibid.), characterized by its alienation of personal sense and societal meaning and finally by the phase of «reintegration» with its «new relation between sense and meaning» and with «a new psychological structure of consciousness» caused by liberation of human labour through communist society. But, according to Leontiev «class consciousness» is «*societal* consciousness» and thus explicitly a subject of historical materialism, *not* of psychology. According to Leontiev activity and labour are not identical, and even more: all categories of general psychology — activity, action; operation or motive, goal, condition or sense and meaning respectively — may not be huddled together with, deduced from or replaced by the categories of historical materialism or even the concepts of political economy.

«Because of the existing relations between these sciences, which reflect the objective relations of their objects, such a substitution makes the psychology of consciousness unsubstantial, but restricts the potentials for a further completive development of the other sciences of consciousness ...» [8, p. 444—445].

Nevertheless, since Yudin's essential and useful distinction between activity as an object and as a principle of explanation** the argument is rather common, Leontievs psychology and activity theory are identical. Actually that is by no means correct, and Yudin's distinction is very helpful to make that clear: Indeed, object of *psychology* is, according to Leontiev, activity. But that can only be legitimized in the framework of a *philosophy*, using activity as explanatory principle. Exactly this is Vygotsky's «psychological materialism» [27, vol. I, 253] as philosophy or worldview, as Leontiev

expresses unmistakably clear with his famous letter to Vygotsky:

Today the developmental logic of the system of C[ultural] P[sychology] is in need of focussing on the issue of a philosophical understanding of its basic concepts and principles (Divergence between the actual content of analysis and the level of elaboration of its philos[ophical] foundations, of its underlying world view [...].)

This task [...] cannot be coped with for the price of adapting the C[ultural] P[sychology] to the «standard», in other words, it may not mechanically be squeezed into this or that philos[ophical] context. — It is by itself a philosophical system (a psychological philosophy! — a world view!)***.

Anyway, in summa Leontiev as well did not get beyond the limits of the leading medium but remained — at least in his works earlier than 1960 — within the boundaries of the book printing medium.

On the other hand, beginning with the 60ies when the Russian government forced the development of computer systems to making possible the moon rocket flights, Leontiev was in charge of doing psychological research on problems of man-machine-relations. He then published lots of highly interesting contributions which are rather unknown in the western world but can be seen as his approach to information technology. So I think it worthwhile to at least have a look on the results for the concept of mediation****.

In his first publications about the psychological meaning of automatically controlled machines in 1962 — the term «Computer» was not common then in the SU — Leontiev came to a point of view, which even at that time was much more open-minded to digitalization than the arguments of many of the scientists in the western world at present. Above all, in his assessment of the psychological consequences he freed himself of all restrictions by the theory of historical materialism, and focussed exclusively on the psychological components of activity and the possibility of their technical modelling.

According to Leontiev tools are externalized operations. This understanding lends the tool a conceptual extension far beyond Vygotsky's idea. On the one hand, to Leontiev even «the most modern machines» — as he called computers at that time — are «just a technical means, [...] a method to realize the productive activity» or «"algorithmized" and "automatized" actions», but on the other hand he considered them to be «objectified *human functions*» [11, p. 17]. However, in operations «only those interrelations of the action structure have been retained and fused, which replicate the objective relations of the objective conditions of their accomplishment» and therefore «as such can be uncoupled

---

* Even his concession, «the appearance of a certain bearer of generalization, which is the word, opens up *totally new and infinite perspektives*», has reference exclusively to «the developmental potentialities of the generalizing activity», that is to «the intellektual activity of thinking» itself (Leontiev 2005, 273. Italics GR.); resulting in: «The one and real source not only of the emergence, but of the subsequent formation of human speech and consciousness» is labour (ebd., 334; see also 259ff, 333 ff).

** See Yudin 1978; in German 1984, 2009.

*** Letter from 5. 2. 1932; Vygotsky 2009, 270.

**** Unfortunately those writings haven't been translated into English; so I have to quote them from my German translation.

from man» — «the forming of operations, metaphorically speaking, equals the death of formerly inventive actions» — then again they could in principle be modelled technically. So he did not balk at the then revolutionary consequence, which today still is frightening to many of his colleagues:

«What today occurs to human thinking like a not to be formalised creative action, that tomorrow already could have been changed into an operation. Thus there are no limits to a development of always ‚savvier' machines» [11, p. 19].

Hence, according to Leontiev, all existing barriers for the technical modelling of actions are temporary. When he was asked to assess the limits of capability of computers, he always spoke of «at present *really existing* automatic machines», whose «actual success [...] lies ahead in the near future» [11, p. 7].

Surprisingly Leontiev even in 1962 enunciated the idea (which is customarily associated with Marshal McLuhan) that man «in tools, by which labour is carried out, generates in a way new organs», which «he adds to the vitals of his body» and thus overcomes «the ‚biological idleness of his natural organs, powers and abilities». Very similar to McLuhan's comment on the socialization process of people by media Leontiev wrote — at first more in general:

«While learning to use tools man subordinates his motions to the societally emerged system of operations, which is materially ingrained in them. The tool changes the behaviour of people, it builds new abilities in him» [11, p. 11].

Then with reference to machines, including computers:

«What machines contribute to human activity by their work, at the same time give rise to the emergence of new abilities of man — of new functional systems of his brain, which appear like the "mobile physiological organs" (Ukhtomsky) of those abilities» [11, p. 19].

Leontiev obviously supposed, that with machines in general and computers in particular — seen as technically modelled former human operations — quasi human «organs» have been built and dislocated to the outside — much like our brain today no more serves as an adequate information store, because we may relocate our memory into a computer. Though Leontiev saw the then state of affairs of the digitalization development rather sceptical, he basically suspected already in 1962, however, the technical modelling even of brain functions, which today can use everybody, who has an internet account to his disposal and disposes of adequate media skills. These are e.g. the software developments of Web 2.0 like expansions of social bookmarking and their socially interactive memory stores, which are going to combine the memories of people, concerning a special object, and to make the combination available to everybody quasi as a collective brain. And these are networks like e. g. flickr, splashr, favr, del.icio.us, YouTube, facebook, Gravatar or technorati, but also Amazon, Google and E-bay, whose results are much more than a sum of particular brains, and whose «collective results of thinking» cannot at all be noted by men, but automatically by machines, as well as e. g. the results of «beta versions» or «open sources» concerning the collective improvement of software or the ranking of Google places.

Astonishingly Leontiev did not see any consequence for a changing of his general system of psychology: just abilities change but the system of consciousness keeps the same. On the other hand, his results characterize, although only in general and implicitly, the basic dependence of consciousness as a totality of human potentialities from the actual social-historical system of human mediational means. Even when the explicit concept of «medium» is still missing, Leontiev's approach provides us with an interesting and still useful interface with actual media theory and media history respectively. However, the more digital technology continues strengthening and widening out interactivity as a principle of all web 2.0 social services the more our traditional understanding of technology as a mono-causal amplifier of intentional actions will disappear.

III
Activity theory and the transformatory potential of digital technology — two hypotheses

First hypothesis

Thus concerning our first hypothesis we may resume our results as follows.

In spite of their differences Vygotsky and Leontiev equally confine to speak about mediational means and neglect to reflect on the medium which makes an object being a means. The reason is obvious: What goes without saying needs no thinking about. Humans are air breathing beings but don't even perceive it until the air is polluted. Even in big cities heavily pestered by smog people are in need for experiencing clear fresh air as a different medium to become aware of the difference although they of course are still breathing air. But not before getting under water — that is, within a totally different medium — they conceive what air as a medium really is and at the same time they understand that air is the leading medium to every land born being like water to every sea born animal. In terms of the same metaphor we may say that Vygotsky and Leontiev never came under the water of digitalization.

In the history of mankind there are several leading media. The most interesting ones especially to human sciences are communication media like language, scripture, and book printing. To say they are historical, means, they follow each other in history having their historical roots and conditions. To say they are leading, means, they impact every other medium and build the decisive framework for every societal communication system existing at a time. Therefore media theory speaks of leading or predominant media in terms of societal formations or cultures, eras, epochs, or ages — as e.g. Marshal McLuhan who used the metaphor «the Gutenberg Galaxy», in order to characterize the book

printing century as a long lasting era which had been coined by book printing as leading medium. In the same way at present many scientists refer to digital technology as the new leading medium in order to characterize the drastic and comprehensive impact of digital technology on every existing communication system. They then use notions like Information Age, Connected Age (Anne Zelenka) or Digital Age (MIT). Others speak of Information Society (Giesecke), Media Society (Flusser), Network Society (Castells), Knowledge Society (Willke), Meaning Society (Bolz) or simply Next Society (Drucker).

Coming back to Vygotsky and Leontiev.

We first have to take note of the fact that Vygotsky lived at the end of the «Gutenberg galaxy». He was not able to even notice the emergence of digital technology. Leontiev certainly lived in the years of emerging digitalization technology but he was still far away from that widely spreading out impact of computers on our daily life today. Up to his death in 1979 hard resistance against those «inhuman and hostile robots» was common with people in general and with scholars in human sciences as well. It is therefore no judgement about personal limitations when we say that Vygotsky and Leontiev really could not reflect neither on digital technology nor on its revolutionary importance as a new leading medium of a new age or society.

Second hypothesis

But may we as well assume that those historical and biographical restrictions are true to present activity theory?

One of the most interesting living scientist doing research in the tradition of Herbert Marshal McLuhan, Jack Goody, Erik A. Havelock, Walter Ong, Andre Leroi-Gourhan, Elizabeth Eisenstein or Jacques Derrida is the media theorist and media historian Michael Giesecke*. To answer my question I condense the theoretical guidelines of Giesecke's voluminous historical research on media within 10 arguments pointing out the consequences on activity theory.

1. There is neither information nor communication between systems without a medium, they be individual, social or cultural. Each new medium gives rise to a new epistemology, and this again leads to the discovery of new worlds. New world views emerge, that means, the position of man in relation to the world gets reformulated. Or as Postman puts it:

«Each epistemology is the epistemology of a period within the development of media» [15, p. 36—37]**.

2. In reliance to the given leading medium the understanding of what could be a tool or a helpful instrument changes. Existence, form and function of tools and instruments as well as the social rules of their application and use depend on the actually given medium and its information and communication systems. No exceptions are possible. If we take the notion of tools as an example we can see, that it is based on linearity and causality but not on interaction. The feedback of an action is a failure. If the handle of a hammer breaks when using, the hammer is no good as a tool. The feedback minimizing of objects on a tool makes it a good tool. But the creating of most possible feedback possibilities makes the interactive social networks effective.

Every leading medium constellation produces its own typical practices and products, activities and cooperation forms, its means, tools and devices as medium between man and environment, and it emerges symbolically generalized communication media to steer the communication between individual or social systems like e.g. power, law, money, knowledge or networks.

«Even the defining characteristics of what is human move and slip» [15, p. 290].

3. This basic impact of media on speech and thinking, feeling and knowledge, perception and cognition, aesthetics, epistemology, social rules and ways of reflecting the world got the media historians to argue in terms of media formations history. With respect to book printing e.g. they think it rather unbelievable what obstacles and barriers have been cleared out of the way to push through the typographic communication system: All linguistic conditions were restructured completely, Latin lost its monopoly, new standardized national languages with specific oral and scriptural forms emerged, status and function of dialects within the hierarchy of languages changed fundamentally, age-old religious myths were replaced by new ones, social norms valid for thousands of years have been smashed, the self image of the individual has been outlined through and through [4].

«New religiousness, enlightenment, democracy, and industrialization — everything has been given a push, accelerated and perfected by this medium. Each field of life has been made scriptural and is controlled by bookish knowledge» [6, p. 227]***.

4. To make things absolutely clear Giesecke emphasizes that the privileging and accelerating of a new medium equally to digital technology in those days and today depend basically on the potential, viability, and power people expect of it in realizing their social utopia.

---

* See Giesecke 4/2006, 2/1998, 2002 und 2006.
** See also G. Bateson 1981, 245, 577ff. For more details see Giesecke 2002, 303—330.
*** To Giesecke that is effective even to production. Quoting McLuhan who called the invention of Gutenberg «the basic form of any further mechanization» and referring to other historians of technology who argue that the principle of Gutenberg's mould returns up to modern age in every machine, Giesecke concludes, that without the printing machine indefinitely producing identical perfectly fitting pieces neither the industrial mass production nor the market economy and its distribution mechanisms would have been possible (1991, 80, 182; 2002, 225). Other than historical materialism he is convinced: «The typographical technology is the prototype of the production technology of the industrial era.» (Ibid., 229.)

In other words, a medium is a catalyst (McLuhan), not a cause.

«In order to become a catalyst of social transformations a medium has to draw social attention and to attract social projections. The more total the demand of those projection is — it could also be said: their megalomania is — the more important the catalytic effects to societal transformation will be» [4, p. 156].

5. But there are always different competing technologies with different promises of sense and value which forces them to start a predatory competition by developing sense creation processes, forming new semantic systems and ideologies. Because of the heavy cultural losses which come unavoidably together with a new medium cultures therefore are forced to justify their self definition by depreciating the old media and glorifying their own aims and goals, and by making mysteries of their historical outcomes and achievements as if they were unchangeable characteristics of man and would mark the top of the development of mankind.

6. The failure of scrutinizing the mysteries and ideologies of the book printing culture has an adverse effect on the critical analysis and shaping of the potentialities of the new medium and of activity theory as well. Giesecke describes eleven of such myths and mystifications which build the specific tradition of book culture [6, 223-257]. I just mention those few which can be found easily within activity theory:

• The myth of the rational linguistic information processing: Logical thinking and reason are more important and valuable than emotional intelligence what is effective to activity theory as well.

• The myth of knowledge being a result of individual efforts. There is hardly a chance for Surowiecki's «Wisdom of crowds» (2004) in activity theory.

• The myth of learning being an individual process only. There is no place in activity theory for the concept of learning systems (even computer systems), learning organizations or learning cultures.

• The myth of the «true (or objective) reality» being the only possible. Thinking of reality in terms of communication is not the business of activity theory.

• The myth of history being a steady linear process of accumulation of knowledge.

• The myth of the early cultures being «natural» and «direct», that is «non-mediated» and therefore minor, primitive or inferior, while books and reason are identified and privileged as «real» culture.

All these myths and mystifications are specific to book culture and its «imperialistic» (Giesecke) medium and cannot be found in any other earlier leading medium formation.

7. In every new medium formation — and that's true to the Digital Age as well — the sheer reproduction of the programs of a declining formation cannot, by no means, reproduce the achievements of the old medium but is condemned to fail against the new challenges and potentials of the new medium.

8. In order to stand these challenges we have to see through those myths, to understand there dependency and to grasp their historical necessity. That is the only way to get along with the problems of transformation processes, that is with its specifity of the concurrence of the inconcurrence of different leading media e. g. books and networks which both are still competing for their being privileged and generalized.

9. However, for being able to identify those myths as implications of a leading medium a scientific concept of medium is required. Neither tool nor sign or meaning are concepts adequate to identify and to distinguish different formations of cultures, societies or ages of a leading medium, or media formations. Nor are they adequate instruments to grasp the revolutionary quality of the transformation processes of cultures and societies introduced by the change of leading media. The concept of medium — not tool, sign or meaning — provides us with the methodological means necessary to form the model, the stages und laws of transition between different leading media which we so urgently are in need of.

10. To understand the limitations and restrictions of activity theory concerning the problem of mediation it seems to be useful to notice, that — according to Yudin* — the century of activity as explanatory principle in spite of all existing differences moves within a closed «space of thinking», which is finally based on the same fundamental problem of mediation whose origin is historically far beyond the activity theory of the 20th century. This historical constellation fixed the margin for perceiving the evolution of media, which results in restricting the attempts of modern activity theory in clearing its dependence and in adapting its methodology.

Activity theory in its basic structure depends on book culture but does not notice this dependency, because of its loss of adequate concepts. Activity theory cannot escape its own theoretical limits and methodological constraints. For the time being, however, that is during ongoing transition processes, we are still forced to deal with the epistemological and communication theoretical structures of book culture because such an anachronism is rather unavoidable to the transition processes in all present societies**. But activity theory is urged to test seriously its common grounds or interfaces with new emerging sciences like media history and media science and to check their specific potential in modelling the new forms of information processing and communication systems if it aims to be still functional in the future of the Digital Age.

---

* Judin, 1978.
** See *G. Rückriem, C. Ang-Stein, J. W. Erdmann.* Understanding media revolution — how digitalisation is to be considered. Lecture given at the Summer School of MGPPU, August 2010, Moscow, Russia. Revised version of the Lecture on FISCAR. Nordic Conference on Activity Theory, May 23—25, 2010, Aalto University, Helsinki, Finnland.

References

1. *Bateson G.* Ökologie des Geistes. Frankfurt a. M., 1981.
2. *Engeström Y.* Lernen durch Expansion. Marburg/Lahn, 1999.
3. *Engeström Y.* Developmental Work Research. Expanding Activity Theory in Practice. Berlin, 2005.
4. *Giesecke M.* Der Buchdruck in der fruhen Neuzeit. Eine historische Fallstudie über die Durchsetzung neuer Informations — und Kommunikationstechnologien. Frankfurt/Main, 1991.
5. *Giesecke M.* Sinnenwandel, Sprachwandel, Kulturwandel. Studien zur Vorgeschichte der Information-sgesellschaft. Frankfurt/Main, 1998.
6. *Giesecke M.* Von den Mythen der Buchkultur zu den Visionen der Informationsgesellschaft. Frankfurt/Main, 2002.
7. *Giesecke M.* Die Entdeckung der kommunikativen Welt. Frankfurt/Main, 2006.
8. *Leontiev A. A.* The life and creative path of A. N. Leontiev // Journal of Russian and East European Psychology. Vol. 43. 3. 2005.
9. *Leontiev A. N.* Lekcii po obščej Psichologii. Hrsg. von A. A. Leont'ev und E. E. Sokolova. Moskva, 2001.
10. *Leontiev A. N.* Tätigkeit, Bewusstsein, Persönlichkeit. Köln, 1982.
11. *Leontiev A. N., Panov D. Ju.* Psichologija čeloveka i techničeskij process. M., 1963.
12. *Leont'ev A. N., Panov D. Ju.* Psichologija čeloveka i techničeskij process // Voprosy filosofii. № 8. 1962.
13. *Leontiev A. N.* Probleme der Entwicklung des Psychischen. Berlin/DDR, 1971.
14. *Leontiev A. N.* Frühe Schriften, Band II. Hrsg. von G. Rückriem. Berlin, 2006.
15. *Postman N.* Wir amüsieren uns zu Tode. Frankfurt/Main, 1988.
16. *Rückriem G.* Digital Technology and Mediation: A Challenge to Activity Theory // Learning and Expanding with Activity Theory. (Eds.) A. Sannino, H. Daniels and K.Gutierrez. Cambridge UP, 2009.
17. *Rückriem G.* La technologia digital y la mediación: un desafio a la teoria de la actividad. Conferencia invitada de la Facultad de Psicologia de la Universidad Autónoma de Mejico (UNAM) y de la Universidad Abierto y Educación a Distancia (CUAED). 28 de septiembre del 2009 In: Sinéctica 34. Revista electronica de Educación. Enero-junio de 2010. http://www.sinectica.iteso.mx/index.php?cur =34&art= 34_00.
18.*Rückriem G., Ang-Stein C., Erdmann J. W.* Understanding media revolution - how digitalisation is to be considered. Lecture given at the Summer School of MGPPU, August 2010, Moscow, Russia. Revised version of the Lecture on FISCAR. Nordic Conference on Activity Theory, May 23—25, 2010, Aalto University, Helsinki, Finnland, 2010.
19. *Surowiecki J.* The Wisdom of Crowds. Why the Many are Smarter than the Few and How Collective Wisdom Shapes. N. Y., 2004.
20. *Van der Veer R., Valsiner J.* Understanding Vygotsky: A Quest for Synthesis. Cambridge Mass., 1991.
21. *Van der Veer R.* The Concept of Culture in Vygotsky's Thinking // Culture and Psychology. № 2. 1996.
22. *Vygotsky L. S.* Socialističeskaja peredelka čeloveka // VARNITSO. Vol. 9—10, 1930.
23. *Vygotsky L. S.* Denken und Sprechen. Hrsg. von J. Lompscher und G. Rückriem. Weinheim und Basel, 2002.
24. *Vygotsky L. S.* Mind in Society. The development of higher psychological processes. Cambridge, MA, 1978.
25. *Vygotsky L. S.* Geschichte der höheren psychischen Funktionen. Münster/Hamburg, 1992.
26. *Vygotsky L. S.* Briefe/Letters 1924—1934. Hrsg. von G. Rückriem. Berlin? 2009.
27. *Vygotsky L. S.* Ausgewählte Schriften. Bd. I. Hrsg. von J. Lompscher. Berlin, 2003.
28. *Yudin E. G., Judin E. G.* Sistemnyj podchod i princip dejatel'nosti. M., 1978 In German: Systemansatz und Tätigkeitsprinzip. Methodologische Probleme der modernen Wissenschaft. Hrsg. von G. Rückriem. Berlin, 1978.
29. *Judin E. G.* Das Problem der Tätigkeit in Philosophie und Wissenschaft. In: D. Viehweger (Hrsg.), Grundfragen einer Theorie der sprachlichen Tätigkeit. Berlin, 1984.
30. *Willke H.* Systemisches Wissensmanagement. Stuttgart, 1998.

Цифровые технологии и опосредование — вызов теории деятельности

Георг Рюкрим

доктор психологических наук, проректор и профессор Берлинского университета искусств

Несмотря на различия между взглядами Л. С. Выготского и А. Н. Леонтьева, они одинаково описывают орудия опосредования и в равной степени игнорируют вопрос о его носителе. Л. С. Выготский жил в конце «эры Гутенберга». Он не застал даже первых ростков цифровых технологий. Леонтьев жил в период, когда развитие цифровых технологий уже началось, но эта стадия развития была далека от всепроникающего влияния компьютеров на повседневную жизнь человека. Таким образом, мы не можем назвать личным упущением Л. С. Выготского и А. Н. Леонтьева тот факт, что они ничего не сказали о цифровых технологиях и об их исключительной значимости как нового ведущего орудия опосредования новой эры. По своей базовой структуре теория деятельности принадлежит до-цифровой, «книжной» культуре. В течение длительного переходного периода мы вынуждены иметь дело с эпистемологическими и коммуникационными аспектами теории деятельности, возникшей в «книжной» культуре, потому что данный анахронизм практически неизбежен в текущем переходном периоде. Требуется серьезный пересмотр основных положений теории деятельности в свете новых областей знания, таких как история и теория мультимедиа, а также проверка ее потенциала в моделировании новых форм обработки информации и коммуникационных систем в случае, если эта теория претендует на то, чтобы продолжать развиваться в Цифровую Эру.

Ключевые слова: теория деятельности, культурно-историческая психология, культурология, теория мультимедиа, история мультимедиа, культура, цифровые технологии, артефакты, инструменты, средства, объекты, орудия, опосредование, коммуникации, мифы «книжной» культуры, периодизация, формирование медиасферы.

Presence, social presence and heterotopia: the self and the others in a multi-space

Giuseppe Ritella

Doctoral student in the Center for Research on Activity, Development and Learning (CRADLE),
Faculty of Behavioural sciences, University of Helsinki, Master degree in Psychology of organization
and communication

The way people percept themselves and the others during collaborative activities is changeable, being shaped also by the technologies used for communication. Some scholars used the concepts of sense of presence and social presence for understanding this issue in activities mediated by technology [18]. Other scholars refer to presence as a «basic state of consciousness: the attribution of sensation to some distal stimulus, or more broadly to some environment» [15, p. 159], both real and virtual. A problematic issue in this debate consists in understanding how presence is felt within situations in which real and virtual worlds are present at the same time and participants deal with a multi-space - an heterotopia [6] - that enables many forms of interaction and communication. A possible way to analyze it is to use the concept of activity [9] and the activity system as unit of analysis [5]. The aim of the present work is to reflect on this problem using some empirical data from a collaborative activity in which teachers from different schools work together face to face, in the school laboratory, using the educational software CoFFEE. Six sessions during which 10 teachers prepared a pedagogical scenario to be implemented in school have been filmed and qualitatively analysed. Some representative excerpts are analyzed in order to clarify some aspects related to sense of presence and social presence.

Keywords: sense of presence; heterotopias; activity theory; collaboration; qualitative analysis.

Introduction

A group of teachers is participating in a course designed for making them familiarizing themselves with CoFFEE* (an educational software developed for mediating face to face interactions) and developing a shared pedagogical scenario to be used later with their students. During six sessions, teachers from different schools work collaboratively face-to-face using CoFFEE. Every teacher sits in front of a computer into the computer laboratory of the school, uses the software and discuss with her colleagues. During the fourth session, one of them — Mariangela — is in charge as coordinator of the group work and is using the controller (Fig. 1), that is an application of CoFFEE. Using controller teachers can manage groups of students collaborating with the tools offered by the program. In the picture, the teacher has selected three of the tools offered by CoFFEE: a) the cowriter, a tool used for writing collaborative texts. Selecting a name in the bar above, the teacher enables users to write one at a time; b) The Graphical Tool, a shared virtual whiteboard where conceptual maps can be drawn in groups. Each user can add contributions, which appear on the shared whiteboard as a text box that can be dragged around the screen and linked to other contributions; c) the posi-tionometer that permits students to position themselves in a graduate scale in respect of the theme or the question proposed by the teacher.

The other teachers are using the discusser (fig. 2), the application developed for students, that reproduce in all the screens the interactive virtual space arranged by the teacher. Using controller, Mariangela can start a session and students (in this case, her colleagues) can log in the session using a nickname. When the students are logged in they appear in a little window called «groups console» (fig. 1), visible in the upright corner of the controller. While all the teachers are logging in Mariangela states: «students are you all connected? I see Loretta, Ada..», and teachers answer: «I am here»**, «I'm not»***. In other words, Mariangela is checking if all her colleagues are «present» using the group's console.

This little narration makes evident how the sense of presence — generally defined as «the sense of being there» [20] — is shaped by many factors and that the use of technologies that enable different types of participation, impact the way in which people percept themselves and the others. At a general level, Mariangela and her colleagues are dealing with two interweaving ways for feeling their respective presence: the perception of the physical existence in the same room and the perception

---

* More info about Collaborative Face to Face Educational Environment (CoFFEE) are available at the website http://www.coffee-soft.org/product.aspx.
** In italian they state «ci sono», that imply the reference to a specific location.
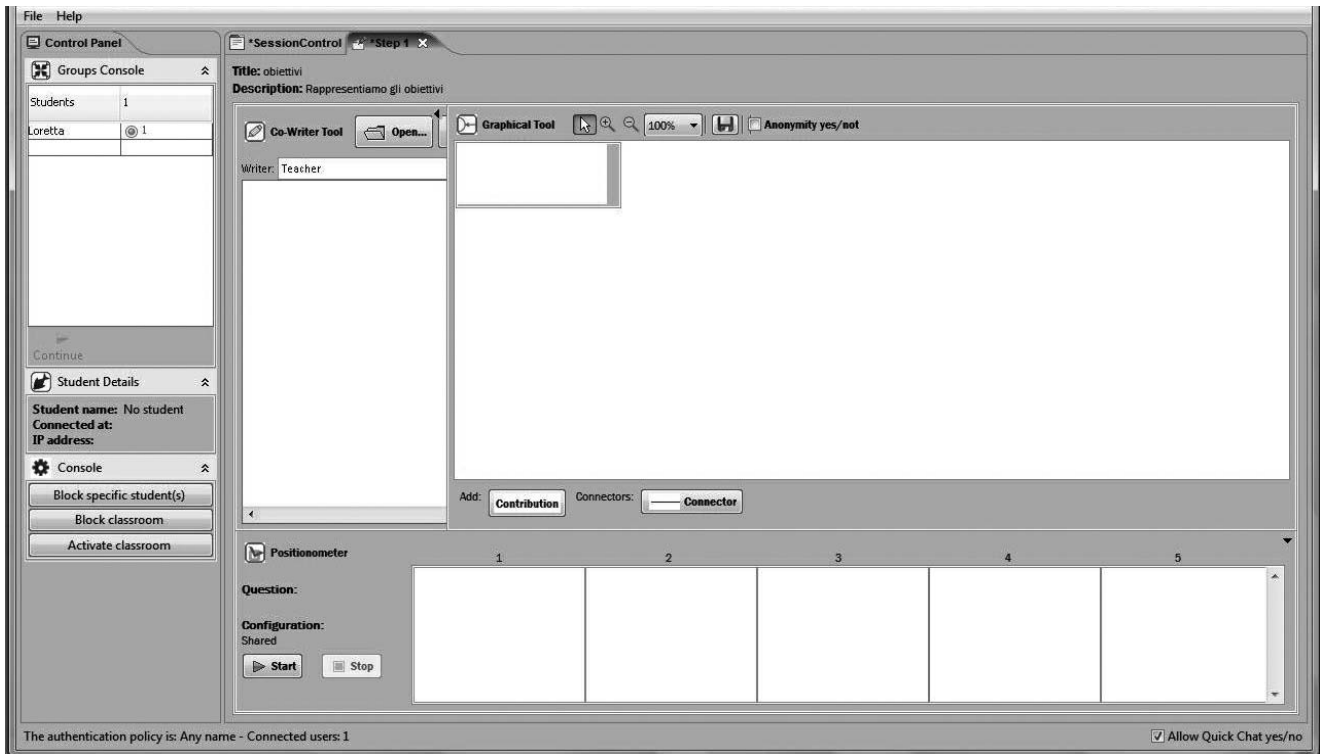*** In italian she states «io no».
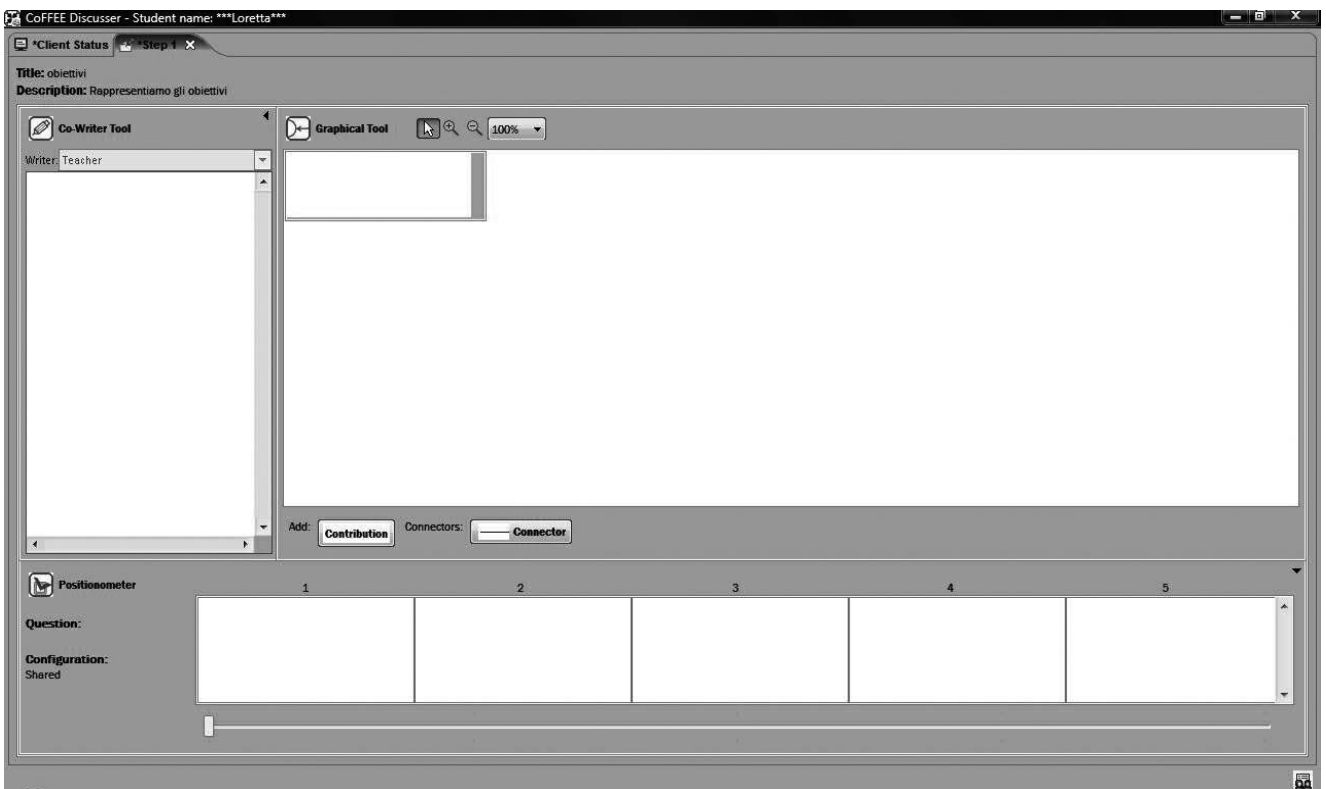
Fig. 1. Screenshot of Controller

Fig. 2. Screenshot of discusser

of the nicknames into the group's console of CoFFEE. The second type of presence is so important for the activity that Mariangela, as the leader of the group, keeps on assuring that her colleagues are connected before beginning the session. In fact, being logged in gives the right to access the tools and the semiotic resources necessary for the activity. If not, the participation of the teachers cannot be considered complete, even if they are physically present and they can participate in the face-to-face interactions.

As stated by Biocca [2], the concept of presence can be considered a key issue for understanding the participation

in mediated activities, but at the same time it seems to be a multifaceted concept. So, before continuing the reflection by the analysis of the empirical data, it is important to answer three theoretical questions: What are presence and social presence? How are they related to participation? How is it possible to analyze them?

Presence and social presence

The use of the word presence is not unproblematic, given that for understanding it we must keep in mind that it is often used as a shortened version of the term telepresence [15] and that telepresence itself «is a popular idea that is not well defined» [17, p. 64]. So, some clarifications are needed for using the concept. The purpose of this paragraph is not to give an exhaustive review of the use of the concept, but to clarify some aspects related to presence that are crucial for its definition.

Firstly, Steuer [20] distinguish between presence and telepresence «which refer to the sense of being in an environment, generated by natural or mediated means, respectively» [20, p. 3]. Nonetheless, many authors use presence for telepresence and usually refer to experiences elicited by technology and to theories about virtual environments [2]. In this sense the International society for presence research (quoted in [15]) defines presence as the psychological state in which individuals do not recognize the role of technology in their experience. However, as Loomis [12] stated, presence can be referred to a similar and more general concept discussed by many philosophers and perceptual psychologists: the «distal attribution» through which individuals attribute sensation to the external world. In this view, presence is a «basic state of consciousness» [15, p. 159] that is not closely related to technology and permits to use presence for understanding different kinds of experience: presence could be defined, then, as «the feeling of being located in a perceived external world around the self. This applied both to unmediated and mediated presence» [22, p. 3].

Moreover, Mantovani and Riva [13] suggest that the use of the concept of presence in literature is related to the ontological position of the author that is using it and they identify three ontologies of presence that lead to three different characterization of the concept:

1. the scholars that follow the ontology called by these authors «ingenuous realism» concentrate their efforts on physical presence: a person or an object are *really present* if they exist in a physical environment; they are *virtually present* if they exist in an environment by the mediation of a technological tool as they were physically presence. Virtual presence depends here on the appearance of the virtual world and on its resemblance with physical presence;

2. within the «ecological approach», related to Gibson's theory of perception, organism and environment do not exist independently from each other and presence is considered a relational concept linked to action: a person or an object is *present* in an environment insofar as they can undertake successfully actions in the environment and undergo actions by the environment. In this view the focus is on the implications for action rather than on appearance;

3. the cultural perspective, related to social constructivism, take up and expand the ecological approach, integrating it with the socio-cultural dimension of experience: a person is present in an environment if he or she participate in the culture-mediated and socially distributed process that makes the environment exist.

An interesting cultural perspective on presence has been developed by Riva [15] that strongly link it to agency:

presence has a simple but critical role in our everyday experience: the control of agency and social interaction through the unconscious separation of both «internal» and «external», and «self» and «other» [15, p. 160].

The author, building on neuropsychological findings, argues that people do not separate their knowledge about a place from their ideas about the possible actions that is possible to undertake in that place and from their goals. So, he defines presence as the prereflexive perception of successfully goal directed actions. On the contrary, social presence is prereflexive perception of an «enacting other (I can recognize his/her intensions) in an external world» [15, p. 160].

These definitions, and the cultural perspective more in general, lend itself to analyze situations in which it is difficult to separate physical and virtual worlds, as it is the case of our teachers. In fact, reflecting briefly on the anecdote described above, it is reasonable to argue that the sense of presence of the teachers is not (only) related to physical presence, but it is deliberately socially constructed in order to participate in a collaborative activity in which physical and mediated presence are equally relevant and interweaved. Moreover, it presents some relevant connections — sometimes made explicit by the author himself — with cultural historical activity theory (CHAT), that will be analyzed in the next paragraph and that can make possible to use the concept of activity, as developed in the soviet tradition [23], for the analysis of presence.

Presence and activity

In Riva's construction «the feeling of presence provides to the subject a feedback about the status of its activity» [14] and the author directly uses Leont'ev (in: [22]) hierarchical organization of activity, sharing the idea that human action cannot be understood if we do not consider its multilevel configuration [15]. If presence is so characterized, teacher's action of declaring their presence can be considered as a functional part of the broader activity undertaken and understood in the light of the motives that lead their professional life. Even if in this article the focus of the analysis will remain at the level of actions and operations, it is important to consider them as part of the whole they constitute as activity.

As stated by Kozulin [9], Vygotsky [21] used the concept of activity the first time as explanatory principle for the comprehension of consciousness: for Vygotsky social laden activities are «generators of consciousness» [21]. In addition, Leont'ev [11] in his elaboration of the concept has maintained the strong relation between activity and consciousness. Riva, in a similar way, consider activity related to presence. An exhaustive discussion of the epistemological issues behind the positions of those authors and a theoretical comparison between the concepts of consciousness and presence is beyond the aims of this article, but it is important to clarify our use of the terms activity and presence: in this paper the concept of activity will be used in order to understand how people perceive themselves and the others while participating in a collaborative activity. It will be showed that such an analysis enlighten some important aspects related to coordination.

Following this thread, we will now describe some features of the concept of activity — some of them considered by Wertsch [22] the main features of the theory of activity — useful for the analysis of presence:

1) in Leont'ev (in: [22]) hierarchy, social laden activities give a cultural structure to human actions and operations. In such a hierarchy, one of the objectives to be reached is to coordinate the various actions carried out by the participants of the activity. In this endeavour for coordination, presence and social presence play a crucial role and activity theory gives a useful framework for analyzing it;

2) the notion of goal-directedness of actions claimed by Leont'ev (in: [22]) permits to characterize the concept of presence as a relational concept: if persons act in order to reach objectives, their sense of presence has to be understood in relation to these objectives and their fulfilment. In other words, the way in which a person projects structure on the external world [8] and percept themselves in the world is considered as embedded in practices and sensitive to motives and goals that give reason for them. In particular, it is worthy to distinguish between the role of the motive and the role of the objectives. In fact, while the motive defines the sense of the activity and gives to the activity its direction; the sense of presence, being involved in the monitoring of the state of an ongoing activity, is related to the level of actions and it is sensitive to the fulfilment of the intermediate goals. So the relation between sense of presence and sense of the activity can be considered hierarchical as the relation between motives and goals;

3) Vygotskian concept of mediation makes clear that human beings use material and psychological tools in order to reach their objectives. If we consider the «context» [4] have an action as a physical/symbolical/cultural space filled in with cultural artefacts, presence become a relational concept that contain the bond between the subject and the context in which he or she acts. In other words, answering the question «where am I?», presence could be considered a key concept for understanding how people «segment reality» [1] and use the artefacts present in the environment in order to carry out object directed activities. In this sense, presence is strictly linked with the concept of chronotope as it has been used elsewhere [10];

4) activity theory's emphasis on genetic explanation can be considered a base and a further expansion of this work. In fact, the ontogenetic and phylogenetic origins of the sense of presence are not investigated here. We take for granted that presence is «a neuropsychological phenomenon, evolved from the interplay of our biological and cultural inheritance» [15, p. 6], being that experiments in peripersonal space confirm this claim [14]. This article, instead, focus at the micro-level of actions and operations and on the role that presence play in some significant moments of a collaborative activity carried out in a complex environment — an heterotopia [6] — as the one described in the introduction. However, it is clear that presence is shaped by the configuration of the activity and our aim is to discuss how some aspects of the activity, in the here and now of the interaction, generate a particular form of presence.

Presence and heterotopia

In the beginning of this article, we started with the description of a situation in which different kind of spaces were overlapping. These spaces are defined by participants while interacting with the environment and transforming parts of the context in a resource for action. In that process of space definition, activity have an important role. In fact, on the one hand, parts of the physical environment irrelevant for the activity are not considered at all by the participants, and on the other hand, participants actively arrange artefacts — like handbooks containing notes or the virtual space generated by the software — that become semiotic resources for the activity. Indeed, the context of the activity is constituted by heterogeneous spaces arranged by the participants in line with their objectives. In Foucault's [6] language, it constitutes a heterotopia, defined as «juxtaposing in a single real place several spaces, several sites that are in themselves incompatible».

This concept, if applied to our context enables us to consider the school as a highly complex heterotopia in which heterogeneous physical, relational, organisational, cultural and virtual spaces overlap. As in a cinema, where the audience and screen spaces overlap, or in a library, where the physical space overlaps with both the timeless space of the written pages and the «historicised» space of the culture laid down within those pages, so in a school we can see a complex overlap of heterogeneous spaces, both in the classroom and in other working spaces — laboratories, textbooks, computer labs or informal meeting places such as the corridors or the playground.

Foucault's conception of space is valuable for better understanding the issue of sense of presence. In fact, using this concept it is possible to readapt the definition of sense of presence given above and focus on its rela-

tional aspects that in Riva's definition remain implicit: sense of presence is, then, the perception of successful goal directed action carried out in a specific selection of the overlapping spaces of an heterotopia.

This definition maintains the original characterization of the concept, but adds to it the explicit reference to a specific context. So, when we talk about sense of presence, we refer to the space — or the spaces — relevant for the interaction at a given moment.

The starting point of this vision is socio-constructivist. In fact, according to this approach, people interactively construct the realities in which they live, developing symbolic, sense-filled «possible worlds», while they act in their physical, social and cultural environment [3]. These possible worlds constitute themselves as heterotopias in which physical, symbolical and cultural spaces coexist and people actively negotiate the spaces relevant for their inter-actions.

The construction of these possible worlds is strictly related to activity and its motives and it reflects the negotiation that take place between individuals and between them and their environment, but also the broader social phenomena that have to do with the historical evolution of the social practices and the culture of a community. Therefore, even if in this paper the focus will be on the micro-level, it is important to take in account the expansion of the unit of analysis described by Engestrom [5] in the second and third generation of activity theory. In fact, as pointed out by Spinuzzi [18, p. 28] often researchers specialized in a field search the crux of the problem only at one level of analysis. The author argues that it is important to «integrate research scope» and to examine workers' labour at different levels because single-scope methods «tend to produce design solutions oriented to that level of scope». An expanded unit of analysis that comprise the subject and their socio-cultural environment composed also by communities, artefacts, rules and division of labour, then, if treated as a multilevel system as theorized by Leont'ev (in [22]), and clarified by Spinuzzi, make possible to understand the complex processes underlying human life.

Back to the teachers: the context of the research

The data analyzed in the following paragraph consist in video records and software logs from a training course for a group of secondary school teachers, during which they familiarized themselves with a software suite designed to support face-to-face interaction. The aim of this activity was to jointly develop a shared educational scenario on career guidance to be subsequently implemented in the classroom. The course required six sessions, with the voluntary participation of 10 teachers, all women, from different schools, who were attending a Master's degree on career guidance. Once they are awarded the Master, the teachers should be able to offer career advice and guidance to their students and will take on the role of career teacher in their school. The use of a software program and the planning of a classroom activity were proposed as a Masters training assignment with a strong effect on the acquisition of professional skills, both technological and concerning career guidance. During the six training sessions, the teachers became familiar with the software package and worked in groups in order to develop a pedagogical scenario, in which the topic of further education and careers was treated as a problem-solving activity. In the first three sessions, the objectives were discussed and the various tools in the software package illustrated. The last three sessions were devoted to the development of the usage scenario.

This corpus was firstly analyzed in order to understand the space-time management of the teachers using the concept of chronotope [10]. During the analysis, other aspects of the interaction attracted the attention of the researcher and other theoretical concepts revealed themselves to be useful for understanding some interesting issues. This article is the result of this kind of follow up succeeding the main study and its aim is not to present a complete and full designed research, but to discuss the role of presence in some interaction that permits to clarify some issues related to coordination.

Presence and coordination

In the introduction of this article, we split presence in two aspects: physical presence and virtual presence. After the theoretical discussion, it results that the distinction is not perfectly satisfying. In fact, in this article the sense of presence is related to the ongoing activity and it is characterized as a psychological process and a social creation: from a psychological perspective, the subject feels his presence insofar as he or she percept his or her actions into the context relevant for the activity; as a social construct, during collaborative activities, presence is negotiated between the participants (as the teachers were doing in the situation descript in the introduction). Therefore, it is not satisfying to say that a teacher is present if her name appears into the groups consol of CoFFEE and/or her body exists into the room. The condition for presence is that the process of social negotiation should generate the sense of presence and the social presence necessary for the participation in the activity. This process is realized in this case by the little dialogue described above, but also by the actions undertaken by all the teachers while sitting in front of the computer, taking relevant artefacts as block notes and books from their bags and logging in. In other words, teachers do not declare their presence, but they actively generate it setting up a configuration of participation that they believe useful for reaching the object that motivate the activity.

That process of social negotiation is not always linear and undisturbed. On the contrary, often it brings tensions and disorder, as it is the case of the excerpt presented below. It is extracted from the third session of

the training — the session preceding the one sketched in the introduction. During this session, the teachers were discussing the objectives of the pedagogical scenario to be implemented in their respective classrooms. The creation of the scenario was the object of the entire training and a description of it was the main outcome. In order to discuss the objectives of the scenario, teachers were requested to represent them in the graphical tool of CoFFEE. They were totally free to decide the number of the objectives, their possible link with each other and the general organization in the space.

The configuration of participation during the discussion was problematic for a series of reasons. Firstly, the order of the computers into the school laboratory was shaped as a horseshoe so teachers were giving their back to their colleagues. For this reason, during the major part of the verbal interaction teachers were looking the screen without seeing their interlocutors, while in some moments in which the verbal communication seemed to be crucial some teachers turned themselves toward each other and/or moved from their seats and approached their colleagues' workspace.

Secondly, the combination of tool selected by the researcher was so organized:

1) in the up-left part of the screen teachers could see and use the graphical tool described in the beginning of the article (see fig. 1);

2) in the up-right part of the screen there was the threaded chat, a tool organized like a forum that permits to create different thread of discussion and carry out thematic discussions. This tool was not used at all during the session because the teachers preferred verbal communication for the thematic discussion about the objectives, so this tool is not relevant for the interaction and will not be described in detail;

3) in the bottom part of the screen there was the repository tool, a tool that permits to share files into the

network of computers created by CoFFEE. This tool was used in order to share some files in the beginning of the session. Among these files there was the file containing the results of the brainstorming about the possible objectives of the scenario elaborated during the preceding session. They used this list as a resource for the discussion. In the beginning of the session, the teachers used the repository for saving on their computer these files and opened them using Microsoft Word. After that, the repository became irrelevant for the activity.

Unfortunately, the security settings of the computers in that laboratory blocked the creation of the log and it is impossible to visualize how the map was like in the exact moment of the interaction but when the researcher realized that the log was not working, he manually created a copy of the map as it was in the end of the session. The final map is represented in fig. 3 and it maintains the features necessary for the analysis.

The excerpt has been extracted from the final part of the session, when the map was almost in its final form. Teachers were using the shared space of the graphical tool as the main space for the interaction. They were modifying the map adding new contributions or editing existent ones and their individual sense of presence was focused into that virtual space. That shared space, however, do not offer any cue for the perception of the social presence, if not that you suddenly see contributions changing, moving or disappear. At a certain point of the interaction, Mariangela exclaimed:

Excerpt 1

1. Mariangela: no, it looks a mess
2. Giuseppe: what?
3. Mariangela: ((non audible words, followed by a laugh))
4. Loretta: it's because they should be numerated
5. Mariangela: because if we have eight steps and they are progressive and here we overlap
6. each other while we're writing we already deleted the numbers and they are gone ((two non
7. audible words)) this should have been three and became six this should have been seven
8. here I had put seven but it comes as five
9. ((overlapped and not udible words for 5 seconds))
10. Mariangela: because it is useless if we go and put well she put two into there (0.8) no it is
11. necessary to be well coordinated in order to do a good group work because this is a crazy
12. group work

It is clear from the excerpt that Mariangela and Loretta were unhappy with the map they were elaborating (lines 1 and 4) and Mariangela saw the crux of the problem in the issue of «coordination» (line 11). In fact, they were overlapping each other and no one of them could realize the map she had in mind. But why they were overlapping? Why was it impossible to be «well coordinated» in this group work? Probably, accordingly to Spinuzzi [18], there is not a crux of the problem but a series of possible solutions.

A possible answer is that there was not enough communication between the teachers, so that they were not
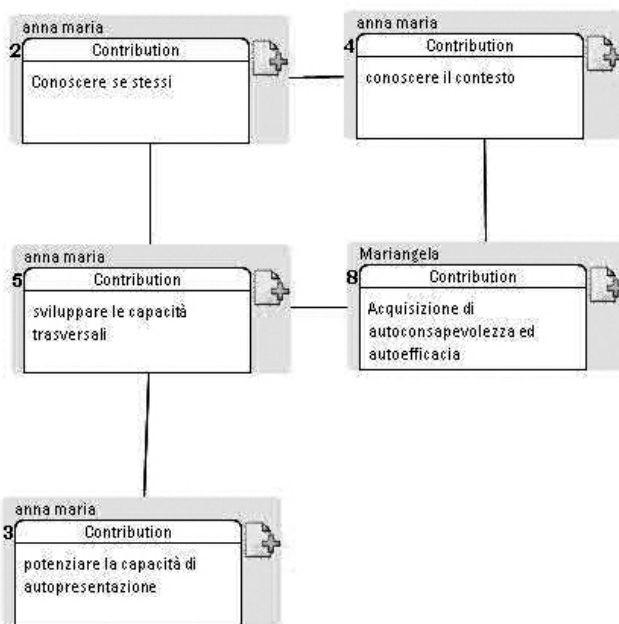

Fig. 3. The conceptual map

able to reciprocally adapt their actions. In this sense, teachers started behaving, as they were alone in the shared space. They felt strong sense of presence seeing their thoughts appear into the map, but it was undermined when they saw the map changing without having the possibility to control these changes and realize the map they had in mind. Their agency was undermined by the actions of someone else. They do not recognized the social presence of their colleagues into the tool and they do not accepted that a generalized other was modifying *their* own space. An information designer probably would have seen the crux in the fact that the tool does not permit to visualize the actions of the other participants, but only the final results of them when they are completed. Following this view, making the actions of the others visible could have made easier the coordination.

However, a pair of minutes after the dialogue in the excerpt 1, Mariangela stated: «work group is to talk, to coordinate and to say ((two non-audible words)) wait your turn». So, at another level of analysis that do not focus only on what happens into the graphical tool, teachers had the opportunity for coordinating with each other by using verbal communication. Mariangela was proposing that they should proceed into the graphical tool as they usually do during conversations: taking turns. In this way, she was creating a rule for the displaying of agency into the map and so she was socially negotiating how to regulate presence into the activity.

Fig. 4. The teachers at work

In this perspective, two different spaces of an heterotopia became relevant at the same time, i. e. the space of verbal conversation and the space of the graphical tool, and to be present in one of them became important in order to get the right to be present in the other.

In conclusion, fig. 4 represents the teachers few seconds after the dialogue discussed above. It is clear that some of the teachers left their computer and approached Mariangela's desk. Here and in other occasions, they felt that in order to participate in the verbal interaction they had to be physically close to their interlocutor. This happened especially in critical moments, when the tension was strong. In particular, Angela (standing in front of the computer) was using all her body — by the practice of pointing [7] — in order to assert herself. Doing so, she selected a particular space framework in which physical presence was strategically used in order to indirectly participate to the map construction. She constructed another framework of presence for the interaction.

Conclusions

This article shows that the combination of the concepts of heterotopia and presence can be functional in order to analyze coordination during collaborative activities. Starting from a constructivist viewpoint, we argue that to use presence in this way can permit to overcome some problems related to the terminological confusion about the concept. In particular, some features of the concept of activity have been used in order to characterize the concept of sense of presence.

Nevertheless, the reflections presented here do not have the characteristic of orderliness required by a fully developed scientific framework, but they can be considered as an attempt to explore the concept and to show how activity theory can give some insights for its characterization. In particular, the selection of the unit of analysis is a problematic issue and deserves a reflection and discussion that is beyond the aims of this explorative work. We consider this article the starting point for a further development of the perspective described, linking the concepts of presence and chronotope as complementary tools for the analysis of space-time management.

References

1. *Bateson G*. Steps to an Ecology of Mind: Collected Essays in Anthropology, Psychiatry, Evolution, and Epistemology. University Of Chicago Press, 1972.

2. *Biocca F*. The cyborg's dilemma: Progressive embodiment in virtual environments // Journal of Computer-Mediated Communication. Vol. 3. 2. 1997.

3. *Bruner J. S*. Actual minds, possible worlds. Cambridge, 1986.

4. *Cole M*. Cultural Psychology. A Once and Future Discipline, Cambridge, MA, 1996.

5. *Engeström Y*. Innovative learning in work teams: analysing cycles of knowledge creation in practice / In: Y. Engeström et al (Eds.) Perspectives on Activity Theory, (Cambridge University Press). 377—406. 1999.

6. *Foucault M*. Of other spaces, heterotopias, 1967. http://foucault.info/documents/heteroTopia/foucault.heteroTopia.en.html.

7. *Goodwin C*. Pointing as situated practice / In: S. Kita (Eds.) Pointing: where language, culture, and cognition meet. Mahwah, N. J., 2003.

8. *Kirsh D*. The Intelligent Use of Space // In Artificial Intelligence. Vol. 73. 1995.

9. *Kozulin A.* The concept of activity in Soviet psychology: Vygotsky, his disciples and critics. In Daniels H. (Eds.) An introduction to Vygotsky. N. Y/, 1996.

10. *Ligorio M. B., Ritella G.* Chronotopes and heterotopias as conceptual tools to understand the development of a computer supported collaborative professional task. International Journal of Computer-Supported Collaborative Learning (in press).

11. *Leont'ev A. N.* Activity and consciousness. Marxist Internet archive, 1977. http://www.marxists.org/archive/leontev/works/activity-consciousness.pdf

12. *Loomis J. M.* Distal attribution and presence // Presence Teleop Virt. Vol. 1. 1992.

13. *Mantovani G., Riva G.* «Real» presence: how different ontologies generate different criteria for presence, telepresence, and virtual presence // Presence, Teleoperators, and Virtual Environments. Vol. 8. 5. 1999.

14. *Riva G.* The psychology of ambient intelligence: Activity, situation and presence / In: G. Riva, F. Vatalaro, F. Davide, M. Alcañiz (Eds.), Ambient intelligence: The evolution of technology, communication and cognition towards the future of the human-computer interaction. Amsterdam, 2005.

15. *Riva G.* Is presence a technology issue? Some insights from cognitive sciences // Virtual Reality. Vol. 13. 3. 2009.

16. *Riva G. et al.* From intention to action: The role of presence // New Ideas in Psychology. Vol. 29. 1. 2009.

17. *Schloerb D.* A quantitative measure of telepresence // Presence Teleoperator Virtual environment. Vol. 4. 1995.

18. *Sheridan T. B.* Musing on telepresence and virtual presence // Presence, Teleoperators, and Virtual Environments. Vol. 1. 1992.

19. *Spinuzzi C.* Tracing genres through organizations: A sociocultural approach to information design. Cambridge, MA, 2003.

20. *Steuer J.* Defining virtual reality: dimensions determining telepresence // Journal of Communication. Vol. 42. 4. 1992.

21. *Vygotsky L. S.* Consciousness as a problem for the psychology of behavior. In The collected works of L. S. Vygotsky. Vol. 3. N. Y., 1997.

22. *Waterworth J. A., Waterworth E. L., Mantovani F., Riva G.* On feeling (the) present: an evolutionary account of the sense of presence in physical and electronically-mediated environments // Journal of Consciousness Studies. Vol. 17. 2010.

23. *Wertsch J.* (Eds.) The concept of activity in Soviet psychology. Armonk, N. Y., 1981.

Присутствие, социальное присутствие и гетеротопия: Я и Другие в мульти-пространстве

Джузеппе Рителла
аспирант Центра исследований деятельности, развития и обучения (CRADLE) факультета наук о поведении Университета г. Хельсинки, магистр организационной психологии и психологии коммуникаций

То, как люди воспринимают себя и других во время совместной деятельности, является изменчивым, а также формируется технологиями, используемыми при коммуникации. Некоторые ученые использовали понятие «ощущение присутствия и социального присутствия» при интерпретации этого вопроса в деятельности опосредованной технологией [18]. Другие ученые ссылаются на присутствие в качестве «основного состояния сознания: присвоение ощущений некоторым периферическим стимулам, или в более широком плане некоторой окружающей среде» [15, c. 159], как реальной, так и виртуальной. Проблемным вопросом в этой дискуссии является понимание, как присутствие ощущается в случаях, когда реальный и виртуальный миры представлены одновременно, и участники взаимодействуют с мультипространством — гетеротопией [6], которое активирует множество форм взаимодействия и коммуникации. Одним из возможных путей для анализа его заключается в использовании концепции деятельности [9] и системы деятельности в качестве единицы анализа [5]. Целью настоящей работы является рассмотреть данную проблему с помощью эмпирических данных о совместной деятельности, в которой учителя из разных школ работают вместе, лицом к лицу, в школьной лаборатории, используя образовательное программное обеспечение CoFFEE. Шесть сессий, в ходе которых 10 учителей подготовили педагогический сценарий для реализации в школе, были сняты на видео и качественно проанализированы. Несколько репрезентативных отрывков были проанализированы в целях уточнения некоторых аспектов, связанных с ощущением присутствия и социального присутствия.

Ключевые слова: ощущение присутствия; гетеротопии; теория деятельности, сотрудничество, качественный анализ.

Towards understanding conceptual formation in science education

André Machado Rodrigues
Ph.D., Student, University of São Paulo (Brazil), Officer, Secretariat of the Department
of Education of São Paulo State

Cristiano Rodrigues DeMattos
Ph.D., University of São Paulo, Institute of Physics, University of São Paulo, Professor

In this paper we will discuss the concept formation in science education. It is well know that since 80's the most part of research in science education dealing with concept formation is related — directly or indirectly - with the conceptual change model. However, the science education research still lacks a consensual model to explain the concept formation considering the complex meaning negotiation dialogue within social interactions, both in school and daily life contexts. This theoretical discussion is important to point new directions to conceptual profile model research. The teaching-learning process in science education should not be limited to contents exposition. Toward an effective meaningful learning, teacher should also consider the conscious awareness as a target to meaning making. In this work Activity Theory is a relevant theoretical framework for understanding the teaching-learning of scientific concepts and to interpret the qualitative changes in this process. This approach opens the door to develop in two ways: embed the praxis in cognitive models on the one hand and insert communicative and semiotic processes in the Activity Theory on the other. We propose three categories that help us to understand the complex dynamics of teaching-learning process based on the dialectic interplay of the internalization and externalization.

Keywords: conceptual profile; activity theory; order of learning; science education; complexity.

Introduction

This paper brings the conceptual formation and use in the Science education up for theoretical discussion. In the last 30 years most part of research in Science education addressing conceptual learning focused on the conceptual change model [29]. In fact, the term — conceptual change — describes a complex theory that attempts to model the learning process answering how do learners make a transition from one «old» conception to a «successor» conception. However, usually this process was treated as the simple replacement of the preconceptions* by science conceptions.

Research on conceptual change has not been able to reveal the background of change, but several researchers have made important contribution to review and rethink the concept formation, in special scrutinizing the principles of conceptual change [29; 9; 10; 11; 6; 20; 36; see also 26; 27]. The main critics are summarized in four topics below:

(i) Affective aspects, values, feelings and motivations have been neglected in the conceptual change model.

(ii) A rational approach to science education has been excessively emphasized. From the educational point of view, one of the biggest problems of conceptual change model was the belief that learning is only effective when students abandoned his/her previous conceptions, replacing them with the «correct» — scientific ones — as usually taught in the science classroom.

(iii) Strike and Posner [36, p.14] claimed «that students' conceptual ecology should be view much more in terms of a dynamic system than as in the initial theory. There, the interaction of prior conceptions and the new conceptions was not sufficiently acknowledged». Actually, the conceptual formation must not be looked as a phase transition through static states.

(iv) The praxis and social level are completely forgotten in the conceptual change model. Considering the plurality and diversity of human activity that comes with its complex dialogical communicative dimension, the conceptual change research fails to understand the daily learning experiences and to relate formal school learning to other forms of learning.

Based on Vygotsky's and Bahktin's perspectives Mortimer [26] tries to further elaborate conceptual change model by emphasizing the relationship between speech and thought in concept formation. Mortimer points to the ecological diversity and plurality of concepts representation.

Our research questions rises from this ground. We are interested to understand what processes unite lan-

---

* There are differences amid «preconception», «misconception» and «alternative conception» and it is a important aspect of our discussion. However, here is not possible scrutinize this subject. For this see [16].

guage and activity; in fact we would like to understand how conceptual profile is united with the context (praxis).

Conceptual profile changes

The notion of conceptual profile [26; 27] enlarges the theoretical options to understand the teaching-learning process, mainly because considers the coexistence of «new knowledge» and the «old knowledge». Indeed, the coexistence of several views on the same concept allows us to understand better the case of students, which use scientific concepts in classrooms and preconceptions in daily life. In spite of underuse of some preconceptions at school stated in formal evaluations, a lot of evidences have been presented showing no concept substitutions. Instead coexistence in the same individual is manifested in different ways depending on the context he/she lives.

The conceptual profile model has its roots on Gaston Bachelard's [2] notion of epistemological profile. Bachelard illustrated his idea proposing a historical analysis of scientific concepts to show that their meaning could be found scattered in various philosophical schools. He classified the concept of mass into epistemological categories such as realistic, empiricist, rational classic and rational modern.

Bachelard's philosophical doctrine has been a useful philosophical tool, but as a model to explain the cognitive phenomenon it is very limited [12]. Transposing the epistemological model to a cognitive model, Mortimer [26; 27], preserved the same structure of the epistemological profile. According to Mortimer: «the conceptual profile should have some similarities with the epistemological profile, such as hierarchies among the different zones, by which each successive zone is characterized by having categories with more explanatory power than its antecedents» [26, p. 272—273].

Mortimer [26] built a conceptual profile of mass based on the same categories Bachelard has used. Based on empirical evidences Mortimer proposed a histogram of epistemological categories versus subject's frequency of use. The figure 1 shows Mortimer's representation of the conceptual profile of mass.
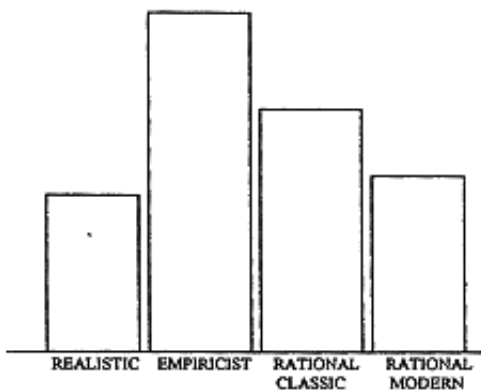
Fig 1. Mortimer's conceptual profile on «mass» concept

Henceforward, a lot of works focusing on assessment; theoretical development and critical reviews are produced in the science education [35; 1; 8; 12]. The methodology consists of the choice of a concept taught in the regular school and passing to the student a questionnaire presenting some situations. Part of the questions assesses opinions and the other one to solve a problem. Educational intervention data analyze the efficacy of the intervention using pre and post setting.

As Mortimer already indicated this framework allows exploring the dynamics aspect of learning as a change or evolution on the conceptual profile dealing with one of the most important methodological challenge in education, the assessment. According to Mortimer [26, p. 284] «an important question to be addressed in this research is how to determine the profile of each individual before and after teaching and to what extent He or She achieves a consciousness of this profile at the end of the teaching process». In this framework the dynamics aspect of learning could be understood as a change or evolution in the conceptual profile. Mortimer already indicated to the methodological challenge of Science education assessment.

We think that the conceptual profile model can be improved. Recently we have criticized «theoretical» and «methodological» uses of the model. We believe that the model includes important principles considering the plurality and diversity of representations of the world. However, we understand that this framework could be more consistent if the *praxis* were included.

Mortimer [27] points to the existence of a relationship between conceptual profile and context, assuming that the conceptual profile is «context-dependent, since it is strongly influenced by different experiences of each individual, and content dependent, since, for each concept has a different profile» [27, p. 80]. On the other hand, given context important influence, we must take into account the relationship between conceptual profile and context when conducting research on the conceptual profiles. Our studies [32; 33] pointed out that ignoring context as a relevant factor in research can lead to misinterpretation of data.

The close relationship between learning, utterances and the conceptual profiles zones' contexts of use, demands integration of the notion of context as a central element in the theoretical and methodological framework of the conceptual profile model. It is helpful to understand what kind of criteria — contextual markers — students use when are dialoging in different context, *p. e.*, daily or scientific context. In other words, how do we decide to use one class of knowledge?

El-Hani and Mortimer [12] improved the notion of conceptual profile using questions embedded in the philosophy of science. They situate the conceptual profile notion in a middle position, escaping from the clash between universalism and multiculturalism. However, their arguments remain tied only to an epistemological ground. Then, every goal for science teaching is connected only with epistemology — mainly science — and the internal questions related to it.

Including context

In fact, our interest is the text produced in human activity, i. e., human discursive production in their social relations. Particularly we are interested in the teaching and learning of concepts emerged from the social situation we call classroom. This is a complex process of meaning negotiation — a context negotiation.

The notion of context has been studied by many authors [28; 13; 7; 14; 15; 17]. In despite of some consensus among researchers about the importance of the notion of context, its polysemy forbids an unambiguous definition [7; 15].

In a brief review about the concept of «context» [31; 23; 37] we could recognized its complexity and multilayeredness. Nevertheless, our intention is not to exhaust this subject, but to show how heterogeneous and diverse it can be. The diversity of meaning is not a theoretical or methodological problem we overcome by an exhaustive search for a hermetic or complete definition of what «context» is. On the contrary, this diversity should be used as an intrinsic property of the context notion.

Recently, Gilbert [15] showed how the context is being addressed in some theoretical perspectives in different fields of science education research. He looked for what treatment context has from curricular issues to activity theory. From a contextual approach, Gilbert proposed extracting criteria to assess and to build the science curriculum, and particularly, the chemistry curriculum. On other hand, Finkelstein [14] discusses the model; Cole [7] proposed adapting it to teaching and learning situations in physics classrooms. Finkelstein [14, p. 119] explores the idea of «frames of context», suggesting that there are interactions between each frame considering how those layers interactions affect teaching electromagnetism.

In despite of the way context is conceived, one of the most common ideas is that actions and discourse produced in social interaction, are characterized as dependent variables, while the surroundings are an independent variable. This idea does not allow conceiving productions and discursive activities as part of an «ecology of ideas which together constitute the small subsystem which I call "context"» [4, p. 338].

We are aligned with Bateson working the context as a «complex system», i. e., a system composed by a great number of elements arranged in several different hierarchical levels of interaction. Thus distinguish amid a lot of contexts implies reading its several hierarchical levels which includes the subject and his relative position in the world — discursive position.

A subject could recognize contexts during a dialogical interaction instance is he/she discerns the «context marker», as proposed by Bateson:

But, certainly in human life and probably in that of many organisms, there occur signals whose major function is to classify contexts. It is not unreasonable to suppose that when the harness is placed upon the dog, who has had prolonged training in the psychological laboratory, he knows from this that he is now embarking upon a series of context of a certain sort. Such a source of information we shall call a «context marker», and note immediately that, at least at the human level, there are also «markers of contexts of contexts» [4, p. 289—290].

Bateson also brings the notion of «contexts of contexts», corroborating the complex perspective we introduced and driving us to understand various phenomena related to communication and learning. Bateson points out how context markers relate to the context allowing «meanings making» in different hierarchical levels.

For example: an audience is watching Hamlet on the stage, and hears the hero discuss suicide in the context of his relationship with his dead father, Ophelia, and the rest. The audience members do not immediately telephone for the police because they have received information about the context of Hamlet's context. They know that it is a «play» and have received this information from many «markers of context of context» — the playbills, the seating arrangement, the curtain, etc., etc. The «King», on the other hand, when he lets his conscience be pricked by the play within the play, is ignoring many «markers of context of context». [4, p. 290].

The construction of dialogic interaction utterances is ruled by context recognition. In his work, Bernstein [5] distinguishes children's explanatory forms of worker class and middle class children, stressing that differences between children is not a difference of ability or cognitive, but a difference of recognition and realization rules they use to read the context, select your interactive practice and create their texts.

Recognize context marks allows the emergence of certain utterances in detriment of others. Context recognition implies the recognition of the relative positions those context marks occupy in the discursive-interactive space.

A shared context is constituted during meaning negotiation, based on the construction of teacher's and students' intersubjectivity [34]. To share some context marks allows establishing the opening of a meanings negotiation, a game that is kept on until the mutual perception of a communication success. The perspective of the context as complex object built in an interactional dialogic situation «allows to apprehend the text and the context, the being and the environment, the place and the global together, the multidimensional, in short, the compound, that is, the conditions of the human behavior». [25, p. 100]. Then, the context is dialectical overcoming antinomies [3].

To express an object as a complex system directly drives us to the methodological problem of how to observe it. The limitation of representation instruments leads us to choose cuttings of the object. We intend to consider on specific cuttings of this complex object that allow us to reveal aspects of the complexity of the system in the case of sciences teaching.

According to Nardi, there is a similarity between the notions context and activity.

Activity theory, then, proposes a very specific notion of context: the activity itself is the context. What takes place in an activity system composed of object, actions,

and operation, is the context. Context is constituted through the enactment of an activity involving people and artifacts. Context is not an outer container or shell inside of which people behave in certain ways. People consciously and deliberately generate contexts (activities) in part through their own objects; hence context is not just «out there» [28, p. 38].

Towards teaching-learning dynamics

Considering Vygostsky's concept development process we step away from associationism and naive realism [38; 39], and from generalization understood as finished and static state of the concepts formation.

We previously associated teaching-learning as dynamic communication process, to deal with this complex process we proposed the «orders of learning» as a conceptual profile?s dynamics markers [21]. Those learning orders can be also considered as markers of the dynamic processes of internalization and conscious awareness.

Internalization process

Internalization is one of the most important concepts of on socio-cultural-historic theories. It has a central role to understand learning process and the development of consciousness.

Zinchenko's radical view, argues «that the word accompanies a person from the moment of birth» [41, p. 5]. On the other hand, using a classical definition, Wertsch situate internalization «as a process whereby certain aspects of patterns of activity that had been performed on an external plane come to be executed on an internal plane» [40, pp. 61-62]. Both perspectives point to wide view of internalization process, which should include all genetic domains. At last, internalization idea could be expressed as a process where the complexity of external world helps to build the complexity of the essentially internal psychic world. Based on Activity theory we could say that the complex external world is composed by an ecology of human activities emerged in its all diversity as a complex coordination of operations and actions reflected and refracted during learning process. From this point of view we internalize activities that coordinated to others became actions that coordinated to others became operations, a continuously process representing the generalization continuous process. This complex process of synthesis allows the emergence of new activities.

To transform the child's action in operation we must give him a new goal in which the action becomes the means to carry out another action. In other words, what was the goal of the first action must become one of the conditions of required action by the new goal. [19, p. 183—184].

Leontiev [19] exemplify this complex process with arithmetic's learning process. Arithmetic can be an action or an operation *a priori*. Nevertheless for the novice it presents itself as an action with conscious goals, little by little in their learning process he internalizes it and its conscious action becomes to solve a broader problem and no more the arithmetic construction. In this example, especially the new problem pre-

sented may be the learning of algebra. With the exchange of actions in operations, the novice will be able to solve even more complex problems.

We worked on this topic making a theoretical reconciliation between activity theory and complex systems features through the notion of internalization [21]. According to this work, the word «force», hides a number of processes and operations that is summarized in the word. To operate with the idea of force is not necessary that all operations that compose consciousness must be present at all times.

This process makes possible to speak about force, mass, energy without necessarily having to expose all conceptual net supporting its complete understanding — underlying operations, this is where we identify the lexical density. The fact that these concepts are operationalized does not mean they vanish from subjects' conscience, since during externalization process operationalized concepts are always coming back to mind emerging as actions. This process — to internalize the external actions — influences subject's cognitive ability as well as change its own conceptual world.

To begin with, consciousness exists only in the form of a mental image revealing the surrounding world to the subject. Activity, on the other hand, still remains practical, external. At a later stage activity also becomes an object of consciousness; man becomes aware of the actions of other men and, through them, of his own actions. They are now communicable by gestures or oral speech. This is the precondition for the generation of internal actions and operations that take place in the mind, on the «plane of consciousness». Image-consciousness becomes also activity-consciousness. It is in this fullness that consciousness begins to seem emancipated from external, practical sensuous activity and, what is more, appears to control it [18, p. 100].

Another important process is the apparently inverse of internalization — the externalization process, when the operation comes back to consciousness.

Conscious awareness

Another important point is the inseparability of teaching-learning internalization processes consisting of the mechanism of conscious awareness. Vygotsky [38; 39] extensively discussed about conscious awareness, criticizing the idea that it occurs naturally, spontaneously or purely by biological maturation, and pointing to the importance of social nature of this mechanism. Hence Vygotsky [38, 39] sees school's primary function and formal education contributes to the conscious awareness, a child at school begins his/her education to literacy of what he/she knows from his/her previous experience.

In the spheres of attention and memory, then, the school child manifests a capacity for conscious awareness and voluntary behavior. Indeed, the emergence of this capacity is the central feature of mental development during the school age [39, p. 187].

In this sense, school life brings besides internalization of new discursive genres, a conscious awareness of earlier

internalized quotidian discourse. Then objects are internalized as new instruments allowing to see new objects opening new paths to new internalization processes.

The school's merit to develop superior psychological functions, consists to make possible arbitrary processes — operations — that are automatically daily realized, come to the level of action brought to consciousness trough the teaching-learning process [18, 19]. This process of bringing to the sphere of consciousness the unconscious is carried out by the educational activity itself, complementing the internalization process.

Children start to learn during their life a lot of concepts, that are internalized and at some moment operationalized. For instance, a child identifies her mother and learns to use the concept in the proper context. However, when the child is asked «what is the mother?», or when asked to define the concept, the child has difficulty and cannot do it immediately.

The same occurs with other concepts, as time, for instance. Most of people can use and operate with a time concept in their daily life. Although when someone asks them «what is time?», it requires a kind of cognitive effort to bring this specific concept to our consciousness. We could develop our argument discussing other examples of science education. Generally students solve standard problems using correctly Physics formulae, which were internalized to the operational level. Nonetheless solving exercises and problems, even in classical or modern physics, when students are asked about the concept definition, its structure of relations with other concepts, they have a lot of difficulty.

From this perspective teaching-learning process is a multilayer phenomenon mediating and organizing contexts and activities to different qualities of conscious awareness. From our point of view conscience is the emergence of coordination of conceptual profiles zones resonating with the subject's living contexts. This resonance evolves during context markers negotiations considering subjects consciousness during dialogical interaction.

Orders of learning

Bateson proposed such acquisitions might occur in two forms, the «zero learning» and the «Learning I» [4, p. 284]. Based on game theory, Bateson understands that novices learn just through random exploration, building on their decisions. Then, «zero learning» could be characterized as a stimulus and response scheme where each stimulus runs independently. Each piece of information is always new and the organism is unable to correct errors based on it. Bateson called «Learning I» [4, p. 287] to go further in its appropriation of Pavlov reflexology. He based «Learning I» on the behaviors created by conditioning and reinforcement assuming that subjects have the ability to distinguish contexts linking them to specific stimuli even if the contexts are hierarchically organized. From this point of view, subjects consider the history of stimuli and responses to decision making. Then, subjects could correct errors based on historical information.

Our proposal is far from behaviorist position, and Bateson comes over here to support the introduction of man-world interaction complexity. From this point of view, the orders of learning are proposed to help us understand subjects learning of new discursive positions in context, *i. e.*, we want to understand how we learn being in the world.

We propose the learning orders as «learning markers» instead to introduce a learning dynamics that could be partially inferred from those orders as we can see in the next section.

First order of learning

To deal with novices learning we introduce the first order of learning to refer the subject's addition of new zones of a conceptual profile. In general, intervention strategies and research aligned with conceptual change seek out to modify or assess the changes occurred.

Using Activity Theory background this order of learning marks the stage of non conscious operations, in other words, a kind of instrumentalization. In this case operations are shaped by immediate material conditions of production. Then the appropriation of concepts indicates the appropriation of mental operations, which appear primarily as external actions, and then, are transformed in inner intellectual operations [19].

We refer here to the most elementary internalization process, in which actions are appropriated and become operations. In general operations are non conscious at all.

First order of learning can be thought in terms of a consciousness category representing subject's initial conceptual profile zone. The correspondence between the conceptual profile zone and its context of use indicates the validity of subject's utterances. This conceptual profile zone could resonate just with one specific context, for instance, a quantum mechanical class, or with any context indicating subject non discernment of context markers. In this sense the conceptual profile zone could be seen as an amalgam of zones. Consequently, school's context shapes zones that could resonate just inside this context. Similarly, use of daily concepts will be delimited to daily contexts without connections to school context.

Second order of learning

Considering the second order of learning conceptual profile changes not only due by new internalizations, but also a qualitative change of conceptual profile zones. Two different changes can happen: the amalgamated conceptual profile zone is split in different zones or a new zone is added to the previous conceptual profile. In both situations subjects make correct utterances in each context relating correctly contextual markers and the use of word meaning. For instance, the subject could use both correctly the Newtonian zone of the conceptual profile of mass during a classical mechanics class and the relativistic zone of the conceptual profile of mass during a general relativity class. Nevertheless the subject's zones of the conceptual profile of mass resonates adequately with the specific contexts, nevertheless he/she does not have consciousness of that correct use. He/she uses of these zones without intentionality — clear purpose or arbitrariness — is met even less in a new context. The subject simply uses

the zone of the conceptual profile being aware of making a correct utterance, although not aware of all meanings word have. Then, the recognition of different contexts is non intentional — still mechanical — and operative.

However, during this stage appears the possibility of «coordination of actions» [22] emerges at the upper level of consciousness. The potentiality of this level appears also as possibility of explicit meaning negotiation.

Third order of learning

The third order of learning can be defined by the subject's conscious awareness of the relationship between conceptual profile zones and the possible contexts of use. At this level subjects understand how contexts markers are distributed the situation he/she is inserted.

When subject is conscious of the relationship between conceptual profile zones and the appropriate contexts of use, he/she is able to articulate and interpret others' utterances properly. He/she is aware that a physical definition of mass does not always fit in all contexts. He/she realizes uses and limits of the conceptual profile zones in different contexts and, at same time, contexts' boundaries. Conscious subject can figure out his/her different «zones» giving different meaning to the concepts, recontextualizing contexts and choosing appropriates zones to communicate successfully with others.

Considering a meaningful learning perspective, Moreira [24, p. 168] warns that «[...] meaningful learning is not synonymous of 'correct' learning. A student can learn in a meaningful but a 'wrong' way, *i. e.*, he can attribute meaning to concepts that, for him, entails meaningful learning, nevertheless for the teacher are wrong because they are not shared by the users community». It happens because at the time of explanation, teacher and student are inserted in different contexts. In the third order of learning this problem disappears, and students become aware not only of parts of the profile, but also the possible contexts in which it is inserted.

Subjects at the third order of learning have a meta-consciousness, which allows him/her to observe intercontextuality — a situation as multi-contextual — , identifying different context markers. Maturana and Varela [22] proposed the coordination of coordination of actions, as a hierarchical upper level of structural representation. Thereby, they established a hierarchical organization for both context and is internal representation.

As a direct consequence of the third order of learning, subject becomes capable to intentionally select analogies, metaphors and ironies, crossing context's boundaries and finding new meaning to communicate an idea.

Conclusion

This theoretical discussion proposes new directions to conceptual profile research. The teaching-learning process in science education should not be limited to contents exposition. To achieve an effective meaningful learning, teacher should also consider the conscious awareness as a target of meaning making.

This work evidences the relevance of Activity Theory as a theoretical framework to understand learning of scientific concepts and interpret the qualitative changes in subject's learning. This approach points out theory to be developed in two ways: (i) embed the praxis in cognitive models on the one hand and (ii) integrating communicative and semiotic processes into Activity Theory on the other.

Finally, we cannot think on concept learning solely, but we have to think about learning of concepts in contexts, inserted in specific social practice.

References

1. *Amaral E. M. R., Mortimer E. F.* Uma metodologia para estudar a dinâmica entre as zonas do perfil conceitual no discurso da sala de aula / In: Santos F., Greca I (org.). A pesquisa em Ensino de Ciências no Brasil. Ijui, 2006.

2. *Bachelard G.* The Philosophy of No. A philosophy of the new scientific mind. N. Y., 1968.

3. *Bakhtin M.* Marxismo e filosofia da linguagem: problemas fundamentais do método sociológico da linguagem. São Paulo, 2006.

4. *Bateson G.* Steps to an ecology of mind. Chicago, 2000.

5. *Bernstein B.* A estrutura do discurso pedagógico: Classe, código e controle. Petrópolis, 1996.

6. *Carey S.* Sources of conceptual change / In: E. K. Scholnick, K. Nelson, & P. Miller (Eds.) Conceptual development: Piaget's legacy. Mahwah, N. J., 1999.

7. *Cole M.* Cultural psychology. A once and future discipline. Cambridge, 1996.

8. *Coutinho F. A., Mortimer E. F., El-Hani C. N.* Construcão de um perfil para o conceito biológico de vida // Investigacoes em Ensino de Ciencias. 2007. Vol. 12, № 1.

9. *diSessa A. A.* A history of conceptual change research: Threads and fault lines / In: K. Sawyer (Ed.) Cambridge handbook of the learning sciences. Cambridge, 2006.

10. *Duit R., Treagust D. F.* Conceptual change: a powerful framework for improving science teaching and learning // International Journal of Science Education. 2003. Vol. 25, № 6.

11. *Duit R., Treagust D.* Learning in science - From behaviourism towards social constructivism and beyond / In: B. Fraser & K. Tobin (Eds.) International handbook of science education. Dordrecht, The Netherlands, 1998.

12. *El-Hani C. N., Mortimer E. F.* Multicultural education, pragmatism, and the goals of science teaching // Cultural Studies of Science Education. 2007. Vol. 2.

13. *Engeström Y., Miettinen R., Punamäki R.-L.* Perspectives on activity theory. Cambridge, 1999.

14. *Finkelstein N.* Learning Physics in Context: A study of student learning about electricity and magnetism // International Journal of Science Education. 2005. Vol. 27. № 10.

15. *Gilbert J. K.* On the Nature of «Context» in Chemical Education // International Journal of Science Education. 2006. Vol. 28. № 9.

16. *Gilbert J. K., Watts D. M.* Concepts, Misconceptions and Alternative Conceptions: Changing Perspectives in Science Education // Studies in Science Education. 1983. Vol. 10. № 1.

17. *Givry D., Tiberghien A.* Studying the evolution of student's ideas in a physics classroom // In: V ESERA. Barcelona, 2005. Vol. 1.

18. *Leont'ev A. N.* Activity, consciousness, and personality. Englewood Cliffs, N. J., 1978.

19. *Leontiev A. N.* O Desenvolvimento do Psiquismo. Lisbon, 1978.

20. *Linder C. J.* A challenge to conceptual change // Science Education. 1993. Vol. 77.

21. *Mattos C. R., Rodrigues A. M.* Theoretical Consideration about conceptual profile dynamic // VI ESERA. Malmö. 2007. Vol. 1.

22. *Maturana H., Varela F.* A arvore do conhecimento. Saõ Paulo, 2007.

23. *Mayhew S.* A dictionary of geography. Oxford, 1997.

24. *Moreira M. A.* Aprendizagem significativa. Brasilia, 1999.

25. *Morin E.* The seven complex lesson in education for the future. Paris, 1999.

26. *Mortimer E. F.* Conceptual Change or Conceptual Profile Change? // Science & Education. 1995. Vol. 4.

27. *Mortimer E. F.* Linguagem e formacão de conceitos no ensino de ciencias. Belo Horizonte, 2000.

28. *Nardi B. A.* Studying Context: A Comparison of Activity Theory, Situated Action Models, and Distributed Cognition / In: B. A. Nardi (ed.) Context and Consciousness: Activity Theory and Human-Computer Interaction. Cambridge, 1996.

29. *Özdemir G., Clark B.* An Overview of Conceptual Change Theories. Eurasia Journal of Mathematics // Science & Technology Education. 2007. Vol. 3. № 4.

30. *Posnèr G. J., Strike K. A., Hewson P. W., Gertzog W. A.* Accommodation of a scientific conception: Toward a theory of conceptual change // Science Education. vol. 66, № 2, 1982.

31. *Richards J. C., Platt J., Platt H.* Longman Dictionay of language teaching and applied linguistics. Essex, 1992.

32. *Rodrigues A. M., Mattos C. R.* The complex dynamic of the learning activity // In: XIV IOSTE. Bled. 2010. Vol. 1.

33. *Rodrigues A. M.* Redimensionando a nocão de aprendizagem nas relacoes entre perfil conceitual e contexto: uma abordagem sócio-cultural-histórica. São Paulo, 2009.

34. *Rommetveit R.* On the Architecture of Intersubjectivity / In: Rommetveit R. and Blakar R. M. (Eds.) Studies of Language Thought and Verbal Communication. London, 1979.

35. *Silva F. A. R.* O perfil conceitual de vida: ampliando as ferramentas metodologicas para sua investigacão. Belo Horizonte, 2006.

36. *Strike K. A., Posner G. J.* A revisionist theory of conceptual change / In: R. A. Duschl & R. J. Hamilton (Eds.) Philosophy of science, cognitive psychology, and educational theory and practice. N. Y., 1992.

37. *van Dijk T. A.* Discourse, context and cognition // Discourse Studies. 2006. Vol. 8. № 1.

38. *Vigotski L. S.* A Construcão do Pensamento e da Linguagem. São Paulo, 2001.

39. *Vygotsky L. S.* The collected works // In: Problems of general psychology. Vol. 1. N. Y., 1987.

40. *Wertsch J. V.* Vygotsky and the social formation of mind. Cambridge, 1985.

41. *Zinchenko V.* The earliest stages of the cultural development of the child // ISCAR. San Diego, 2008. Vol. 1.

К пониманию формирования понятий при обучении естественным наукам

Андрэ Мачадо Родригес
аспирант Университета г. Сан Пауло (Бразилия), сотрудник секретариата департамента образования штата Сан Пауло

Кристиано Родригес ДеМаттос
кандидат физико-математических наук, профессор Института физики Университета Сан Пауло

В работе обсуждается формирование понятий в процессе обучения естественным наукам. Хорошо известно, что с 80-х годов большая часть исследований в области обучения естественным наукам, посвященным формированию понятий, связана — прямо или косвенно — с моделью понятийных изменений. Однако в исследованиях в области обучения естественным наукам до сих пор нет согласованной модели, которая бы объясняла формирование понятий, учитывая сложный диалог о значении, в рамках социальных взаимодействий как в контексте школы, так и в повседневной жизни. Данное теоретическое обсуждение важно для проектирования новых направлений в исследованиях модели понятийного профиля. Процесс преподавание-обучение в области обучения естественным наукам не должен быть ограничен разъяснением содержания. Учитель для обеспечения эффективного и осмысленного обучения должен также принимать во внимание осознанную осведомленность в качестве цели при создании смыслов. В данном контексте теория деятельности является подходящей теоретической основой для понимания процесса преподавание-обучение научных понятий и для интерпретации качественных изменений в этом процессе. Данный подход позволяет развиваться в двух направлениях: включить праксис (действия) в когнитивные модели, с одной стороны, и добавить коммуникативные и семиотические процессы в теорию деятельности с другой. Предложены три категории, способствующие пониманию сложной динамики процесса преподавание-обучение, основанные на диалектическом взаимодействии интернализации и экстернализации.

Ключевые слова: концептуальный профиль, теория деятельности, порядок обучения, обучения естественным наукам, комплексность.

The knowledge externalisation cycle (KnEx): development of a systematic cyclic research method to guide researchers

Louise Hawkins

Graduate Diploma of Information System Management (GDISM) Central Queensland University;
Bachelor of Arts, Lecturer, Faculty of Arts, Business, Informatics and Education,
Central Queensland University

Knowledge workers (such as group facilitators) reflect and externalise prior knowledge as a means to plan for future activities. Reflection and knowledge externalisation can be increased by engaging in reflection with other people through dialogue. Reflecting and planning in a group can assist with articulation and transference of tacit knowledge. The Knowledge Externalisation Cycle (KnEx) is developed as a method within social constructivism, to capture and communicate the complexities of knowledge within this context. The KnEx takes as its point of departure, Engestrom's expansive learning cycle (ELC), which was developed as a method for studying and transforming work activities. The original objective of the expansive learning cycle was as a means for practitioners to consider their own ways of working, with data, conceptual tools, and guidance provided by the researchers. This paper describes the contradictions identified between the original objective of the ELC (to directly assist the practitioners) and the objective of the KnEx (to create a systematic cyclic research method to be used by the researcher). This paper aims to explain the transformation of the ELC to the KnEx, and provide a detailed description of each phase within the cycle.

Keywords: expansive learning cycle, knowledge externalisation, knowledge workers, planning, methodology.

Introduction

When planning, knowledge workers draw on their prior knowledge and reflect-before-action [38] on how the future activity could play out. Facilitators, as knowledge workers, plan future meetings, drawing on their past experiences. The knowledge externalised from these past experiences can be increased by facilitators reflecting as a group, as well as modelling the dialogue. It is within this context of externalising knowledge that the Knowledge Externalization Cycle (KnEx) was developed to guide the researchers through the research process from data generation to the presentation of results. The KnEx was modified from the Expansive Learning Cycle developed by Engestrom [9].

In this paper, I briefly discuss Engestrom's ELC and how a change of motive of the ELC led to the development of the KnEx. I will then describe the KnEx using data drawn from research looking at facilitators' knowledge to illustrate each phase of the KnEx. Providing a clear exposition of the research process is a way of overcoming debates about objectivity since:

It opens up the possibility of getting beyond the meaningless abstractions of objectivity and subjectivity and moving ahead to carefully selecting descriptive methodological language that best described your own inquiry processes and procedures [32, p. 576].

The Point of Departure — Engestrom's Expansive Learning Cycle

The original purpose of the expansive learning cycle (Figure 1a) was as a means for practitioners to consider their own ways of working, with data, conceptual tools, and guidance provided by the researchers [11]. The ELC was initially applied to large-scale transformations spanning several years [12]. Later Engestrom [10] identified miniature cycles of innovative learning which could occur in shorter timeframes (e. g. Hours duration rather than years), which were regarded as potentially expansive. These miniature cycles focused on teams rather than a whole organisation. Malopinsky [26] noted that «Engestrom provides a rather limited explanation of how the process of movement through the phases is reflected in the discourse» [26, p. 91]. In describing the modifications made to the ELC (Figure 1b), it is the aim of this paper to answer Malopinsky's concern and provide a detailed explanation of each phase within the KnEx.

The Expansive Learning Cycle (ELC) [9] was developed as a method for studying and transforming work activities. The core of the ELC is to «go beyond the given, to achieve something that is not yet there, and to master the future» [24, p. 5]. The KnEx also holds to this core, as the process of externalising more of the

knowledge contained within dialogue aids the use of this knowledge in mastering the future. The ELC is a «sequence of epistemic actions that starts with questioning the accepted practices and applying historical analysis of the situation with the goal of exploring underlying principles and rationales» [26, p. 54]. The KnEx, after describing the cycle context, also has a strong focus on questioning like the ELC. In the ELC, the analysing phase is often a challenge. In the KnEx, the stages of analysing and modelling have been combined. The analysis of the conversation during the focus group is undertaken by the researcher, to highlight discussion of the origin (historical [11]) of the facilitation situations, and the current understanding (actual-empirical [11]) of the facilitation situations, along with aspects of the discussion that look to future possibilities. Identification of the separate activities from the dialogue is undertaken prior to modelling the activity using the activity theory framework. The second part of analysis occurs between the identified activities and the modelled activities leading to the identification of the types of knowledge externalised within a given activity.

Before moving to a discussion of the phases of the KnEx, a brief discussion on activity theory is provided.

Activity theory

Activity theory reflects how language «expresses the rules of an activity, shapes the community, formulates the object, positions the subject, and affords or constrains the actions of the subjects working on the object» [2, p. 160]. The activity theory framework, contributes to understanding knowledge externalisation, as the activity theory framework is used as a representational device [33] to articulate the knowledge identified within the data. By drawing on activity theory notation (subject, object, tools, rules, community and division of labour) [13] the knowledge cases can be visually represented.

The other concept within activity theory that is important in question development to assist knowledge externalisation is that of contradictions (primary, secondary tertiary and quaternary) [19]. Contradictions

aid in knowledge externalisation as they « help to identify problematic areas whose investigation is necessary for the purpose of understanding» [28] the knowledge used in an activity system. Tensions and breakdowns, being inextricable aspects of activity systems [4], are consequently used as points of reference for studying knowledge externalisation. The identification of problems or conflicts signifies the presence of contradictions [21], and can highlight where to ask questions to externalize more knowledge. This research relies on activity theory constructs to form the basis of what to code and how to categorize facilitators' descriptions (Phases 5 and 6 provide more details).

The KnEx

An expansive learning activity produces new ways of thinking and doing, which are «literally learned as they are being created» [9, p. 138]. In addressing the issues of questioning accepted practice and learning during creation, the KnEx sets the contextual scene prior to addressing accepted practices within the questioning phase. The path which the discussion and questions take within the focus group is identified as the dialogue is being created, not before. During the conversation activities that have occurred or will occur are discussed. Questioning is directed at understanding what the facilitator knows of the historical development of the group and the issue that will be facilitated. Where the discussion refers to a previous facilitated meeting, questioning is directed at how things developed prior to the meeting, as well as changes that came out of the meeting. For the facilitator, a reflection on past facilitated meetings provides a chance to consider how their own practice was changed following a given meeting. Finally, the questioning and discussion considers what impact the facilitators reflection of their past facilitated meeting may have on future activities and actions.

The KnEx has been developed to aid the systematic and explicit progression through the research process in order to show how knowledge has been identified within conversations. The KnEx reflects the phases through
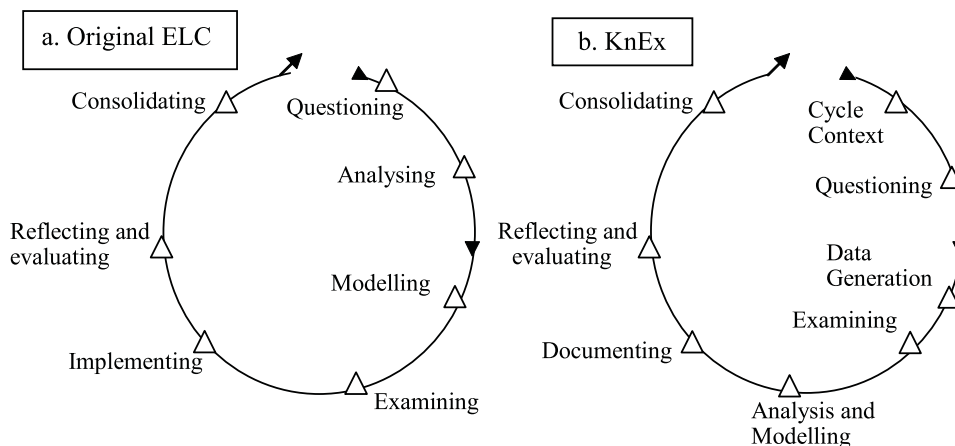

Fig. 1. The original Expansive Learning Cycle (ELC) and the Knowledge Externalisation Cycle (KnEx) [16, p. 15]

which the research (and researcher) moved through the research process. During the research discussed here, three sites were visited. For each site, the researcher moved through the KnEx once; therefore giving three KnEx cycles. Moving through multiple cycles allowed the documenting of the researcher's progressive understanding of the phenomena of planning knowledge under focus.

The KnEx is a procedural model to assist a group of researchers (or an individual researcher) to move constructively and openly through the research process. The KnEx also aids the researcher in navigating through the complexity and volume of data that is generated within qualitative research [39]. The purpose of the ELC is to assist practitioners to look at their own work activity, while the KnEx is to guide the researcher. Drawing on the fact that in activity theory, a different object equals a different activity [18], the KnEx has a different purpose to the original ELC. The path through the phases of the KnEx is towards knowledge building [24]. The KnEx is utilized in this project as a research tool to identify and evolve knowledge artifacts [30] which can be further manipulated and transformed. The rest of the paper will describe the aim of each of the phases of the KnEx, illustrated with data from a focus group discussion run with facilitators within a large multinational company.

KnEx Phase 1: Cycle context

The first phase of the KnEx involves presenting a description of the context within which the conversation has taken place. This contextual information is especially important where multiple cycles with different participants and locations are involved. Participants are described within their particular work context, including the «ease of access to the [participants, and] whether data can be adequately recorded» [36, p. 8].

Participants for this research were facilitators with varying levels of face-to-face electronic and distributed facilitation experience who all worked within a multinational company. Facilitation was one part of their job, and none of the participants were full-time facilitators. The site was selected fortuitously [36] through personal contact by the researcher made at a conference. Entry to the data site was negotiated through the contact person.

KnEx Phase 2: Questioning existing practice

During the questioning phase the questions asked by the researcher and participants during the focus groups and individual interviews were identified. Prior to the discussion with the participants, the researcher identified questions based on the notation structure of subject-tool-object and social rules — subject as suggested by Mwanza [27] and Boer et al. [4] (Table 1).

Examples of notation used for question development

AT Notation defined within the literature	Examples of questions using Mwanza and Boer's notations applied to this research
Subject — Tool — Object [27]	How does the facilitator (subject) utilize computer technology (tool) to assist group process (Object)?
Social Rules — Subject [4]	To what extent is the facilitator (subject) restricted in his or her behaviour by the rules of facilitation (rules)?

The notational structure presented in Table 1 incorporates the idea that «human understanding is mediated not only by physical and symbolic artefacts, but also by the social division of labour and cultural practices' [34, p. 7]. The same notation was also used to analyse the questions identified within the data transcript that had been asked during the focus group.

During the focus groups the researcher and the facilitators asked questions of each other by highlighting contradictions, which enhanced the externalization of knowledge. «Contradictions are not the same as problems or conflicts» [9, p. 137] but should be seen in the case of knowledge research as opportunities to externalise more knowledge. It is through the energy generated by these contradictions that activities can be transformed and further explained beyond the current level. A contradiction often encountered by facilitators relates to circumstances under which it is ok for a facilitator to provide input into the content of a meeting. Most facilitators hold to the rule that they should only provide process guidance, not content direction. Through dialogue, facilitators can engage in reflection of experiences where for example, they have provided input into the meeting content, and through this reflection transform their future activities. Drawing out the knowledge of facilitators can be accomplished by asking questions that assist the facilitator to reflect on their existing standards of practice [8]. Questioning and the surrounding discussion were digitally recorded as part of the next phase of the KnEx: data generation.

KnEx Phase 3: Data generation

The third phase of the KnEx, data generation, involves audio recording the interactive conversation between the facilitators and between the facilitators and the researcher. The term data generation is used in this research instead of data collection, as reality is understood to be co-generated. The data is not sitting there waiting for the researcher to come along and pick it up; the data has to be generated through joint interaction of all parties involved (this includes the researcher). «The knowledge to understand, frame, and solve these problems does not exist, but is collaboratively constructed and evolved during the process of solving them» [15]. The aim of the data generation phase was to engage in «meaning-making in the context of joint activity» [34, p. 3].

KnEx Phase 4: Examining

The aim of phase four, examining, is to transform the digital audio files into transcribed written documents. The audio recordings were listened to and then transcribed using Transcriber© software. «Transcription is not simply a way for a researcher to capture, represent, or re-present talk, but a constructive and interpretive act in which the researcher positions him/herself» [23, p. 209]. The interpretation given to the data during transcription and therefore the positioning of the researcher in relation to the data is dependent on the researcher's cultural and social context. Each phase in the KnEx is described here as a way of making explicit some of the researcher's decision making.

Each knowledge case is now identified and articulated (modelled) in phase 5, and then described in phase 6.

KnEx Phase 5: Analysing and Modeling

Knowledge cases, precepts and theory were identified from the data. For this paper, the discussion will be restricted to a single knowledge case as the focus here is to provide a detailed description of the KnEx. The analysis and modelling phase involved searching the transcribed data for activities in order to identify the elements of the activity theory framework that make up those activities (subject, tools, rules, community, division of labour and object) [7]. The activity theory framework was «useful in identifying what to look for» [3, p. 157] within the transcripts, as well as providing a powerful explanatory framework when analysing a large body of qualitative data [17].

Prior to articulating (modelling) and describing the knowledge cases, we first need to define the rules by which knowledge cases can be identified within the data transcripts (Table 2).

Table 2
Rules for identifying knowledge cases

A case:
1. Consists of a description of a particular instance of facilitating (a story)
2. Provides details for at least three elements within the activity theory framework (subject, tools, rules, division of labour, and community).
3. May or may not provide details of links to other activities within the system (historical, possible culturally advanced activities, and/or concurrent activities).
4. Describes/provides identification of contradictions that aid knowledge externalization/identification.
    i. Contradictions: The presence of words with meaning similar to: *disturbances, obstacles, difficulties, failure, disagreement, conflict, trouble, innovation, potential, etc.* [9, 20] and potential contradictions [35, p. 628]

Table 3 presents an example of a knowledge case that was identified from the focus group transcripts. Within Table 3, each row shows what the participant said and immediately below the activity theory elements that the dialogue relates to. The object of the activity for the facilitator (Table 3) was to develop a plan by mentally rehearsing different scenarios.

Table 3
A knowledge case identified from the data transcripts with links to activity theory elements

Data	Speaker #7: In my	head, when I'm running a	session, before I start I
AT elements		**Subject** (Speaker #7)	**Future activity**
Data	...go through what I think possible reactions could be to it, and try and sort of devil's advocate.	I try and think of scenarios that may come up that I can	
AT elements	**Division of Labour (Subject** speaker#7)		
Data	...address in advance.	So, I always try and think about ...what I'm going to do in those complete silences	
AT elements	**Future activity**		
Data	...if I've really got, someone who is antagonistic	then I know I that I will say, «oh, but I'm not an expert in this, so it's not my role». I'm waiting for the question, in that sort of way. but sometimes, it really is... it's just that	
AT elements	**Community** (personality of a participant)		
Data	tactic	when you've got a very difficult person in a group, when they've really	
AT elements	**Tools**	**Community** (personality of a participant)	
Data	don't want to be there, or they're so set in their path or their role,		
AT elements	**Contradiction** between personalities (**community**) and meeting **object Contradiction** between **subject** and personalities (working at odds with each other) **Contradiction** between personalities (**community**) and participants role (**division of labour**)		
Data	then, I do I do find that difficult. I go through what I think possible reactions could be to it, and try and sort of [unclear audio] devil's advocate. (C1II2L196-202)		

Note: The object (motive) of the planning activity is the development of a plan.

Once the cases have been identified within the data (Table 3) each case needs to be articulated using the activity systems framework [33]. Articulation refers to how some of the knowledge within the extracts will be transformed (modeled) for further knowledge externalization and analysis (Table 4).

Rules for articulating knowledge cases

The case:
1. Mapping [3] AT elements to the activity systems analysis framework.
2. Tools can be described within a hierarchy of characteristics. There are four classes of tools: what, how, why and where to tools).
3. Contradictions between elements within an activity or between activities will be identified by a thick line between the relevant elements/activities.
4. Describe the case in one sentence (this sentence will then be used as the title of the Knowledge case — e. g., «Run through scenarios on the facilitator's internal mental plane»).

Each knowledge case (such as the example presented in Table 3) is articulating using the rules presented in Table 4. The output of this articulation process is presented in Figure 2.

KnEx Phase 6: Documenting

The documenting phase makes connections to previous knowledge literature. Previous literature that is considered includes general knowledge theories [5—6; 14; 22; 29] and facilitation knowledge research [1; 25; 37] as described in Table 5. Making connections to previous literature provides support to and combine previous knowledge theories as a means of supporting the contextually rich process described by the KnEx.

A description of the knowledge theories and facilitation knowledge theories in relation to Figure 2 is now presented:

Knowledge theories present in Figure 2: The knowledge that Speaker #7 is drawing on, within

Figure 2, include analysis of the context centered on who the participants will be, a plan for implementation, as well as a forecast of the possible outcomes [22] (Table 6). By drawing on predictive, problem solving knowledge [29], Speaker #7 is able to match participants and motive with a selection of processes from her facilitators' toolkit. An antagonistic personality is one aspect that Speaker #7 is considered during this planning activity. The aim of planning for possible antagonistic personalities is for Speaker #7 to consider a number of alternatives and justify those scenarios which have a better chance of being able to reduce the negative impact of the antagonism on the meeting [6]. Mentally rehearsing a variety of scenarios also means that

Rules for describing knowledge cases drawing on published theories and activity theory

1. Describe the knowledge contained within the case using, as much as possible, the actual words of the facilitators.
   a. Knowledge theories
      i. Case Problems [22]
      ii. Replicative, applicatory, interpretive and associative knowledge [5, 14]
      iii. Conceptual and instrumental knowledge [29]
      iv. Functions of knowledge [Loewenberg 1984, as cited in 29]
      v. Knowing (empirical, ethical, personal and aesthetic) [6]
   b. Facilitation theories
      i. Development facilitation, Content facilitation, Process facilitation, and Technical facilitation [1]
      ii. Intellectual, Managerial, Social, and Technical facilitation [37]
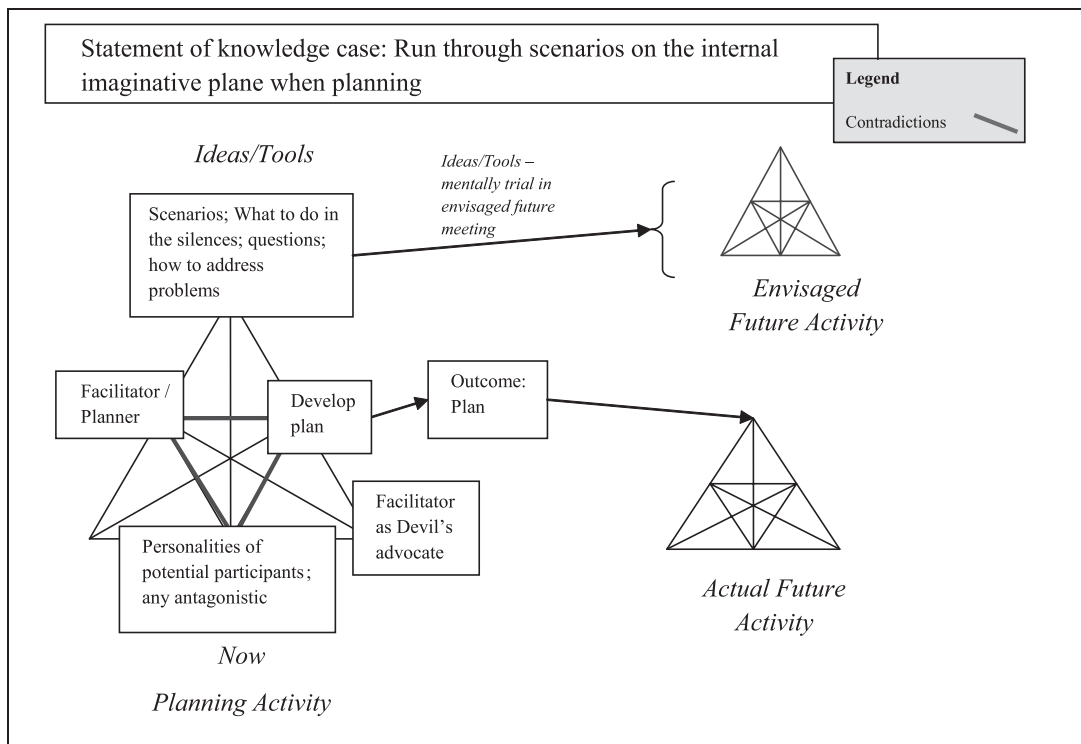   iii. Divergent/convergent methods x innovative/adaptive methods [25]

Fig. 2. Articulating the knowledge case from Table 3

Speaker #7 can envisage what each possible scenario would mean for the meeting members [6].

Facilitation knowledge theories present in Figure 2: When considering the facilitator knowledge literature, we see a combination of content and technical facilitation [1], and the drawing on of innovative divergent methods as Speaker #7 considers a variety of techniques and tools. A summary of the knowledge theories and facilitation knowledge theories drawn on in describing Figure 2 are presented in Table 6.

Table 6

Knowledge theories compared to case

Knowledge Theories		Case: Scenario planning before the meeting
[22]	**Case Problems**	who the participants will be, a plan for implementation, as well as a forecast of the possible outcomes
[5, 14]	**Professional Knowledge**	Interpretive - judgement
[29]	**Conceptual Knowledge [29]**	Predictive knowledge
	Instrumental Knowledge [29]	Problem solving knowledge
	Functions of Knowledge (Lowenberg)	Explanation, practice
[6]	**Empiric knowing**	NA
	Ethical knowing	Justification to herself of scenarios that have a better chance of a positive outcome than other scenarios
	Personal knowing	NA
	Aesthetic knowing	Rehearsing — what do these envisioned scenarios mean for this group?
Facilitation Knowledge Theories		
[1]	**Facilitation classification**	Content and technical facilitation
[37]	**Within meeting roles**	NA
[25]	**Innovative/ adaptive method characteristics**	innovative convergent methods

The richness of the knowledge externalized in this case has been shown in Figure 2 and in Table 6 have communicated the complexity of knowledge within a given context. Presenting Figure 2 and Table 6 back to Speaker #7 will provide another opportunity to reflect on the knowledge externalized through dialogue.

The final theory to consider in describing each knowledge case are the what, how, why and where to tools identified within activity theory. **Activity theory description of tools within Figure 2:** The scenarios that Speaker #7 is considering are ideas/tools that cross from the current planning activity to the model of the future activity. Within Activity Theory, tools are understood within a hierarchy (*what, how, why and where to tools*). The *What* tools, a different group exercise, will be used by Speaker #7 if the conversation (to reach motive) within the group slows down or stops, as a way of getting the conversation moving again. The

How tools provide knowledge of how these scenarios will get the participants interacting positively and moving towards the object.

KnEx Phase 7: Reflecting and Evaluating

Before consolidating what has been learnt about knowledge and the research process in Phase 8, we now turn to Phase 7: reflecting and evaluating, to consider the researcher's role in the process.

As I identified each phase of the KnEx, including similarities with the ELC [9] and the order in which each phase occurred, I was challenged to find ways of explaining my decision making to others in a concise written manner. My aim was for other's to read about the phases and be able to use this as a blueprint for their investigation into externalizing knowledge (I leave this to the reader to decide if I have achieved this aim).

KnEx Phase 8: Consolidating

Consolidation as the final phase of the KnEx draws together the knowledge cases and knowledge externalized from the discussions undertaken with a particular group of participants. The consolidating phase is also the transition phase between one research site and/or research participants, so it is an opportunity to identifying what this iteration of the KnEx means for the next cycle (in a different location with different participants). In describing each phase of the KnEx, and using the KnEx in practice, this paper has consolidated «the new practice in its new form» [31, p. 557].

As only one knowledge case has been described in this paper, it is not possible here to draw overarching conclusions to what knowledge was externalized across all the knowledge cases identified from the data transcript. However, in concluding the KnEx and this paper, we are able to consider what the output of the KnEx means for the facilitators, and for knowledge theory researchers.

For the facilitators, the output, in the form of identified, articulated and described knowledge cases can be presented back to the participants as knowledge artifacts that can be used to continue the reflective dialogue of facilitation practice.

For knowledge researchers, the KnEx provides a systematic process through which they can work with qualitative data while maintaining rich descriptions of the concepts under investigation. For activity theory researchers, the KnEx provides a research process that is congruent with activity theory principles. Identification of tools at different levels of the hierarchy of activity theory tools has supported the depth of knowledge externalized using the KnEx. By modifying Phase 6, with the identification of theory in an area other than knowledge, researchers can use the KnEx as a generic qualitative analytical tool. Further research is needed to show if the KnEx is a useful process for qualitative research.

Future research will investigate the extent to which the KnEx increases quality of knowledge externalized by presenting the KnEx analysis of individual cases back to the original participants for further reflection.

Future research will also investigate what additional richness can be identified when a sequence of multiple KnExs are conducted with different groups, and what this means for knowledge externalization and planning.

References

1. *Antunes P., Ho T.* The Design of a GDSS Meeting Preparation Tool // Group Decision and Negotiation, V. 10. № 1. 2001.

2. *Boag-Munroe G.* Wrestling with words and meanings: Finding a tool for analysing language in activity theory // Educational Review, V. 56. № 2. 2004.

3. *Bodker S.* Applying activity theory to video analysis: how to make sense of video data in human-computer interaction. In Nardi B. (Ed.). Applying activity theory to video analysis: how to make sense of video data in human-computer interaction. V. Cambridge, MA. 1995.

4. *Boer N. I., van Baalen P. J. and Kumar K.* An activity theory approach for studying the situatedness of knowledge sharing. In 35th Hawaii International Conference on System Sciences. Hawaii. 2002.

5. *Braxton J. M.* Reflections on a Scholarship of Practice // Review of Higher Education, V. 28. № 2. 2005.

6. *Chinn P. L., Kramer M. K.* Theory and nursing: Integrating knowledge development. V. St. Louis. 1999.

7. *Cruz Neto G. G., Gomes A. G. and de Castro J. B.* Mapping Activity Theory Diagrams into i* Organizational Models // Journal of Computer Science and Technology, V. 5. № 2. 2005.

8. *Engestrom Y.* Activity theory as a framework for analysing and redesigned work // Ergonomics, V. 43. № 7. 2000.

9. *Engestrom Y.* Expansive learning at Work: toward an activity theoretical reconceptualization // Journal of Education and Work, V. 14. № 1. 2001.

10. *Engestrom Y.* Innovative learning in work teams: Analyzing cycles of knowledge creation in practice. In Engestrom Y., Miettinen R. and Punamaki R. L. (Ed.). Innovative learning in work teams: Analyzing cycles of knowledge creation in practice. V. Cambridge. 1999.

11. *Engestrom Y.* Learning by expanding: An activity theoretical approach to developmental research. V. Helsinki. 1987.

12. *Engestrom Y.* Learning by expanding: Ten years after (Lernen durch Expansion). V. Marburg. 1999.

13. *Engestrom Y.* Putting Vygotsky to work: The change laboratory as an application of double stimulation. In H. Daniels M. C., & J. V. Wertsch(Ed.). Putting Vygotsky to work: The change laboratory as an application of double stimulation. V. Cambridge, England. 2007.

14. *Eraut M.* Knowledge creation and knowledge use in professional contexts // Studies in Higher Education, V. 10. № 2. 1985.

15. *Fischer G.* Shared understanding, informed participation, and social creativity: Objectives for the next generation of collaborative systems. In COOP'2000: Fourth International Conference on the Design of Cooperative Systems. Sophia Antipolis, France. 2000.

16. *Foot K. A.* Cultural historical activity theory as practical theory: Illuminating the development of a conflict monitoring network // Communication Theory, V. 11. № 1. 2001.

17. *Harris S. R.* Supporting Learning-in-Use: Some Applications of Activity Theory to the Analysis and Design of ICT-Enabled Collaborative Work and Learning. 2007.

18. *Hasan H.* A cultural-historical activity theory approach to users, usability and usefulness. In Pacific Asia Conference on Information Systems (PACIS). Auckland. 2007.

19. *Hawkins L. A., Whymark G.* Increasing the descriptive power of CHAT with culturally advanced notation. 2006.

20. *Helle M.* Disturbances and contradictions as tools for understanding work in the newsroom // Scandinavian Journal of Information Systems, V. 12. № 1-2. 2001.

21. *Hill R., Capper P., Wilson K., Whatman R. and Wong K.* Workplace learning in the New Zealand apple industry network: A new co-design method for government «practice making» // Journal of Workplace Learning, V. 19. № 6. 2007.

22. *Jonassen D.* Learning to solve problems: An instructional design guide. V. San Francisco, CA. 2004.

23. *Lapadat J. C.* Problematizing transcription: purpose, paradigm and quality // International Journal of Social Research Methodology, V. 3. № 3. 2000.

24. *Lipponen L., Hakkarainen K. and Paavola S.* Practices end orientations of computer-supported collaborative learning. In Stribos J., Kirschner P. and MArtens R.(Ed.). Practices end orientations of computer-supported collaborative learning. V. Boston, MA. 2004.

25. *Lopez-Mesa B.* Selection and use of engineering design methods using creative problem solving. 2006.

26. *Malopinsky L. V.* Facilitating organisational change: The use of activity theory as a framework for social construction of strategic knowledge. 2008.

27. *Mwanza D.* Mind the gap: Activity theory and design. In CSCW 2000. Philadelphia, Pennsylvania. 2000.

28. *Mwanza D.* Where theory meets practice: A case for an Activity Theory based methodology to guide computer system design. In INTERACT' 2001: Eighth IFIP TC 13 Conference on Human-Computer Interaction. Tokyo, Japan. 2001.

29. *Osmond J.* Knowledge Use in Social Work Practice: Examining its Functional Possibilities // Journal of Social Work, V. 6. № 3. 2006.

30. *Paavola S., Hakkarainen K.* From meaning making to joint construction of knowledge practices and artefacts — A trialogical approach to CSCL. In Computer-Supported Collaborative Learning. Rhodes, Greece. 2009.

31. *Paavola S., Lipponen L. and Hakkarainen K.* Models of Innovative Knowledge Communities and Three Metaphors of Learning // Review of Educational Research, V. 74. № 4. 2004.

32. *Patton M. Q.* Qualitative Research and Evaluation Methods. V. Thousand Oaks, CA., 2001.

33. *Squire K.* Cultural framing of computer/video games // The International Journal of Computer Game Research, V. 2. № 1. 2002.

34. *Stahl G.* Can shared knowledge exceed the sum of its parts? In DeRidder R. V. J. (Ed.). Can shared knowledge exceed the sum of its parts? V. Amsterdam, Netherlands. 2003.

35. *Uden L. and Helo P.* Designing mobile interfaces using activity theory // International Journal of Mobile Communications, V. 6. № 5. 2008.

36. *Wainwright D.* Can Sociological Research Be Qualitative, Critical and Valid? // The Qualitative Report, V. 3. № 2. 1997.

37. *Wang Q.* Student-facilitators' roles in moderating online discussions // British Journal of Educational Technology, V. 39. № 5. 2008.

38. *Wilson J. P.* Reflecting-on-the-future: a chronological consideration of reflective practice // Reflective Practice, V. 9. № 2. 2008.

39. *Yamagata-Lynch L. C.* Confronting Analytical Dilemmas for Understanding Complex Human Interactions in Design-Based Research From a Cultural-Historical Activity Theory (CHAT) Framework // Journal of the Learning Sciences, V. 16. № 4. 2007.

Цикл экстернализации знаний (ЭкЗн): развитие последовательного циклического исследовательского метода для ориентира исследователей

Луиза Хокинс
специалист по управлению информационными системами, бакалавр искусств, преподаватель факультета искусства, бизнеса, информатики и образования Университета Центрального Квинслэнда

Работники умственного труда (например, группа фасилитаторов) рефлексируют и экстернализируют имеющиеся знания в качестве средства для планирования будущей деятельности. Рефлексия и экстернализация знаний могут быть увеличены путем включения в рефлексию с другими людьми посредством диалога. Рефлексия и планирование в группе может помочь при формулировке и передаче неявных знаний. Цикл экстернализации знаний (ЭкЗн) разработан как метод в рамках социального конструктивизма для запечатления и передачи сложности знания в этом контексте. ЭкЗн в качестве отправной точки принимает цикл экспансивного обучения Энгестрёма (ЦЭО), который был разработан как метод исследования и преобразования трудовой деятельности. Первоначальная цель цикла экспансивного обучения заключалась в предоставлении средства практикующему специалисту для рассмотрения своих методов работы, при использовании данных, концептуальных инструментов и руководящих указаний исследователей. Данная статья описывает противоречия, установленные между первоначальной целью ЦЭО (непосредственно помогать практикам) и целью ЭкЗн (создать последовательный циклический исследовательский метод для использования исследователем). Данная работа призвана разъяснить преобразование ЦЭО в ЭкЗн и предоставить подробное описание каждого этапа в течение цикла.

Ключевые слова: цикл экспансивного обучения, экстернализация знания, работники умственного труда, планирование, методология.

О деятельностном содержании психолого-педагогической подготовки современного учителя для новой школы*

В. В. Рубцов

доктор психологических наук, профессор, академик Российской академии образования,
ректор Московского городского психолого-педагогического университета

А. А. Марголис

кандидат психологических наук, первый проректор Московского городского психолого-педагогического
университета, профессор кафедры педагогической психологии факультета психологии образования
и кафедры международной культурно-исторической психологии
Московского городского психолого-педагогического университета

В. А. Гуружапов

доктор психологических наук, профессор, зав. кафедрой педагогической психологии
Московского городского психолого-педагогического университета

В статье рассматриваются вопросы профессиональной подготовки учителей для начальной школы в контексте введения нового ФГОС общего начального образования второго поколения (Стандарта). Показано, что подготовка учителя начальной школы, способного реализовать требования нового Стандарта, предполагает: новое содержание подготовки, новые содержание и форму организации учебного процесса студентов, новые формы институализации программ такой подготовки, создание базового центра психолого-педагогического образования. Специально рассмотрен вопрос о формировании метапредметных компетенций учащихся начальной школы. Приведены примеры дисциплин, обеспечивающих подготовку будущих учителей по ФГОС ВПО третьего поколения (в рамках направления «Психолого-педагогическое образование» (050400)).

Ключевые слова: учебная деятельность, стандарт общего начального образования, деятельностный подход, начальная школа, учитель, развитие компетенций учащихся; профессиональное развитие учителей.

В 2010 г. в Российской Федерации утвержден новый Федеральный государственный стандарт общего начального образования (Стандарт) 2-го поколения, основанный на системно-деятельностном подходе к организации обучения [14]. Это создает принципиально новую ситуацию в отечественном образовании. В качестве образовательных результатов в начальной школе декларируется три типа компетенций — предметных, мета-предметных и личностных. Стандарт остро ставит вопрос об ориентации педагогической деятельности на привитие ученикам универсальных учебных действий и освоение ими фундаментального содержания основных учебных дисциплин общего начального образования.

Другое важное обстоятельство, которое необходимо учитывать в связи с введением нового Стандарта, касается психологической компетентности учителя. По сути, проблема состоит в том, что передача ответственности за формирование компетенций в руки учителя требует принципиально иного уровня его психологической подготовки, существенно отличного от имевшегося ранее. Этот аспект проблемы уже был рассмотрен А. А. Марголисом и В. В. Рубцовым [8; 9]. Понятно, что необходимы новые методы повы-

шения квалификации и профессиональной подготовки учителей начальной школы, направленные на усиление их психологической составляющей.

В настоящей статье мы рассмотрим задачу подготовки будущих учителей начальной школы на примере такой педагогической задачи, как формирование у учащихся метапредметных компетенций, а именно: способности ученика рассматривать методологические и теоретические аспекты решения конкретных предметных задач. К метапредметным результатам обучающихся относятся освоенные ими универсальные учебные действия (познавательные, регулятивные и коммуникативные), обеспечивающие овладение ключевыми компетенциями, составляющими основу умения учиться, а также межпредметные понятия. При этом необходимо учитывать, что в Стандарте признается «решающая роль *содержания* образования и способов организации образовательной деятельности и *учебного сотрудничества* в достижении целей личностного, социального и познавательного развития обучающихся (курсив наш. — *В. Р., А. М., В. Г.*)».

Известное ныне выдвинутое Л. С. Выготским и развитое в трудах А. Н. Леонтьева, А. В. Запорожца, П. Я. Гальперина, Д. Б. Эльконина, В. В. Давыдова и других представителей психологической теории деятельности положение, что обучение ведет за собой развитие, становится главной целью каждодневной работы любого учителя. Наиболее проблемным местом в организации учебного процесса является развитие теоретического мышления учащихся, формирование понятий, необходимых для формирования метапредметных компетенций. Фактически ставится вопрос о переходе российской системы общего начального образования от традиционной модели обучения, нацеленной по преимуществу на привитие ученикам навыков счета, чтения и письма, к обучению, направленному на организацию деятельности, способствующей развитию учеников. Необходимо преодолевать распространенное в учительской среде стремление к формированию элементарных навыков в ущерб формированию понятий.

Определенные предпосылки для введения новых стандартов общего начального образования в РФ уже сложились. Дело в том, что в течение последних двух десятилетий идеи развивающего обучения В. В. Давыдова и его последователей проникли в содержание современных программ начальной школы. Особенно явно это проявилось в программах обучения младших школьников математике. Учебно-методические комплекты насыщены заданиями, связанными с отображением объектов в математических моделях. На содержании этих заданий можно формировать у учащихся такие метапредметные компетенции, как умение анализировать условия адекватности отображения свойств объекта в его модели и планировать решение соответствующих задач, способность школьника обдумывать способ своих действий с моделью.

Проиллюстрируем сказанное примером из широко распространенного в России учебника математики авторского коллектива М. И. Маро [7, с. 45]. Авторы позиционируют свой учебник как усовершенствованное традиционное пособие для начального изучения математики. Вместе с тем в него вкраплены задания, требующие теоретический подход к их постановке и решению.
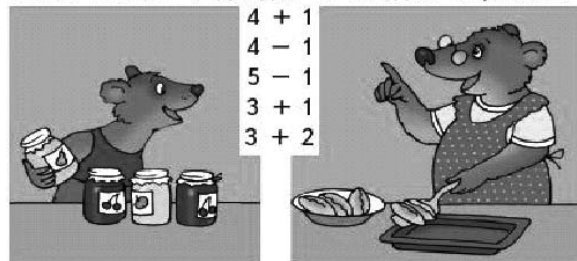
Рассмотрим сначала только левую картинку. Возможны по крайней мере две стратегии решения этой задачи на уроке: 1) сосредоточиться на проработке навыков устного счета; 2) заострить внимание детей на работе с арифметическими действиями как моделями действий изображенных персонажей.

В первом случае достаточно предложить ученикам сначала решить указанные примеры. Дети получат следующие результаты: «4 + 1 = 5, 4 - 1 = 3, 5 - 1 = 4, 3 + 1 = 4, 3 + 2 = 5». Затем учитель попросит учеников подсчитать, сколько баночек варенья на картинке. Дети ответят: «4». И вот тогда учитель предложит им определить, какой пример подходит к картинке. В этом случае дети сделают следующий вывод: «На картинке изображено четыре баночки варенья, значит, подходят примеры «3 + 1 = 4» или «5 - 1 = 4». Учитель может спросить: «Есть ли на картинке 5 баночек?» Дети ответят: «Нет!». Значит, подходит пример «3 + 1 = 4». Очевидно, что тренировка навыков устного счета в пределах «пяти» прошла успешно. Учителям, ориентирующимся на традиционный подход к обучению, эта стратегия понятна и близка их профессиональным взглядам. Но для развития мышления учеников действовать только по данному сценарию недостаточно.

Рассмотрим второй возможный способ действия. Учитель предлагает ученикам: «Пробуйте сначала, не решая примеры, определить, каким арифметическим действием можно описать поведение медвежонка!» Возникнет дискуссия. Одни решат, что подходит действие вычитания, а другие — действие сложения. В этом случае учителю с учениками придется разбираться в основаниях их выводов. Первые будут утверждать, что медвежонок берет баночку варения, а значит надо выбирать пример с действием вычитания. Вторые в ответ возразят, что медвежонок ставит баночку на стол, поэтому надо выбирать пример с действием сложения. В результате дети придут к следующему выводу: «Прежде чем решить, какой пример подходит к картинке, надо договориться, как интерпретировать поведение изображенного на картинке медвежонка. И только после этого можно обсуждать выбор примера». В этом случае предметом размышлений учеников становятся не результаты сложения чисел, а способы установления соответствий объекта и его модели. Таким образом, постанов-

ка задачи оказывается нацеленной на развитие у детей метапредметных компетенций.

Дальнейшее решение задачи возможно по следующему сценарию. Учитель предлагает ученикам: «Предположим, что медвежонок берет баночку. Тогда какой пример больше подходит?» Дети ответят: «4 - 1». Далее: «Какой пример подойдет для описания ситуации, когда медвежонок ставит баночку на стол?» Дети ответят: «3 + 1».

Тут учитель задает провокационный вопрос: «Так все-таки какой пример больше подходит к данной картинке?» Дискуссия в этом случае фактически приобретает методологическое содержание. Дети могут обсуждать и неопределенность постановки задачи, и соотношение модели и объекта, и необходимость предварительной интерпретации смысла картинки. Согласно теории учебной деятельности В. В. Давыдова дети будут вынуждены осуществлять действия анализа и рефлексии, которые лежат в основе универсальных учебных действий, т. е. действий, необходимых для решения задач с разным предметным содержанием. В соответствии с этим желаемый вывод, который должны сделать ученики, следующий: «Если считать, что медвежонок берет баночку, подходит пример «4 - 1», если считать, что медвежонок ставит баночку на стол, подходит пример « 3 + 1». Таким образом, выполнение задания из плоскости конкретной практической задачи переходит в пространство задач метапредметного содержания, а именно задач на анализ условий соответствия объекта и его математической модели. В этом случае учебная дискуссия не может завершиться просто констатацией, что возможны два приведенных выше варианта решения конкретной задачи. Надо нацелить учеников на осмысление метапредметного содержания только что решенной задачи. Можно, например, задать следующий вопрос: «Какой мы может сделать вывод на будущее, чтобы успешно решать похожие задачи?» В этом случае ход урока приобретет форму дискуссии о возможном способе планирования решения задач определенного типа. Одним из желаемых результатов может быть следующий вывод учеников: «Прежде чем отвечать на вопрос такой задачи, надо понять, какое действие изображено на картинке». В таком суждении проявляются зачатки будущих метапредметных компетенций учеников. И как только они обнаружились и были осознаны, следует приступать к обсуждению задачи применительно ко второй картинке. Учитель может задать следующий вопрос: «С чего надо начинать решение нашей задачи применительно ко второй картинке?» Теперь дети непременно ответят, что надо начинать с определения, что делает медведица, изображенная на картинке.

Очевидно, что для подобной педагогической работы учитель должен обладать существенно иными компетенциями, нежели для ведения урока, нацеленного только на привитие ученикам навыков устного счета. Он должен обладать культурой организации учебной деятельности, направленной на развитие ос-

нов теоретического мышления, лежащего в основе метапредметных компетенций. В отечественном общем начальном образовании до недавнего времени такой способ работы учителя был представлен, по сути, только в системе развивающего обучения Д. Б. Эльконина—В. В. Давыдова, начавшей внедряться в практику образования в начале 90-х гг. XX в. Учебная деятельность в этой системе строится в процессе решения учащимися (совместно и под руководством учителя) учебных задач и выполнения школьниками ряда особых учебных действий (преобразование условий задачи с целью обнаружения в предмете исходного («всеобщего») отношения, моделирования, преобразования модели, контроля и оценки). Такой способ организации обучения предполагает широкое учебное сотрудничество учащихся и сложный процесс управления коллективно-распределенной формой организации деятельности со стороны учителя.

Несмотря на имеющиеся отличия развивающего обучения от системно-деятельностного подхода, описанного в новом Стандарте (что может быть предметом специального обсуждения) общим является то, что основы теоретического мышления и универсальные учебные действия формируются в процессе специально организованной учителем учебной деятельности, принципиально отличающейся от готовых предписаний и ответов, свойственных традиционной модели обучения в начальной школе. Поэтому для подготовки учителей к работе по новому Стандарту желательно воспользоваться опытом подготовки педагогов по системе Д. Б. Эльконина—В. В. Давыдова.

Благодаря целенаправленным усилиям коллектива разработчиков и целого ряда связанных с ним образовательных учреждений (прежде всего школы № 9, в то время бывшей базовой школы Психологического института РАО), по существу, была создана альтернативная система передачи деятельностной технологии работы с учащимися, основанная на деятельностной форме совместного проектирования уроков, организации учебных баз для стажировки новых учителей в тех школах, где были созданы и реально действовали эффективные образцы учебной деятельности школьников на рефлексивном анализе способов учебной работы в этих школах.

Основная идея состояла в том, что подготовка учителей в системе развивающего обучения должна осуществляться только в условиях самой же реально функционирующей системы, в процессе практического решения соответствующих педагогических задач совместно с людьми (прежде всего с методистами), уже умеющими решать такие задачи.

В исходной форме эта работа представляет собой сотрудничество учителей, желающих освоить систему развивающего обучения, и методистов соответствующей квалификации. В этих условиях учителя и методисты получают возможность выполнять совместную работу на всех стадиях учебного процесса: при проектировании уроков, их проведении, анализе и

оценке. Опыт показывает, что в течение полутора-двух лет учитель, как правило, овладевает новым типом педагогической деятельности, содержанием и методами развивающего обучения, а в дальнейшем может осуществлять его самостоятельно (конечно, на основе соответствующих учебно-методических пособий). Описанная форма работы с учителями, благодаря которой в проектировании и реализации нового типа обучения детей совместно участвуют учителя и методисты (к этому можно добавить и исследователей-преподавателей), вполне может быть названа *мастерской*, где живой работой со школьниками учителя овладевают в столь же живой совместной работе с «мастерами» этого дела. Нам кажется, что овладеть любой формой живой деятельности, связанной с другими людьми, можно только этим способом, в сотрудничестве «взрослых учащихся» и «мастеров»» [5; 6; 12].

Таким образом, важнейший вывод из опыта внедрения систем РО в практику состоит прежде всего в том, что в новой системе подготовки учителя, способного организовать обучение на основе деятельностного подхода, должны быть реализованы по крайней мере следующие важнейшие принципы:

• будущий учитель в такой системе должен иметь значительно более высокую психологическую подготовку;

• обучение будущего педагога, осваивающего технологии организации учебной деятельности, должно быть построено также на деятельностных основаниях, т. е. в форме решения педагогических задач и моделирования его будущей педагогической деятельности.

• для реализации этой задачи необходимо иметь практические базы, в которых уже есть эффективные образцы учебной деятельности, образцы взаимодействия учащихся и учителя.

Анализ зарубежных стандартов профессиональной деятельности учителя начальных классов показывает, что в современных образовательных системах, не опирающихся прямо на деятельностный подход в обучении, весьма высокие требования, предъявляемые к учителю (в том числе в области психологической компетентности); это и его умение организовывать эффективное взаимодействие со взрослыми и между учащимися, и включение иных социальных институтов; ориентация на развитие учащихся в ходе обучения и его индивидуализации с учетом учебных особенностей школьников — закреплены нормативно и измеряются в процессе сертификации и аттестации учителя [15; 16]. Эти требования необходимо учитывать в процессе реализации программ подготовки учителя для начальной школы, что невозможно без принципиальной перестройки педагогического образования. Определенные попытки повышения психологической составляющей профессиональной подготовки студентов в деятельностном залоге в настоящее время предпринимаются и в некоторых вузах России [4].

Перестройка системы профессиональной подготовки учителей начальной школы может быть, по нашему мнению, осуществлена при переходе к Федеральному государственному стандарту высшего психологического образования 3-го поколения (ФГОС ВПО). В Московском государственном психолого-педагогическом университете разработан проект такого стандарта в рамках направления «психолого-педагогическое образование» (050400). Главной целью обучения студентов по соответствующим профилям («Психология и педагогика дошкольного образования», «Психология и педагогика начального образования», «Психология и социальная педагогика», «Психология образования») является формирование у будущих специалистов таких знаний и общих для этих видов профессиональной деятельности компетенций, которые позволят им вне зависимости от конкретных профессиональных задач организовывать и осуществлять процессы воспитания и обучения по типу игровой, учебной и учебно-исследовательской деятельности учащихся [13].

Конкретные виды деятельности взрослых и детей или самих детей становятся условием развития учащихся, а формирование требуемых компетенций — результатом их возрастных достижений, неразрывно связанных с ведущей для данного возраста деятельностью. Реализация деятельностного подхода в образовании как базовой части в профессиональном цикле ФГОС ВПО по направлению «Психолого-педагогическое образование» является, таким образом, основанием модели подготовки специалистов указанных профилей, которые на практике в своих видах деятельности смогут на принципиально новом уровне ставить и решать профессиональные задачи, связанные с реализацией ФГОС общего (начального) образования.

Включение в направление «Психолого-педагогическое образование» профиля «Психология образования», основанного на общем с другими профилями базовом профессиональном цикле подготовки, позволит более эффективно решить проблемы взаимодействия психолога с воспитателями, учителями начальных классов, педагогами дополнительного образования и обеспечит возможность для реального, а не декларативного построения индивидуальных траекторий обучения учащихся, формирования их компетенций, необходимым условием чего является общий «профессиональный язык», т. е. одинаковое понимание организации в условиях учебно-воспитательного процесса индивидуальной и совместной деятельности учителя и самих учащихся.

Универсальное ядро общекультурных и базовых профессиональных компетенций (общее для всех профессий) создает возможность для «бакалавра» любого профиля психолого-педагогического направления продолжить свое обучение в магистратуре по другому профилю и быть подготовленным к профессиональной деятельности в смежной области. Так, например, «бакалавр» по профилю «Психология и педагогика начального образования», уже получив достаточно глубокую психолого-педагогическую подготовку, сможет продолжить свое обучение в ма-

гистратуре, где будет осваивать профессиональную деятельность психолога образования. Это справедливо и для образовательного маршрута «воспитатель-психолог».

Реализация таких сопряженных образовательных маршрутов позволит на практике осуществить подготовку педагогов, способных решать сложные профессиональные задачи организации, учебной, организационно-управленческой или научно-методической деятельности, ориентированных на развитие учащихся, построение их индивидуальных образовательных траекторий с учетом возрастных и личностных особенностей.

Реализация различных образовательных траекторий в пределах направления при переходе от бакалавриата к магистратуре в полной мере отвечает целевым установкам создания системы непрерывного образования в РФ.

Рассмотрим особенности психолого-педагогической подготовки учителей применительно к задачам формирования метапредметных компетенций учащихся начальной школы. Для решения этих задач **бакалавр** по направлению «Психолого-педагогическое образование» (050400) (профиль «Психология и педагогика начального образования») должен быть, в частности, готов организовать индивидуальную и совместную учебную деятельность учащихся, основанную на применении развивающих образовательных программ. Для этого в **модуле «Основы современного общего начального образования»** предусмотрены такие теоретические дисциплины, как «Современные отечественные и зарубежные дидактические и воспитательные системы начального образования» и «Теория учебной деятельности младших школьников», дающие различные образцы развивающего образования. В модуле **«Теория и практика психолого-педагогической деятельности учителя»** студенты будут осваивать такие дисциплины, «Учебное сотрудничество и социальное взаимодействие в современном образовании (с практикумом по педагогическому общению)» и «Развитие личностных качеств и формирование универсальных учебных действий младших школьников (с практикумом по анализу учебных ситуаций)». Это позволит им усилить свою способность понимать развивающее содержание современного учебного процесса. Наконец, в модуле «Теоретические и технологические основы организации учебно-воспитательного процесса в начальной школе» студенты будут осваивать методику преподавания отдельных школьных предметов, причем до 40 % аудиторного времени планируется посвятить сценированию уроков. Предполагается участие студентов и в деловых играх, диагностическом обследовании учащихся, направленных на определение уровня сформированности метапредметных компетенций.

В обучении **магистров** центр тяжести профессиональной подготовки переносится на овладение проектной и исследовательской деятельности в системе образования. В соответствии с этим для них **в базовой общепрофессиональной части** запланированы такие теоретические дисциплины, как «Методология и методы организации научного исследования в образовании» и «Проектирование и экспертиза образовательных систем». В **модуле «Проектно-аналитические основы деятельности современного учителя начальных классов» студенты должны осваивать такие дисциплины, как** «Проектирование и модернизация современных технологий обучения и методов воспитания младших школьников», «Проектирование контрольно-измерительных инструментов диагностики и мониторинг качества учебно-воспитательного процесса», «Перспективы и риски профессионального становления учителя».

Не отрицая важности лекционных форм преподавания в высшей школе, хотим отметить, что обучение будущих магистров должно по преимуществу строиться в форме их участия в проектных и аналитических семинарах, в реальных исследовательских проектах. Это им позволит овладеть таким компетенциями как способность проектировать и осуществлять диагностическую работу, необходимую в их профессиональной деятельности, владение современными технологиями проектирования и организации научного исследования в своей деятельности на основе комплексного подхода к решению проблем профессиональной деятельности, умение анализировать и прогнозировать риски образовательной среды, планировать комплексные мероприятия по их предупреждению и преодолению.

Особо необходимо остановиться на формировании исследовательских компетенций. Обучение будущего учителя проведению исследований заключается не только и не столько в том, чтобы подготовить его к самостоятельной научной деятельности, сколько в том, чтобы встроить возможность проведения необходимых изысканий в собственную педагогическую работу и своего педагогического коллектива. Индивидуализация обучения, построение индивидуальных траекторий обучения и развития учащегося, организация полноценного учебного диалога невозможны в рамках обучения, построенного даже по типу учебной деятельности, если она остается монологичной. Определение индивидуальных особенностей учащихся в работе с учебным предметом и превращение учебной деятельности в деятельность коллективно-распределенную является необходимым условием учета реальности разнообразия учащихся, особенностей их мышления и коммуникации. Учитель, способный к проведению таких фокусных мини-исследований в ходе педагогической деятельности, овладевший научным методом ее построения, приобретает квалификацию *учителя-исследователя* или, иными словами, *учителя как рефлексивного практика*.

Заключение

Подготовка учителя начальных классов для новой школы рассматривалась нами в контексте двух основных изменений. Во-первых, в связи с введением нового

ФГОС общего (начального) образования (Стандарт). Во-вторых, в связи с введением нового ФГОС высшего профессионального образования по направлению «Психолого-педагогическое образование» (профиль «Психология и педагогика начального образования»).

Необходимо также отметить, что содержание такой подготовки, задаваемое стандартом ВПО, предполагает тесную связь образовательных программ разных профилей, в частности профилей «Психология образования» и «Психология и педагогика начального образования», поскольку они основывались на общих для них (равно как и для остальных профилей этого направления) профессиональных задачах и соответствующих им общепрофессиональных компетенциях. Это существенное отличие от прежних стандартов высшего профессионального образования [1; 2; 3].

Базовое инвариантное (общепрофессиональное) ядро построено на деятельностном психологическом содержании, что позволяет принципиально иначе, чем это было принято ранее, решить вопрос о психологической подготовке будущих учителей начальных классов, не только вооружая их некоторыми психологическими знаниями, но, по сути, организовав их подготовку как «*психопедагога*», владеющего психологическими технологиями, ориентированными на развитие учащегося в процессе учебной деятельности. Это соответствует идеям «нашей новой школы» [10].

Мы отдаем себе отчет, что такая форма обучения студентов требует создания базового центра психолого-педагогического образования, имеющего в своем составе реально действующие исследовательские и методические службы, нацеленные на научно-практическое обеспечение внедрения новых стандартов в практику образования. Именно в таком центре будущие педагоги должны проходить производственную и исследовательскую практики.

Литература

1. Государственный образовательный стандарт высшего профессионального образования. Специальность «Педагогика и методика начального образования», 1995 г.

2. Государственный образовательный стандарт высшего профессионального образования. Специальность «Педагогика и методика начального образования», 2000 г.

3. Государственный образовательный стандарт высшего профессионального образования. Специальность «Педагогика и методика начального образования», 2005 г.

4. *Гуружапов В. А.* Проблема развития профессиональных компетенций будущих специалистов // Психологическая наука и образование. 2008. № 2.

5. *Давыдов В. В.* Концепция гуманизации российского начального образования (необходимость и возможность создания целостной системы развивающего начального образования) // Вестник развивающего образования. 2000. № 7.

6. Концепция российского начального образования (система Д. Б. Эльконина—В. В. Давыдова). М., 2000.

7. *Маро М. И., Волкова С. И., Степанова С. В.* Математика. 1 класс. Учебник для общеобразовательных школ. Часть 1. М., 2009.

8. *Марголис А. А., Рубцов В. В.* Учитель для новой школы: модернизация педагогического образования в России // Образовательная политика. 2010. № 4 (42).

9. *Марголис А. А., Рубцов В. В.* Психолого-педагогическая подготовка учителя для новой школы / Образовательная политика. 2010. № 5—6 (43—44).

10. Национальная инициатива «Наша новая школа». МОН РФ. М., 2010.

11. Примерная основная образовательная программа образовательного учреждения. Начальная школа. МОН РФ. М., 2010.

12. *Рубцов В. В.* Социально-генетическая психология развивающего образования. М., 2008.

13. ФГОС ВПО по направлению «Психолого-педагогическое образование» (050400). МОН РФ. М., 2010.

14. Федеральный образовательный стандарт общего (начального) образования. МОН РФ. М., 2009.

15. Elementary Education Standards and Supporting Explanation // International Association for Childhood Education, 2007.

16. Middle Childhood Generalist Standards, 2001 // National Board for Professional Teaching Standards. Washington, 2001.

On the Activity Content of Psycho-Pedagogical Training of the Modern Teacher for the New School*

V. V. Rubtsov

Doctor of Psychological Sciences, Professor, Academician, Russian Academy of Education,
Rector of the Moscow State University of Psychology and Education

A. A. Margolis

Ph. D., First Vice-Rector of the Moscow State University of Psychology and Education, Professor,
Educational Psychology Chair, Department of Psychology of Education, International Cultural-Historical
Psychology Chair, Moscow State University of Psychology and Education

V. A. Guruzhapov

Ph. D. in Psychology, Professor, Head of the Educational Psychology Chair, Moscow State University
of Psychology and Education

The article describes the issues of the professional training of teachers for primary schools in the context of the introduction of the new FSES for the general primary education, the second generation (Standard). It is shown that the preparation of a new elementary school teacher who is able to implement the new Standard includes: the new content of preparation, new content and organization of the educational process for students, new forms of institutionalization of the training programs, creation of a general center for psycho-pedagogical education. Special attention was devoted to formation of meta-subjected competencies of primary school students. Examples of disciplines that provide training for future teachers of FSES HPE, the third generation (from the framework of «Psycho-pedagogical education» (050400)) are given.

Keywords: educational activity, standard of general primary education, activity approach, primary school, teacher, development of competencies of students, professional development of teachers.

References

1. Gosudarstvennyi obrazovatel'nyi standart vysshego professional'nogo obrazovaniya. Special'nost' «Pedagogika i metodika nachal'nogo obrazovaniya», 1995 g.

2. Gosudarstvennyi obrazovatel'nyi standart vysshego professional'nogo obrazovaniya. Special'nost' «Pedagogika i metodika nachal'nogo obrazovaniya», 2000 g.

3. Gosudarstvennyi obrazovatel'nyi standart vysshego professional'nogo obrazovaniya. Special'nost' «Pedagogika i metodika nachal'nogo obrazovaniya», 2005 g.

4. *Guruzhapov V. A.* Problema razvitiya professional'nyh kompetencii budushih specialistov // Psihologicheskaya nauka i obrazovanie. 2008. № 2.

5. *Davydov V. V.* Koncepciya gumanizacii rossiiskogo nachal'nogo obrazovaniya (neobhodimost' i vozmozhnost' sozdaniya celostnoi sistemy razvivayushego nachal'nogo obrazovaniya) // Vestnik. № 7. 2000.

6. Koncepciya rossiiskogo nachal'nogo obrazovaniya (sistema D. B. El'konina—V. V. Davydova). M., 2000 g.

7. *Maro M. I., Volkova S. I, Stepanova S. V.* Matematika. 1 klass. Uchebnik dlya obsheobrazovatel'nyh shkol. Chast' 1. M., 2009.

8. *Margolis A. A., Rubcov V. V.* Uchitel' dlya novoi shkoly: modernizaciya pedagogicheskogo obrazovaniya v Rossii // Obrazovatel'naya politika. 2010. № 4 (42).

9. *Margolis A. A., Rubcov V. V.* Psihologo-pedagogicheskaya podgotovka uchitelya dlya novoi shkoly / Obrazovatel'naya politika. 2010, № 5—6 (43—44).

10. Nacional'naya iniciativa «Nasha novaya shkola», MON RF, 2010.

11. Primernaya osnovnaya obrazovatel'naya programma obrazovatel'nogo uchrezhdeniya. Nachal'naya shkola. MON RF, M., 2010.

12. *Rubcov V. V.* Social'no-geneticheskaya psihologiya razvivayushego obrazovaniya. M, 2008.

13. FGOS VPO po napravleniyu «Psihologo-pedagogicheskoe obrazovanie» (050400) MON RF, M., 2010.

14. Federal'nyi obrazovatel'nyi standart obshego (nachal'nogo) obrazovaniya, MON RF, 2009.

15. Elementary Education Standards and Supporting Explanation // International Association for Childhood Education, 2007.

16. Middle Childhood Generalist Standards, 2001 // National Board for Professional Teaching Standards. Washington, 2001.

The Vigesimal Numeral System: Another Logic for Constructing and Using Amounts in the Maya Culture's Community Practices

Miriam Moramay Micalco Méndez
Ph.D. candidate, Center for Basic Research, Politecnic Institute Of Mexico, Master

This study is situated in the Maya region of the state of Chiapas, in southern Mexico. The schools in the region do not take into account the numerical knowledge that students acquire in their community. Children arrive at school with mathematical skills based on the vigesimal numeral system. This ethnographic study attempts to discover the logic of the vigesimal numeral system in community practices, including buying and selling at the public market, planting and harvesting corn and coffee, and producing embroidered items. The historical and cultural perspective [22] is a basic reference for analysis in the study. While some studies focus on mathematical procedures within cultures [21; 5; 18; 7], and others center on the Maya culture's written expression [19; 12; 1; 11], no previous studies have looked at mathematical knowledge based on oral elements. The results of analysis show that the vigesimal numeral system has a specific logic that is evident in various aspects, such as the construction of names of amounts, commercial transactions, and the women's calculations for embroidery work. A unique aspect of this logic is the relation the Maya people make between the human body and their names for numbers. Also unique in the Maya's use of the vigesimal numeral system is the way they construct phrases while buying and selling products in the market: they use both languages and two different numeral systems to construct a single phrase.

Keywords: Numeral system; community practices; culture; oral.

Introduction

This research was completed in the context of a specific culture: the Maya-Tseltal culture in the state of Chiapas, Mexico. The communities participating in the study are located in the municipalities of Chilon and Ocosingo.

In Western culture, mathematics have been associated generally with abstract aspects. There are some beliefs in some communities in Mexico relative to the people constructed the bases of mathematics, including numeral systems, during their free time.

If we review the history of mathematics, however, we discover that cultures' use of numbers and their construction of the numeral system have been based on human needs. For example, the Greek culture had spatial concerns related to the polis that led to the precise development of geometry.

The intent of this study is not to address the cultural origins of numbers, but to emphasize the importance of considering the aspects of culture and context that influence numerical concepts in the Maya culture and its communities.

The study is based on ethnographic theory [15]. The analyses presented below are a result of fieldwork carried out in 2007 and 2008 with young people, adults, and elders in Tzeltal communities. Some data are from taped interviews and other data are part of field notes logs.

Statement of problem

Schools show similar situations when teaching numbers and the Spanish language versus the native language. They do not take into account the numerical knowledge that children have learned in their native culture (counting, and the names of numbers), and begin to teach them the decimal system. For example, schools do not consider that children from the Tseltal culture use a vigesimal numeral system.

The lack of integration between Maya students' previous mathematical knowledge and the strategies implemented in the mathematics classroom may be one of the causes for student difficulties. Therefore, we decided to focus this research on the knowledge and current use of the vigesimal numeral system in the Maya culture.

We started with the premise that mathematical knowledge is a cultural and historical construction, in addition to an issue of social equality [3]. Through

mathematics, children develop skills that contribute to the quality of life in diverse settings. All of Mexico's youth should have equal access to the opportunity to learn these skills. Saxe reflects the concerns that provide the basis for this study:

«One problem across studies of schooling in traditional cultures is that researchers have not typically investigated the role of knowledge forms indigenous to children's culture in guiding children's interaction with the novel school curriculum. This neglect has been manifest in a disregard for the characteristics of indigenous cognitive forms, the use of dependent measures developed outside the settings of the group under study, and failure to consider the possible interplay between indigenous knowledge forms and Western school concepts in discussing the character of school effects» [17, p. 503—504].

Taking the above into account, we can infer the need to study the use of the vigesimal numeral system in the daily practices of Indian communities.

Historical and Cultural Context

During the construction of Mexico as a modern nation, the voice of the native peoples (Indians) has been excluded. The nation's social structure has been developed by mestizos, the mixed-race descendants of the Spanish and Indians. In 1521, the Spanish conquest decimated the native population. Three centuries later, Mexico declared its independence. In this process, the voice of the native peoples was not included [](Hernandez, 1998). At the present time, 12 % of the population (112 million inhabitants) can be classified as native people. In the indigenous communities, the public schools have implemented educational models with a Spanish-speaking focus, aimed at having Indians assimilate into the mestizo «civilization». These models generally attach more value to Western culture than to native culture.

The state of Chiapas is located in southeastern Mexico. Of a population of three million, 34 % is indigenous and mostly Maya. 17,8 % of the state's population lives in extreme poverty. Chiapas is one the nation's wealthiest states, however, in natural resources: jungles, forests, beaches, waterfalls, lagoons, and rivers. In the educational sphere, Chiapas has the lowest indexes of educational quality in Mexico (high dropout rates, high failure rates, and high absentee rates). Of the population between ages six and fourteen, 26,94 % speak an indigenous language. The number of incomplete indigenous schools (schools that have only a few grades of basic elementary education) is 863 out of a total of 2452, or 35,20 % [8]. Of the thirteen Maya groups, the five largest are Tseltal, Totsil, Tojolabal, Ch'ol, and Mam. They live in the mountain and jungle regions of Chiapas. The Tseltal occupy primarily the border zone between the mountains and jungle, and most of them live in the topical canyons; they represent 10 % of the state's total population, with 392,000 inhabitants. Their principal source of work is growing coffee, corn, beans, sheep, and goats, and producing honey and handicrafts (De Vos,

2008). The cultural references of the Tseltal groups are linked to a cosmic view based on contact with nature. The oldest expression of these references is the book of *Popol Vuh*.

The community organization consists of elected authorities. Some positions, like teaching, involve service. Teachers are called *nopteswanej* in the Mayan language, literally «he who helps in learning». The elders are recognized as sources of wisdom and are known as «principals». They participate mainly in religious rituals and work to restore community harmony in situations of conflict [13].

Logic of constructing numbers in the maya-tseltal community

Geertz quoted Max Weber's image of humanity as «animals suspended in nets of meaning that they have woven themselves». He added, «I believe that those nets are culture» [6, p. 118].

In this sense, we have discovered that mathematical constructions are related to daily life, in a framework of culture as well as context. Context is defined by Michael Cole [6] as «that which interlinks»; context is also understood as «the connected whole that gives coherence to its parts». In the paragraphs below, we shall attempt to present the specific aspects of numbers in Maya community practices as related to the whole of Maya culture.

In the past, the Maya's primary interest was time [11]. Their numerical construction was linked to the period or date for planting, harvesting, or selling; to religious rituals; and to astronomical observation. The manuscript that describes these interests is the Dresden Codex, one of the few codices saved from burning during the Spanish conquest [12].

A characteristic of the Maya's numeral system is that two numbers are fundamental in mathematical constructions: 20 and 13. Each number has a specific function. Both relate to the human body and represent its totality: 20 is the number of a person's fingers and toes, and 13 is the total number of primary articulations. These numbers are the basis of a wide variety of aspects within Maya culture.

The Number 20

The number 20 represents a man who has ten fingers and ten toes, as explained by a community elder:

«Because those are the old customs of our ancestors. Because they did not know how to count in Spanish. They didn't have a school and they were used to talking in Tseltal. But they thought through their hearts and they began to count the numbers 1, 2, 3, 4, 5... on their fingers, but in Tseltal. Not only with their fingers, but also with their toes: *jun, cheb, oxeb, chaneb, vo'eb* until reaching the number 20, which is *jun winik (tab)* in Tseltal. That's how they counted».

The Number 13

The number 13 represents the number of primary articulations in the human body: shoulders (2), elbows (2), wrists (2), hips (2), knees (2), ankles (2), and neck (1).

The following account shows the way 13 is used in various dimensions of daily life:

«On one occasion, one of the teachers arrived in the community with an eye problem. It was swollen and red, with an infection, and the teacher called it a "sty". Then the lady of the house where the teacher was staying told him: "To get rid of your sickness, you take 13 kernels of corn to rub on your eyes where you have the inflammation (sty), one after another". The teacher asked her, «How many times do I rub each kernel on my eye? 13 times. He did it like that and he was cured»».

Home remedies are prescribed in periods of 13 days.

The Numbers 20 and 13

The combination of the two amounts, 20 and 13, is the origin of the prophetic calendar known as Tzolkin (20 × 13 = 260), meaning 260 days [1; 11; 12].

The combined prophetic cycle was obtained by multiplying 20 x 13. The number 20 corresponded to the designated gods according to the particular characteristics of the days [11]. In addition, the number 20 refers to the human body's total of 20 fingers and toes [10]. The number 13 was a number or figure that some believe to be only a number [11]; based on the data collected from today's Tzeltal communities, we know that it corresponds to the number of primary joints in the human body. Thus we can appreciate the Maya's references to the human body for constructing amounts and designating cycles.

Naming Amounts in Tseltal

The reference to the human body is fundamental for naming amounts in Maya-Tseltal. The basic unit considers a man's fingers and toes: 20. The name of the number 20 is *jun winik*, which means one man. As mentioned above, the Maya elders' stories tell the way their ancestors counted with their fingers. This observation defined 20 as the basis of their numeral system.

Naming amounts follows a corporal logic of complete men (groups of 20) implied by a given amount, called prospective [1]. Amounts are named by saying the units that remain after having identified the number of complete men. Thus we say that numbers are based on the last «fingers and toes» or units that remain after considering complete men. The remaining fingers and toes are mentioned and then the name of the man to which they belong — the man following the previous complete man.

For example, to say the number 46, first the number 6 is pronounced and then the number 60 (*wakeb oxwinik*). Why is 6 (*wakeb*) related to the number sixty (*oxwinik*)? The logic is as follows: The number 46 contains two complete groups of 20 (complete men) who total 40. The six remaining units do not pertain to either of the first two groups of 20, but to the third group of 20 (third complete man) — the number 60. In summary, the remaining units are named once the number of complete men has been identified, followed by the name of the man to which the remaining units pertain.

To name a larger amount, calculations identify the number of complete men in the amount, plus the remainder, as shown by the following dialogue with a young man:

Researcher: Yes, that's it. Now, for example, this number: 199. How would you say it?

H: 199 would be...... (10 seconds) *balun... balunlajuneb lajunwinik... lajunwinik.*

Researcher: How do you know? How do you do it to know it is *balunlajuneb lajunwinik*?

H: It would be 19 units of the tenth man.

Researcher: Oh, I see.

H: It's almost, almost ten men. One unit is missing to get to ten men.

Researcher: What do you think about first when you see this number?

H: What do I think about first? Fast I go 20 by 20 because ten men would be 200, and 199 would be *balunlajuneb lajunwinik. Balunlajuneb lajunwinik.*

In this case, the young man first relates the amount, 199, to the closest number of complete men, which is 200, realizing that 10 complete men (10 men with 20 fingers and toes) is equal to 200 fingers and toes.

Following our Western logic, we can state that 9 groups of 20 (180 units) fit in 199, and that 199 minus 180 gives us 19 units, and that these 19 units belong to the tenth man. Therefore, the name must be 19 (balunlajuneb) of the tenth man (lajunwinik). In Tseltal, one would say *balunlajuneb lajunwinik*.

Logic of daily use of numbers in the maya-tseltal community

Units of Measurement of the Maya-Tseltal Culture

In some cases, the measurement used is well determined. For example, in planting and harvesting corn, *zonte* establishes the number corresponding to 200 ears of corn. The number of ears that fit in a bag is stipulated: «200 ears in a bag».

The following dialogue between the interviewer and a young man involves the corn harvest.

Researcher: When a man is going to pick corn, he gets 350 ears in a day. How many bags or nets will he need to take the ears home?

E: Two bags or two nets.

M: Why two bags or nets?

E: Because 200 ears fit in each bag, and there is still room for 50 more.

The participant used his previous cultural knowledge (a bag has 200 ears), in relation to the base 20 of the vigesimal numeral system [17] as well as base 10.

Indications of the relation between the proposed arithmetic problem and the vigesimal numeral system can be seen in the above example. The student searches for a balance between the total and the number of parts with a culturally defined unit [7]. Amounts are grouped around 200, which is a multiple of 20. The young man knows the number of ears that fit in a bag, and compares that unit with the total ears picked. He finds not only the result — two bags — but also the amount that can still fit (50) in the two bags (400).

Ways of Counting Based on Embroidery Experience

Another way that community practices relate to numbers is manifest in the Maya's description of completing a task (with implied adjustments in proportion) as «working with the heart». Embroiderers use this expression to explain how they embroider small items instead of large items like blouses. They are referring specifically to the size of the embroidered figures.

In this section, we shall attempt to understand this relationship by asking the following questions: What does «working with the heart» mean for the Maya? What is the heart's place in the Maya culture? What are the implications of describing an imminently numerical task as «working with the heart»? What are the implied concepts and forms of perception? How does this form of relation refer to a unique way of using mathematics?

Embroiderers work with garments (mainly blouses), household items (mats), and items for carrying objects (bags). They sew and embroider items of various sizes. In the case of blouses, they produce more large blouses for women than small blouses for girls. If we ask the embroiderers how they calculate the size of the embroidered figure on a girl's blouse, they answer that they «work from the heart». The same reply is used to explain how they calculate a smaller mat than usual. Producing a smaller figure based on a larger figure is a topic of proportions.

In Western mathematics, a proportion is equality between two ratios, such as: $a/b = c/d$ For example, $2/5 = 4/10$, indicating that the two amounts that are related on an object can be represented on another object in lesser or greater amounts, provided the ratio between the two is respected [14].

Using Western mathematics, we can establish that proportions are a fundamental topic for defining the relation between a large and small blouse. However, rather than indicating a direct numeric activity, the embroiderers' expressions have to do with a fundamental aspect of the Maya's cosmic vision: the heart.

The Maya's cosmic vision associates the mind and the heart. For example, the statement is made that «the mind is the head of the heart». For example, «If someone is forgetful, his heart does not take care of things. Whatever your eyes see, goes does to your heart and then rises to your thinking. Your heart is like a treasure chest and it takes care of everything you see» [9].

Thoughts are in your head. «Let's think with the heart's head». Thinking is the heart's head. «What we see goes to our heart, and from there to our head, because the heart is the mother of our blood, and then it passes through the air» [9].

The heart in the Maya's cosmic vision «keeps all wisdom and is the seat of the memory and knowledge. Through the heart, perception occurs, and emotions are an aid for mental processes, as well as for the body's functions».

If we turn to Vygotsky's historical and cultural focus in psychology, which states that knowledge is constructed through socialization with adults from a determined culture upon carrying out shared social activities, we discover that the concept of activity is crucial. From the viewpoint of cultural psychology, activity has its own meaning. Activity is not a type of action, but is *social, practical, and shared.* This concept contains symbolic exchange and the use of cultural tools for mediation. In such activity, therefore, adults and non-adults, and expert and novice individuals meet. Meaning is created in activity, and practical, emotional, relational, and cognitive aspects are integrated.

The embroiderers, for example, carry out a joint activity that employs cultural constructs whose meanings are shared by the community's members. The meaning under study refers not only to the heart as a physical organ or to the heart's symbolic aspect in emotions, but also to the rational aspect of the heart: the heart's function in realizing numerical operations.

At the market, buying and selling are joint activities that are practical and specific. They employ a mixture of languages and numerical references that show that culture is a dynamic construct that is transformed by shared activities.

Bruner suggests that «The most general implication is that a culture is constantly re-created by being interpreted and renegotiated by its members». According to this perspective, culture is a place for negotiating and renegotiating meanings and explaining action, like a set of rules or specifications for action [4, p. 128].

We shall see how the names of numbers for products and money are used in market transactions in the Tzeltal region:

Ways of Buying and Selling: Two Languages and Two Numeral Systems in a Single Phrase

Sometimes the Tzeltal use numbers in both languages — Tseltal and Spanish — to say the price of a product and the amount of product that corresponds to that price. The amount of the product is stated in Tseltal and the price is stated in Spanish. The amounts in Tseltal use the vigesimal numeral system, while the amounts in Spanish use the decimal numeral system.

Two amounts, in two languages, can be used in a single phrase to refer to two numeral systems. For example, *chaneb plátano ta cinco pesos*, means that four

bananas cost five pesos. We may wonder about the cultural implications of using numbers in this manner. The amount said in Spanish, in the decimal numeral system, is tied to a specific magnitude: money. Money is associated with the Mexican monetary system, based on the decimal numeral system: bills and coins and a unit of one peso. A monetary system is the basis for defining the type of objects represented by money and value. The Tseltal use the monetary system stipulated by the government of the country where they live: Mexico.

When the Tseltal use Spanish to refer to the price, they are using the monetary system stipulated by the nation's «dominant» culture. This monetary system's influence is shown by the use of the number in Spanish to specify the amount of money. This influence, however, does not affect the amounts of products bought or sold (*chaneb plátano*), which are named in Tseltal in relation to the vigesimal numeral system. Thus we can confirm a limit on the influence of the decimal numeral system in the Maya culture, which continues using the

Tseltal language for counting objects unrelated to money.

Conclusions

The logic of construction and the use of numbers in the Tzeltal community revolve around multiples of 20 and 13. Particularly in daily practices, the number 20 is the base for constructing measures through the solution of everyday problems. We discovered that the use of numbers is related to specific aspects of the Maya's cosmic vision that would appear to be separate from numbers; research on the origins and use of certain expressions revealed numerical topics like proportion. Lastly, we found that the uses of numbers combine with numerical knowledge from the outside culture: some phrases feature two languages and two numeral systems. The diversity of usage shows the dynamism of this culture, conceived as a changing pattern of networks of meaning that are updated by community practices.

References

1. *Barriga F.* La numerologia maya. Tesis doctoral. Instituto Nacional de Antropologia e Historia. México, 2006.

2. *Bishop A.* Mathematics education and culture // Educational Studies in Mathematics, Vol. 19. 2. 1988.

3. *Bishop A.* Enculturación matemática. La educación matemática desde una perspectiva cultural. Barcelona, 1999.

4. *Bruner J.* Realidad mental y mundos posibles. Barcelona, 1988.

5. *Cole M.* La zona de desarrollo próximo: donde cultura y conocimiento se generan mutuamente // En Infancia y Aprendizaje. Vol. 25. Madrid, 1984.

6. *Cole M.* Psicologia Cultural. Madrid, 1999.

7. *D'Ambrosio U.* Ethnomathematics and its place in the history and pedagogy of mathematics // For the Learning of Mathematics, Vol. 5. 1. 1985.

8. *De Vos J.* Nuestra raíz. México, 2003.

9. *Guiteras C.* «Los peligros del alma. Visión del mundo de un tzotzil». Fondo de cultura económica. México, 1965.

10. *Hernández N.* Más allá de los 500 años, en In tlahtoli, in ohtli. La palabra, el camino. Memoria y destino de los pueblos indígenas, México: Plaza y Valdés, 1998.

11. *Ifrah G.* Histoire Universelle de Chiffres. Paris, 1985.

12. *López Austin A.* Dioses del norte, Dioses del sur. México, 2008.

13. *Mankiewicz R.* Historia de las matemáticas. Barcelona, 2005.

14. *Maurer E.* Los Tseltales. México, 1987.

15. *Norena F.* Matemáticas de Emergencias. México, 1999.

16. *Rockwell E.* Reflexiones sobre el proceso etnográfico (1982—1985). México, 1987.

17. *Saxe G. B., Posner B.* The Development of numerical cognition: cross-cultural perspectives / En H.P. Ginsburg, The Development of Mathematical Thinking. Rochester, N. Y., 1983.

18. *Saxe G. B.* Effects of schooling on arithmetical understadings: Studies with Oksapmin Children in Papua New Guinea // Journal of Educational Psychology. Vol. 77, 5, 1985.

19. *Thompson E.* Grandeur et décadance de la civilisation maya. Paris, Payot. 1985. Ed. Americaine: Norman-University of Oklahoma Press, 1954.

20. *Toñda J.* Los señores del cero. México, 1996.

21. *Vygotski L. S.* El desarrollo de los procesos psicológicos superiores. Barcelona, 1989.

22. *Vygotski L. S.* Thought and Language. Barcelona, 1995.

Двадцатеричная система счисления:
Другая логика для построения и использования величин в общественных практиках культуры Майя

М. М. Микалко

аспирант Центра фундаментальных исследований Политехнического института г. Мехико, магистр

Это исследование проводится в регионе Майя в штате Чьяпас на юге Мексики. Школы в данном регионе не принимают во внимание численные знания, которые студенты приобретают в своей общине. Дети приходят в школу с математическими навыками, основанными на двадцатеричной системе счисления. Данное этнографическое исследование стремится раскрыть логику двадцатеричной системы счисления в общественных практиках, в таких как покупка и продажа на общественном рынке, посадка и уборка урожая кукурузы и кофе, производство предметов с вышивкой. Исторический и культурный подход [22] является основным при осуществлении анализа в исследовании. Хотя некоторые исследования посвящены математическим процедурам в различных культурах [21; 5; 18; 7], а другие фокусируются на письме в культуре Майя [19; 12; 1; 11], но математические знания на основе устных элементов ранее не рассматривались. Результаты анализа показывают, что двадцатеричная система счисления имеет специальную логику, которая проявляется в различных аспектах, таких как конструирование названий величин, коммерческих операциях и в расчетах женщин для работ по вышиванию. Уникальной особенностью этой логики являются соотношения, которые майя производят между телом человека и названиями чисел. Также уникальным в использовании майя двадцатеричной системы счисления является способ, которым они строят фразы при покупке и продаже товаров на рынке: они используют оба языка и две различные системы счисления при построении одной фразы.

Ключевые слова: система счисления, общественные практики, культура, оральный.

Cultural-historical methodology of the study of human development in transitions

Pentti Hakkarainen

Ph.D., Professor, Department of Education, Oulu University (University Consortia of Kajaani)

Many methodological ideas of Vygotsky's cultural-historical psychology still are hypothetical and require further elaboration and empirical evidence. Such theoretical concepts as social situation of development, crisis and latent period, neoformation, psychological age, the zone of proximal development etc. are involved in transitions. But the mechanism of transition still needs specifying. In our intervention study we have focused on the transition from play to learning activity. We introduce the concept of transitory activity system, which is specified in our study as a hybrid activity of play and learning. We have named this hybrid activity «narrative learning» following the ideas of Donald and Bruner. The second level of research is comprised from a series of playworld projects in vertically integrated multiage classrooms (4—8 years olds). Adult interventions consist of inviting children to imaginative environment, presenting role characters and their relations, introducing challenging problems, organizing children's dialogues and providing opportunities for child-initiated play.

Keywords: cultural-historical methodology, genetic experiment, developmental transition, transitory activity system, neoformation, narrative learning, narrative intervention.

Introduction

Cultural-historical psychology (Vygotsky-Luria-Leontiev) has inspired researcher in the west to elaborate a multidisciplinary approach called CHAT (Cultural-historical activity theory) or DWR (Developmental work research). Representatives of the modern western approach assign themselves «the third generation» and direct descendants of the founders. Cultural-historical psychology today tries to sketch what actually was the methodological revolution of «non-classic psychology». Methodological approach to human development is a joint challenge of psychological and multidisciplinary research on human development. Historical-philosophical analysis of the roots of activity concept shows that a deeper historical understanding of methodological ideas is necessary [1].

The necessity to develop a non-classic approach to human sciences different from natural sciences has been recognized long ago. In his essay on man Cassirer [4] claims referring to Greek classic philosophy that we cannot study human nature with the same methods as the nature of physical objects. Objects can be described using objective attributes, but human beings can be described and defined only in terms of their consciousness. Thus traditional methods of research cannot be used. The psychology of the beginning of 20th century tried to solve the problem by attempting to develop «objective methods» of studying consciousness. It is possible to understand another person in immediate interaction face to face. Human nature can be grasped in dialogue or by using dialectical thinking. Continuous cooperation between human subjects may lead to the truth because truth is the product of social actions. In living interaction a person recreates and defines himself as a personality.

In psychology and multi-disciplinary study of activity it is easy to adhere to any research tradition just by declaring certain methodological approach. But in fact concrete research methods do not always correspond declarations. In other words methods are in contradiction with the (only declared) methodology. Classical natural scientific approach has certain a priori assumptions, which are used in «non-classic» psychology or multidisciplinary activity research without noticing the contradiction with the methodological frame. The first assumption is that the object of the study exists independently of the researcher, is empirically given, possess immanent properties that can be experimentally revealed and the study does not change the object. The second is that an explanatory principle is adopted before the experiment and the experimental method exists in a ready-made form before the research begins. The third assumption is that the researcher is a detached observer [25].

Alternative methodological approaches like formative (projecting) method or developmental work research emphasize research as intervention. Formative experiments aim at anticipated results or products. Three types of analyses (present activity, dynamics of historical changes and «history of theories») result in

«developmental hypothesis» of the present activity system in developmental work research. The researcher introduces and elaborates in his interventions new tools or other elements of activity in cooperation with «the agents». Activity as the unit of development produces new culture [15]. Formative psychological experiments produce new higher mental functions. In both approaches the researcher is an active transformer of the subjects or activities pursuing his goals in cooperation with the subjects. A critical question often is «you can form it, but should you?» [25].

The concept of development has an essential role in the elaboration of an appropriate research methodology. Problems of Vygotsky's non — classic psychology lack the appropriate counter part (research methods should be appropriate to research problems). Experimental-genetic method is just a general proposal and not a concrete research method. There are some hints how to continue the elaboration of Vygotsky's methodological proposal. The unit of development has been an obstacle in all attempts to elaborate an appropriate methodological approach. In developmental work research the proposed unit is an activity system (or network of systems). But the apparent clarity hides complicated problems (e.g. the relation between individual and collective subjects, development of consciousness etc.) [26].

Vygotsky's unit of cultural development was «greater we» and El'konin's «child in society». These units are selected taking into consideration the development of consciousness and self. An example of «greater we» is a mother-child dyad, which both participants are developing. El'konin refers to other possible concrete units of cultural development in childhood. For example children's pretend role-play expands possible mutual relations and the amount of role positions of a child. Kravtsova [25] emphasizes duality of positions in play having in mind real life position and role position of play.

Genetic experiment in non-classic psychology has a different background compared to classic experimental or modern descriptive method. Experiment is not a proof of facts, but rather creative and dialogic search for developmental alternatives. Development represents significant self-development challenges for the researchers (teachers) because they are active participants of the unit of development. Self-development is based on the change of consciousness and reflection of the human unit of development. Joint developmental challenge (if the researcher/teacher accepts it) changes the goal setting of research because the results cannot be completely predefined and unexpected changes are possible. Goal setting may be limited to pitting ideal and real form against each other in the construction of activity environments.

Developmental transitions

El'konin [11] elaborated his stage model of human individual development using the concept of activity as the criterion. Thus each stage can be characterized by leading activity, which is intimately related to developmental neoformations. Transition from one stage to the next one is a real theoretical challenge in this model because participation in a new activity presupposes the change of needs and motivation. El'konin solved the challenge by dividing each stage into two functionally different periods: tools elaboration and motivational periods. But there are little concrete research on the problem how transition from one activity to another proceeds and how education can support transitions.

We can suppose that El'konin's stage model was an attempt to integrate Vygotsky's theoretical ideas about human development and Leontiev's [27] activity concept. Slobodcikov and Tsukerman [29] radically changed the stage model and rejected activity concept as the criterion of stages. They proposed five stages in individual development: 1. Animation, 2. Self-discovery, 3. Personalization, 4. Individuation, and 5. Universalization. Each stage is divided into two periods: interactive development and individual development. At the beginning of each stage a birth crisis is faced followed by acceptance phase. The period of individual development is as well divided into two phases: developmental crises and mastery phase. This model covers individual life from birth to old age and stages are quite long including two crisis phases each (birth of a new stage and developmental phase).

The new model takes another perspective compared to El'konin's model. The character and the content of the crisis phases are different. In the new model the first crisis of each stage is the crisis of a new community and social interaction in this community and the second crisis is more or less individual development crisis (crisis of self-development). This idea is in accordance with the general genetic law of development by Vygotsky. The content of crises is described as tension between different positions (individual vs. community/social environment). This may help to look for the roots of transitions, but research methods and educational approaches (interventions) have to be elaborated.

Transitory activity system

Stage models of human development characterize the general picture of transition: the change of activity type or social community, which are connected with crises. Continuity is stressed between stages, but there are few attempts to describe how previous stages prepare transition to the next ones. Vygotsky proposed the concept of neoformation, but he describes it in general terms. Davydov [5] analyzed in his book the importance of advanced role-play as a precondition of learning activity and presented a hypothesis how the need for theoretical understanding might appear in play activity. According to Davydov the child is able to act skillfully in imagined situations replacing real actions with symbolic ones, but sense making is restricted to the use of imagination. Play is lacking realistic content and mastery of daily life. Advanced mastery of imagination and symbolic function create the need for realistic mastery of the environment.

An unsolved problem of theoretical models is what really happens when the previous activity does not make sense any more and the new activity has not replaced the old one? Perhaps hybrid activities are needed at transitions having a mixture of elements of old and new activity systems? Leontiev [8] hinted at this when writing about first-graders having still play motives of school going (they are playing school). The term of «hybrid activity» has been spread last years to other contexts meaning a mixture of different activities and operators. E. g. Yamazumi [38] describes his «New School» activity network as «a hybrid after-school learning activity for children».

«Transitory activity system» may be a better concept for referring to transitions between stages of human development. It might be clearer to call horizontal development across existing activity systems «hybrid activity» [16] and vertical development across stages «transitory activity systems». The function of «a transitory activity system» is to support the move from one leading activity to another and overcome psychological crisis. «Transitory activity system» can be used as a tool of educational intervention in which new types of «perezhivanie», positions and motives can be «tested». We have elaborated and tested in school practice «transitory activity system» between play and school learning* in vertically integrated multi-age classrooms. We have called this «narrative learning» referring to psychological mechanism of learning rather than narratives as objects of learning. This mechanism is described in detail in Bruner's [4] analysis of modalities of learning.

«Narrative learning» as «transitory activity system» is composed of «playworlds» and realistic problems embedded in the story frames. Children are invited to imaginary situations of playworlds, but they meet problems, which cannot be solved by using narrative logic [17]. In play and stories a miracle happens and a complicated problem is solved without any information how the solution actually took place. In our learning environments children's help is asked because the story cannot go on before a realistic solution of the problem is found. Different types of problems from moral dilemmas to traditional learning tasks are intertwined with the storylines [20; 21].

Narrative learning as developmental intervention at transition

The unit of development is a serious challenge of cultural-historical psychology and education. As we know Vygotsky elaborated his approach to the problem of the unit of development starting from psychological functions and ending to personality. His main interest was human cultural development, but there were three stages in his research focus: 1) development of higher mental functions, 2) development of psychological systems, and 3) development of personality and sense-making structure as the core of consciousness [23].

The evolution of Vygotsky's methodological thinking was not always supported by appropriate research methods and evidence. For example «the method of double stimulation» corresponds with the first stage of his methodological development. Experimental situation of double stimulation still corresponds classical science. El'konin and Zinchenko [9] made an attempt to describe «non-classical» experimental situation aiming at cultural development of the child. They understand experimental situation as interaction between representatives of different «cultures», in which the drama between ideal and real forms can take place.

They argue that culture is not a «motor» or determinant of development, but rather an inviting power, which a subject may take or ignore. If he accepts the invitation «an event of development» may happen and in this case the subject adopts cultural ideal form of acting, which becomes the subject's real form of acting. In turn this real form is able to create new ideal forms. When a subject masters cultural mediators (also sense) his real form becomes ideal and cultural. These researchers call joint action or joint creativity «mediating actions», which are always accompanied by passion.

There are several methodological principles, which can be used as the guidelines for constructing methods and practices corresponding Vygotsky's lastly elaborated units of development. «Double-stimulation» situations are limited to problem solving tasks**, which do not correspond the child's «social situation of development» («greater we») or El'konin's «child in society» as holistic methodological principles. In our interventions instead of giving children problem solving tasks directly and providing neutral objects to be incorporated into the task a long-lasting playworld is created, which incorporates different types of realistic problem situations intertwined with the storylines.

The role of the adult is principally different in playworld interventions compared to classic experiments. We accept the conclusion presented by van der Veer and Valsiner «Hence the experimental setting becomes a context of investigation where the experimenter can manipulate its structure in order to trigger (but not 'produce') the subject's construction of new psychological phenomena» [30, p. 399]. Zinchenko formulates the same idea more metaphorically by stating that the child and the teacher should stand in the united front against the world and knowledge. «The teacher carrying out his role as a mediator in the true and noble sense of the term does not just teach, but rather reflects together with the pupil, in other words educates and develops» [37, p. 288].

Playworld [30] as the form of narrative learning (learning integrating affect and intellect in Vygotsky's

---

* It is not possible to talk about «learning activity» in the Finnish educational system in the same sense as El'konin-Davydov system uses the concept. Learning activity is not developed, but rather «school-going activity» [15].

** The same limitations can be identified in the elaboration of the concept of the zone of proximal development in school context. A more detailed analysis is given in [28].

methodology) and concrete tools of intervention is derived from two sources: imaginary situations as the basic element of play and aesthetic reaction as a tool of sense making. Adult participation as co-players and co-constructors of imaginary situations radically changes the approach to play guidance and eliminates adults' authority position. In a playworld the adult cannot decide if play events are correct or not, but he or she can propose next moves from his or her role position. Experimental setting and reflective interaction described above is possible in playworlds.

Narrative learning in playworld observes the mutuality and rules if play. Adults have to obey them and construct their playworld interventions following these principles. Experimenter's role here is flexible and requires creativity. We have described the principles in social pretend play as follows: «No single child can determine the flow of play alone. No child knows what happens next and at any point a wide range of new moves can be picked up. A participant cannot know how the others will interpret his turn and each turn gains its final meaning in others' reactions. A large number of next actions are possible and each one can result in going in a radically different direction. Ambiguities between potential meanings are not solved until the subsequent turn happens. In this sense play is a primary example of nonlinear process [20].

Psychological tools* of developmental transition

Cultural-historical psychology has emphasized the specific nature of human development as self-development. Education, teaching and adult interventions are not the cause of development, but the developing subject (individual or collective) actively constructs its development. In Vygotsky's conceptual repertoire psychological tools were the tools of self-development. Using these tools a subject can change its consciousness and personality. In our empirical work we have asked what psychological tools are needed for overcoming the crisis period, which Vygotsky called «the crisis of the seventh year» and what kind of educational interventions support the construction of these tools.

We have described the main three domains of the crisis in the curriculum guidelines document of developmental preschool education in vertically integrated groups (4—8 years) as follows [19]:

1. Development of volition
— Independent relation to phenomena irrespective of outside pressure
— Reflection on sense and meaning between willing and doing
— Selective revelation or hiding of own ideas (disappearance of immediacy of a small child)
2. Change of generalization

— Prolepsis in different situations
— Making choices based on internal position and carrying out internal actions
— Differentiating between internal and external worlds
3. Development of emotions and feelings
— Identification of oneself as the source of feelings
— Contradiction between intentions and deeds
— Emotional imagination and anticipation

How psychological tools are connected with these domains of crisis manifestations. Representatives of cultural-historical psychology have elaborated answers to this question, but in one domain each. El'konin family has emphasized sense-making orientation of play and ideal form of volition in heroes of tales and child play [8—12; 7; 13; 14]. Willingness and wish of helping others is a prominent attribute of characters of classical tales and stories. El'konin-Davydov system of developmental education is oriented to the formation of theoretical generalizations and thinking starting from the first grade [5, 6]. In this approach scientific explanation and prognosis is the appropriate form of prolepsis. Learning of emotional imagination and anticipation was one of the ideas in Zaporozhets' research program [36]. The real challenge is how domains can be combined and psychological «super» tools developed for overcoming the crisis as a whole.

Starting from the psychological content of the crisis of development («the crisis of the seventh year») we defined six most important goals of child development to be aimed at in education striving to support transition from play to school learning. These goals are [19]:

1. Ability of discerning and crossing the boundary between real and imagined.
2. Taking responsibility for one's own and joint activity.
3. Awakening children's need and motivation for changing himself.
4. Forming a personal relation to phenomena and other persons.
5. Reflection and sense making as the core of learning.
6. Understanding the role of flexibility and multiple points of view in learning.

We suppose that imaginary situations combined with realistic problems can serve as a psychological «super» tool of self-development of all participants. Learning environments are constructed using different narrative forms such as play-worlds, adventures, play-based instruction and problem solving. These environments are appropriate for four-year-olds as well as eight-year-old children, but the same environment mounts different challenges for different ages (e. g., reading and writing for a school child and drawing for a small one). Joint activities of the whole multi-age group are organized 70—80 % of the time and the rest of time is differentiated between the age groups.

---

* In the west the term "tools of mind" [1] has replaced Vygotsky's original term.

In the construction of play-worlds we have used the play pedagogy Gunilla Lindqvist [30] has developed in her work. In this approach a literary text (story, folk tale, or poem) is transformed into an imaginary play theme and environment with adults' active participation. The theme should be challenging and deal with essential problems of human life, the tale or story may be written for the adults as well as for children. They can create the dynamics of play world and provoke children to continue the theme in their free play and enrich them. A second approach is a play-based curriculum, which combines stories or adventures with subject matter related problem solving (e. g. mother tongue or math).

The theoretical elaboration of developmental curriculum resulted in the following didactic principles of constructing transitory activity systems:

1. Children are invited to enter jointly created imaginary situations based on tales, stories and children's fiction (ideal cultural forms) which serve as the basis of adult-child joint playworlds and child initiated pretend play.

2. Themes are carefully selected to reflect basic human values and dichotomies as well as coincide with educational needs of the classroom and individual children.

3. The theme is brought alive with adults' participation and emotional involvement (in roles, dramatizations, story telling etc.). Sense and significance of events and relations between characters has to be emphasized and made as clear as possible (without directly telling everything!).

4. Dramatic collisions of tales and stories raise children's questions and are starting points of joint reflection (Why Kai became mean after getting a piece of mirror in his eye? [Snow Queen]). Changing or adding dramatic events from other stories causes more collisions and helps in inventing dilemmas, which have to be solved realistically before the story can continue (Shipwreck stopped captain Hook's voyage and children are asked to help him building (planning) a new ship).

5. Creating environments and reserving time for child-initiated play is essential in the development of children's reflection on playworld events. Observation of child-initiated play reflecting playworld events offers valuable hints about new turns or further elaboration of joint playworld themes.

It is possible to claim that our playworld as transitory activity consisting of narrative learning is equivalent with Vygotsky's genetic experiment. An essential difference is the construction of new psychological tools instead of introducing auxiliary neutral objects to be used in problem solving. Also imaginary situations can be understood as cultural «super tools» of child development. There are other essential differences between Vygotsky's classic genetic experiment and transitory playworlds. Classic experiment consisted of one problem solving session, but playworlds often last several months. The experimenter is also a partial subject of development (adult-child joint fiction). The social situation is different — in the classic experiment the experimenter introduces the problem and regulates the progress of the experiment, but in playworlds adults are co-players of a group of children supporting children's creativity.

Types of psychological tools in playworlds

Playworld as such can be comprehended as psychological «super tool». Development «in terms of drama» can take place in playworlds. Basic human values and dual oppositions (good — bad, fair — unfair, pretty — ugly etc.) collide in playworld story lines and force each participant to reflect own relation toward opposite value positions. Such cultural tensions in playworlds forms a substratum for making sense of life phenomena. At the same time each child is forced to form a personal relation towards values. An example can be our playworld where children found a trunk, opened it and saw that the content was divided into two parts: a container with a text «seed of wisdom» and an open box full of sweets and diamonds (glass imitation). Children's collective, unanimous decision was that they take the container and do not touch the sweets. Only later some boys regretted «why did we not take some sweets».

Story structure of playworld organizes children's thinking and reflection. Memory processes transform our observations into story form and we remember «stories», not separate perceptions (perceptions would not make sense without this elaboration). Leontiev [29] offers an example of this. We see «a watch» and not separate hands, crystal and bezel. These conceptual wholes (like «a watch») are combined into story form by our memory. An excellent example in our opinion is students' failure to evoke children's dialogue after dramatized playworld episodes of «The snow queen». Their careful plan and «didactic» questions did not lead to children's verbal reflection, but the story form of child-initiated play was a genuine reflection of the episodes.

In all playworlds some kind of psychological tools was used in transitions from classroom to imaginary playworld. In classic tales and stories such symbolic divider of different worlds is the door. Inside the home a friendly atmosphere predominates, but outside the hero meets different challenges and hostile powers. In «Narnia — playworld» a cardboard box fixed to the doorframe marked the boundary between the classroom and playworld. The psychological function of these world-dividing tools was observed in the following episode. The playworld episode was organized in wintertime in the nearby forest (like in the original story). The children were ready to go out, but suddenly a boy realized «if we go out now we are not in «Narnia»». Children turned back from the entrance door went through the «Narnia cupboard» and then through the door to the forest to be in «Narnia».

The transition from the classroom to the playworld was much more complicated in the «Rumpeltiltskin — playworld» The playworld was based loosely on the folk

tale, Rumpelstiltskin by the Brothers Grimm. A dramatic turn occurred when the king's herald waited for the children at the beginning of a playworld session. He started to read a letter from the king, but the words of the message were backwards. Working together, the children discovered that someone had put a spell on the king's court, turning all 365 rooms upside down and causing everyone in the kingdom to talk backwards. The king asked if the children could visit the court in disguise and help solve a task in each room in order to restore the court to its normal order. The children decided to enter the kingdom walking backwards, turn their jackets inside out with the buttons on their backs and talk backwards. At this point, the classroom became the Kingdom of Surmundia, where both children and adults entered by walking backwards. The operations were carried out in the opposite order when returning back from «Surmundia» [20].

The transition rituals change children's mode of psychological activity and its logic. In the classroom adults are authorities and decide what children have to do. But in the playworld adults are co-players and have to obey narrative logic. The difference between the logic of each environment was evident during the visits to the «upside-down» «Surmundia». Children found out realistic problems for restoring the rooms in «Surmundia», but did not stay there and solve the problems. They returned back to the classroom for solving the problems using transition rituals and crossed the boundary back to «Surmundia» with their solutions in order to restore the rooms of the court. These psychological tools open a whole world with specific rules for children.

Some psychological tools have a more explicit self-regulation function. Vygotsky [31; 32; 34] supposed that rules are an essential element of pretend play and regulate role behavior. An adopted role can radically change a child's play activity and have long-term effects on self-development. Psychological tools took concrete forms in some episodes of our «Rumpeltiltskin — playworld». The king asked in his letter the children if they could help free the maidens and knights, who had been arrested and locked in a dark basement. The children had to be careful because Rumpelstiltskin might be watching. Before stepping into the dark castle basement (the school basement), the children decided to prepare shields to protect themselves against spells and evil powers*.

The children worked in groups to prepare their shields, cutting a piece of cardboard and attaching a handle to it. Then they decided to add colors and a personal spell written inside the shield to give them extra protection against Rumpelstiltskin's spells. Several girls agreed that the heart is the strongest symbol against evil powers, so they made red and white heart-shaped shields. Some girls made two human figures representing good. The boys' favorite symbols were a red triangle

and the Finnish flag. They believed that the color on the shield would send a very effective symbolic message against evil powers («Rumpeltiltskin is allergic to red»). After the adventure in the basement, many children took their shields with them everywhere. The teacher reported that, unlike some of the other props in the classroom, all shields were still intact even a year after the playworld ended.

Discussion

The study of human development was the prime emphasis in Vygotsky's non-classic cultural-historical psychology and pedology. But his methodological principles and theoretical concepts were not shaped into research methods very often. For example the demand that human development should be analyzed into units (not elements) was concretized in «genetic experiment» on micro-level analysis (a neutral object as a new tool of problem solving). His more advanced and broader units of development (personality, consciousness) lack elaboration of corresponding research methods.

In cultural-historical approach there are two prominent stage models of individual development. El'konin uses the change of the activity type as the criterion of the stage and Slobodcikov and Zuckerman model focus on individual developmental trajectory. Sub-stages and their contradictions are different in both models. A joint problem of these models is transitions between stages. How transitions take place and how they can be supported?

The proposed transitory activity system is studied in vertically integrated (multi-age) classrooms of 4—8 years old children. Traditionally these pupils would work in three separated segments of our educational system: day care (4—5 years), kindergarten (6—7 years) and elementary school (1.—2. Grades). Joint activities of all children take place daily before noon and individualized study after noon. Development oriented new curriculum guidelines guide the educational work. Overcoming «the crisis of the seventh year» and development of learning potential are the general goals of the educational work.

Transitory activity system in the study is based on adults and children's joint fiction «playworlds» and «narrative learning», which combines realistic problem solving with the narrative playworld frame. We suppose that transitory activity system creates a specific «social situation of development», which promotes children's elaboration of psychological tools. Intertwining realistic problem solving with fictive frame changes the traditional problem-solving situation at school. Children are «inside» the problem situation and emotionally involved [19].

---

* Vygotsky described psychological tools as mediating human social processes and thinking, not only to change the outside world, but also to «direct their own (or another) mind and behavior». «Language; various systems for counting; mnemonic techniques; algebraic symbol systems; works of art; writing; schemes, diagrams, maps, mechanical drawings; all sorts of conventional signs, etc.» [33, p. 137] are used as psychological tools.

References

1. *Blunden A.* An interdisciplinary theory of activity. Leiden, 2010.

2. *Bodrova E., Leong D. J.* Tools of the mind. Englewood Cliffs, 1996.

3. *Brown K., Cole M.* Cultural historical activity theory and the expansion of opportunities for learning after school. In G. Wells, G Claxton (Eds.) Learning for life in the 21st century. Oxford, 2002.

4. *Bruner J.* The culture of education. Cambridge, MA, 1996.

5. *Cassirer E.* An Essay on Man. New Haven, 1944.

6. *Davydov V. V.* Teoriya razvivayushego obuceniya [Theory of developmental education] Moscow, 1996.

7. *Davydov V. V. & Kudryavtsev V. T.* Razvivayushie obucenie. Teoreticeskaya osnova perekhoda ot doshkol'nogo do shkol'nogo obuceniya [Developing education: Theoretical basis of transition from preschool to school] // Voprosy psikhologii. 1997. № 1.

8. *El'konin B. D.* Vvedenyje v psihologiju razvityja [Introduction to Developmental Psychology]. M., 1994.

9. *El'konin B. D., Zinchenko V. P.* Developmental psychology or psychology of development, 2002. http://www.i-u.ru/biblio/archive/elkonin%5Fpsihrazv/ (Retrieved 08.10.2010)

10. *El'konin D. B.* Psikhologiya igry. [Psychology of play]. Moscow, 1978.

11. *El'konin D. B.* Izbrannye psikhologicheskie trudy. T. 1 [Collected psychological works, Vol. 1]. M., 1989.

12. *El'konin D. B.* Psikhologiceskie voprosy doshkol'noi igry // Leontiev A. N. and Zaporozhets A. V. (Eds.). Voprosy psikhologii rebenka doshkol'nogo vozrasta. M., 1995.

13. *El'konin D. B.* The Development of Play in Preschoolers // Journal of Russian and East European Psychology. 1999. Vol. 37. № 6.

14. *El'konin D. B.* Psychology of play I-II // Journal of Russian and East European Psychology. 2005. Vol. 43.

15. *El'koninova L. I.* (2001). The Object Orientation of Children's Play in the Context of Understanding Imaginary Space — Time in Play and Stories // Journal of Russian and East European Psychology. 2001. Vol. 39. № 2.

16. *El'koninova L. I., Bazanova T. V.* K probleme prisvoeniya smyslov v syushetno-rolevoi igre doshkol'nikov [On the problem of forming sense in pretend role play of preschoolers]. Vestnik Moskovskogo Universiteta. Ser. 14. Psikhologiya. 2004. № 3.

17. *Engeström Y.* Learning by expanding. Helsinki, 1987.

18. *Engestrom Y.* Development, movement and agency: Breaking away into mycorrhizae activities. In K. Yamazumi (Ed.), Building activity theory in practice: Toward the next generation. Osaka, 2006.

19. *Fisher W.* Human communication as narration: Toward a philosophy of reason, value, and action. Columbia, 1987.

20. *Gutierres K. D., Baquedano-Lopez P., Tejeda C.* Rethinking diversity: hybridity and hybrid language practices in the third space. Mind, culture, activity. 1999. № 6 (4).

21. *Hakkarainen P.* Kehittävä esiopetus ja oppiminen [Developmental preschool education and learning]. Jyväskylä, Finland, 2002.

22. *Hakkarainen P.* The challenges and possibilities of narrative learning approach in the Finnish early childhood educations system. International Journal of Educational Research. 2008. № 47.

23. *Hakkarainen P.* Development of motivation in play and narratives / In: S. Blenkinshop (eds.) The Imagination in Education: Extending the Boundaries of Theory and Practice. Cambridge Scholars Publishing, Newcastle upon Tyne, 2009.

24. *Hakkarainen P., Bredikyte M.* The zone of proximal development in play and learning. Cultural-historical psychology. 2008. № 4.

25. *Hakkarainen P., Bredikyte M.* Vygotsky' non-classical psychology today: implications for theory and practice. 2009.

26. *Kasavin I. T.* Smysl [Sense] / In: I. T. Kasavin (eds.) Sotsialnaya epistemologiya. M., 2010.

27. *Kravtsov G. G., Kravtsova E.* Play in L. S. Vygotsky's non-classical psychology. Journal of Russian and East European Psychology. 2010 (in print).

28. *Lektorsky V. A.* Mediation as a means of collective activity / In: A. Sannino, H. Daniels, K. D. Gutierrez (Eds.) Learning and Expanding with Activity Theory. N. Y., 2009.

29. *Leont'ev A. N.* Activity, Consciousness, and Personality. N. Y., 1978.

30. *Lindqvist, G.* The Aesthetics of Play. A Didactic Study of Play and Culture in Preschools. Stockholm, 1995.

31. *Mescheryakov A.* Awakening to Life: On the Education of Deaf-Blind Children in the Soviet Union. M., 1974. Электронная версия: http://vygotsky.dk/iscar-dk/wp-content/uploads/Medier/Udgivelser/Meshcheryakov-awakening-MIAP.pdf.

32. *Slobodcikov V. I., Tsukerman G. A.* Integral Periodization of General Psychological Development. Journal of Russian and East European Psychology. 2003. Vol. 41. № 6.

33. *Van der Veer R. & Valsiner J.* Understanding Vygotsky: A quest for synthesis. Oxford, 1991.

34. *Vygotsky L. S.* Igra i ee rol' v psikhiceskom razvitii rebenka // Voprosy psikhologii. 1966. № 6.

35. *Vygotsky L. S.* Play and its role in the mental development of the child / In: Cole M. (Eds.). Soviet develomental psychology. New York, 1977.

36. *Vygotsky L. S.* Sobranie sochinenii. T. 1 [Collected works.] M., 1981.

37. *Vygotsky L. S.* Appendix. From the notes of L. S. Vygotsky for lectures on the psychology of preschool children // Journal of Russian and East European Psychology. 2005. Vol. 43. № 2.

38. *Yamazumi K.* A hybrid activity system as educational innovation // Journal of Educational Change. 2008. Vol. 9. № 4.

39. *Zaporozhets A. V.* Towards the question of the genesis, function and structure of emotional processes in the child // Journal of Russian and East European Psychology. 2002. Vol. 40. № 2.

40. *Zinchenko V. P.* Psikhologiceskie osnovy pedagogiki [Psychological basis of pedagogics] M/, 2002.

41. *Zuckerman G.* Child-adult interaction that creates a zone of proximal development // Journal of Russian and East European Psychology. 2007. Vol. 45 (3).

Культурно-историческая методология исследования человеческого развития в переходных периодах

Пентти Хаккарайнен

Ph.D., профессор факультета образования Университета Оулу (университетский консорциум г. Каяни)

Многие методологические идеи культурно-исторической психологии Л. С. Выготского до сих пор носят гипотетический характер и требуют дальнейшей разработки и эмпирических доказательств. Такие теоретические понятия, как социальная ситуация развития, кризис и латентный период, новообразование, психологический возраст, зона ближайшего развития и другие участвуют в переходных периодах. Но механизм перехода все еще не установлен. В нашем экспериментальном исследовании мы сосредоточили внимание на переходе от игровой к учебной деятельности. Мы вводим понятие промежуточной системы деятельности, которое в нашем исследовании определено как гибрид деятельности игры и обучения. Мы назвали эту гибридную деятельность, следуя идеям Дональда и Брунера, как «нарратив обучения». Второй уровень исследований состоит из серий проектов игрового мира в вертикально интегрированных многовозрастных классах (дети от 4 до 8 лет). Вмешательства взрослого заключаются в приглашении детей в воображаемое окружение, представлении ролей персонажей и их отношений, внедрении сложных задач, в организации диалога детей и в предоставлении возможностей для игры, инициированной ребенком.

Ключевые слова: культурно-историческая методология, генетический эксперимент, переход развития, переходная деятельностная система, новообразование, нарративное обучение, нарративная интервенция.

Introducing cultural historical theory: main concepts and principles of genetic research methodology

Nikolai Veresov

Ph.D. in Psychology, Dr. Phil., Researcher, Oulu University

This paper explores two main topics. First, it presents main concepts and principles of cultural-historical theory (CHT) in relation to development. Second, it describes principles of the genetic research methodology, which are derived from the CHT framework. In other words, I will try to provide a systemic overview of Vygotsky's psychological theory in order to answer two questions: (1) what is cultural-historical theory about and (2) what does it mean to make an experimental psychological study meeting requirements of cultural-historical theory*.

Keywords: cultural-historical theory, genetic research methodology.

Development of human mind: subject matter of cultural-historical theory

Undoubtedly, Vygotsky's cultural-historical theory has the higher mental functions of human beings as its principle object of study. However, this object is not simple and should be clarified. The distinction between the lower mental functions, equal in animals and human beings (such as sensations, representations, perception etc.) and the higher specifically human mental functions (abstract thinking, logical memory, voluntary attention, etc.) was originally introduced to scientific psychology by W. Wundt. He propounded that the higher functions could not be studied in experimental psychology, but by the historical analysis of various cultural products (folk-tales, customs, rituals and so on). Vygotsky's theory took an opposite approach — the higher mental functions (human mind) should become the subject-matter of scientific experimental psychology. Psychology should create a new methodology of experimental research, and new theoretical instruments (concepts and principles).

Vygotsky explained that higher mental functions which have already matured (the «fruits of development») are closed for direct investigation by traditional experimental methods. Even more, when a function becomes ingrown, i. e., when it «moves within», an extremely complex transformation of that function's structure takes place, and its entire construction becomes indiscernible. Galperin explained «when functions are developed they «recede into the depths» and are covered by phenomena of a completely different appearance, structure, and nature» [1, p. 26]. A new, different kind of methodology, a genetic approach, is required to investigate this circumstance. In this situa-

tion, traditional, classical, quantitative methods are not valid and must be replaced by qualitative ones. «To understand the mental function means to restore both theoretically and experimentally the whole process of its development in phylo- and ontogenesis» [2].

The one-sidedness and erroneousness of **the traditional view** (emphasis mine — NV) ...on higher mental functions consist primarily and mainly in an inability to look at these facts as facts of historical development, in the one-sided consideration of them as natural processes and formations, in merging and not distinguishing the natural and the cultural, the essential and the historical, the biological and the social in the mental development...; in short — in an incorrect basic understanding of the nature of the phenomena being studied...

Putting it more simply, with this state of the matter, the very process of development of complex and higher forms of behaviour remained unexplained and unrealised methodologically [12, p. 2].

«Development» is the key word here. «Fruits» (results, products) of development become accessible for the analysis through the theoretical and experimental reconstruction of the whole process of development. For Vygotsky, the subject matter of the theory was not the «higher mental functions» as they are, but the very process of their development. *Cultural-historical theory was the theory of the origin and development of higher mental functions.*

Accordingly, every concept and principle of cultural-historical theory refers to a certain aspect of the complex process of development of the higher mental functions. The role, place, and interrelationships of all the concepts and principles within the theory become clear in terms of the origins and development of the higher mental functions.

However, what is «mental development»? What kind of understanding of development is CHT based on? From various papers of Vygotsky we find important notes concerning this matter. Development **is not** just a simple change. Development **is not** an organic growth or maturation. Development **is not** the collection of quantitative changes. Development **is** a complex process of qualitative change, reorganisation of a certain system. Psychological theory might be the theory of development when it is able to represent a system of concepts and principles, which explain main aspects of the process of development, such as:

- nature of development;
- sources of development;
- moving forces of development;
- specific features of development;
- results of development;
- main law (laws) of development.

The essence of the methodological alternative proposed by Vygotsky was that cultural-historical theory was the theory in which the main concepts *are related and reflect theoretically these aspects of development.* I could put it even stronger: there was (and there is) no other developmental theory in psychology which describes and theoretically reflects all these aspects of the process of development in their interrelations and unity.

In the next section of the paper I will try to present some key concepts of CHT and their relations to these aspects of the complex process of development.

Lower and higher mental functions: the nature and the source of development

W. Wundt's distinction between lower and higher mental functions was a methodological reflection of the current situation at the time in classical psychology. For Vygotsky, this separation was a kind of methodological step forward in explaining the nature of human development. The first methodological task of distinguishing between the lower and higher mental functions was to discover development as a qualitative reorganisation of the system.

Higher mental functions are not built on top of elementary processes, like some kind of second storey, but are new psychological systems comprising a complex nexus of elementary functions that, as part of a new system, being themselves to act in accordance with new laws [10, p. 58].

In this passage the keywords are «new system» and «new laws». The task to create the non-classical cultural-historical psychological theory was the task to study these new systems and to discover these new laws, unknown to classical empirical psychology.

The second methodological task was to explain the sources of the development of higher mental functions. The lower and higher functions have different origins and natures. Lower mental functions are completely biological by their origin, whereas higher functions are completely social.

The social environment is the source for the appearance of all specific human properties of the personality gradually acquired by the child or the source of social development of the child... [13, p. 203].

In contrast to traditional psychology, which describes the development of human mind as a process influenced by two main groups of factors (biological and social), cultural-historical theory defines social environment not just as a factor, but as a source of development. The development of the human mind is not a biological, but rather a cultural-social process. Looking at this from historical perspective, Vygotsky claims:

The transition from the biological to the social path of development is the central link in the process of development, a cardinal turning point in the history of the child's behavior [14, p. 20].

The following famous example illustrates these theoretical items:

In The *History of Development of Higher Mental Functions* [12], Vygotsky examines the development of the pointing gesture in the child, which constitutes an extraordinarily important part in the development of the child's speech, and to some degree, creates the basis for all higher forms of development. In the beginning, the pointing gesture of a child is merely an unsuccessful grasping movement aimed at an object; the child tries to grasp a distant object, but its hand, in reaching for the object, remains hanging in the air while the fingers make grasping movements. This situation is the point of departure for the subsequent developments. When the mother comes to the aid of the child and comprehends his movement as a pointing gesture, the situation essentially changes. The child's unsuccessful grasping movement gives rise to a reaction not from the object, but from another person. The original meaning of this unsuccessful grasping movement is thus imparted by others. And only afterwards, on the basis of the fact that the child associates the unsuccessful grasping movement with the entire objective situation, does the child himself begin to treat this movement as a pointing gesture. Here the function of the movement itself changes: from a movement directed toward an object it becomes a movement directed toward another person, a means of communication; the grasping is transformed into a pointing. This movement becomes a gesture for oneself not otherwise than by being at first a pointing in itself, i. e., by objectively possessing all the necessary functions for pointing and a gesture for others, i. e., by being comprehended as a pointing by the surrounding people. The child is thus the last to realise his own gesture. Its meaning and function are created first by the objective situation and then by the people surrounding the child. Thus, the pointing gesture first begins to indicate by movement that which is understood by others and only later becomes a pointing gesture for the child himself.

This example, Vygotsky wrote, shows the essence of the process of cultural development expressed in a purely logical form. The personality becomes for itself what it is in itself through what it is for others. This is the process of the making of the personality [12, p. 105].

Thus, in cultural-historical theory the distinction between lower and higher mental functions is a fundamental methodological step directed toward the solution of two main tasks related to the problem of development. First, it defines its character and nature (development as qualitative change, emergence of a new system of functions acting according to new laws) and, second, it points to the social source of development. In other words, by making this methodological step, cultural-historical theory overcomes the limits of the traditional view on higher mental functions and clearly distinguishes the natural and the cultural, the biological and the social in mental development.

Interaction of ideal and real forms: moving force of development

Another main concept in CHT is that of the interaction of «ideal» and «real» (or present) forms. This concept is quite complicated, yet it reflects the form and the moving force of development. On the other hand, it is closely connected with the concept of the social-cultural environment as the source of development and therefore could not be separated from it.

According to cultural-historical theory:

The social environment is the source for the appearance of all specific human properties of the personality gradually acquired by the child or the source of social development of the child which is concluded in the process of actual interaction of «ideal» and present forms [13, p. 203].

We see that the concept of social environment refers to the source of development, whereas the concept of the interaction of ideal and real forms explains the moving force of development. Here again, two key concepts of the theory are connected to each other through their relation to development, bringing forth explanations of its aspects.

However, what are «ideal» and «real» forms? The following passage from Vygotsky gives an answer:

We have a child who has only just begun to speak and he pronounces single words... The child speaks in one word phrases, but his mother talks to him in language which is already grammatically and syntactically formed and which has a large vocabulary, even though it is being toned down for the child's benefit. All the same, she speaks using the fully perfected form of speech. Let us agree to call this developed form, which is supposed to make its appearance at the end of the child's development, the final or ideal form — ideal in the sense that it acts as a model for that which should be achieved at the end of the developmental period; and final in the sense that it represents what the child is supposed to attain at the end of his development. And let us call the child's form of speech the primary or rudimentary form [11, p. 348].

These two examples (the pointing gesture and speech development) show the entire logic of the developmental approach that cultural-historical theory explores. The grasping movement is a kind of primary form which, from the beginning, interacts with the «ideal» form (the mother's comprehension of the movement as a pointing gesture) and this creates the moving force for grasping to transform into pointing. In both cases, social interaction exists as a process of interaction of the ideal and real forms. Speaking generally, every cultural form of behaviour might become an ideal form for the child. This statement reflects an important aspect of development, which Vygotsky presents in clear form:

In none of the types of development known to me does it ever happen that at the moment when the initial form is taking shape . . . the higher, ideal form, which appears at the end of development, should already be present and that it should interact directly with the first steps taken by the child along the path of development of this initial or primary form. Here lies the greatest peculiarity of child development in contrast to other types of development [15, pp. 112—113].

The development of any higher mental function in child is impossible without the interaction of the ideal and real form. The grasping movement never becomes the pointing gesture without an adult. We can say exactly the same about the development of speech, thinking, logical memory and voluntary attention.

The concept of sign and principle of mediation: developmental approach

The concept of sign and the principle of sign mediation is rightfully considered as one of the core ideas in cultural-historical theory. Even more, for many experts this concept is a kind of distinguishing feature of CHT. It is true that in Vygotsky's writings we could find various examples of sign mediations such as knots for memory, lots in case of two equal stimuli, and many others. He even listed a number of examples of systems of cultural signs: «language; various systems of counting; mnemonic techniques; algebraic symbol systems; works of art; writing; schemes, diagrams, maps and mechanical drawings; all sorts of conventional signs and so on» [6, p. 137]. However, signs and mediation were known and had been studied in psychology long before cultural-historical theory. They were used to describe a situation where one entity plays an intermediary causal role in the relation between two other entities. But Vygotsky's specific approach to sign and mediation was essentially new. For an adequate understanding of the place and role of the concept of sign and sign mediation within the cultural-historical theory, we need to make clear the links of this concept with the subject matter of the theory, i.e. to clarify its relation to the process of development. Let us take a look at the cultural sign from developmental perspective.

First, cultural signs and sign mediation are essential for the process of qualitative reorganisation of the psychological functions:

The sign as a tool reorganizes the whole structure of psychological functions. It forms a structural centre, which

determines the composition of the functions and the relative importance of each separate process. The inclusion in any process of a sign remodels the whole structure of psychological operations, just as the inclusion of a tool reorganizes the whole structure of a work process [4, p. 421].

Mediation is essential: every higher mental function is a mediated function. Every new structure of mental functioning is the result of its remodelling, the product of the sign inclusion. Using Vygotsky's terminology, we might say that a new structure is a «fruit of development». However, as has already been shown in this paper, Vygotsky's methodology is not focused on fruits; it is directed on the analysis of the process of development, i.e. the transition «from buds to fruits».

We need to concentrate not on the product of development but on the very process by which higher forms are established.... [5, p. 64—65].

On the other hand,

The sign arises as a result of a complex process of development — in the full sense of the word [14, p. 9].

In other words, looking at it from a structural perspective, the sign is the product of development. But just a structural analysis of sign mediation is not enough; the genetic approach is needed. In Vygotsky's words, mental development consists in the «the transition from direct, innate, natural forms and methods of behaviour to mediated, artificial mental functions that develop in the process of cultural development» [13, p. 168]. Therefore, the second crucial point about sign and sign mediation in cultural-historical theory was not to investigate its place and role in the structure of matured reorganised functions (fruits of development) only, but to study it within the frames of developmental process, i. e., within the transition from the buds of development to its fruits. In cultural-historical theory, the sign is a mental tool (tool of mind) which does not simply exist, and does not only reorganise the structure of functions, but arises with necessity in the process of the cultural development of the higher mental functions.

Following this general methodological approach, CHT undertakes three important theoretical distinctions with respect to sign mediation. The first distinction it makes is between two branches (streams) in the process of cultural development.

The concept «development of higher mental functions» and the subject of our research encompass two groups of phenomena that seem, at first glance, to be completely unrelated, but in fact represent two basic branches, two streams of development of higher forms of behaviour inseparably connected, but never merging into one. These are, first, the processes of mastering external materials of cultural development and thinking: language, writing, arithmetic, drawing; second, the processes of development of special higher mental functions not delimited and not determined with any degree of precision and in traditional psychology termed voluntary attention, logical memory, formation of concepts, etc. Both of these taken together also form that which we conditionally call the process of development of higher forms of the child's behaviour [12, p. 14].

This means that sign mediation, viewed from the developmental perspective, is related to the first stream of development of higher mental functions, i.e. to the processes of mastering external materials of cultural development. The theoretical importance and significance of this distinction is it defines the cultural sign (the mediator) as a tool, which initially exists in external form as a certain kind of cultural material. By using signs the individual obtains the possibility of mastering his own behaviour. This distinction, therefore, brings strong emphasis to the transition from direct, non-mediated forms of behaviour to mediated ones.

The second distinction CHT makes is between mediated activity and mediating activity. I should accentuate the difference between **mediated** (oposredovannaya in Russian) **activity**, and **mediating** (oposreduyushaya in Russian) activity. Mediated activity is *already mediated* by mediators, which were given or established, i. e. are **created before**. Mediated activity is by definition mediated by signs, tools, artefacts, etc. It is therefore, related to the fruits of development. Mediating activity, in contrast, is an activity that is not mediated, but mediates the whole process; it is an activity of mediating, not of mediation. The processes of active searching and finding a sign, as well as transforming of the whole unit and *transition* from direct connection to indirect (mediated) connection were in the focus of Vygotsky's theoretical and experimental studies of origins of mediating activity. Later in this paper I will give an example of the experimental study of mediating activity, but before this it makes sense to take a look on the third distinction related to the concept of sign in cultural-historical theory.

A third theoretical distinction cultural-historical theory makes with regard to sign mediation is between two types of mediating activity. Figure 1 represents the famous diagram:
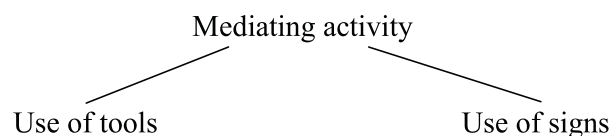
Mediating activity

Use of tools   Use of signs

Fig. 1. Vygotsky's model of mediating activities [12, p. 62]

And here are Vygotsky's comments:
... our diagram presents both types of devices as diverging lines of mediating activity ... A more substantial difference of the sign from the tool and the basis for the real divergence of the two lines is the different purpose of the one and the other. The tool serves for conveying man's activity to the object of his activity, it is directed outward, it must result in one change or another in the object, it is the means for man's external activity directed toward subjugating nature. The sign changes nothing in the object of the psychological operation, it is a means of psychological action on behaviour, one's own or another's, a means of internal activity directed toward mastering man himself; the sign is directed inward. These activities are so different that even the nature of the devices used cannot be one and the same in both cases [12, p. 62].

Thus, according to this distinction, the cultural sign is presented as a means of internal activity directed toward mastering man himself.

Due to these three theoretical distinctions, the concept of cultural sign in cultural-historical psychology is quite complicated. This concept does not simply reflect theoretically the entire fact of existence of the cultural sign as a mediator within a new structure, as a result or the product of development. CHT presents the sign from developmental perspective: the sign (or system of signs) originally exists as an external tool, as a kind of cultural material (first distinction) and later it becomes a tool of internal mediating activity (second and third distinction). Here again we see that sign mediation is presented in cultural-historical theory from the point of view of the transition from non-mediated to mediated action.

The following example of Vygotsky's experimental study illustrates the approach to sign mediation. The aim of the experimental study was to observe *the process of transition* from direct operation to using a sign.

In our experimental studies, we placed the child in a situation in which he was presented with a problem of remembering, comparing, or selecting something. If the problem did not exceed the natural capacity of the child, he dealt with it directly or with the primitive method... But the situation in our experiments was almost never like that. The problem confronting the child usually exceeded his capacity and seemed too difficult to solve with this kind of primitive method. At the same time, beside the child, there usually were placed some objects which were completely neutral in relation to the whole situation (pieces of paper, wooden sticks, peas, shot, etc). In this case, under certain conditions, when the child was confronted by a problem he could not solve, experimenters could observe how the neutral stimuli stopped being neutral and were drawn into the behavioural process, *acquiring the function of sign* [12, p. 85; 11, p. 60].

Experimental results were concluded in a diagram (Figure 2).
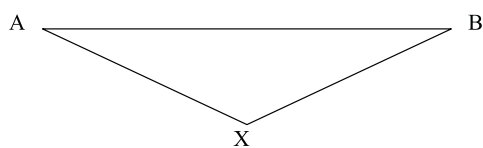
Fig. 2. General scheme of mediating [12, p. 79]

Explanation of the diagram reveals its transitional, dynamical aspect, rather than the structural one:

In our diagram two arbitrary points, A and B are presented; a connection must be established between these points. The uniqueness of the experiment consists of the fact that there is no connection at present and we are investigating the nature of its formation. Stimulus A elicits a reaction that consists of finding stimulus X, which in turn acts on point B. Thus, the connection between points A and B is not direct, but mediated. This is what the uniqueness of all higher forms of behaviour consist of [12, p. 80].

The processes of active searching and finding a sign, as well as the transformation of the whole unit and the transition from direct connections to indirect (mediated) connections, were the focus of Vygotsky's experimental studies of the origins of mediating activity. They were examples of the cultural-historical approach to the experimental investigation of sign and sign mediation; they were experimentally studied in the process of the genesis of the higher mental function.

General genetic law of cultural development

Since the subject matter of the theory is the process of development, correspondingly the general law was named «the general genetic law of cultural development of higher mental functions».

«... any function in the child's cultural development appears on stage twice, that is, on two planes. It firstly appears on the social plane and then on a psychological plane. Firstly it appears among people as an inter-psychological category, and then within the child as an intra-psychological category. This is equally true with regard to voluntary attention, logical memory, the formation of concepts and the development of volition» [8, p. 145].

At first glance, this formulation emphasises the most important aspect — the social origins of mind, as fundamental in cultural-historical approach to human development. But the attentive and careful reader can easily see some discrepancies here. They might ask: if every function appears first in the social relations between people on the social level, and then inside (within) the child, then how did mental functions appear in the social relations in the first place? And in what form did they exist? If they do appear in social relations, how do they then change their location, moving from social relations to the individual? What is the transitional mechanism? Or do they disappear from the social level and then reappear by some mystical way again within the individual?

Internalisation can explain the transformation from the social level to individual, but it cannot explain the original appearance of the function on the social level, within the relations. So how do the mental functions first appear in the social relations?

The problem here is we are asking the question backwards. The crucial point is that the mental functions do not and cannot appear *in* the social relations.

«... every higher mental function, before becoming internal mental function was external because it was social before it became an internal, strictly mental function; it was formerly a social relation of two people» [12, p. 105].

Social relations are not the «area», not the field, and not the «level» where mental functions appear. It is the other way around — the social relations themselves become the human mental functions. There is the solution.

Second, if every higher mental function was a social relation between two or more people, does it mean that every social relation can become a mental function? There is a clear notion of what type of social relation can actually become a mental function. I refer here in particular to the word «category» that Vygotsky uses in the formulation. The term «category» (which is repeated

twice in the formulation of the general law) has definite meaning. In Russian pre-revolutionary theatre's vocabulary the word category meant «dramatic event, collision of characters on the stage». Vsevolod Meierhold (a famous Russian theatre director) wrote that category is the event which creates the whole drama [3].

Vygotsky was familiar with the language of Russian theatre and arts and used the word «category» to emphasize the character of the social relation, which became the individual function. The social relation he meant was not an ordinary social relation between two individuals. He meant a social relation that appears as a category, i. e. as an emotionally coloured and experienced collision, a contradiction between two people, a dramatic event, a drama between two individuals. Being emotionally and mentally experienced as social drama (on the social plane) it later becomes an individual intra-psychological category.

Probably the best example here might be the case of a debate between two people. Imagine (or just remember) that one day you met a friend and had a debate, expressing opposite positions. Dramatic collision in a debate, experienced by the both participants, can lead to a sort of self-reflection. In the course of time, (for example, next morning) one of the participants remembers the event and thinks about what he said. He might say to himself «I was wrong saying that, I made a mistake... I should not say such sharp words... I was so aggressive and did not pay enough attention to what he tried to say... How stupid I was yesterday...» We see here that the individual now experiences the same «category» intra- psychologically. In this type of internal category, all the higher mental functions of the individual are involved (memory — «I said something rough», emotions — «How stupid my behaviour was, what a shame», thinking — «I have to think it over and never repeat such bad things», volition — «I must stop this. I must be more patient...»).

Such emotionally experienced collisions can bring radical changes to the individual's mind, and therefore can be a sort of act of development of mental functions — the individual becomes different, he becomes higher and above his own behaviour. Without internal drama, an internal category, such mental changes are hardly possible. So, the term «category» is a key word here. Dramatic character development, development through contradictory events (acts of development), category (dramatic collision) — this was Vygotsky's formulation and emphasis. On the same page where Vygotsky formulated the general genetic law of cultural development, he explained how the law is connected with the experimental method.

From here comes, that one of the central principles of our work is the experimental unfolding of higher mental process into the drama, which happened between the people [8, p. 145].

So, the requirement for experimental research is the necessity to reveal the original form of any mental function, the form of social relations named by Vygotsky clearly and openly — the drama. Every higher mental function originally exists as an inter-psychological category (dramatic social event in the relations of the two people) and after that it appears as an intra-psychological category. If the only objective analysis of the higher mental function is experimental reconstruction of the history of its development, we have to start from the experimental reconstruction of its original form — the drama between the people. But this is not the only requirement for the organisation and the conducting of the experimental study which follows from the cultural-historical theory. CHT also provides the system of principles of experimental study which might be defined as «genetic research methodology».

Developmental research methodology and its principles

In this section of the paper I present a brief description of the main principles of the genetic research methodology which follow from the requirements of cultural-historical theory. It is true that these principles differ from those in classical experimental studies. The methodological difference between a Vygotskian experiment and a «classical» one is obvious when we take into account the subject matter of cultural-historical theory. Genetic research methodology is a methodology of the experimental study of the very process of development, i.e. artificial reconstruction of the process from the very beginning, from the «buds» of development to its «fruits». Such a task obviously requires a different approach.

«The method we use may be called an experimental-genetical method in the sense that it artificially elicits and creates a genetic process of mental development ... the principal task of analysis is restoring the process to its initial stage, or, in other words, converting a thing into a process. ... This kind of experiment attempts to dissolve every congealed and petrified psychological form and convert it into a mowing flowing flood of separate instances that replace one another. In short, the problem of such an analysis can be reduced to taking each higher form of behaviour not as a thing, but as a process and putting it in motion so as to proceed not from a thing and its parts, but from a process to its separate instances» [12, p. 68].

The principle of buds of development. Child development is not a linear, homogenous process. Simultaneously, there are different levels of development of different functions in the child. At each age there are functions which are already matured (developed) and there are functions that are in a process of maturation. So there are «functions that have not yet matured but are in the process of maturation, functions that will mature tomorrow but are currently in an embryonic state. These functions could be termed the «buds» or «flowers» of development rather than the «fruits» of development» [12, p. 226]. The principle of «buds of development» means that at the beginning the experimental study should detect the function (or functions) which are in their «bud» (embryonic) stages, and are not yet developed.

The principle of category (collision, dramatic event). The principle follows from the general law of cultural development of higher mental functions. The «category» here means a dramatic collision, an event that happened between two individuals. The principle of category means that the experiment should begin with the category (dramatic event, collision) the child should experience. This collision should be artificially created. The dramatic event is the form in which the higher mental function appears first as a social relation before it becomes an internal higher mental function.

The principle of interaction of real (natural) and ideal (cultural) forms. There is no development if there is no interaction between the ideal and real forms. The principle of interaction of real (natural) and ideal (cultural) forms means that in the course of experimental study both forms should be detected. It also means that the higher «ideal form» must be present in the beginning of the experiment. And, finally, tools and means of interaction between these forms should be specially created and involved in the experimental procedure.

The principle of developmental tools. Sign mediation, the use of sign as a mental tool, is one of the fundamental ideas in cultural-historical theory. The cultural sign (or system of signs) is seen as the developmental tool. The principle of developmental tools means that during the experiment, cultural tools should not be given to the child directly; they have to be discovered (found) by the child (in cooperation with an adult or more competent peer). The experimenter should have a set of tools that the child is able to find and master in the course of experimental study.

The principle of sustainable qualitative changes as an outcome of the experiment. According to cultural-historical theory, new psychological formations (neo-formations) are the results of development. Neo-formations are not just new functions that appeared as the results or outcomes of development. They are, rather, a new type of construction and organisation of the psychological system as a new nexus of elementary and higher functions. In cultural-historical theory «by new psychological formations we must understand that new type of the construction of the personality and of its activity and those mental and social changes that first arise at a given age level and that in the main determine the consciousness of the child» [9, p. 248]. The principle of sustainable qualitative changes means that the results of the experimental study must not simply be statistically valid changes, but a new quality of the structure and the construction of child's consciousness as a result of its re-organization. These new qualitative levels of organization should be experimentally detected and described.

These five principles are significant aspects of the genetic cultural-historical methodology for organizing, designing and conducting the experimental study of the process of development in different settings and activity systems. It is easy to see that they strictly flow from the theoretical requirements, concepts and principles of cultural-historical activity theory.

One could say that these principles are so general that they could hardly be suitable for concrete experimental research settings. It is true that these principles only describe the overall methodology and outline the general framework of Vygotsky's approach. At the same time, they could be useful as indicators of the degree to which a certain experimental study might be considered as being carried out within the framework of the requirements of cultural-historical theory.

Some concluding remarks

CHT is a «non-classical» psychological theory that aims toward theoretical explanation and experimental investigation of the very processes of mental development of the human being. It constitutes the system of interconnected concepts and principles constructed so that they completely theoretically reflect the whole process of development in its main aspects. The place and role of each separate concept and principle becomes clear when they are seen through their relations to the subject matter of the theory — the process of cultural development of higher mental functions. This paper discusses some of them as theoretical instruments for the analysis of the very process of development. The limited space of this paper does not allow me to present some other important concepts of CHT, such as the social situation of development, zone of proximal development, psychological neo-formations, and perezhivaniye (experiencing). However, the reader could easily recognise their connections and interrelations with respect to development. An important trait of cultural-historical theory is that together with a system of theoretical instruments for the analysis of development it also provides a new «non-classical» experimental methodology, the genetic-experimental method for the investigation of the development of higher mental functions.

References

1. *Galperin P.* O teorii interiorisatsii. Voprosy psikhologii. 1996. № 6.

2. *Luria A. & Vygotsky L. S.* Ape, primitive man, and child: Essays in the history of behavior. N. Y.: Harvester Wheatsheaf, 1992.

3. *Meierhold V.* Teatralnii slovar. Moscow, 1920.

4. *Vygotsky L. S.* The problem of the cultural development of the child. II. Journal of Genetic Psychology. 36. 1929.

5. *Vygotsky L. S.* Mind in society: the development of higher psychological processes. Cambridge: Harvard University Press, 1978.

6. *Vygotsky L. S.* The instrumental method in psychology / In J. V. Wertsch (Ed.), The concept of activity in Soviet psychology. Armonk, N. Y., 1981.

7. *Vygotsky L. S.* Sobranie sochinenii. T. 2. M., 1982.

8. *Vygotsky L. S.* Sobranie sochinenii.T. 3. M., 1983.

9. *Vygotsky L. S.* Sobranie sochinenii.T. 4. M., 1983a.

10. *Vygotsky L. S.* Sobranie sochinenii.T. 6. M., 1984.

11. *Vygotsky L. S.* The problem of the environment / In R. van der Veer & J. Valsiner (Eds.). The Vygotsky reader. Blackwell, 1994.

12. *Vygotsky L. S.* Collected works. The History of the development of higher mental functions.Vol. 4. N. Y.: Plenum, 1997.

13. *Vygotsky L. S.* Collected works. Vol. 5. Plenum Press, 1998.

14. *Vygotsky L. S.* Collected Works. Vol. 6. Plenum Press, 1999.

15. *Vygotsky L. S.* Osnovy pedologii. Stenogrammy lektsii. Izevsk, 2001.

Представляя культурно-историческую теорию: основные понятия и принципы генетической методологии исследования

Николай Вересов
кандидат психологических наук, доктор философии, научный сотрудник Университета Оулу

В данной статье рассмотрены две основные темы. Во-первых, представлены основные понятия и принципы культурно-исторической теории (КИТ) относительно развития. Во-вторых, описаны принципы генетической методологии исследования, которые вытекают из КИТ. Другими словами, я постараюсь обеспечить системный обзор психологической теории Л. С. Выготского, чтобы ответить на два вопроса: (1) о чем культурно-историческая теория и (2) что это значит, провести экспериментально-психологическое исследование, которое соответствует требованиям культурно-исторической теории*.

Ключевые слова: культурно-историческая теория, методология генетических исследований.

Towards cultural-historical and dialogical writing research — some methodological considerations*

Andrea Karsten
Postgraduate Student, Institute of General and structural linguistics, University of Munich, M.A.

Based on a cultural-historical and dialogical conceptualization of thinking and speech as formulated in Soviet psychology and linguistics of the 1920s and 1930s, this article seeks to reflect upon a congruent way of investigating writing as a cognitive and communicative activity. What has to be taken into account when developing a methodology for writing research from a cultural-historical and dialogical perspective? Firstly, writing is not separated from other forms of speech activity like interpersonal and intrapersonal speech. Thus, inner dialogue and the addressed character of writing become crucial notions to be methodologically considered. Secondly, contrary to current writing research traditions such as literacy studies and studies of the writing process in cognitive psychology, both individual writing processes and socio-cultural writing practices as well as their relationship must be considered. These reflections lead towards the conclusion that writing is not fully accessible to external observation or to introspection. In consequence, a suggestion of a methodological approach is given, inspired by the activity theoretically informed method of auto-confrontation. The proposed method consists of two phases: a) videotaping of a writing episode and b) co-analysis of the videotaped writing episode in dialogue between writer and researcher. The second phase transfers the writing activity into a new context where understanding it becomes possible. The co-analysis makes involved positions audible: positions of the writer and of the researcher, of real and imagined readers as well as intersubjective and community-related positions. Finally, implications of the proposed research setting are discussed and evaluated with regard to the theoretical grounding.

Keywords: writing, writing research, dialogue, dialogical perspective, auto-confrontation.

Introduction

What can a suitable way of investigating writing from a dialogical and cultural-historical perspective look like? It is this question the present article wants to address — the functioning of writing as one type of speech activity being the object of psycholinguistic interest. But this question first leads to another one. What is meant by a dialogical and cultural-historical perspective? During the 1920s and 1930s several attempts are made in Soviet psychology, linguistics and language philosophy to conceptualize thinking and speech in a way that focuses on the social nature of language both in communication and in cognition. Four scholars are especially productive and creative in this attempt: the linguist Lev P. Jakubinsky (1892—1945), the founder of the cultural-historical approach in psychology Lev S. Vygotsky (1896—1934), and two of the scholars who formulated an explicitly dialogical approach in language philosophy, Mikhail M. Bakhtin (1895—1975) and Valentin N. Voloshinov (1895—1936)**. What they have in common is a deep interest in language, an image of language as a dialogic and social activity also when it is used in other contexts than primarily communicative ones, and the role they assign to language for human consciousness.

In this article, some important aspects of their dialogical conceptualizations of thinking and speech are discussed in order to formulate methodological consequences for researching writing: the addressing and addressed tendencies in speech, even if it serves other functions than face-to-face communication, the creative-semiotic nature of speaking and writing as creating spheres of meaning for others, and the diversity of these others which lies beyond concrete communication partners. The relationship of writing with other forms of speech, especially with inner dialogue, and the close integration of individual writing processes and socio-cultural literate practices are identified as two major implications for writing. The question is raised whether current methodologies in writing research (e. g. literacy studies, analysis of thinking-aloud protocols or real-time computer-based experimentation) meet these affordances posed by a dialogical perspective on writing.

** For the purpose of easier reading, I will in the following speak of a «dialogical perspective» instead of a «cultural-historical and dialogical» one. However, the term is meant to point to a theoretical stance developed examining all four of the named scholars' perspectives.

In consequence, an alternative extension to current methodologies for investigating writing is sketched, which is a variegation of auto-confrontation as method in workplace psychology [9; 10; 11; 12]. The relevant features of auto-confrontation in being a dialogically oriented method are discussed and their advantages for studying writing elaborated. Finally, the proposed research setting is critically evaluated against its theoretical basis and with regard to its implementation.

Dialogical and cultural-historical conceptualizations of thinking and speech — some central aspects

The most outstanding characteristics of a dialogical perspective on thinking and speech is its focus on dialogue and on sociality in language. Jakubinsky's 1923 paper «On Dialogic Speech»* (O dialogičeskoj reči) expresses the focus on dialogue in a prominent way and, in that, influences the other scholars mentioned [cf. 5, p. 73]**. In this article, Jakubinsky takes interest in the various forms or gestalts of linguistic activity. Language, according to Jakubinsky [24], only exists as differing forms of speech, which are interrelated on the one hand, but also specific on the other hand, in that they always correspond with the forms of social interaction they take place in and with the quality of the other's presence. The functional speech forms are classified along two lines: a dialogic-to-monologic one and a direct-to-indirect one. Like this, it is possible to conceptualize monologue and dialogue without sharp distinction but rather as gradual relation. Furthermore, Jakubinsky goes beyond a simple identifying of direct, face-to-face speech with dialogue (although this is the most prevalent and interesting form for him) and indirect, mediated (and mostly: written) speech with monologue. In so doing, the addressed and addressing character of writing can become visible. In this regard, Jakubinsky and the members of the Bakhtin circle share the «common opinion that even in monologue we find dialogic tendencies due to the fact that the speaker is constantly aware of the attitude and potential response of the perceiver» [25, p. 319].

The other does not always have to be a concrete person. In the absence of a real other that is present or can be imagined «an addressee is presupposed in the person (...) of a normal representative of the social group to which the speaker belongs» [33, p. 85]. More so, there is always a third position involved, the «superaddressee (...), whose absolutely just responsive understanding is presumed, either in some metaphysical distance or in distant historical time» [3, p. 126].

In Bakhtin's writings yet another aspect comes into play. He affirms that utterances are always dialogic, not only because they are more or less intentionally addressed and evoke responses, but moreover because every «utterance is a link in a very complexly organized chain of other utterances» [2, p. 69]. It is not only the real or imagined response of an addressee that leads to dialogicality, but the larger historicity of the utterance:

«However monological the utterance may be (for example, a scientific or philosophical treatise), however much it may concentrate on its own object, it cannot but be, in some measure, a response to what has already been said about the given topic, on the given issue, even though this responsiveness may not have assumed a clear-cut external expression. It will be manifested in the overtones of the style, in the finest nuances of the composition. The utterance is filled with dialogic overtones, and they must be taken into account in order to understand fully the style of the utterance. After all, our thought itself-philosophical, scientific, and artistic-is born and shaped in the process of interaction and struggle with others' thought, and this cannot but be reflected in the forms that verbally express our thought as well». [2, p. 92].

The previous citation shows clearly that dialogicality, how ever far the notion applies to monologic or written speech genres and not just face-to-face dialogue, always stays tied to certain stylistic, formal properties and is not only a matter of a somehow language-free inner orientation towards others.

On the other hand, it becomes also clear that language is no «ready-made artefact» [33, p. 77] or an instrument*** that determines the type of interaction with others according to its inherent formal properties. Language is shapeable and indeed must be shaped every time it is used, although this shaping is never at random but always responsive, dialogic. It is in the process of shaping that meaning is constituted, because meaning is neither something firmly attached to a verbal form**** nor something that exists independently from language in the speaker's cognition. To the contrary, meaning emerges as an evaluative answer to the historicity of every utterance, in a positioning act.

Every utterance takes its role in shaping specific chronotopes, that is, spheres of meaning and of temporal

---

* I take up the title of the 1997 translation of Michael Eskin [23] as it is more literal than in the 1979 translation of Jane E. Knox [24] titled «On verbal dialogue». However, I use whenever possible the latter translation of the text, since it comprises more relevant passages and it seems to be more informed with regard to the historical context of the essay [cf. 25]. It must be noted, that both translations are only partial. To my knowledge, the only full translation to a Western European language is the German translation by Katharina Meng [22].

** See also [21] on Jakubinsky's influence on Voloshinov and [13; 14] on his influence on Vygotsky.

*** Although Vygotsky is famous for his metaphor of language as an instrument or tool, he himself later criticizes this idea [35 as well as later texts]. Instead he turns to conceptualizing the relationship of linguistic form and meaning not as stable associations but as a process. At first as an ontogenetic one - outcome of his studies on concept-formation, and then as a microgenetic one in his last work written in 1934, the 7th chapter of «Thought and Language» (Myšlenie i reč', literal: Thinking and Speech) [36, cf. the analysis in 5, p. 102ff.].

**** All authors hold that meaning is more than conventionalized significations of words. For example, Vygotsky [36] distinguishes between «meaning» and «sense», only the latter referring to the dynamic whole of a word's meaning. Similarly, Voloshinov [33] identifies three aspects («meaning» in a narrow sense as a bare potentiality, «theme» as actual, contextual meaning, and finally «evaluation»), which play a role in a word's concrete, overall meaning.

and topological constructs the speakers orientate and position themselves in. This process is a semiotic one, in that meaning is re-presented, or better: created, through language. A distinction must be made between representing time, the space of the author and his addressees, and represented time, the world created by a person for another person in the process of speaking. However, both chronotopical levels are dialogically interrelated: «the author-creator, finding himself outside the chronotopes of the world he represents in his work, is nevertheless not simply outside but as it were tangential to these chronotopes» [1, p. 256]. These creative-semiotic characteristics of language seen from a dialogical perspective are especially important in writing, when the other is not there, at least not in the same quality as he or she is in face-to-face dialogue*. The writer, then, has to build up the situation for communication alone; he or she has to imagine and to anticipate the other and to orchestrate the adequate contextual potentials.

Whether this leads to a more extended form of speech, as Vygotsky [36] suggests, is discussable**. In any case, though, to explain this aspect, another extension of the notion of dialogic speech must be made. Not only are there dialogic relations crystallized in written texts, but there are also dialogic relations in the very process of writing. Dialogue must be turned towards a merely imagined, even idealized other or towards oneself; it has to become something «inner». It is especially Voloshinov and Vygotsky who show how language can be conceptualized as an intrapersonal activity, which stays deeply social in nature.

In turning against the current approaches in the philosophy of language of his time, Voloshinov [33] criticizes the assumptions of what he calls «individualistic subjectivism» and «abstract objectivism». Individualistic subjectivism holds that in language, the individual speech act is crucial, and therefore the psychological processes of the individual determine language. In contrast, abstract objectivism supposes that the individual speech act can be neglected, because it does not belong to the system of language, which is ahistorical and supra-individual. With a synthesizing gesture, Voloshinov formulates his own position: «Language is a continuous generative process implemented in the social-verbal interaction of speakers» [33, p. 98, italics removed]. And further: «The laws of the

generative process of language are not at all the laws of individual psychology, but neither can they be divorced from the activity of speakers. The laws of language generation are sociological laws» [33, p. 98, italics removed]. Like that, he conceptualizes language as both a psychological process and as social, i. e. dialogic. This is possible, because the individual consciousness follows social laws since it is «filled with signs» [33, p. 11]. In a similar movement, Vygotsky [34] formulates at the beginning of his psychological career his own view of conceptualizing consciousness as social, also finding a third way apart from the two major psychological tendencies of his times, subjective psychology and reflexology. There is, he states in a reflexological terminology, a special type of reflexes in humans, that are «reversible» [34, p. 277; 5, p. 105]. «A word that is heard is the irritant, and a word that is pronounced is a reflex producing the same irritant. The reflex is reversible here, since an irritant can become a reaction, and vice versa» [34, p. 277]. This is, for him, the reason, why the mechanisms of social interaction and of consciousness are the same***. The self becomes plural and dialogic in the sense that the child learns to address her- or himself and to be self and other at the same time. In a similar direction points Bakhtin, when he writes: «If I relate (or write about) an event that has just happened to me, then I as the *teller* (or writer) of this event am already outside the time and space in which the event occurred. It is just as impossible to forge an identity between myself, my own 'I,' (sic!) and that 'I' that is the subject of my stories as it is to lift myself up by my own hair» [1, p. 256]. Inner dialogue and the management of various positions (self, self-as-other, real or imagined addressee, superaddressee) thus become a necessary feature in building complex chronotopical spheres of meaning on one's own, as it happens in narrative and to a greater or lesser extent in all forms of writing.

Implications for writing

These moments in a dialogical perspective on language — the dialogic tendencies in speech beyond face-to-face dialogue, the creative-semiotic nature of speech and the multiplicity of positions a speaker and especially a writer must assume — cannot stay without conse-

---

* This holds true, even if I imagine a situation where the other is co-present, but we have to communicate in writing, say for example exchanging notes, because we are in an auditorium and do not want to disturb the speaker and the other listeners. In such a situation, the other's presence has a different quality compared to an oral dialogue. There is, for example, a (very short, of course) time-delay, there is no vocal expression and I do not look at the other during composition.

** For an elaboration of Vygotsky's concept of written speech as it develops in the course of his work see [31].

*** Vygotsky [35] can in the later years of his career provide an ontogenetic model how this is possible: interiorization. In this model, speech plays a key role, because to Vygotsky it is in using signs that humans interact and sociality is grounded, as it can be seen in his distinguishing of signs and tools: «The tool serves for conveying man's activity to the object of his activity, it is directed outward, it must result in one change or another in the object, it is the means for man's external activity directed toward subjugating nature. The sign changes nothing in the object of the psychological operation, it is a means of psychological action on behaviour, one's own or another's, a means of internal activity directed toward mastering man himself; the sign is directed inward. These activities are so different that even the nature of the devices used cannot be one and the same in both cases» [35, p. 62]. The concept of interiorization states that children in the course of development more and more learn to be others for themselves, to turn ways of interacting with others onto themselves. «Every higher mental function was external because it was social before it became an internal, strictly mental function; it was formerly a social relation of two people. The means of acting on oneself is initially a means of acting on others or a means of action of others on the individual» [35, p. 105]. As Veresov [32, p. 6] puts it: «Social relation is not the 'area', not the field, and not the 'level' where mental function appears, — the social relation itself becomes child's individual function». The most important way of shaping social relations (and Vygotsky's principle example when it comes to the social nature of higher psychological functions) is speech.

quences if writing processes are the subject under study. There are two major implications for writing research undertaken from a dialogical stance: Firstly, writing must be seen in its relationship to other forms of speech activity like interpersonal and intrapersonal speech. And secondly, individual cognitive writing processes and socio-cultural writing practices are closely tied together and must be investigated in their interrelatedness.

Regarding the first aspect, writing, as the reading of the Soviet scholars shows, is not a completely new form of speech fully in its own right, because it cannot be separated from other forms of speech activity. It is closely linked with dialogue although the writer must abstract from oral communication and rely on inner dialogue. There can — but do not have to — be shifts of function like e.g. from communication with others to reflexive thinking for oneself. Such shifts go hand in hand with alterations in linguistic forms. In fact, there are several characteristics of writing that make such alterations necessary: the other is not there or at least cannot serve the same here-and-now collaborative function as in dialogue, the utterance becomes crystallized in a visible and mostly durable form etc. In writing one must create chronotopically structured spheres of meaning on one's own with the resources at hand, but at the same time one necessarily relates to socially typical forms of speech or genres and different forms of addressees. Therefore, inner dialogue and the addressed character of writing become crucial notions to be methodologically considered. Without the inner «work» of the writer in relation to the written utterance, one cannot know what writing is.

A second implication is that contrary to current writing research traditions such as literacy studies and studies of the writing process in cognitive psychology, both individual writing processes and socio-cultural writing practices as well as their relationship must be considered. One needs to look neither only at the characteristics of utterances or texts that are carried forward by literate practices nor the social forms of interaction fostered by writing [e. g. 15; 30]. Nor is it enough to investigate the individual psychological processes during writing with computer-based real-time methods as if they were isolated from social practices*. Both aspects are necessary, but writing is more than dealing with social and medium constraints or other influencing factors and processing information. It is creating spheres of meaning for others and oneself (as an other).

As a consequence, writing, taking into consideration its psychological volume, is not fully accessible to observation of supposedly writing-related practices on a macro-cultural level without looking at concrete writing activities of individuals. In one of his first sketches of his «Ethnography of Communication», Hymes [19, p. 25] criticizes the generalizing interpretations of literacy studies because they lack sufficient ethnograph-

ic data: «There is a tendency to take the value of a channel as given across cultures, but here, as with every aspect and component of communication, the value is problematic and requires investigation. (...) To provide a better ethnographic basis for the understanding of the place of alternative channels and modalities in communication is indeed one of the greatest challenges to studies of the sort we seek to encourage». On the other hand, experimental measuring of individual writing-related psychological processes with computer-based methods [e. g. 16; 8, various contributions to 29] methodologically ignores any grounding of writing in social interactions of various forms. These methods do allow experimental investigation of cognitive processes in the sense of in — and decrease of reaction times. But they cannot, by their very nature, investigate meaning-related psychological processes. Like this, both literacy studies and real-time cognitive approaches do not consider the creative and re-presenting meaning-making activity of the writer with regard to his or her addressees. The third influential approach in writing research, the tradition working with thinking-aloud protocols [seminal: 17; 18], investigates writing processes through introspection. However, this means to conceptualize writing as a conscious psychological process — especially when the thinking-aloud protocols are taken as indicators for the basic cognitive processes involved in text production and not as exteriorizations of complex inner dialogues with various functions during problem solving**. Giving attention to the complex historicity and dialogicality of every utterance, the scope must be extended and comprise also more subtle processes than the ones that become voiced at once during thinking-aloud tasks. A methodology is needed that gives insight to the complex dialogicality of writing. As a consequence, in the remainder of the paper, one suggestion of such a methodological approach to writing is sketched***.

Developing a dialogical methodology for writing research — a sketch

The writing research method described here is inspired by the method of auto-confrontation [9; 10; 11; 12]. The original auto-confrontation method was developed as a means of intervention in workplace psychology in a cultural-historical and activity theoretical tradition. It consists of three phases:

(1) Constitution of an analysis group. The work collective chooses pairs of workers that, together with the researcher, form an analysis group.

(2) Simple and crossed auto-confrontations. The chosen pairs are filmed during resembling work situations. First, every worker is confronted with the video of his or her own work activity in presence of the

---

* For an overview over the most important real-time methods currently used see [26].

** But see for example [6] and [37] for an inner speech-related analysis of thinking-aloud protocols in another research context.

*** Of course, there are various other ways of approaching writing from a dialogical or cultural-historical perspective. Compare for example works in education from different countries and contexts: e. g. [27], several contributions to [4], [7], [28] or the 2002 Special Issues of «Written Communication» on Norwegian research on writing [20].

researcher (simple auto-confrontation). Then, for each pair of workers, every participant is confronted with the video of his or her respective colleague's work activity in presence of this colleague and of the researcher (crossed auto-confrontation). Both simple and crossed auto-confrontations are filmed, too.

(3) Extension of analytical work to the work collective. An edition of the filmic material is presented to the whole work collective. The collective goes on with an analysis of the work situations and auto-confrontations filmed. [12, p. 21ff.]

Auto-confrontation in the narrow sense, i.e. the second phase, is of interest here. This phase consists of three succeeding steps: filming of a work situation, simple auto-confrontation and crossed auto-confrontation. Here, several dialogical characteristics of the method appear. The filming process provokes a self-observation of the worker [9; 10]. The activity of the other (researcher) is turned towards oneself in a reversing gesture; the worker's new observing perspective enters into a dialogic relationship with the old working one. Furthermore, through observation and videotaping, the working activity is actively set into a plurality of contexts, which go beyond the here-and-now [9; 10]. To put it differently, the activity takes place in and shapes various differing but related chronotopes at once. During simple auto-confrontation the newly emerged dialogue is set into another context where it can develop further [9; 10]. Understanding, according to Voloshinov [33], is answering, bringing an utterance (or here: filmic re-presentations of a work sequence) into a new context. Like this, the development that can happen in auto-confrontation can be conceptualized as an instance of «understanding-through-answering». Furthermore, the «volume» and the richness of the activity [12, p. 18; cf. also 34] become accessible in this new context: that is, not only what the worker did do, but also what he or she could not do, wanted or not to do etc. It is here, in interaction with a researcher alien to the work under scrutiny, that the tensions and relations between the personal style of doing this work and the collectively assumed, 'right' ways of doing it, what Clot and colleagues call «genre professionel» (professional genre) [12, p. 22; cf. also 2] or «collectif dans l'individu» (collective in the individual) [9, p. 226; cf. also 35], come to light*. Social practices, conventionalized ways of activity, shape the individual way of carrying out the work in a normative way and are in turn shaped by the workers' individual styles. Thus, the superaddressee's position enters the dialogue [9, 10; cf. also 3]. During crossed auto-confrontation, finally, the self-dialogue of one worker is confronted with the colleague's one. There, even activities that have not been questioned so far can become the object of discussion and development, because the worker is not just confronted with a normative, collective position but also with another individual style of

carrying out the work. Further and even more important, two ways of perceiving social practice collide, which allows the workers to question this third superposition [9; 10].

For writing, the method can be adapted and variegated. First of all, the objectives change to a certain degree. Primary goal is not intervention, although change and development brought about by dialogic interactions on and recontextualizations of writing processes still form one objective and one of the reasons why the method brings about a more cooperative style of research, which includes participants as active partners. However, the method in particular leads to videos and then protocols of dialogic writing process reconstructions that can serve, in order to further understand writing, as an alternative or an extension to thinking-aloud protocols, external observations of different kinds, text analysis and computer-based experimentation.

The greatest alteration in comparison to the original method is the abandonment of crossed auto-confrontation. As long as the focus of interest comprises writing «in general», — or to put it more correctly: in its functional manifoldness and diversity [cf. 24] — and not a specific work genre, simple auto-confrontation and crossed auto-confrontation merge, since the researcher holds the position of both an alien person, in that he or she does not have direct access to the inner dialogicality of the writer, and a peer, in that he or she belongs to the same community of speakers as the writer. Thus, the method consists of only two steps:

(1) videotaping of a writing episode
(2) co-analysis of the filmed writing episode in dialogue between writer and researcher.

In general, the dialogical mechanisms of the method are the same for writing as for working. The tensions between the corresponding genre and personal style, between what «one» has to do when writing the given kind of text and what «I» see myself doing on the screen, become voiced. Thus, the method aims at the complex interaction of social literal practices and psychological writing processes. Further, recursive form-giving and form-changing processes as they are experienced, «lived», during writing and relived during watching, become the object of co-analysis; processes of coming from vague thoughts writers can almost not grasp themselves to addressed utterances readers can understand. In the described variation of the method of auto-confrontation for writing research, the position of the cameras seem of special interest, implying the perspectives from which co-analysis can take its start, voicing positions of the writer's inner dialogue. To elaborate: The work of analysis, which in the original workplace method is divided between worker, co-worker, working collective and researcher, in the writing research variation lies on writer and researcher alone. But even in that dyadic form of interaction more than two positions of

---

* It must be noted that both concepts implied, speech genre and interiorisation, in their original formulations by Bakhtin and Vygotsky, refer to dialogic, creative-semiotic interactions between people and not to working activity. In my opinion, this is crucial. However, since the method of auto-confrontation is to be adapted for a use in writing research, this can be left aside for now, although the feature is worth to be further discussed.

the writing dialogue can become voiced. Two cameras are employed for filming the writing episode. The first one records the writer in profile. The second one captures the evolving text from behind, «looking over the writer's shoulder» from an angle. For auto-confrontation both images are edited picture-in-picture and synchronized. However, both perspectives provoke different ways of looking at the writing process, for the participant as well as for the researcher. Whereas the profile perspective stands for a third party, non-involved position, participants tend to react strongly to the over-the-shoulder camera. This second camera holds a perspective that is similar, but not congruent with the writer's own perspective during composition. Rather, it involves a distance and closeness of observation at the same time. Like this, the perspective helps in eliciting and voicing addressee-positions involved in inner dialogue: perspectives of concrete or idealized addressees, of a generalized reader position involved in revision and editing processes, of the super-addressee, perspectives associated with normative, social practice related positions etc.

Putting the method to work

In order to implement the proposed methodological setting for writing research certain challenges have to be met. Firstly, it is not fully predictable what the concrete ways of voicing writing processes and practices as well as inner dialogicality in auto-confrontation situations will look like. This is especially important for analysis of the auto-confrontation protocols. Hints can be gained from auto-confrontation dialogues in workplace studies, which show for example that the ways of dealing with personal pronouns are a fruitful source to look at [e. g. 11]. Additional hints can come from studies with thinking-aloud protocols, where features like questions, formulations of goals or associative chains were taken as indication for e.g. planning or revision activities [cf. 17].

However, it is probable that the data goes beyond these features of evidence. Thus, it is crucial for the researcher to constantly monitor and reflect the choice of categories for analysis. The primary source and the horizon against which to evaluate categories and findings must be the outlined dialogical theory. This is important, for instance, for not falling into the trap of interpreting too much on a content level without considering the form-content relationship as it has been described above.

This leads to another consideration. Analyzing not only the protocols of auto-confrontation dialogues, but also the respective filmed writing episodes, where one can see the texts as they are produced, can be one way to avoid speculation. Further, this can reveal if the writers really do what they report and elaborate or if there is a discrepancy between the dialogic reconstruction during auto-confrontation and the episode itself. Possible differences, however, will not derogate the informative value of the auto-confrontation protocols, but only contribute to finding the complex relationship between inner dialogue in writing and what is actually written as well as between socially constructed writing practices and individual instances of writing activities.

References

1. *Bakhtin M. M.* Forms of Time and of the Chronotope in the Novel. In M. Holquist (Ed.), The Dialogic Imagination. Four Essays by M. M. Bakhtin. [Translated by C. Emerson & M. Holquist]. Austin, 1937—1938/1981.

2. *Bakhtin M. M.* The Problem of Speech Genres. In C. Emerson & M. Holquist (Ed.), Speech Genres and Other Late Essays. [Translated by V. W. McGee]. Austin, 1953—54/1986.

3. *Bakhtin M. M.* The Problem of the Text in Linguistics, Philology, and the Human Sciences: An Experiment in Philosophical Analysis. In C. Emerson & M. Holquist (Ed.), Speech Genres and Other Late Essays. [Translated by V. W. McGee]. Austin, 1959—1961/1986.

4. *Ball A. F. & Freedman S. W.* (Ed.) Bakhtinian Perspectives on Language, Literacy, and Learning. Cambridge, 2004.

5. *Bertau M.-C.* Anreden, Erwidern, Verstehen. Elemente einer Psycholinguistik der Alteritat. Habilitation thesis. Ludwig-Maximilians-Universitat, Munich, 2009.

6. *Bertau M.-C.* Spuren des Gesprachs in innerer Sprache. Versuch einer Analyse der dialogischen Anteile des lauten Denkens // Sprache & Kognition. 1999. Vol. 18. № 1/2. P. 4—19.

7. *Brossard M.* Pratiques d'ecrit, fonctionnements et developpement cognitifs / In C. Moro, B. Schneuwly & M. Brossard (Ed.) Outils et signes. Perspectives actuel les de la theorie de Vygotski. Bern, 1997.

8. *Chenoweth N. A. & Hayes J. R.* The Inner Voice in Writing // Written Communication. 2003. Vol. 20. №. 1. P. 99—118.

9. *Clot Y.* Travail et pouvoir d'agir. Paris, 2008.

10. *Clot Y.* L'auto-confrontation croisee en analyse du travail — l'apport de la theorie bakhtinienne du dialogue / In L. Fillettaz & J. P. Bronckart (Ed.) L'analyse des actions et des discours en situation de travail. Concepts, methodes et applications. Leuven, 2005.

11. *Clot Y & Faita D.* Genres et styles en analyse du travail. Concepts et methods // Revue Travailler. 2000. №. 4. P. 7—31.

12. *Clot Y. Faita D., Fernandez G. & Scheller L.* Entretiens en auto-confrontation croisee: une methode en clinique de l'activite // Education permanente. 2001. Vol. 146. P. 17—25.

13. *Friedrich J.* Die Apperzeptionsgebundenheit des Sprechens. Ein historischer Exkurs in die Diskussion um die innere Sprache / In M.-C. Bertau, A. Werani & G. Kegel (Ed.) Psycholinguistische Studien 2. Aachen, 2005.

14. *Friedrich J.* The Use and Function of Dialogue in the Soviet-Russian Discourse of the 1920ies, especially with Yakubinsky and Vygotsky / In M.-C. Bertau & J. Friedrich (Ed.) Think about Language Dialogically — Understand Action Dialogically. 2005. Electronic document: http://epub.ub.uni-muenchen.de/2020/.

15. *Goody J.* The Logic of Writing and the Organization of Society. Cambridge, 1986.

16. *Hayes J. R. & Chenoweth N. A.* Working Memory in an Editing Task // Written Communication. 2007. Vol. 24. № 4. P. 283—294.

17. *Hayes J. R. & Flower L. S.* Identifying the Organization of Writing Processes. In L. W. Gregg & E. R. Steinberg (Ed.) Cognitive Processes inWriting. Hillsdale, 1980.

18. *Hayes J. R., Flower L. S.* The Dynamics of Composing: Making Plans and Juggling Constraints / In L. W. Gregg & E. R. Steinberg (Ed.) Cognitive Processes in Writing. Hillsdale, 1980.

19. *Hymes D.* Introduction: Toward ethnographies of communication // American Anthropologist. 1964. Vol. 66. № 6. P. 1—34.

20. *Igland M.-A. & Ongstad S.* (Ed.) Special Issues on Norwegian Writing Research // Written Communication. 2002. Vol. 19. № 3 & 4.

21. *Ivanova I.* Le dialogue dans la lingustique sovietique des annees 1920—1930 // Cahiers de l'ILSL. 2003. № 14. P. 157—182.

22. [Jakubinsky] *Jakubinskij L. P.* Uber die dialogische Rede / In K. Ehlich & K. Meng (Ed.) Die Aktualitat des Verdrangten. Studien zur Geschichte der Sprachwissenschaft im 20. Jahrhundert. [Translated by K. Hommel & K. Meng]. Heidelberg, 1923/2004.

23. [Jakubinsky] *Yakubinsky L. P.* On Dialogic Speech // PMLA. 1923/1997. Vol. 112. № 2. P. 243—256. [Translated by M. Eskin].

24. [Jakubinsky] *Jakubinskij L. P.* On Verbal Dialogue // Dispositio Vol. IV. 1923/1979. № 11/12. P. 321—336. [Translated by J. E. Knox].

25. *Knox J. E.* Lev Jakubinskij as a Precursor to Modern Soviet Semiotics // Dispositio Vol. IV. 1979. № 11/12. P. 317—320.

26. *Levy C. M. & Olive T.* Real-time Studies in Writing Research: Progress and Prospects / In T. Olive & C. M. Levy (Ed.) Contemporary Tools and Techniques for Studying Writing. Dordrecht, 2001.

27. *Lysaker J.* Reading, Writing, and the Transformation of Self: the Accomplishment of Literacy through the Lens of Dialogism // International Journal for Dialogical Science Fall. 2007. Vol. 2. № 1. P. 325—336.

28. *Nystrand M.* The Structure of Written Communication. Studies in Reciprocity between Writers and Readers. Orlando, 1986.

29. *Olive T. & Levy C. M.* (Ed.) Contemporary Tools and Techniques for Studying Writing. Dordrecht, 2001.

30. *Ong W.* Orality and Literacy: The Technologizing of the Word. N. Y., 1982.

31. *Surd-Buchele S. & Karsten A.* Vygotskijs Konzeption von Schreiben // ICHS-Journal. 2010. Vol. 1. P. 15—42.

32. *Veresov N.* Zone of Proximal Development (ZPD): the Hidden Dimension? 2004. Electronic document: http://nveresov.narod.ru/ZPD.pdf

33. *Voloshinov V. N.* Marxism and the Philosophy of Language. [Translated by M. Ladislav & I. R. Titunik]. Cambridge, 1929/1986.

34. *Vygotsky L. S.* Consciousness as a Problem in the Psychology of Behavior. In N. Veresov (Ed.), Undiscovered Vygotsky. Etudes on the Pre-history of Cultural-historical Psychology. [Translated by N. Veresov]. Frankfurt/Main, 1925/1999.

35. *Vygotsky L. S.* The History and the Development of Higher Mental Functions. The Collected Works of L. S. Vygotsky. Vol. 4. [Translated by M. J. Hall]. N. Y., 1931/1997.

36. *Vygotsky L. S.* Thought and Language. [Translated by A. Konzulin]. Cambridge, MA, 1934/1986.

37. *Werani A.* Die Erforschung des inneren Sprechens - ein Ergebnis aus einer empirischen Studie // ICHS-Journal. 2010. Vol. 1. P. 83—101.

К культурно-историческим исследованиям и исследованиям диалогического письма — некоторые методологические соображения

Андреа Карстен
аспирант института общей и структурной лингвистики Университета г. Мюнхен, магистр

На основе культурно-исторической и диалогической концептуализации мышления и речи, сформулированных в советской психологии и лингвистике 1920-х и 1930-х гг., в этой статье сделана попытка отразить конгруэнтный способ исследования письма в качестве когнитивной и коммуникативной деятельности. Что необходимо принимать во внимание при разработке методологии для исследования письма с точки зрения культурно-исторической психологии и диалогического подхода? Во-первых, письмо не отделено от других видов речевой деятельности, таких как межличностная и внутриличностная речь. Таким образом, внутренний диалог и адресный характер письма становятся важными понятиями, которые должны быть рассмотрены методологически. Во-вторых, в отличие от настоящих традиций исследования письма, таких как исследования грамотности и исследования процесса письма в когнитивной психологии, должны быть рассмотрены как индивидуальные процессы письма, так и социально-культурные практики письма, а также и их отношения. Эти размышления приводят к выводу, что письмо не в полной мере является доступным для внешнего наблюдения или самоанализа. В результате дано предложение методологического подхода, вдохновленное методом автоконфронтации, теоретически обоснованного в теории деятельности. Предлагаемый метод состоит из двух этапов: а) видеозаписи момента письма и б) совместного анализа данной видеозаписи в диалоге между тем, кто писал, и исследователем. Второй этап переводит деятельность письма в новый контекст, где понимание становится возможным. Такой совместный анализ позволяет услышать различные позиции: позиции пишущего и исследователя, позиции и воображаемых читателей, а также интерсубъективных позиций и позиций, связанных с обществом. В заключение выводы предлагаемого исследовательского подхода обсуждаются и оцениваются с точки зрения теоретической базы.

Ключевые слова: письмо, исследование письма, диалог, диалогическая перспектива, автоконфронтация*.

Сочинения молодых женщин из меньшинств и мета-рефлексия в школе: диалог между Выготским и Фуко.
Часть 1

Михалис Контоподис
Ph.D., секретарь ISCAR

В статье представлены материалы двух исследований, проведенных в школах среди учащихся, переживших опыт социальной изоляции, академически неуспешных в условиях массовой школы, испытывающих экономические трудности и семейные проблемы. Один из этих проектов возник как продолжение этнографического исследования, проведенного в экспериментальном профессионально-техническом училище в Германии в 2004 и 2005 гг., второе исследование представляет собой анализ результатов школьного проекта, проведенного в Старшей Школе Вудроу Вилсон в Лонг Бич, штат Калифорния, с 1994 по 1998 гг. Следуя за Фуко и Выготским, автор показывает, как дневники и сочинения способствовали формированию качественно новых форм рефлексии и развитию различных форм коммуникации между учителями и учениками. В представленном материале отражается и описывается значение этих изменений в педагогической и психолого-педагогической практике. Статья написана в двух частях — первая представлена здесь, вторая выйдет в следующем номере журнала «Культурно-историческая психология».

Ключевые слова: критическая рефлексия, опосредование, экспериментальные школы, Фуко, общественный сдвиг, технологии себя, Выготский, молодые женщины.

Акт первый:
Создание средств рефлексии в школе

Учитель: Я тут подумал, сможем ли мы к окончанию этого отдельно взятого проекта найти какой-то индивидуальный способ выразить себя и свой собственный процесс (обучения/развития) в письменной форме. (.2)* Честно говоря, мне кажется, это невозможно...

Автор: Ммм.

У: ... не может же это просто произойти само собой. [...] (чтобы они) размышляли об (.1) этом процессе сами, я думаю, им понадобятся какие-то вопросы (.1) как некий ориентир. Ну, то есть, не все же могут просто взять да и (сказать): «Это было хорошо, а проблема для меня всегда состоит в том, чтобы ... и т. д. и т. п.» Это, конечно, было бы здорово, но, мне кажется, что <э... ммм...> мы хотим слишком многого.

А: Ммм.

У: Итак (.1) повторим, некий ориентир: взглянуть на это еще раз и [...] ну, просто чтобы пролить свет на этот процесс.

---

* Указывает на паузу в 2 секунды.

А: (.1) Ммм.
У: (.1) И я хотел бы, чтобы (.1) это было сделано в письменной форме [...]

[перевод с английского/перевод с языка оригинала выполнен автором]

Выше приведена выдержка из плановой дискуссии, проведенной с целью координации моей (А) работы, работы учителя (У), а также еще одного педагога, вплотную работавшего с классом из 20 учеников в течение года в Школе индивидуально-практического обучения (название изменено) в одном крупном городе в Германии. Мы обсуждаем способы опосредования, которые могли бы помочь учащимся почувствовать и осознать «процесс» их собственного развития в течение пятнадцатидневного проекта индивидуального обучения. Этот отрывок показывает, что учитель (У) предлагает задать ученикам вопросы, побуждающие к рефлексии в отношении себя и собственного процесса развития. Он делает акцент на том, что это важно выполнить в письменной форме, задавая ученикам некий ориентир.

В Школе индивидуально-практического обучения опыт размышления и рефлексии в отношении своей успешности в школе и своего развития с использованием изобразительных средств, повествовательных средств и других способов опосредования является частью повседневной жизни. В целом все материалы, которые я анализирую ниже, получены во время этнографического полевого исследования, проводившегося в этой школе в течение одного года.

Здесь я хотел бы вернуться к отрывку, представленному в начале статьи. Письменная форма, упомянутая учителем, должна была бы представлять собой обзор различных действий ученика и его взаимодействий с учителем, произошедших в те две недели, в течение которых длился образовательный проект. Предполагалось, что вести такой отчет будет не учитель, а сам ученик, который вместе с тем будет рефлексировать в отношении себя.

Как я покажу далее, необходимо перейти от идей Выготского (который, конечно же, хорошо знаком читателям этого журнала) к Фуко (крупному французскому философу и историку мысли) и обратно, чтобы понять, как опосредование в данном конкретном случае запускает определенные механизмы рефлексии и формирует определенные способы отношения к себе и другим, в то же время делая невозможными другие процессы. Опосредование, которое учитель хочет создать, включает не только размышление и взаимодействие — оно также предполагает определенную форму индивидуальности, в отношении которой происходит рефлексия. Предполагается, что ученик будет активно вовлечен в процесс самоконтроля посредством самопонимания.

Акт второй: Фрейлины Веласкеса

В знаменитом вступлении к своей книге «Слова и вещи» Фуко анализирует картину Веласкеса «Фрейлины». Полотно представляет самого художника за работой над портретом короля Филипа IV и его жены Марианы. Позирующая королевская чета не видна зрителю на картине — он может увидеть лишь их отражение в зеркале [20]. На картине за Веласкесом наблюдает инфанта Маргарита с группой фрейлин и другие люди, пришедшие посмотреть на работу мастера. Фуко утверждает, что мы находим на картине не репрезентацию изображенного человека, но репрезентацию репрезентации.

Репрезентация здесь предпринимает попытку представить себя во всем множестве своих элементов — образов, глаз, которыми эти образы представлены, лиц, которые она делает видимыми, жестов, которые она вызывает к бытию [20]. Согласно Фуко, репрезентация представляет себя здесь в самой чистой форме.

Объединяя взгляды Фуко и Выготского, можно утверждать, что картина наподобие «Фрейлин» Веласкеса опосредует коммуникацию между художником и зрителями и в то же время опосредует внутреннюю речь как художника, так и зрителя. Картина запускает процесс рефлексии у рассматривающих ее субъектов относительно представленной темы или объекта в нескольких модальностях. То же можно утверждать и о других семиотических средствах или средствах коммуникации, таких как литература, кинематография, прикладное искусство*.

Как упоминается в первом акте, такие средства часто используются в школе. В рамках социокультурного и культурно-исторического подходов к обучению и развитию исследователи всесторонне изучили, как семиотические средства (такие, как письмо или рисование) одновременно опосредуют общение между учителями и учениками, взрослыми и детьми, «внутреннюю речь», обращенную к самому себе, а также формируют мышление и воображение [6; 9; 16; 40].

Исследования такого рода основаны на семиотическом подходе Выготского, в рамках которого мышление понимается как опосредованное знаками, используемыми в конкретную историческую эпоху и в конкретной социокультурной среде [84; 87; 90]. Уникальность картины Веласкеса в том, что она не только способствует рефлексии как таковой, но запускает рефлексию и по отошению к самой работе художника, побуждая к осмыслению социальных условий, в которой она создавалась, и связанных с ней отношений власти. И даже больше, картина способствует рефлексии в отношении условий рефлексии и ее качеств.

Ссылаясь на Фуко, мы расширяем понимание Выготского и можем утверждать, что это отличный тип рефлексии от интроспекции в отношении себя,

---

* Например, известная по кинематографу работа Deleuze, 1987.

самонаблюдения, доминирующего в современной психологической и консультационной (и психолого-педагогической) практике. Интроспекция, возникновение которой можно проследить от христианской практики исповеди, анализируется в работе Фуко, посвященной «техникам» или «технологиям себя» [23; 22; 47].

Согласно Фуко, тот тип мета-рефлексии, который порождает картина Веласкеса, свидетельствует об изменении западной мысли в конце XVI — начале XVII в., когда «изображение начало ослаблять свою связь со знанием и исчезать, по крайней мере частично, из области познания» [20]. С этого времени знаки уже не воспринимались как отражение истины, объективно существующей «вовне», они были признаны отражающими истину семиотических отношений. В этом контексте и «внешняя реальность» и «внутренняя» рассматриваются не как таковые, а только в отношении к наблюдателю, а также в отношении к форме и средствам процесса наблюдения или процесса представления.

Именно в данной традиции особое значение в работах Фуко приобретает концепция «дискурса». В рамках этого семиотического понимания репрезентации формируется его критический анализ технологий себя, отношений власти, психологического и других дискурсов, а также механизмов репрезентации и регуляции [21; 65].

Акт третий: Разговор о сегодняшнем дне

Работы Фуко крайне важны для изучения современного образования на Западе. В большинстве стран Запада жизнь взрослого человека все чаще организована на краткосрочных трудовых контрактах и на фоне сокращения фондов социальной поддержки. Воспитание эффективных соискателей и работников стало основной целью многих образовательных программ [66; 78]. Не будет преувеличением сказать, что развитие учеников все чаще становится ориентированным на профессионально-техническое образование, на развитие самоконтроля, собственной ответственности и навыков по поиску работы. В этом контексте учащиеся часто бывают вовлечены в организованную педагогом практику самонаблюдения и рефлексии, по отношению к своим прошлым достижениям и будущей карьере. Более того, школы взаимосвязаны с рынком труда, а также с психологическими службами.

Эта ситуация становится все более проблематичной для учащихся с опытом социальной изоляции. Вместо рефлексии условий, как было с картиной Веласкеса, учащихся часто поощряют лишь к самонаблюдению и к персонализации таких более широких социальных проблем, как маргинализация и возрастающая безработица. Они часто рассматривают эти социальные проблемы в терминах своего собственного неуспеха и не способны к рефлексии относительно процесса, причин и последствий такого пере-

носа социальных проблем на себя. В результате они склонны искать индивидуальные решения этих проблем в стремлении быть более продуктивными, гибкими и дисциплинированными. Они оказываются не способны к критической рефлексии и решению ключевых конфликтов их социальной ситуации. Они также не чувствуют в себе сил и права бросить вызов условиям своего образования [62; 66]. Ситуация становится еще более острой, когда учащиеся с опытом социальной изоляции, с плохой успеваемостью в школе, финансовыми затруднениями и семейными проблемами подпадают под распространенные сегодня неолиберальные реформы образования, которые в какой-то мере можно наблюдать и в России [57; 61].

Ниже я проясню эту теоретическую и политическую позицию и попытаюсь найти радикальные альтернативы этому феномену. Я обращусь к некоторым случаям и примерам из практики. Основываясь главным образом на анализе дневников, написанных учащимися двух разных школ, я намерен разобрать современный опыт «репрезентации» и предложить критическое понимание рефлексии. Эта статья — также и писательский эксперимент; она разворачивается как театральная пьеса с девятью актами и двумя интерлюдиями. Однако эта пьеса не дописана до конца, последующие и завершающие акты все еще остаются неизвестными. В статье рассматриваются современные проблемы, с которыми сталкиваются этнические и классовые меньшинства в образовательной среде Германии и других развитых стран [3; 43].

В этом контексте я собираюсь проанализировать стандартную практику в экспериментальной школе в Германии, рассмотрев сделанные в особой форме письменные отчеты как ключевой показатель развития образования. Я также предложу сравнение с другими способами рефлексивной работы, внедренными в одном инновационном классе общеобразовательной школы в Лонг Бич, штат Калифорния. Таким образом, я попытаюсь представить решение политической проблемы, при котором рефлексию можно концептуализировать и стимулировать так, чтобы в школе появлялись свобода, воображение и активность.

Для достижения этой цели я сравниваю дневники трех девушек со сходными проблемными, с образовательной точки зрения, биографиями и общими чертами опыта социальной изоляции: дискриминацией по половому признаку, финансовыми затруднениями и семейными проблемами. Для них сочинение представляет инструментом опосредования в образовательной среде. Я также обращаю внимание и на более широкий контекст их сочинений. Тексты отражают настоящую и будущую ситуации респонденток.

Материалы в первых двух случаях получены в ходе лонгитюдного этнографического исследования, проведенного мною в Германии. Третий случай, представленный в данной статье, относится к широко известному и подробно документированному школьному проекту, осуществленному в Калифорнии. Хотя мне и не случилось наблюдать этот проект

как этнографу, он вдохновлял меня при анализе данных своего исследования. При сравнении этих двух школьных проектов я обращаю особое внимание на респондентов, подвергшихся дискриминации или оттесненных на периферию в их среде [31; 38; 93].

Я сосредоточусь только на учащихся женского пола, на том, как этническая принадлежность, пол и социальный класс взаимосвязаны [55; 91; 92]. Я представлю три случая — три девушки из двух образовательных ситуаций, описанных выше в теоретической части. Хотя изучаемая проблема достаточно широка и влияет на большинство студентов, а не только из меньшинств, я делаю акцент на наиболее острые и сложные ситуации. Можно сказать, что в этих ситуациях маргинализация усложняет процесс образования, и что — в определенной степени — критическая рефлексия здесь еще нужнее, чем в обычных случаях. Записи женщин, на которых сделан акцент в данной статье, можно назвать типичными в том смысле, что они схожи с записями многих других учащихся из маргинальной среды, собранными в ходе исследования. Я подчеркиваю, что эти материалы являются «частями целого», отражающими общие тенденции и феномены, которые я наблюдал в ходе исследования или анализа конкретных случаев. Поэтому они могут быть использованы в качестве примера в контексте более общего анализа [85].

Четвертый акт:
Записи о повседневной жизни в Школе индивидуально-практического обучения

На третий день я вообще-то ничего особенного не делала. Как всегда я пришла к 9.45. Я сразу сложила полотенца, потом [...]. Первый клиент пришел в 10 часов — он привел с собой собаку, она лаяла и все время действовала всем на нервы. Тем временем я сняла бигуди (с болванки), которые я накручивала вчера: они выглядели просто здорово. В общем, я была горда собой, кудри выглядели красиво и аккуратно, прямо от корней. Майк (псевдоним) тоже так сказал! [...] Со стрижкой пошло не так хорошо, но к счастью пришла клиентка, и Анна (псевдоним) делала ей ту же стрижку. Я внимательно наблюдала за всем от начала и до конца. В среду попробую еще раз.

[перевод с английского/перевод с языка оригинала выполнен автором]

Автора записи зовут Самира (псевдоним), девушка-турчанка из рабочего класса. Школьное обучение ее не было очень успешным, и поэтому она поступила в Школу индивидуально-практического обучения. Однако по сравнению со многими другими учащимися этой школы ее успеваемость за последний год была достаточно высокой. Она редко пропускала занятия, что соответствовало ожиданиям учителей, и в целом

была охарактеризована как «ответственная». Как и многие другие девушки, учащиеся в Школе индивидуально-практического обучения, Самира стажировалась в парикмахерском салоне. Во время учебы в школе в рамках курса немецкого языка она должна была ежедневно или еженедельно писать отчет курирующему педагогу о своих занятиях во время стажировки. Целями этой деятельности были одновременно практика написания изложения на немецком языке и рефлексия по поводу своей стажировки, своих профессиональных интересов и целей.

В приведенном выше отрывке Самира письменно фиксирует задачи, которые она выполняла, и оценку их исполнения взрослыми, работающими в парикмахерской, где проходил ее проект «Обучение на практике». Это третий день ее стажировки. Дневниковая запись начинается в 9.45 утра, затем отмечено время 10 утра и т. д. Во всем отчете события повседневной жизни изображены так, как они должны формулироваться в немецком языке, в прошедшем времени и в некоторой последовательности. Также указана связь с будущим: «В среду попробую еще раз». Дневник Самиры представляет собой нечто вроде исповеди, он написан с целью беспристрастно изобразить произошедшие события.

Мы обнаруживаем, что Самира рассматривает то, что произошло «вовне» в контексте конкретной ситуации. Она сидит за партой в классе (внутри) и под руководством педагога-куратора переводит множество событий, произошедших во время стажировки (вовне), в некое временно заданное, но значительное целое. Информация не просто передается, она сжимается, обобщается, индивидуализируется и модифицируется для использования в будущих ситуациях для других целей. Важным элементом такого перевода из внешних событий в письменную речь является тот факт, что это действие индивидуализировано, и субъект написания текста помещен в центр изложения. Другой важный элемент перевода в письменную речь — это установленный временной порядок, делающий происходящее во время стажировки значимым для Самиры и для учителя, который позже прочитает ее отчет и оценит его.

Заданный временной отрезок включает не только прошлое, но и будущее. События и действия, произошедшие за время стажировки Самиры, значимы с точки зрения той будущей позиции, к которой она стремится: позиции рационального [95] взрослого [35], работающего или ищущего работу человека [66]. Ее письменный отчет должен был поддержать рефлексию в отношении своего прошлого, а также помочь ей поставить цели на будущее. И это ясно проявляется в дальнейших отчетах Самиры*, а также в отчете другой девушки, извиняющемся и оправдывающемся по тону, где изложена история неуспешного прохождения стажировки в парикмахерской. Этот отчет, названный «Мой последний день в

---

* Другие написанные ею ежедневные и еженедельные отчеты, финальные отчеты, заметки и видеозаписи, касающиеся двух визитов в парикмахерскую во время стажировки, а также резюме и анкеты.

парикмахерской», написан Гуриетой (псевдоним) — еще одной учащейся турецкого происхождения.

Продолжение статьи читайте в следующем номере журнала «Культурно-историчекая психология».

Приложение: «Закулисье»

Школа индивидуально-практического обучения (название изменено) — экспериментальная школа, где объединены социальная работа, классное и профессиональное обучение. В 2004—2005 учебном году я провел там этнографическое исследование, ставшее основой представленного здесь анализа. Будучи психологом-практикантом и аспирантом в области школьной психологии, я участвовал в повседневной жизни школы в течение всего учебного года: присутствовал как наблюдатель на занятиях в классе в течение полного учебного дня пять дней в неделю, а также во внеурочное время участвовал в официальных и неформальных собраниях учителей.

Эта школа расположена в одном из крупнейших городов Германии. В ней учились дети, до этого считавшиеся неуспешными в обучении, остававшиеся на второй год более одного раза. В программе обучения важная роль отводилась рефлексии в сочетании с ориентацией на практику: учащиеся проходили различные стажировки, получая опыт «в реальной жизни», чтобы определить сферу своих интересов и принять серьезные решения относительно их будущего.

Вскоре после начала учебного года директор школы и местный образовательный орган власти утвердили мой исследовательский проект. После этого ученики школы, пожелавшие участвовать в проекте, подписали информационные бланки согласия на участие, также одобренные директором. Участницам было по 16 лет и, по закону Германии, согласие их родителей на участие и санкциях университетского комитета по этике не требовалось.

Мои дружеские и доверительные отношения с участницами позволили мне получить доступ ко всем их записям. Учителя также доверяли мне, поскольку я получил образование в области психологии и имел степень магистра, хорошо понимал практические проблемы учеников и учителей в их повседневной жизни в школе. Отношение учителей ко мне как к коллеге, а также мое уважение к личной тайне и сохранение анонимности настоящих имен участников проекта позволили мне получить доступ к большинству документов.

Обычно ученики этой школы происходили из среды иммигрантов либо из проблемных семей алкоголиков и безработных. В результате отбора удалось получить достаточно сбалансированную выборку: в примерно равном количестве — юноши и девушки и — примерно в равных пропорциях по этнической принадлежности — немцы и иностранцы (главным образом турки). В основном (согласно данным шко-

 лы) участники происходили из семей низкого социоэкономического положения. В большинстве случаев это были молодые люди 18 лет, все еще не получившие сертификат о школьном образовании, что в норме происходит к 15 годам.

Участники из иммигрантской среды были в основном иммигрантами второго поколения. Они говорили и писали по-немецки с грамматическими ошибками, что, впрочем, случается и со многими этническими немцами. Между собой же, находясь в этнически однородной компании, эти учащиеся общались на родном языке (в частности, на турецком). Проводя это исследование, я говорил на немецком с неидеальной грамматикой (мой родной язык — греческий), поэтому участники не воспринимали меня как учителя, для них я был между ними и учителями.

Материалы исследования в Школе индивидуально-практического обучения включали 17 часов аудиозаписей и конспектов организационных бесед с учителями, которые проводились еженедельно, 21 беседу с учениками, записанную на аудио-носитель (полуструктурированные и свободные интервью), этнографические материалы (видеозаписи работы в классе) и заметки. Анализ этих данных, а также школьных документов сделан под влиянием этнографических подходов и исследований в науке и технике [14; 39; 50]. Моя методология обобщает критическую этнографию, т. е. включает процесс рефлексивного выбора между концептуальными альтернативами и построением ценностных суждений относительно смысла и метод постановки задач исследования, планирования и других форм анализа [77; 54].

Я использовал разнообразные методы для фиксации семиотической и материальной деятельности, делая акцент на связях между субъектами и способами опосредования, а также на взаимозависимости семиотического и материального аспектов деятельности [49; 51]. Особое внимание в этом этнографическом наблюдении уделялось движению учеников, учителей и школьных документов в пространстве классной комнаты, кабинета школьной администрации, кабинета учителя и места стажировки. Еще один аспект в фокусе моего внимания — использование технологий, оборудования (компьютеры, мобильные телефоны) и электронных способов хранения информации. В некоторых случаях я задокументировал использование других артефактов, таких как рисунки, фильмы, одежда. Также я отмечал использование и обращение жанров письменной речи, употребляемых в школе (дневники стажировок, учебные материалы), и собрал ксерокопии этих источников.

Второй пример, рассматриваемый здесь, — это пример образовательной программы, внедрявшейся в одном классе в Старшей школе Вудроу Вилсон в Лонг Бич, штат Калифорния, США, в 1994—1998 гг. Учитель, создавший эту программу, — Эрин Грауэлл*, преподаватель английского. Под

---

* Настоящее имя, упомянутое в ее книгах [28; 29; 30].

ее руководством ученики начали писать анонимные дневники о своей повседневной жизни и зачитывать их в классе. Это позволило провести в классе дискуссии по многим социальным проблемам, таким, как расизм и сегрегация, дискриминация и культ внешности, домашнее насилие, женоненавистничество, дислексия, синдром дефицита внимания, гомосексуализм, гибель близких людей в перестрелках. Материалы по проекту «Писатели свободы» был взят из книг Эрин Грауэлл [28; 29; 30], а также из других источников, таких, как отчеты очевидцев*.

Участники проекта в школе Вудроу Вилсон, как и ученики Школы индивидуально-практического обучения, произошли из различных этнических сред и имели сходный опыт социальной изоляции, экономической неустроенности, отторжения их культуры, семейных проблем, низкого уровня образования (включая трудности в практической реализации навыков письменного и устного английского языка). Их не отбирали намеренно в этот класс и школу, состав класса был разнообразным в этническом плане. Большинство учеников ранее показывали низкие результаты в учебе. Лишь некоторые из них имели белый цвет кожи.

Многие ученики этих двух школ участвовали в различных антисоциальных агрессивных акциях, хотя учащиеся Школы индивидуально-практического обучения не сталкивались с такими трагедиями, как перестрелки и убийства, что случалось с учениками из школы Вудроу Вилсон.

В повседневной жизни большинство этих молодых людей сталкивались с бедностью, бездомностью, употреблением алкоголя и наркотиков, подростковой беременностью, расизмом и сексуальной дискриминацией. Насилие, пожалуй, было основной проблемой ребят из Лонг Бич. Наиболее распространенной проблемой учащихся немецкой школы была их неуспешность в учебе, которая не позволяла им получать более высокое образование и хорошую работу в будущем.

Этим молодым людям не только не хватало ресурсов и возможностей, как учащимся американской школы; в силу особенностей законодательства Германии у них не было совершенно никакой возможности для продвижения вверх по социальной лестнице. Система в Германии основана на четко различающихся категориях школ, которая облегчает отслеживание и категоризацию учащихся с возраста 12—13 лет, иногда раньше. Эта система отдельных школ для разных категорий учеников создает различные категории работников и соискателей работы по окончании обучения [64]**.

Хотя проблемы, с которыми эти учащиеся сталкиваются в повседневной жизни, могут различаться в деталях, все они считают себя «маргинальными» или «второстепенными» людьми с мета-перспективами, что сплачивает очень разных людей. Стивенсон и Пападопулос вводят термин «общественность в процессе формирования», подчеркивающий процессуальность того, как возникает коллективизм между людьми, разделяющими сходный опыт изоляции, уникальный у каждого, но в то же время похожий на опыт других [22; 73].

В статье я использовал примеры из этих исследований, делая особый акцент на письменных отчетах учеников. Однако я не ставил цель сравнить разные образовательные программы, в контексте которых возникли эти сочинения. Я считаю, что обе образовательные модели были созданы каждая в своем уникальном контексте, и было бы невозможно и неправомерно сравнивать их принципы, ценности и методологию. В их создание были вовлечены разные люди с разными мотивами, что делает невозможным повторение каждой из этих моделей в другом контексте. Однако я попытался связать происходившее в Школе индивидуально-практического обучения с моделью, созданной в Старшей школе Вудроу Вилсон, чтобы иметь возможность взглянуть на конструирование развития с мета-преспективы [18].

---

* Проект «Писатели свободы» скоро стал очень популярным, и даже побудил режиссера Ричарда Ла Гравенезе снять фильм с участием Хилари Суонк [50]. Однако подход «Писателей свободы», представленным в фильме, был раскритикован, так как породил романтическое представление об учителе-герое/героине, приносящем/щей в жертву свою личную жизнь, чтобы преодолеть более глобальные социальные и образовательные недостатки, за которые несут ответственность государственные учреждения [5]. Книга представляет собой более стоящий источник информации, если анализировать ее не с идеализирующей героя точки зрения, а в сочетании с другими источниками — что я и пытаюсь делать в последующих абзацах.

** В Германии до последнего времени все дети посещали младшую школу вплоть до 4, 5, 6 или 7 класса, в зависимости от законодательства конкретного субъекта федерации. После этого они могли выбрать один из трех путей обучения (Hauptschule, Realschule, Gymnasium) на основании их успешности в школе на начальном уровне. Именно это разделение можно рассматривать как момент сегрегации. Часто ученики, направленные в Hauptschule, обладали похожими этническими и классовыми особенностями, и у них не было возможности в рамках образовательной системы Германии получить впоследствии более высокое профессиональное или университетское образование. Окончание Hauptschule происходит в 9 или 10 классе; Realschule — в 10 классе. Выпускники Hauptschule и Realschule затем участвуют в программе сотрудничества (учеба и работа) или посещают различные Fachoberschulen. Ученики гимназий продолжают учиться там еще 2—3 года, после чего получают диплом уровня абитуриента, позволяющий им подавать документы в колледж или университет. В последнее время в некоторых Землях Германии система была реформирована, и пока неясно, будут ли значительные перемены к лучшему или те же структуры сохранятся в системе под другими названиями и ярлыками. Для примера, другой тип школ — Gesamtschule, общеобразовательная школа (5—9/10 классы), в которой традиционные направления обучения существуют интегрированно и совместно. Ученики общеобразовательных школ могут получить диплом уровня Hauptschule в 9 или 10 классе, диплом уровня Realschule или разрешение на учебу в гимназии в 10 классе, и в процессе учебы есть возможность для смены образовательных направлений.

References

1. *Anonymous* Keepin' it Real. Northwest Education Magazine 8 (2): http://www.nwrel.org/nwedu/08-02/real.asp (date of acces: 28. September 2009), 2002.

2. *Arsenault R.* Freedom Riders: 1961 and the Struggle for Racial Justice. Oxford, 2006.

3. *Benites M., Bernd F.* Vom Umgang mit Differenz: Globalisierung und Regionalisierung im interkulturellen Diskurs (Dealing with Difference: Globalization and Regionalization in Intercultural Discourse). Oberhausen, 2007.

4. *Brockmeier J.* Erinnerung, Identitat und autobiographischer Prozess (Remembering, Identity and Autobiographical Process) // Journal für Psychologie 7 (1), 1999.

5. *Chhuon V., Francisco C.* Book Review: Conchas, Gilberto Q. (2006). The Color of Success: Race and High-Achieving Urban Youth. New York: Teachers College Press / In Urban Education Online. Pp. 1—5, Vol. 20, doi: 10.1177/0042085907311018 (date of acces: 28. July 2010), 2008.

6. *Dafermos M.* The Cultural-historical Theory of Vygotsky: Philosophical, Psychological and Pedagogical Aspects. Athens, 2002.

7. *Daniels H.* Vygotsky and Pedagogy. London, 2001.

8. *Daniels H.* The «Social» in Post-Vygotskian Theory // Theory & Psychology 16 (1), 2006.

9. *Daniels H., Michael C., Wertsch J. V., eds.* The Cambridge Companion to Vygotsky. Cambridge, 2007.

10. *Davis M.* City of Quartz: Excavating the Future in Los Angeles. London, 1990.

11. *Davis M.* Ecology of Fear: Los Angeles and the Imagination of Disaster. New York, 1998.

12. *Davydov V. V., Rubcov V. V.* (red.). Razvitie osnov refleksivnogo myshleniya shkol'nikov v processe uchebnoi deyatel'nosti. Novosibirsk, 1996.

13. *Deleuze G.* Cinema II: The Time-Image. H. Tomlinson and B. Habberjam, transl. London, 1987.

14. *Emerson R. M., Fretz R. I., Shaw L. L.* Writing Ethnographic Fieldnotes. Chicago, 2003.

15. *Fairclough N.* Discourse and Social Change. Cambridge, UK and Cambridge, MA, 1992.

16. *Fichtner B.* Lernen und Lerntatigkeit: Phylogenetische, Ontogenetische und Epistemologische Studien (Learning and Learning Activity: Phylogenetic, Ontogenetic and Epistemological Studies). Magburg, 1996.

17. *Fichtner B.* Reflective Learning: Problems and Questions Concerning a Current Contextualization of the Vygotskian Approach / In: Activity and Sign: Grounding Mathematics Education. Michael Hoffmann, Johannes Lenhard, and Falk Seeger (eds.) New York, 2005.

18. *Fichtner B.* Wirklichkeit vom «Standpunkt des Neuen» sehen-das Beispiel Albert Einstein (What is to View Reality from the «Standpoint of the New»). In Vom Umgang mit Differenz. Globalisierung und Regionalisierung im interkulturellen Diskurs (Dealing with Difference: Globalization and Regionalization in Intercultural Discourse). Maria Benites and Bernd Fichtner (eds.) Oberhausen, 2007.

19. *Filipović Z., Pribichevich-Zorić C.* Zlata's Diary: A Child's Life in Sarajevo. London, 1994.

20. *Foucault M.* The Order of Things: an Archaeology of the Human Sciences. New York and London, 2002 [1966].

21. *Foucault M.* Afterword: The Subject and Power / In: Michel Foucault: Beyond Structuralism and Hermeneutics. Hubert L. Dreyfus and Paul Rabinow (eds.) Chicago, 1982.

22. *Foucault M., Gros F., Ewald F., Fontana A.* The Hermeneutics of the Subject: Lectures at the College de France, 1981—1982. New York, 2005.

23. *Foucault M., Martin L. H., Gutman H., Hutton P. H.* Technologies of the Self: A Seminar with Michel Foucault. Amherst, 1988.

24. *Frank A.* The Diary of Anne Frank (Original title: Het Achterhuis: Dagboekbrieven van 12 Juni 1942—1 Augustus 1944/The Annex: diary notes from 12 June 1942—1 August 1944). Otto H. Frank and Mirjam Pressler (eds.) New York, 1995 [1947].

25. *Freire P.* Cultural Action for Freedom. Harmondsworth, 1972.

26. *Freire P.* Education for Critical Consciousness. New York, 1973.

27. *Garcia-Reid P.* Examining Social Capital as a Mechanism for Improving School Engagement among Low Income Hispanic Girls // Youth & Society, 39 (2), 2007.

28. *Gruwell E.* The Freedom Writers Diary: How a Teacher and 150 Teens Used Writing to Change Themselves and the World Around Them. New York, 1999.

29. *Gruwell E.* The Freedom Writers Diary: Teacher's Guide. New York, 2007a.

30. *Gruwell E.* Teach with Your Heart: Lessons I learned from the Freedom Writers. New York, 2007b.

31. *Hall S., Jefferson T.* Resistance Through Rituals: Youth Subcultures in Post-war Britain. London, 1976.

32. *Hansen D., Jarvis P.* Adolescent Employment and Psychosocial Outcomes — A Comparison of Two Employment Contexts // Youth & Society, 31 (4), 2000.

33. *Haug F.* Female Sexualization: a Collective Work of Memory. London, 1987.

34. *Haug F.* Beyond Female Masochism: Memory-work and Politics. London, 1992.

35. *Holzkamp K.* Kolonisierung der Kindheit. Psychologische und Psychoanalytische Entwicklungserklarungen (Colonializing Childhood: Psychological and Psychoanalytical Explanations of Development) / In: Schriften I: Normierung, Ausgrenzung, Widerstand (Writings I: Normalization, Exclusion, Resistance). Klaus Holzkamp (eds.) Hamburg and Berlin, 1997 [1995].

36. *Houck J. W., Cohn K. C., Cohn C. A.* Partnering to Lead Educational Renewal: High-quality Teachers, High-quality Schools. Long Beach, CA, 2004.

37. *Huijer M.* The Aesthetics of Existence in the Work of Michel Foucault // Philosophy & Social Criticism 25 (2), 1999.

38. *Ivinson G., Murphy P.* Rethinking Single-sex Teachings: Gender, Subject Knowledge and Learning. Buckingham and McGrawHill, 2007.

39. *Jessor R., Colby A., Shweder R.* (eds.) Ethnography and Human Development: Context and Meaning in Social Inquiry. Chicago, London, 1996.

40. *Keiler P.* Lev Vygotskij: Ein Leben fur die Psychologie (Lev Vygotskij: A Life for Psychology). Weinheim, 2002.

41. *Keneally T.* Schindler's Ark. New York, 1982.

42. *Kontopodis M.* Fabrication of Times and Micro-Formation of Discourse at a Secondary School. Forum: Qualitative Social Research (Online Journal) 8, 1, URL (consulted 05 June, 2010): http://www.qualitative-research.net/fqs-texte/1-07/07-1-11-e.htm, 2007.

43. *Kontopodis M.* Culture, Dialogue and Emerging Educational Challenges: An Introduction / In: Children, Culture and Emerging Educational Challenges: A Dialogue with Brazil, Latin America. Michalis Kontopodis (eds.) Berlin, 2009a.

44. *Kontopodis M.* Editorial: Time. Matter. Multiplicity // Memory Studies 2(1), 2009b.

45. *Kontopodis M.* (eds.) Children, Culture and Emerging Educational Challenges: A Dialogue with Brazil, Latin America. Berlin, 2009c.

46. *Kontopodis M.* (eds.) Landless Movement, Materiality and Radical Politics in Brazil, Espirito Santo: A Multimedia Anthropological Scape. Published online: http://landless-mov2010.wordpress.com/ (date of access: 31. July 2010), 2010.

47. *Kontopodis M., Niewohner J.* Das Selbst als Netzwerk: Korper und Artefakte im Alltag (The Self as Network: Bodies and Artifacts in the Everyday). Michalis Kontopodis and Jorg Niewohner (eds.) Bielefeld: transcript, 2010.

48. *LaGravenese R.* Freedom Writers. Paramount Pictures. USA, 2006.

49. *Latour B.* Science in Action: How to Follow Scientists and Engineers Through Society. Cambridge, MA, 1987.

50. *Latour B.* Reassembling the Social: An Introduction to Actor-Network-Theory. Oxford, 2005a.

51. *Latour B.* Trains of Thought: The Fifth Dimension of Time and its Fabrication / In: Thinking Time: A Multidisciplinary Perspective on Time. Anne-Nelly Perret-Clermont (eds.) Göttingen, 2005b.

52. *Lave J., Wenger E.* Situated Learning: Legitimate Peripheral Participation. Cambridge, 1991.

53. *Lee C. A.* Anne Frank and Children of the Holocaust. New York, 2006.

54. *Levinson B., Foley D., Holland D.* (eds.) The Cultural Production of the Educated Person: Critical Ethnographies of Schooling and Local Practice. New York, 1996.

55. *Linstead S., Pullen A.* Gender as Multiplicity: Desire, Displacement, Difference and Dispersion // Human Relations, 59(9), 2006.

56. *Lopez T. A.* (eds.) Growing Up Chicana/-o. New York, 1995

57. *Macrine S. L.* (eds.) Critical Pedagogy in Uncertain Times: Hope and Possibilities. London, 2009.

58. *Magiolino L. S.* Emocoes humanas e significacao numa perspectiva histoirico-cultural do desenvolvimento humano: um estudo teorico da obra de Vigotski (PhD Dissertation), Department of Psychology, UNICAMP, 2010.

59. *Middleton D., Edwards D.* (eds.) Collective Remembering. London, 1990.

60. *Nolan M. K.* «Opposition machen wir!» (We make opposition!) — Youth and the Contestation of Civic and Political Legitimacy in Germany // Childhood-A Global Journal of Child Research, 8 (2), 2001.

61. *Papadopoulos D.* The Ordinary Superstition of Subjectivity: Liberalism and Technostructural Violence // Theory & Psychology, 13 (1), 2003.

62. *Papadopoulos D.* Editorial: Psychology and the Political // Critical Psychology, 12, 2005.

63. *Pourkos M.* The Role of Socio-Historical-Cultural Context in the Interpretation and Understanding of the Columbine Tragedy: Towards an Eco-Bodily-Experiential Approach / In: Socio-Historical and Cultural Approaches in Psychology and Education. Marios Pourkos (eds.) Athens, 2006.

64. *Radtke F.-O.* Segregation im deutschen Schulsystem (Segregation in the German School System) / In: Was heiβt hier Parallelgesellschaft? Zum Umgang mit Differenzen (What is called here parallel societies? About Dealing with Differences). Wolf-Dietrich Bukow, Claudia Nikodem, Erika Schulze, and Erol Yildiz (eds.) Wiesbaden, 2007.

65. *Rose N.* Governing the Soul: The Shaping of the Private Self. London, 1990.

66. *Rose N.* Powers of Freedom: Reframing Political Thought. Cambridge, 1999.

67. *Roth W.-M.* On Mediation: Toward a Cultural-Historical Understanding // Theory & Psychology, 17 (5), 2007.

68. *Roth W.-M., Tobin K., Elmesky R., Carambo C., McKnight Y.-M., Beers J.* Re/Making Identities in the Praxis of

Urban Schooling // A Cultural Historical Perspective Mind, Culture and Activity, 2 (1), 2004.

69. *Rubcov V. V.* Social'no-geneticheskaya psihologiya razvivayushego obucheniya: deyatel'nostnyi podhod. M., 2008.

70. *Rubcov V. V., Margolis A. A., Guruzhapov V. A.* Tehnologii razvivayushego obrazovaniya; Kul'turno-istoricheskii tip shkoly (proekt razrabotki), 1996. № 4.

71. *Sorensen E.* The Materiality of Learning: Technology and Knowledge in Educational Practice. Cambridge, 2009.

72. *Spielberg S.* Schindler's List. Universal Pictures. USA, 1993.

73. *Stephenson N., Papadopoulos D.* Analysing Everyday Experience: Social Research and Political Change. London, 2006.

74. *Stetsenko A.* From Relational Ontology to Transformative Activist Stance on Development and Learning: Expanding Vygotsky's (CHAT) Project // Cultural Studies of Science Education, 3 (2), 2008.

75. *Stetsenko A.* Vygotsky and the Conceptual Revolution in Developmental Sciences: Towards a Unified (non-additive) Account of Human Development / In: World Year Book of Education. Constructing Childhood: Global-local Policies and Practices. Marilyn Fleer, Mariane Hedegaard, Jonathan Tudge, and Allan Prout (eds.) London, 2009.

76. *Stetsenko A., Arievitch I.* The Self in Cultural-Historical Activity Theory: Reclaiming the Unity of Social and Individual Dimensions of Human Development // Theory & Psychology, 14 (4), 2004.

77. *Thomas J.* Doing Critical Ethnography. Newbury Park, CA, 1993.

78. *Urciuoli B.* Skills and Selves in the New Workplace // American Ethnologist, 35 (2), 2008.

79. *Urciuoli B.* Helping Young Children to Become Literate: the Relevance of Narrative Competence for Developmental Education // European Early Childhood Education Research Journal, 15(2), 2007.

80. *Veresov N.* Undiscovered Vygotsky: Etudes on the Pre-history of Cultural-historical Psychology. Frankfurt am Main and New York, 1999.

81. *Vygodskaja G., Lifanova T.* Lev Semjonovic Vygotskij: Leben—Tatigkeit—Personlichkeit (Lev Semjonovic Vygotskij: Life—Activity—Personality). Hamburg, 2000.

82. *Vygotsky L. S.* The Psychology of Art. Cambridge, MA, 1971 [1925].

83. *Vygotsky L. S.* Thinking and Speech / In: The Collected Works of Vygotsky, Vol. 1. Problems of General Psychology. Robert Rieber (eds.) New York, 1987 [1934].

84. *Vygotsky L. S.* The Socialist Alteration of Man / In: The Vygotsky Reader. R. van der Veer and Jaan Valsiner (eds.) Oxford and Cambridge, 1994 [1934].

85. *Vygotsky L. S.* The Historical Meaning of the Crisis in Psychology: A Methodological Investigation / In: The Collected Works of Vygotsky, Vol. 3. Problems of the Theory and History of Psychology. Robert Rieber (eds.) New York, 1997a [1927].

86. *Vygotsky L. S.* The History of Development of Higher Mental Functions / In: The Collected Works of Vygotsky, Vol. 4. The History of Development of Higher Mental Functions. Robert Rieber (eds.) New York, 1997b [1931].

87. *Vygotsky L. S.* The Teaching about Emotions: Historical-Psychological Studies / On the Problem of the Psychology of the Actor's Creative Work / In: The Collected Works of Vygotsky, Vol 6 Scientific Legacy. Robert Rieber (eds.) New York, 1999 [1934].

88. *Vygotsky L. S.* Play and its Role in the Mental Development of the Child. Psychology and Marxism Internet Archive, http://www.marx.org/archive/vygotsky/works/1933/play.htm (Date of Access: 28. July 2010), 2002 [1933].

89. *Vygotsky L. S.* Imagination and Creativity in Childhood // Journal of Russian and East European Psychology, 42 (1), 2004 [1939].

90. *Vygotsky L. S.* Concrete Human Psychology: An unpublished manuscript. University of California, San Diego, 2005 [1929].

91. *Walkerdine V.* Schoolgirl Fictions. London, 1990.

92. *Walkerdine V.* Daddy's Girl: Young Girls and Popular Culture. Cambridge, MA, 1997.

93. *Walkerdine V., Lucey H., Melody J.* Growing up Girl: Psychosocial Explorations of Gender and Class. New York, 2001.

94. *Wiesel E.* Night (Original Title: Un di Velt Hot Geshvign). Marion Wiesel, transl. New York, 2006 [1960].

95. *Wulf C.* Educational Anthropology. Munster and New York, 2002.

Young Minority Women's Narrations and Meta-Reflection at School: A Dialogue between Vygotsky and Foucault, Part I

Michalis Kontopodis
Ph.D., the Secretary of ISCAR

The article presents the materials of two studies conducted in schools among students who have experienced the social isolation, economic hardship and family problems or were academically unsuccessful in a regular school. One of these projects has emerged as a continuation of an ethnographic study conducted in an experimental vocational-technical college in Germany in 2004 and 2005. The second study is an analysis of a school project, carried out in Woodrow Wilson High School, Long Beach, California from 1994 to 1998. Following Foucault and Vygotsky, the author shows how the diaries and writings contributed to the formation of qualitatively new forms of reflection and development of various forms of communication between teachers and students. The presented material reflects and describes the significance of these changes in pedagogical and psychological and educational practices. The article is written in two parts - the first is presented here, while the second will be released in the next issue of the Journal of Cultural-Historical Psychology.

Keywords: critical reflection, mediation, experimental schools, Foucault, social changes, technologies of the Self, Vygotsky, young women.

IX Всероссийская научная конференция «Нейрокомпьютеры и их применение»

Москва, 15 марта 2011 года

Уважаемые коллеги!

Приглашаем Вас принять участие в IX Всероссийской научной конференции «Нейрокомпьютеры и их применение», которая состоится 15 марта 2011 года в Московском городском психолого-педагогическом университете (г. Москва, ул. Сретенка, д. 29). Конференция посвящена актуальным проблемам применения нейронных сетей и других обучаемых структур для решения задач в области естественных, технических и гуманитарных наук. Ее целью является объединение специалистов, работающих в различных сферах применения нейросетевых алгоритмов, обсуждение и обобщение опыта их теоретических и практических разработок, определение перспектив развития обучаемых структур. Тематические разделы конференции определяются проблематикой как традиционных областей использования искусственных нейронных сетей (технической, медицинской, психологической, юридической и других), так и новых направлений (квантовые нейронные сети). Рассматриваются теоретические и прикладные аспекты применения нейронных сетей. Конференция должна положить начало регулярному проведению в будущем аналогичных мероприятий, способствуя активному развитию теории нейронных сетей и смежных областей научных знаний.

Учредители конференции

Департамент образования города Москвы
Издательство «Радиотехника»
Редколлегия журнала «Нейрокомпьютеры: разработка и применение»
Московский городской психолого-педагогический университет

Руководство оргкомитета

В. В. Рубцов, доктор психологических наук, профессор, академик РАО, ректор Московского городского психолого-педагогического университета, директор Психологического института РАО — председатель

А. В. Чечкин, доктор физико-математических наук, профессор Военной академии ракетных войск стратегического назначения имени Петра Великого, главный редактор журнала «Нейрокомпьютеры: разработка и применение» — зам. председателя

Л. С. Куравский, доктор технических наук, профессор Московского городского психолого-педагогического университета, декан факультета информационных технологий — зам. председателя

Основные направления работы

Теория нейронных сетей
Обработка сигналов и изображений
Интеллектуальные информационные системы
Нейрокомпьютеры в системах управления
Обучаемые структуры в психологии и медицине
Биометрические системы
Характеризационный анализ

К началу конференции будет опубликован сборник тезисов.
Лучшие работы, представленные на конференции,
будут опубликованы в журнале «Нейрокомпьютеры: разработка и применение».

Заявки на участие и тезисы докладов принимаются до 1 февраля 2011 года.

Дополнительная информация доступна по ссылке http://www.it.mgppu.ru/confnc.
Справки по электронной почте *conf.nc@mgppu.ru, nc.mgppu@gmail.com*
Контактный телефон/факс: +7(499) 167-66-74.

НАШИ АВТОРЫ

Аркидьяконо Франческо — Ph.D., профессор Института психологии и образования Университета Ньюшатель
francesco.arcidiacono@unine.ch

Бредиките Милда — Ed.D., доцент факультета образования Университета Оулу (университетский консорциум г. Каяни)
milda.bredikyte@oulu.fi

Вересов Николай — кандидат психологических наук, доктор философии, научный сотрудник Университета Оулу
nikolai.veressov@oulu.fi

Гуружапов Виктор Александрович — доктор психологических наук, профессор, зав. кафедрой педагогической психологии факультета психологии образования Московского городского психолого-педагогического университета
otdel-m@yandex.ru

ДеМаттос Кристиано Родригес — кандидат физико-математических наук, профессор Института физики Университета Сан Пауло
mattos@if.usp.br

Карстен Андреа — аспирант института общей и структурной лингвистики Университета г. Мюнхен, магистр
mail@andreakarsten.de

Контоподис Михалис — Ph.D., секретарь ISCAR
michaliskonto@googlemail.com

Марголис Аркадий Аронович — кандидат психологических наук, первый проректор Московского городского психолого-педагогического университета, профессор кафедры педагогической психологии факультета психологии образования и кафедры международной культурно-исторической психологии Московского городского психолого-педагогического университета
amargolis@mail.ru

Микалко Мэндез Мириам Морамай — аспирант Центра фундаментальных исследований Политехнического института г. Мехико, магистр
mmicalco@gmail.com

Обухова Людмила Филиппона — доктор психологических наук, профессор МГУ им. М. В. Ломоносова, заведующая кафедрой возрастной психологии факультета психологии образования МГППУ, действительный член РАЕН
mila-38@mail.ru

Понтекорво Клотильда — Ph.D., почетный профессор психологии образования, руководитель факультета социальной психологии и психологии развития Римского университета «La Sapienza»
clotilde.pontecorvo@gmail.com

Рителла Джузеппе — аспирант Центра исследований деятельности, развития и обучения (CRADLE) факультета наук о поведении Университета г. Хельсинки, магистр организационной психологии и психологии коммуникаций
gritella@gmail.com

Родригес Мачадо Андрэ — аспирант Университета г. Сан Пауло (Бразилия), сотрудник секретариата департамента образования штата Сан Пауло
andremr@if.usp.br

Рубцов Виталий Владимирович — доктор психологических наук, профессор, академик Российской академии образования, ректор Московского городского психолого-педагогического университета
rectorat@list.ru

Рюкрим Георг — доктор психологических наук, проректор и профессор Берлинского университета искусств
georg.rueckriem@gmx.net

Хаккарайнен Пентти — Ph.D., профессор факультета образования Университета Оулу (университетский консорциум г. Каяни)
phakkar@gmail.com

Хокинс Луиза — специалист по управлению информационными системами, бакалавр искусств, преподаватель факультета искусства, бизнеса, информатики и образования Университета Центрального Квинслэнда
l.hawkins@cqu.edu.au

OUR AUTHORS

Arcidiacono Francesco — Dr., Institute of Psychology and EducationUniversity of Neuchatel
francesco.arcidiacono@unine.ch

Bredikyte Milda — Ed.D., Associate Professor, Department of Education, Oulu University (University Consortia of Kajaani)
milda.bredikyte@oulu.fi

Veresov Nikolai — Ph.D. in Psychology, Dr. Phil., Researcher, Oulu University
nikolai.veressov@oulu.fi

Guruzhapov Victor Aleksandrovich — Ph.D. in Psychology, Professor, Head of the Educational Psychology Chair, Moscow State University of Psychology and Education
otdel-m@yandex.ru

Cristiano Rodrigues DeMattos — Ph.D., University of São Paulo, Institute of Physics, University of São Paulo, Professor
mattos@if.usp.br

Andrea Karsten — Student, Institute of General and structural linguistics, University of Munich, M. A.
mail@andreakarsten.de

Michalis Kontopodis — Ph.D., the Secretary of ISCAR
michaliskonto@googlemail.com

Margolis Arkady Aronovich — Ph.D., First Vice-Rector of the Moscow State University of Psychology and Education, Professor, Educational Psychology Chair, Department of Psychology of Education, International Cultural-Historical Psychology Chair, Moscow State University of Psychology and Education
amargolis@mail.ru

Méndez Miriam Moramay Micalco — Ph.D. candidate, Center for Basic Research, Politecnic Institute Of Mexico, Magister
mmicalco@gmail.com

Obukhova Ludmila Filippovna — Doctor of Psychological Sciences, Professor, M.V. Lomonosov Moscow State University, Head of the Develpmental Psychology Chair, Department of Education, MSUPE, full member of RANS
mila-38@mail.ru

Pontecorvo Clotilde — Ph.D., Professor Emeritus in Psychology of Education, Head of the Faculty of Social and Developmental Psychology, Rome University «La Sapienza»
clotilde.pontecorvo@gmail.com

Ritella Giuseppe — Doctoral student in the Center for Research on Activity, Development and Learning (CRADLE), Faculty of Behavioural sciences, University of Helsinki, Master degree in Psychology of organization and communication
gritella@gmail.com

Rodrigues André Machado — Ph.D. Student, University of São Paulo (Brazil), Officer, Secretariat of the Department of Education of São Paulo State
andremr@if.usp.br

Rubtsov Vitaly Vladimirovich — Doctor of Psychological Sciences, Professor, Academician, Russian Academy of Education, Rector of the Moscow State University of Psychology and Education
rectorat@list.ru

Rückriem Georg — Dr. of Psychological Sciences, Vice-Rector, Professor, Berlin University of Arts
georg.rueckriem@gmx.net

Hakkarainen Pentti — Ph.D., Professor, Department of Education, Oulu University (University Consortia of Kajaani)
phakkar@gmail.com

Hawkins Louise — Graduate Diploma of Information System Management (GDISM) Central Queensland University; Bachelor of Arts, Lecturer, Faculty of Arts, Business, Informatics and Education, Central Queensland University
l.hawkins@cqu.edu.au

Содержание

Contents