



# Studies in social sciences, humanities and engineering

The second joint research  
publication of Peter the Great  
St. Petersburg Polytechnic  
University and Kymenlaakso  
University of Applied Sciences

Ari Lindeman (ed.)





Kouvola, Finland 2015

Publications of Kymenlaakso  
University of Applied Sciences  
Series A. No: 71

**Publisher:**  
Kymenlaakso University of Applied Sciences

**Editor:**  
Ari Lindeman

**Graphic design:**  
Petri Hurme, Vinkeä Design Oy

**Cover graphic:**  
iStock

**Printing press:**  
Tammerprint Oy 2015

ISBN (PB): 978-952-306-137-8  
ISBN (PDF): 978-952-306-138-5  
ISSN: 1239-9086  
ISSN-L: 1239-9086

# Studies in social sciences, humanities and engineering

The second joint research  
publication of Peter the Great  
St. Petersburg Polytechnic  
University and Kymenlaakso  
University of Applied Sciences

## Dear friends

This book is a tangible proof of our good relationship between Peter the Great St. Petersburg Polytechnic University and Kymenlaakso University of Applied Sciences. It is very interesting to publish about the research and development work we are doing in both universities. Our second publication extends the dialogue to learning from differences. In every country and every culture we have our own ways to do things. When we are developing our own work and researching it is good to look at other perspectives and other ways of doing things.

I hope that we are able to publish together scientific publications in the future, too. There are plenty of themes to be chosen. Joint-publishing is an excellent means to develop our Universities!

**Seija Aalto**

*Director of Education, Common Core Studies*  
Kymenlaakson University of Applied Sciences

Dear friends!

Kymlaakso University of Applied Sciences and Peter the Great St. Petersburg Polytechnic University continue to cooperate. You can read the second edition of the science digest which includes papers written by instructors and researchers of our universities. The first edition was released in 2013, it was devoted to social and political issues, which caused a great interest of readers.

At the suggestion of the rector of Peter the Great St. Petersburg Polytechnic University Dr A.I. Rudskoy the subject matter of the new digest was extended. It is focused on engineering science. The authors delve into innovative technologies, prospective development of high-tech industries.

I hope that the new digest will foster the dialogue between our universities, our instructors. I assume that the selected format of opinion exchange between the Universities in the form of scientific publications will be developed in further cooperation.

**Nadezda Almazova**

*PhD, professor*

Director of the Institute of Humanities

Peter the Great St. Petersburg Polytechnic University

# Writers

## **Olga Bulavenko**

*Senior Lecturer*

Department of International Relations  
Institute of Humanities  
Peter the Great St. Petersburg  
Polytechnic University

## **Aleksandr Chusov**

*PhD, Head of Department*

Department Civil Engineering  
and Applied Ecology  
Civil Engineering Institute  
Peter the Great Saint Petersburg  
Polytechnic University

## **Mikhail Glukhikh**

*Ph.D., Senior Associate Professor*

Dept. of Computer Systems  
and Software Engineering,  
Institute of Computer Science and Technology  
Peter the Great Saint Petersburg  
Polytechnic University

## **Miia Karttunen**

*MA, senior lecturer*

Kyminlaakso University of Applied Sciences

## **Sirkka Komulainen**

*PhD, research manager*

Kyminlaakso University of Applied Sciences

## **Konstantin Kriulin**

*PhD, Associate Professor*

Department Civil Engineering  
and Applied Ecology  
Civil Engineering Institute  
Peter the Great Saint Petersburg  
Polytechnic University

## **Ekaterina Kuchumova**

*PhD, Associate Professor*

Department of International Relations  
Institute of Humanities  
Peter the Great Saint Petersburg  
Polytechnic University

## **Jagat Bahadur Kunwar**

*MSc, lecturer*

Kyminlaakso University of Applied Sciences

## **Ari Lindeman**

*MSc. MA., team leader*

Kyminlaakso University of Applied Sciences

## **Vladimir Maslikov**

*PhD, Professor*

Department Civil Engineering  
and Applied Ecology  
Civil Engineering Institute  
Peter the Great Saint Petersburg  
Polytechnic University

## **Sergei Pogodin**

*Dr.Sc., Professor*

Head of the Department  
of International Relations  
The Institute of Humanities  
Peter the Great Saint Petersburg  
Polytechnic University

## **Evgeny Pyshkin**

*Ph.D., Senior Associate Professor*

Dept. of Computer Systems  
and Software Engineering  
Institute of Computer Science and Technology  
Peter the Great Saint Petersburg  
Polytechnic University

## **Anna Riabova**

*PhD, Associate Professor*

Department of International Relations  
Institute of Humanities  
Peter the Great Saint Petersburg  
Polytechnic University

## **Aleksey Tsyb**

*Phd, associate professor*

Department of international relations  
Institute of humanities  
Peter the great Saint Petersburg  
Polytechnic university

## **Petra Vogler**

*PhD, Assistant Professor and Consultant*

[www.petravogler.com](http://www.petravogler.com)

## **Viacheslav Zhazhkov**

*Assistant, Engineer*

Department Civil Engineering  
and Applied Ecology  
Civil Engineering Institute  
Peter the Great Saint Petersburg  
Polytechnic University

# Content

Ari Lindeman, Sergei Pogodin & Olga Bulavenko	8	<b>Introduction</b> Johdanto Вступление
Miia Karttunen	10	<b>Future time reference in a language without a future tense</b> Tulevan tapahtumisen ilmaiseminen futuurittomassa kielessä Способ выражения действия в будущем в языке без грамматической категории будущего времени
Jagat Bahadur Kunwar	24	<b>Learning from cultural differences Towards culturally inclusive pedagogy</b> Oppia kulttuurieroista – kohti kulttuurisesti osallistavaa pedagogiikkaa Изучение разности культур – основа педагогики в межкультурном образовательном пространстве
Sirkka Komulainen	38	<b>The social, sociological and practical in research with young disabled children: Mutual learning from multiple perspectives</b> Sosiaalinen, sosiologinen ja käytännöllinen tutkimuksessa pienten vammaisten lasten kanssa: Keskinäistä oppimista useista näkökulmista Социальный, социологический и практический аспект в изучении травмированных детей – исследование случая взаимообучения
Ari Lindeman & Petra Vogler	50	<b>Leadership development for the Agile environment</b> Johtajuuden kehittäminen ketteryyttä edellyttävään toimintaympäristöön Развитие лидерства в среде, требующей проявления приспособляемости
E. V. Kuchumova	60	<b>Communicative strategies in international advertising: issues and trends</b> Kommunikatiiviset strategiat kansainvälisessä mainonnassa: aiheita ja trendejä Коммуникативные стратегии в международной рекламе: проблемы и тенденции
Evgeny Pyshkin & Mikhail Glukhikh	72	<b>Teaching Program Flow Validation: A Case Study of Branch Coverage Testing</b> Ohjelman kulun validoinnin opettaminen: Таpaustutkimus rakenteen kattavuuden testauksesta Тестирование хода исполнения программы в академической практике: пример организации тестирования на основе графа потока управления
Anna Riabova	82	<b>The creation of public opinion</b> Yleisen mielipiteen luominen Медиаиндустрия и культурология. Формирование общественного мнения
Alexandr Chusov & Konstantin Kriulin	86	<b>Development of the Open Drainage Network of St. Petersburg Suburbs on the Basis of GIS Technologies</b> Avoimen viemäriverkoston kehittäminen Pietarin lähiöissä GIS-tekniologioiden avulla Развитие системы открытых линейных дрен в пригородах Санкт-Петербурга на основе ГИС технологий
Alexander Chusov, Viacheslav Zhazhkov & Vladimir Maslikov	96	<b>Biogas Emission Assessment of Municipal Solid Waste Landfills in Regions of the Russian Federation with Severe Climatic Conditions</b> Biokaasupäästöjen tutkiminen Venäjän Federaation haastavilla ilmastollisilla alueilla sijaitsevilla kunnallisilla kaatopaikoilla Оценка эмиссий биогаза от муниципальных полигонов твердых бытовых отходов в регионах Российской Федерации с северными климатическими условиями
Aleksey Tsyb	104	<b>“Alexandria school” in II-III centuries a.d.</b> “Aleksandriakoulu” 200–300 luvuilla Krj. “Александрийская школа” во II–III вв. н.э.

# Introduction

It is our pleasure to introduce the second volume of the Kymenlaakso University of Applied Sciences (Kyamk) and Peter the Great St.Petersburg Polytechnic University's joint research publication series. This series aims at publishing a collection of articles every second year. The first volume, titled *Investigations in social sciences and humanities*, was published in 2013, in print in St.Petersburg and online in Kyamk Publication Series A. The publication series showcases, in English, current research and development in the respective institutions, but may also include articles from people attached to other institutions. The aim of the publication series is to improve understanding of the respective institutions' research agenda and to internationalize research themes and activities.

The present title, *Studies in social sciences, humanities, and engineering*, indicates two departures from the first volume. The first collection was meant to represent a large variety of practical and theoretical investigations underway in respective institutions. This second volume aims to showcase studies which are, on the whole, more theoretical or academic. The other departure is that this volume includes contributions from the engineering sciences, too.

This time, contributions were invited from any discipline under the general theme of learning from differences. The aim was to select a total of around ten high-quality texts representing the disciplinary variety of the participating institutions. In the end, four articles from Kyamk and six articles from Peter the Great St.Petersburg Polytechnic University were selected for publication.

Learning from differences can be approached from two perspectives: the author's and the reader's. The articles from Kyamk deal with linguistic differences, cultural differences in the field of pedagogy, methodological differences in studying children, and differences and the integration of leadership development between global workplaces and local higher education institutions (HEIs). This part of the collection interestingly reflects the fundamental areas of competence – language, culture, methodology, and development in an industrial



context – which define the educational objectives of universities of applied sciences such as Kyamk. The articles from Peter the Great St.Petersburg Polytechnic University deal with history of philosophy, advertising, public opinion, pedagogics of software development as well as development and assessment issues in the field in civil engineering. They make the reader think of how the same issues of, for instance, civil engineering may be important both in Russia and in Finland, but how different the scale in which research would need to be applied is for development in whole Russia.

The editors wish to thank the contributors for their high-quality input and acknowledge the persistent scholarly work that lies behind these articles in particular, as thinking and studying are more easily said than done in the authors' own practice-based, fast-paced, and managerially driven HEI settings. We are especially thankful to the first external contributor, Dr. Petra Vogler from Germany, whose input helps us to adjust to the global corporate perspective, as well.

The editors' cooperation has evolved towards collaboration. The common language of presenting research findings, a common theme, and reciprocal responsibility for publishing show that our initial enthusiasm about just getting to know each other's research and researchers better in 2013 has transformed into more coherent visions and practical plans. As a result of the collaboration, a plan has emerged for the third volume. 'Investigations' and 'studies' will be followed by 'research' in 2017, to bring together the respective faculty to develop joint research themes for common research projects. We are looking forward to researching, developing and publishing together, and hope that this new volume invites colleagues to join the effort to improve our life in North-Eastern Europe.

**Ari Lindeman**  
*Team leader*

**Sergei Pogodin**  
*Head of Department*

**Olga Bulavenko**  
*Lecturer*

# Future time reference in a language without a future tense

## Abstract

This article provides a linguistic approach to the current publication's theme, *learning from differences*. The article focuses on the Finnish language, which differs from Indo-European languages. Some Indo-European languages, e.g. Russian and Swedish, are geographically close but typologically distant from the Finnish language. The differences between languages will be investigated focusing on one specific scope: future time references in spoken Finnish.

The article has two main goals. The first aim is to provide an overview on future time references in Finnish, which has been claimed to lack a grammatical future tense. The second is to focus on cases where the speaker expresses his or her own future action. The article discusses the speaker's intention as part of the future time reference system in spoken Finnish. The study is based on empirical data that comes from interviews and service encounters. The expressions of the speaker's intention are analyzed, focusing on their pragmatic functions in respect to contextual and interactional factors.

## Introduction

This article provides a linguistic approach to the theme *learning from differences*. The focus is on the Finnish language, which differs from Indo-European languages essentially. Finnish is a member of Uralic family of languages, and more specifically the Finnic group of Uralic languages. Finnic languages are spoken around the Baltic Sea by about 7 million people. Finnish and Estonian are official national languages with a very stable status, while Ingrian, Karelian, Livonian, Ludic, Veps and Votic are endangered languages, since there are not many native speakers any more. Of these languages, the future perspective is best for the Karelian language (Knuuttila, 2011: 215–221).

Finland shares a common border with Russia, Sweden, and Norway. The national languages of Finland's neighbor countries are geographically close but linguistically distant from the Finnish language. Russian, Swedish, and Norwegian belong to the Indo-European languages, which are typologically different from Uralic languages. The differences between language families will be investigated, focusing on one specific scope: future time references in spoken Finnish.

This article has two main goals. The first is to provide an overview of future time references in Finnish. Finnish is a language which is claimed to lack a grammatical future tense. There are no means to express the future by verbal inflection, but instead, future time references in Finnish can take various forms, e.g. present tense verb forms both alone and combined with temporal adverbials, constructions with certain infinitive forms or modal verbs (see e.g. Metslang, 1994). In addition to that, future time references are connected with notions such as *Aktionsart* and *aspectuality*.

The second goal of the article is to focus on those cases where the speaker expresses his or her own future action. In particular, I would like to discuss the speaker's intention as part of the future time reference system in spoken Finnish. The study is based on empirical data that come from two different corpora of conversational language recorded in Eastern Finland in 1990 and 2000. The data come from both interviews and service encounters, and in this article I would like to share some of my observations based on a comparative study of the two classes of data. The expressions of the speaker's intention were analyzed focusing on their pragmatic functions in respect to contextual and interactional factors.

The article is organized as follows. First, I will discuss the notion of the speaker's intention. Second, my aim is to provide a compact introduction to the Finnish tense system. Naturally, the focus will be on future time references. Third, I will introduce the data of the study, and after that, I would like to provide some evidence from the analysis of the data. The analysis will pay attention to interaction between the interlocutors.

### The speaker's intention – the main source of the future tense

Irrespective of whether a language has an inflectional future tense or not, most of the world's languages still have some, more or less grammaticized, devices for the expression of future time references. Bybee et al (1994: 280; see also Bybee and Pagliuca, 1985) consider the speaker's intention to be a common developmental stage for all kinds of futures,

both inflectional and non-inflectional. That is to say, the speaker's intention seems to be one of the main sources for grammaticized future tense.

According to Bybee et al (1994: 240), the speaker's intention is positioned in the grammaticizing path from the different root meanings to the temporal future meaning. As shown in Figure 1, the speaker's intention can be tracked to its main sources, which are the expressions of desire, obligation, and movement forward in space. Expressions of ability and attempt, as well as temporal adverbs, may also offer a source for expressions of the speaker's intention. However, their development into expressions of the speaker's intention and further to future tenses is not as predictable as in the case of desire, obligation, and movement toward. It is to be noted that most of the sources of intention are different kinds of agent-oriented modalities.

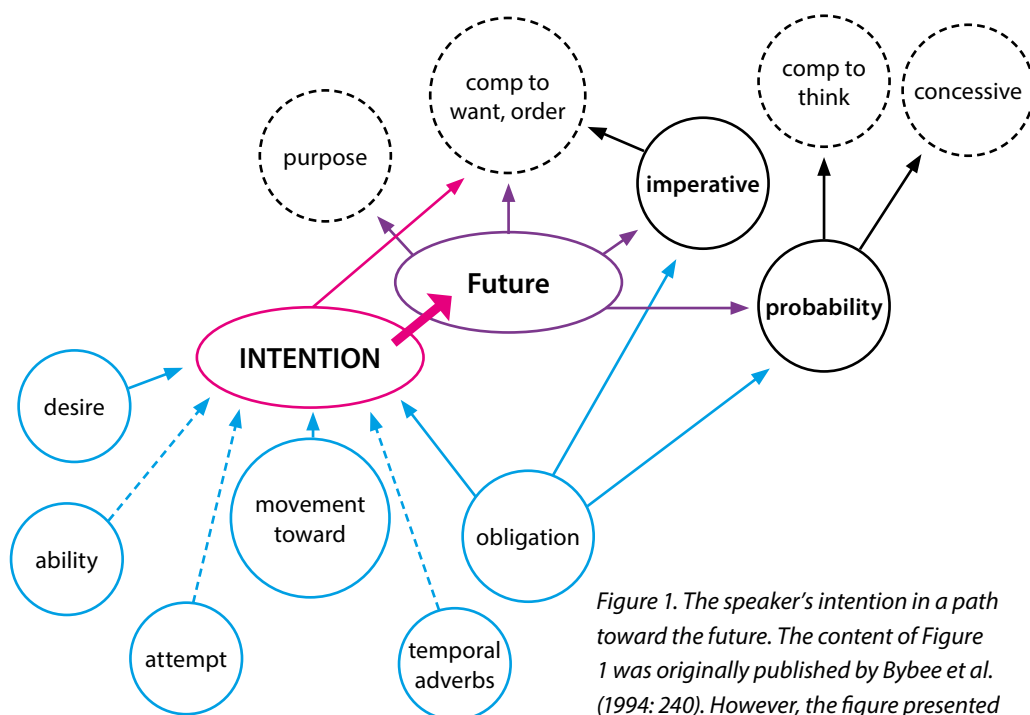


Figure 1. The speaker's intention in a path toward the future. The content of Figure 1 was originally published by Bybee et al. (1994: 240). However, the figure presented herein is a simplified combination of two original figures. All of the modifications were made by the author herself.

In Figure 1, the direction of the development is marked with one-way arrows. Futures arise from certain sources but do not later re-evolve into these very same sources, or into the other sources.

The speaker's intention is the source of two kinds of grammatical futures or, using Bybee et al.'s (1994) terminology, grams. By their nature, these grams can be used to express both intention and prediction (see Figure 2). Whether a particular instance represents an expression of intention or an expression of prediction depends on the listener's inferences.

Thus, the speaker is not solely responsible for the semantic content of the future expression, but the interlocutors produce the utterances and temporal meanings in cooperation when the speaker expresses their intentions and predictions.

As in Figure 1, Figure 2 has a one-way arrow for the purpose of representing the direction of the development. The figure shows that the speaker's intention is primary and prediction is a secondary step in a path toward a grammatical future tense. Bybee et al. (1994: 280) state that "Intention is the crucial bridge to prediction". The primacy of intention has been recognized not only by Bybee et al. but by other linguists as well. For example, Östen Dahl (1985: 103) has argued that pure predictions are very rare in the languages of the world. In

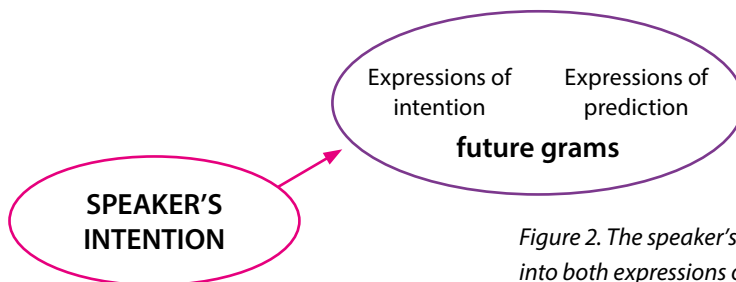


Figure 2. The speaker's intention develops into both expressions of the speaker's intention and expressions of prediction.

fact, the same expression of future may simultaneously both express the speaker's intention and imply prediction. Particularly in expressions which include first person singular markers, the speaker's intention seems to be inevitably present.

Grammatical future tenses appear systematically and also often obligatorily in sentences which express clear predictions about the future. Basically, there are three kinds of sources from which grammatical futures are derived. These sources are periphrastic constructions which can express either (1) obligation, like the verb *must*, (2) volition and intention, like the verb *want*, or (3) motion, like the verbs *go* and *come*. In addition, elements which simultaneously have both a non-past and imperfective meaning will easily grammaticize to a future tense. Instead, less grammaticized constructions often come to express the speaker's plans and intentions (Bybee et al., 1994). In the current article, I will particularly focus on less grammaticized future constructions and share some observations on the role of the speaker's intention in a language which lacks a grammatical future tense.

## A language without a future tense?

Although Finnish lacks a grammatical future tense, the language has several options for expressing future time references and the speaker's intention. The variety is wide, particularly when colloquial language comes under consideration.

Utterances expressing the speaker's intention are often considered as a first step toward a grammatical, i.e. inflectional, future tense (Bybee et al., 1994). In this context, the notions *grammatical future* and *inflectional future* should be understood as certain verb forms which are used exclusively for future time references. Consequently, these grammatical future forms differ from present and past tense verb inflections.



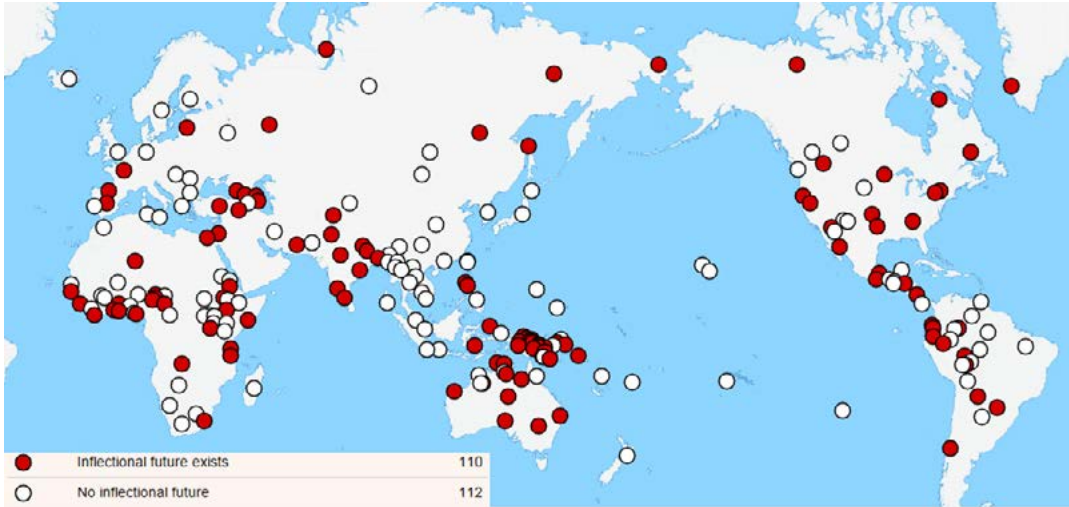


Figure 3. According to WALS (Dahl & Velupillai, 2008), an inflectional future exists in 110 languages (marked with dark spots), while 112 languages (marked with white spots) do not have an inflectional future.

Among the 222 languages analyzed in the *World Atlas of Language Structures* (WALS), 110 languages that have an inflectional future, while an almost identical number have no inflectional future: 112 (Dahl & Velupillai, 2008; Dahl, 2000). In other words, according to WALS, inflectional and non-inflectional futures are equally common in the

languages of the world. As it appears from the map presented in WALS (Figure 3), some widely spoken languages, such as Spanish, Hindi, and Egyptian Arabic, have inflectional future tenses. But then again, some other widespread languages, e.g. Mandarin Chinese, English, and Portuguese, do not have a future tense like that.

The Finnish tense system is based on the opposition *past* vs. *non-past* (see e.g. Wiik, 1976: 138; Comrie, 1985: 43–45, 49). Past time reference in Finnish involves three tenses, which are *simple past* (also known as *imperfect*), *perfect*, and *pluperfect*. However, non-past time reference involves only one tense, *present*. All of these grammatical tenses have a verbal inflection of their own, whereas the future time reference does not. In other words, on the criterion of verbal inflection, Finnish lacks a future tense. Future time reference is forced to make an appearance using the only non-past alternative, the present tense. The present tense refers not only to present and generic events but also to future events (see e.g. Hakulinen et al., 2004: §1542). A simple Finnish sentence such as *Minä lomaillen Espanjassa* (see example (1)) could be translated into English with a present or progressive time reference (1b), with generic meaning (1c), or with a future time reference (1d).

- (1) a. Minä lomaile-n Espanja-ssa.  
       I holiday-1SG\* Spain-INE  
       b. ‘I’m having a holiday in Spain.’  
       c. ‘I have my holidays in Spain.’  
       d. ‘I will spend my holiday in Spain.’

\* Because all the verbs presented here are in present tense, the abbreviation PRS is left out of the glosses. The abbreviation IND for the indicative mood is also left out. The abbreviations are explained at the end of the article.

From example (1), we can observe that the present tense in Finnish is multi-purpose. Solely on the grounds of a present verb form, it is impossible to determine whether the verb should be interpreted as present, generic, or future. The correct interpretation calls for knowledge of the communicational context in which the sentence was spoken aloud (see Edmondson, 1981: 6–7, 66).

Besides knowing the logical, situational, and contextual factors, a sentence with the present tense verb form can include certain syntactic elements that steer the interpretation towards the future. For instance, these elements can be temporal adverbs which make the future time reference explicit and modify the meaning of the sentence. Finnish has a number of lexical temporal adverbs which refer to an action which takes place after the moment of speech. These adverbs are usually deictic, but there are also temporal adverbials that need not be used deictically (Sulkala, 1981: 35). The sentence mentioned above, (1a) *Minä lomaillen Espanjassa* ‘I will spend my holiday in Spain’, could be modified by using adverbials like *pian* ‘soon’ (as in example (2)), *viikon kuluttua* ‘in one week’s time’, *ensi keväänä* ‘next spring’, *kesällä* ‘in summer’, or *vuonna 2017* ‘in 2017’.

- (2) Pian minä lomaile-n Espanja-ssa.  
*soon I holiday-1SG Spain-INE*  
 ‘I will spend my holiday in Spain.’

A present tense verb marked with a temporal adverbial which refers to future action can be interpreted in no other way but as a future time reference.

In addition to temporal adverbs, Finnish grammars mention different periphrastic constructions, but either their role in the tense system is controversial or they are not solely used for future references (Hakulinen et al., 2004: §1546). One of those periphrastic future constructions is *tulla future*, ‘to come’ future, as in (3).

- (3) Minä tule-n lomaile-ma-an Espanja-ssa.  
*I come-1SG holiday-INF3-ILL Spain-INE*  
 ‘I will spend a holiday in Spain.’

This construction has the movement verb *tulla* ‘to come’. The verb *tulla* is in a finite form, as here in the first person singular form. The finite verb is followed by a certain infinitive verb form, the third infinitive, which is identified by the suffix *-ma-*. The infinitive verb is in the illative case (ending *-an*), which is used to indicate movement into something. The meaning of the construction is ‘be about to do something’ or ‘have the intention of doing something’. Besides the future interpretation, the original meaning of the movement verb can still remain: ‘I come to Spain for a holiday.’ The construction has literary uses, particularly in certain contexts where there is a need to show a contrast between present and future time reference, as in (4). The construction emphasizes the future time reference and keeps it distinct from a present time reference (Vilppula, 1993: 3–4).

- (4) Minä lomailen ja tule-n lomaile-ma-an Espanja-ssa.  
*I holiday-1SG and come-1SG holiday-INF3-ILL Spain-INE*  
 ‘I am having a holiday and I will spend it in Spain (in the future as well).’

The other construction mentioned to express future time reference is a combination of a finite verb and participle, as in (5). This construction has the verb *olla* ‘to be’ in a finite form. In example (5), the finite verb is in the first person singular and is followed by a present tense participle form which is identified by the suffix *-va*.

- (5) ? Minä ole-n lomaile-va Espanja-ssa.  
*I be-1SG holiday-PRS.PTCP Spain-INE*  
 ? ‘I will be spending a holiday in Spain.’

It is an exacting task to translate the construction into English, but the idea can be more or less conveyed by using a present-participle (gerund) form: ‘I will be spending a holiday in Spain.’ The construction is archaic and is reminiscent of centuries-old Bible translations. It is seldom if ever used in modern Finnish (Itkonen-Kaila, 1993: 582).

The progressive construction, as in (6), and the ‘be about to’ construction, as in (7), can also have future implications.

- (6) Minä ole-n saapu-ma-ssa Espanja-an.  
*I be-1SG arrive-INF3-INE Spain-ILL*  
 ‘I am arriving in Spain.’
- (7) Minä ole-n saapu-maisi-lla-ni Espanja-an.  
*I be-1SG arrive-ILL5-ADE-PX1SG Spain-ILL*  
 ‘I am about to arrive in Spain.’

Both of these constructions have the verb *olla* ‘to be’ in a finite verb form, here in the first person singular. The finite verb is followed by an infinitive verb form. In the case of the progressive construction, this is the third infinitive, as in (6). The third infinitive of the progressive construction is in the inessive case (ending *-ssa*), which carries the basic meaning of being inside of something. The progressive construction expresses that something is happening at the moment of speech, but it can also refer to future action, especially when the infinitive verb belongs to the aspectual class of achievements. However, with a stative, an activity, or an accomplishment verb (see Vendler, 1979: 94–107), the progressive construction is not that susceptible to having a future implication (Maamies, 1997: 30–32).

The ‘be about to’ construction uses the fifth infinitive, which is identified by the suffix *-misi-*, as in (7). The fifth infinitive of the be-about-to construction is in the adessive case (ending *-lla*), with the basic meaning of being on something. In addition, it can express general proximity in space and time, “being around”. The be-about-to construction has a quite specific meaning with a future implication: ‘on the point of doing something’ or ‘just about to do something’. However, the construction is rare in both spoken and written Finnish.

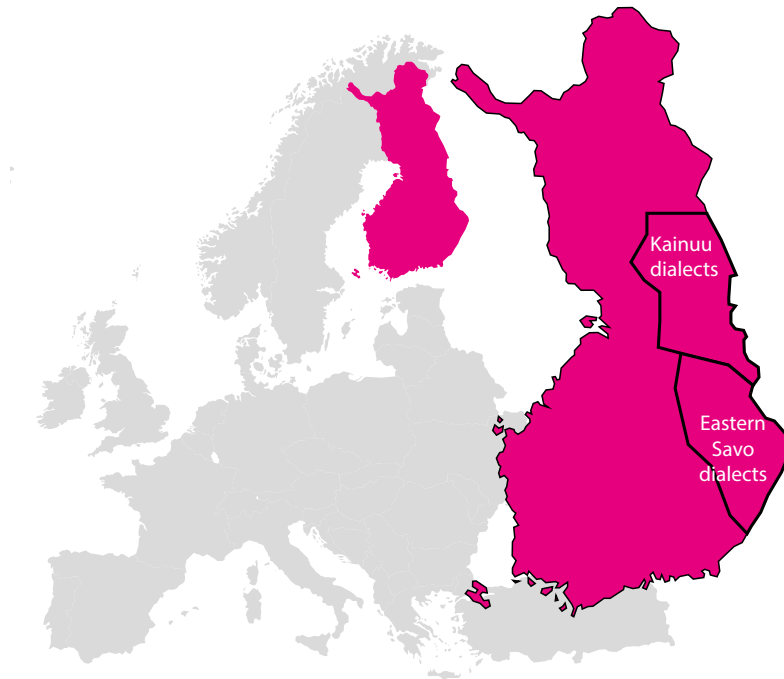


Figure 4. The data come from Eastern Finnish dialects.

Like the progressive construction, the be-about-to construction has restrictions concerning the infinitive verb's type and, particularly, disprefers stative verbs (Maamies, 1997).

The constructions shown in examples (3–7) seem to have a controversial role in the Finnish tense system. Because they have other meanings apart from future time reference, most of the structures are not considered 'pure' futures (cf. Jaszczolt, 2009). Furthermore, these constructions are fairly rare in spoken Finnish, except perhaps for the progressive construction. As a whole, future references and speaker's intention in Finnish are quite unexplored systems, especially in colloquial language. These systems seem to involve much more than grammatical forms and constructions. To get a reliable picture of them, a corpus-based study is underway. In what follows, I will introduce the data from that study. The analysis is based on empirical data, which consist of interviews and everyday conversations.

## Analyzing the empirical data

The data for the current study come from two subgroups of Eastern Finnish dialects: the Kainuu and Eastern Savo dialects (see Figure 4). Irrespective of the dialectal basis, I believe that the data of the study will illuminate the Finnish system of future references as a whole.

The dialectal definition of the data arose because of my participation in the project *FinDiaSyn: Regional Aspects of Finnish Syntax*, which ran from 2008 to 2012. The project was hosted by the Research Institute for the Languages of Finland and funded by the Academy of Finland. The project investigated syntactic phenomena in Finnish regional dialects,

and developed field methods for the study of spoken language syntax (Forsberg & Vilkuna, 2008). As a member of FinDiaSyn, I organized field trips and methodological experiments, and for that reason, part of the data for my on-going PhD study come from that source.

However, the data of the study represented in this article were recorded earlier, in 1990 and 2000, within other projects hosted by the Research Institute for the Languages of Finland. The data consist of approximately 17 hours of audio-recorded interviews and 3.5 hours of video-recorded service encounters at a local office of The Social Insurance Institution, a public health center, and a local shoe shop. Both conversations between interviewer and interviewee and encounters between an official and a customer, a nurse and a patient, and a shoe retailer and a customer can be described as institutional conversation, although the level of formality varies from one situation to another.

In this article, I will focus on only first person singular forms, although sometimes speakers also refer to their own action by using the third person singular and passive forms. The analysis will be restricted to positive verb forms.

A total of 200 expressions which refer to the speaker's future action were collected from the data. In all, 93 expressions were collected from the interviews and 107 expressions from the service encounters. Collecting was restricted to utterances that refer only to future action, not to action which is simultaneous with the speech act or, on the other hand, habitual and repeated. The intended action was to be realized in the immediate or distant future.

## Comparison of interviews and service encounters

According to my investigations, the frequency of the expressions involving future references depends on the type of interaction. There is a relatively large number of such expressions in the service encounter type of interaction compared with the interview type of interaction. In the service encounters, there was, on average, more than one utterance every two minutes, while in the interviews the average was only six utterances per hour.

The speakers tend to refer to their future action by using a large variety of functional alternatives: expressions of intention, prediction, imagination, desire, possibility, promise, and offer. However, expressions of intention are the most typical future time reference. In the corpus of interviews, expressions of intention constitute 39.8 per cent (i.e. 37 cases out of the total of 93 cases) of all of the first person singular expressions with future time references.

In the corpus of service encounters, the percentage is even higher, at 76.6. Expressions of intention are represented by 82 cases out of the total of 107.

## Answering expressions

The most characteristic difference between the interviews and the service encounters was the fact that in the interviews the expressions of intention were uttered only as answers to questions. There were only a few cases where the expression of intention was spoken aloud spontaneously. Usually, in these cases, a normal interviewing situation unexpectedly



changes because of some disturbance which, at least for a moment, involves the interviewee in an action other than answering the questions, as in (8).

- (8) mie mee-j juo-mma-aj joo-ko  
I go-1SG drink-3-ILL yes-Q

‘I will go and have something to drink. OK?’

Example (8) is a fragment of the conversation between the interviewer and the interviewee. The sentence *mie meej juommaaj jooko* ‘I will go and have something to drink. OK?’ interrupts the normal course of interaction and expresses the speaker’s intention to commit an act. At the same time, it functions as a request for permission.

Expressions like that described in (8) are exceptional. It is more common for expressions of intended actions to not take place in the same communicative situation during the interview. Instead, expressions of intention tend to refer to acts which are intended to happen afterwards. For that reason, temporal adverbs, which specify the moment of an action, are more common in interviews than in service encounters.

Expressions of the speaker’s intention seem to have different criteria for their appearance in interviews and service encounters. A comparison between the two different types of data reveals that in dissimilar communicative situations, even similar expressions may have pragmatic functions which totally differ from each other. The question arises as to whether the functions of the intention expressions are connected with such issues as *spontaneity* and *formality* in a certain communicative situation. For example, are the speaker’s expressions ruled by the formal structure of interviews, which forces the interviewee to answer questions instead of expressing his or her spontaneous intention? (see e.g. Karhu, 1995: 94)

## Reporting, offering, and promising expressions

In the corpus of service encounters, only 7 per cent of reporting, offering, and promising expressions were answers to questions. Almost 70 per cent of the expressions were used to report a speaker’s action that takes place immediately. These reporting expressions are used to inform the listener what the speaker is about to do, as in (9).

- (9) käy-n kahto-ma-ssa vielä peilistä  
go-1SG look-3-INE still mirror-ELA

‘I’m just going to have a look in a mirror.’

Example (9) is a fragment of the conversation between a saleswoman and a customer in a local shoe shop. With the sentence *käyn kahtomassa vielä peilistä* ‘I am just going to have a look in a mirror’, the customer informs the shoe retailer of his next action. The expressions of the speaker’s intention are used to report both immediate future actions and on-going actions. It is common for these reporting expressions to have several simultaneous interactional functions. They may be used as offers and promises, as in (10).

- (10) se on kolmekasi nyt mutta  
*it be-3SG 38 now but*  
 ‘The size of that is 38 but  
 mä voisin hakkee ysi että mitä,  
*I can-COND-1SG collect-INF nine-GEN that what*  
 I could get the size 39 so that...’

The saleswoman has just passed a shoe to the customer and simultaneously makes an offer: *se on kolmekasi nyt mutta mä voisin hakkee ysi että mitä* ‘the size of that is 38 but I could get the size 39 so that...’ Example (10) shows that reporting, offering, and promising are all linked to an action which the speaker is about to perform right away, during the same communicative situation (see Edmondson, 1981: 21–22, 47).

### Expressions with overt subjects and clitics

In my data, and especially in the service encounters, the first person singular verb forms do usually occur with an overt subject, the first person singular pronoun, as the previous examples (8) and (10) have shown. Over 90 per cent of first person singular subjects occur with an overt subject pronoun, although Finnish is a partial pro-drop language and the person is already marked in the verb inflection (Helasvuo & Campbell, 2006; Lappalainen, 2006: 37). Even so, pronoun subjects are very frequent in non-standard spoken Finnish. In my data, subjects are omitted from only 8 per cent of first person singular verb phrases.

It is to be noted that about 35 per cent of subject pronouns combine with a clitic. Almost without exception the clitic is *-pa* or *-pä*. The clitics *-han* or *-hän* are also possible but very rare. The clitic emphasizes the pronoun and makes the subject more distinguishable. The intentions expressed with the clitic *-pa* ~ *-pä* can be considered as solutions to some problematic situation: the speaker offers to solve the problem by performing an act, as in (11).

- (11) miepä koeta ekana näitä.  
*I-CLT try-1SG first-ESS this-PL-PAR*  
 ‘I shall try on these first.’

With the utterance *miepä koeta ekana näitä* ‘I shall try on these first’, the customer rejects an offer to have more pairs of shoes to try on. At the same time, the speaker expresses how she is going to act instead. It is also typical for expressions with the clitic *-pa* ~ *-pä* to occur in the openings of sequences.

Typically, the clitic expressions are uttered by the interlocutor whose role in interaction and action is dominant. The clitic emphasizes the pronoun subject and reinforces the speaker’s institutional status or role in the interactional situation.

## Discussion and conclusions

Although I have dealt with Finnish data, the concepts of *future* and *intention* have similarities in other languages. For example, future tends to have a strong connection to modality and aspect. In this article, I have touched on the question of how temporality combines with modality in utterances expressing the speaker's intention.

In my study, I have used different corpora. The data come from two different kinds of institutional conversations: interviews and service encounters. The comparison between interviews and service encounters showed that different corpora create different pictures of the speaker's intention. In the interviews, the expressions of the speaker's intention were uttered as answers to questions. In the service encounters, the interactional functions of intention were diverse, e.g. reporting, offering, and promising. The type of interaction between the interlocutors is reflected in the expression's grammatical forms and pragmatic functions.

To get a detailed picture of the speaker's intention and its interactional functions, a careful study of different corpora remain necessary. Investigating these different corpora helps us to understand the nature of future time references in a language without a future tense: this is literally *learning from differences*.

## References

- Bybee, J., Perkins, R. & Pagliuca, W. (1994) *The Evolution of Grammar: Tense, Aspect, and Modality in the Languages of the World*. Chicago: The University of Chicago Press.
- Bybee, J. & Pagliuca, W. (1985) The Evolution of Future Meaning. Paper presented at the VII ICHL Pavia, Italy. Manuscript.
- Comrie, B. (1985) *Tense*. Cambridge Textbooks in Linguistics. Cambridge: Press Syndicate of the University of Cambridge.
- Dahl, Ö. (1985) *Tense and Aspect Systems*. Oxford: Basil Blackwell.
- Dahl, Ö. & Velupillai, V. (2008) *The Future Tense* [online]. World Atlas of Language Structures Online. Munich: Max Planck Digital Library. Available: <http://wals.info/feature/67>. (Accessed 13.04.2015).
- Dahl, Ö. (2000) The tense-aspect systems of European languages in a typological perspective. In Dahl, Ö. (Ed.), *Tense and Aspect in the Languages of Europe. Empirical Approaches to Language Typology*. EUROTYPE 20-6. Ed. by Bossong, Georg & Comrie, Bernard pp. 3–25. Berlin, New York: Mouton de Gruyter,
- Edmondson, W. (1981) *Spoken Discourse: A Model for Analysis*. London/New York: Longman.
- Forsberg, H. & Vilkuna, M. (2008) Mitenkäs sitä teillä päin lauseet aloitetaan? Murre tutkimuksen uusia tuulia – ja vähän vanhojakin. *Hiidenkivi* 15(1): 12–15.
- Hakulinen, A., Vilkuna, M., Korhonen, R., Koivisto, V., Heinonen, T. R. & Alho, I. (2004) *Iso suomen kielioppi*. Available: <http://scripta.kotus.fi/visk>. (Accessed 12.06.2015)
- Helasvuo, M.-L. & Campbell, L. (Eds.) (2006) *Grammar from the Human Perspective: Case, Space, and Person in Finnish*. Amsterdam studies in the theory and history of Linguistic Science. Series 4, Current Issues in Linguistic Theory. 277.
- Jaszczolt, K. M. (2009) *Representing Time. An Essay on Temporality as Modality*. Oxford: Oxford University Press.
- Itkonen-Kaila, M. (1993) Miten on tekevä -futuuri on tullut suomeen? *Virittäjä* 97: 578–593.
- Karhu, A. (1995) Murrehaastattelu vuorovaikutustilanteena. In: Marjatta Palander (Ed.) *Murteiden matkassa. Juhlakirja Alpo Räisänen 60-vuotispäiväksi*. Studia Carelia Humanistica 6: pp. 92–109. Joensuu: Joensuun yliopiston humanistinen tiedekunta.
- Knuuttila, S.-R. (2011) Children – the future of the Karelian language? Case study in a Karelian village. Eesti ja soome-ugri keeleteaduse ajakiri *ESUKA – JEFUL* 2(1): 215–221.
- Lappalainen, H. (2006) Pronominisubjektin käytöstä ja poisjätöstä Kelan asiointi-keskusteluissa. In Nordlund, T., Onikki-Rantajääskö, T. & Suutari, T. (Eds.) *Kohtaamispaikkana kieli. Näkökulmia persoonaan, muutoksiin ja valintoihin*. pp. 37–64. Helsinki: Suomalaisen Kirjallisuuden Seura.

- Maamies, S. (1997) Hanhi hautomaisillansa. Suomen maisillaan-johdosten kehitys. In Lehtinen, T. & Laitinen, L. (Eds.) *Kieliopillistuminen: Tapaustutkimuksia suomesta*. Kieli 12, pp. 20–37. Helsinki.
- Metslang, H. (1994) *Temporal Relations in the Predicate and the Grammatical System of Estonian and Finnish*. Oulu: Oulun yliopiston suomen ja saamen kielen laitoksen tutkimusraportteja 39.
- Sulkala, H. (1981) Suomen kielen ajan adverbien semantiikkaa. *Acta Universitatis Ouluensis: Series B, Humaniora* 8, Philologica 3. Oulu.
- Vendler, Z. (1979) *Linguistics in Philosophy*. New York.
- Vilppula, M. (1993) Onko tulla-futuuri tarpeeton? *Kielikello* 2/1993: 3–4. Helsinki: Kotimaisten kielten tutkimuskeskus.
- Wiik, K. (1976) Suomen tempusten etä- ja pintarakenteista. *Virittäjä* 1976: 135–162. Helsinki.

## Abbreviations

1SG	first person singular	INF3	third infinitive
3SG	third person singular	INF5	fifth infinitive
ADE	adessive case	PAR	partitive case
COND	conditional mood	PL	plural
CLT	clitic	PRS	present tense
ELA	elative case	PTCP	participle
ESS	essive case	PX1SG	first person singular possessive suffix
GEN	genitive case	Q	question marker
ILL	illative case		
INE	inessive case		



# Learning from cultural differences

## Towards culturally inclusive pedagogy

### Abstract

Increased cultural encounters in educational settings as a result of globalization have led to the increased importance of culturally sensitive pedagogy. In this context, it is necessary to conceptualize culture, categorize differences, understand how cultural values are manifested in educational settings, and find ways for educators to improve their intercultural competence. This article explores these issues.

Culture has been defined as the amalgam of beliefs, attitudes and values and there are a number of well-accepted frameworks used to categorize cultures. Hall's typology, Hofstede's cultural dimensions and Schwartz's classifications are some of the most well-known and accepted frameworks. Using these frameworks, it is possible to see how cultural values along different dimensions manifest themselves in educational settings.

When it is evident that learning is very much a cultural process, it is then necessary to adopt culturally informed pedagogical practices. This can entail being sensitive to various learning styles and cognitive structures, verbal and non-verbal communication styles; rendering functional meaning to abstract concepts through understandable cultural equivalents; preparing culturally informed instructional materials; and exploring the validity of knowledge claims.

Culturally informed pedagogical practices are, however, the result of the educator's well-developed intercultural competence, which is a lifelong endeavor. To increase sensitivity toward other cultural values and to reflect that in pedagogical practices, an educator needs to understand the institutional underpinnings of the natal cultural values and assimilate that in their everyday practice.

# 1 Introduction

Globalization, immigration, easy access to educational institutions abroad and the internationalization of curricula are some factors that have led to pedagogical practices being situated in diverse contexts. Students with diverse cultural backgrounds studying in educational institutions abroad; the proliferation of exchange teachers and students; the identification of culturally sensitive issues in curricula due to increased awareness of different cultural values and increasing numbers of expatriate teachers are but some factors that have led to more conflicting cultural encounters in 'learning spaces'. Whether we wrap ourselves in our snug cultural cocoon or open up and learn from these cultural encounters to sensitize ourselves to cultural differences and improve our pedagogical practices is increasingly a matter of necessity rather than choice. In the end, to be able to do so can have huge implications for the internationalization of the education system and the competitiveness of particular educational institutions.

With this motivation, I intend to explore issues that pertain to the relationship between culture and pedagogy. How shall we conceptualize and categorize culture? To what degree are cultural values actually manifested in educational contexts? Are we perpetuating cultural inequities in the classroom intentionally or unintentionally due to limited awareness of cultural diversity? How can we, being cognizant of these issues, improve our pedagogical practices and improve our intercultural competences as educators? These are some issues I intend to delve into in this article. Obviously, because of limitations of space, it is impossible to explore these issues in detail, but to answer these questions of interest, I will first explain mainstream conceptualizations of culture and different accepted frameworks for categorizing cultures and then use these ideas to explore how they manifest themselves in educational contexts. At the end, I aim to show how understanding cultural values can help to improve our pedagogical practices. The overarching theme of this article is to explore the possibilities of learning from differences in culture and using that knowledge to practice culturally sensitive pedagogy.

## 2 Conceptual framework

### 2.1 Conceptualizing culture

Culture is a term very hard to define. The most common accepted definition is probably:

*Culture is the collective programming of the mind which distinguishes the members of one human group from another...culture in this sense, includes systems of values; and values are among the building blocks of culture.” (Hofstede, 1980:21)*

Culture develops through recurring social relationships which are eventually crystallized and internalized by the members of the entire group. It is learned and acquired by people over time through membership of a group and is transmitted from one generation to the other. All components of culture, such as religion, language, business and social status, are interrelated. Culture is not only specific to a particular group but can also be shared and extended to other members of the group through members of the society and overarching institutions (Hollensen, 2011).

Culture is also multilayered. The tangible aspects of the culture are manifestations of the underlying values that a group of people share. These are influenced by existing family values, sex roles and friendship patterns. However, basic cultural assumptions are deeply ingrained and are formed over a long period of time. This includes cultural components such as national identity, ethnic culture and religion. Other elements that are considered to be important elements of culture are language (both verbal and non-verbal), manners and customs, technology and material culture, social institutions, education, values and attitudes, aesthetics and religion (Hollensen, 2011).

## 2.2 Accepted frameworks for categorizing cultures

There are various frameworks available to categorize cultures. One way of classifying cultures is to divide them into low-context and high-context cultures (Hall, 1960). In low-context cultures, there is a low degree of complexity in communication and the spoken and written language is used to decode meaning. In contrast, in high-context cultures, the context surrounding the message is used to decode the original message and there is a high degree of complexity in communication. Diverse cultures can be placed along this contextual continuum, which extends from cultures where communication is low context and explicit (e.g. Swiss culture) to those where the communication is highly complex and implicit (e.g. Japanese culture).

Hofstede's dimensions (Hofstede, 1980) is another popular framework for identifying differences in national cultures. According to Hofstede, the differences in cultures' perceptions of the world are based on power distance, uncertainty avoidance, individualism, masculinity, and sense of time. Power distance refers to the degree of inequality between people in a certain culture. Uncertainty avoidance refers to whether people in a culture prefer formal rules and fixed patterns of life and the kind of attitudes they have toward taking risks. Individualism refers to the extent to which people in a culture have learned to act as individuals rather than members of groups. Masculinity denotes the degree to which masculine values such as achievement, performance and success pervade society. The time dimension categorizes cultures based on whether a group of people from a certain culture exhibit a long-term or short-term orientation in their behavior. Hofstede also went on to show how different nations can be characterized in terms of their positions on varying combinations of these five dimensions (Hofstede, 1980).

Although Hofstede's dimensions is probably by far the most recognized and accepted model, there are also alternate models which attempt to identify different cultural dimensions. For example, Schwartz's classification (Schwartz, 1994:85-119; Dicken, 2011:175) includes the following dimensions: conservatism, intellectual autonomy, affective autonomy, hierarchy, egalitarian commitment, mastery, and harmony. Conservatism is the degree to which people from a certain group emphasize preserving the status quo and avoid disruption of the traditional order. Intellectual autonomy is the degree to which a culture is free to pursue intellectual ideas. Affective autonomy is about the degree of freedom available for people in a culture to seek their own personal and emotional desires. The concept of hierarchy deals with whether there is an unequal distribution of power and resources in the society. Egalitarian commitment is about the extent to which people in a culture look for common good rather than their self-interest. Mastery deals with

how self-assertive behavior can be exhibited in a society to achieve one's own goals. The extent to which one must fit harmoniously in the environment is denoted by the harmony dimension. There are obvious overlaps in this framework with Hofstede's dimensions (e.g. egalitarian commitment and hierarchy), but nonetheless, this is also another approach to looking at cultural differences.

### 3 Manifestation of cultural dimensions in an educational context

Having delineated different dimensions of cultures, it is now possible to elaborate many different mechanisms through which cultural dimensions, particularly Hofstede's dimensions (Hofstede, 1980), manifest themselves in an educational context. Each of them is elaborated further in this section.

#### 3.1 Power distance

In cultures where power distance is high, there is a gap in hierarchical status between teachers and students. Teachers are often respected or feared. It can be customary to stand up when the teacher enters the class. In a high power distance culture, students may be required to bow, which of course is not the norm in low power distance cultures. In these contexts, the whole learning process is teacher-centered, and it is the teacher who initiates all classroom communication. Students are allowed to speak up when the teacher instructs them to do so. A student seldom criticizes or contradicts the teacher in front of the class. A teacher can enjoy privileged status even outside the school. In many situations, especially during the primary years, corporal punishment is accepted, which can actually be considered as child abuse in other cultures. A teacher is considered as the personification of wisdom and treated as such in society. Where the society is more lateral, or where the power distance is low, the situation is reversed (Hofstede et al., 2010:69-71).

#### 3.2 Individualism and collectivism

In a collectivist society, students do not speak up in class unless they are asked to do so or are somehow sanctioned by the group, if it is a group work situation. Students should be addressed personally by a teacher in these cultures. Students are also apprehensive of speaking up in larger groups when the teacher is not present in a collectivist culture. In order to increase participation in these situations, creating small sub-groups based on cultural differences (if it is a multicultural group) and appointing a representative for each of these sub-groups is a way to increase participation of students during classroom discussions.

In a collectivist society, which is often hierarchically stratified, the social class distinctions also easily seep through in the educational context. Being in an out-group or an in-group is very easily determined by the already held social distinction. It can be customary for a group which identifies with the teacher to expect preferential treatment, whereas in cultures which are individualist, that could be considered as nepotism and generally immoral. The other implication is that in a collectivist culture, where the preoccupation is with 'saving face', a teacher has to be careful to not indulge in confrontations with individual students in front of the group. The general purpose of education in these two different cultures can also be somewhat different; where for the collectivist culture, the purpose of

getting a degree could be very much to gain status or social acceptance, in an individualist culture it could be more pragmatic such as economic prospects and self-worth. (Hofstede et al., 2010:117–119)

### 3.3 Masculinity and femininity

The pedigree of a culture in terms of its assertion of feminine or masculine values also has several implications for educating and teaching. A classroom can be very competitive in a masculine culture where excellence is praised. There could also be awards for excellence. A student from a masculine culture may be willing to re-sit an exam a number of times if he or she is not satisfied with the grades obtained, whereas for a feminine culture this might be not such a major issue where being average is the norm.

In a feminine culture, it might be customary for teachers to praise and motivate weaker students. A culture with masculine overtones can be manifested in a classroom where students try hard to win the teacher's attention and compete openly with each other. The cultural tendency toward masculine or feminine values can also be reflected in the ways in which teachers and students are evaluated. In a masculine culture, a 'good teacher' may be someone who has an academic reputation and is brilliant, whereas in a feminine culture qualities of a 'good teacher' might be related more toward caring and nurturing values. Similar kinds of qualities might apply in assessing a student across cultures. It is also a norm in more masculine cultures for male teachers to be active in the higher education field, whereas in a feminine culture it might be less common and they are more active at lower educational level (Hofstede et al., 2010:158–163).

### 3.4 Uncertainty avoidance

The uncertainty avoidance index, what it is and how it is manifested in societal context has been heavily discussed. Like other dimensions of culture, this can also have different consequences for teaching and education. For example, cultures which score very high in this index tend to have structured learning processes. These include detailed objectives, rigid timetables and assignments that are described in detail. Students from these cultures, more than others, are liable to ask for the learning objectives of the courses to be clear and the evaluation criteria to be very specific. Cultures with low uncertainty avoidance might be happy with open-ended learning situations, where objectives can be vague and are used primarily to facilitate discussions (Hofstede et al., 2010: 205–206).

Students from cultures with high uncertainty avoidance expect to be rewarded for accuracy and often envision a situation with one correct answer. As a result, they tend to do well in multiple choice questions, whereas students with low uncertainty avoidance might expect questions where originality is more valued, such as essay-based questions. In high uncertainty avoidance cultures, a teacher is seen as an expert with all possible answers and is most likely expected to be pedantic and academic, and in such situations students will find it difficult to object openly to teachers. As a consequence, in the educational process, parents will less likely be involved, as teachers are supposed to be experts in teaching. Students in high uncertainty avoidance cultures will also expect arcane and academic knowledge to be delivered by the teacher, as something flimsy and easily understandable might be deemed uncreditable (Hofstede et al., 2010:205–206).



### 3.5 Orientation to time

Similarly, other dimensions of culture such as long-term orientation (LTO) also have implications for education and teaching. It has been claimed that whether a culture is long-term or short-term oriented has corresponding effects on the cognitive structures of individuals. For example, students from high LTO are thought to be better at solving problems that are well defined with explicit goals. For these students, ‘what works’ might be significant than ‘why things work’ the way they do. It has been claimed that because of these tendencies, students from high LTO cultures are prone to doing well in mathematics and applied sciences, and students from low LTO cultures tend to be better at abstract subjects such as philosophy and sociology (Hofstede et al., 2010:262).

## 4 Implications for pedagogy

If pedagogy is defined as the “teaching and learning relationship that creates the potential for building learning conditions leading to full and equitable social participation” (The New London Group, 1996), culture must be a huge part of that. From the discussions above, it should be sufficiently clear that teaching and learning is very much a cultural process. It could then be expected that students learn easily and better when knowledge and skills are channeled through the student’s own cultural frame of references (Gay, 1998:9). The expectations of the teacher’s role, the role of education in society and the norms of assessment can vary according to differences in cultural values. For example, in a masculine culture, the teacher should have a higher academic reputation, whereas in a feminine culture a teacher should be more involved in nurturing students. A student from a high uncertainty avoidance culture will expect precise learning objectives and clear evaluation criteria, whereas for a student from uncertainty avoidance culture this could be too restricting (Hofstede et al., 2010). In this section, some specific ways to move toward culturally sensitive pedagogy are elaborated.

### 4.1 Rendering functional meanings

While teaching, it might be necessary to render functional meaning to abstract concepts by using examples from the student’s own cultural contexts (Gay, 1998:19). Necessarily, there must be some amount of ‘cultural synchronization’ (Lason-Billings, 1995) to create an interpersonal environment between a teacher and a learner to enhance learning. For example, how is it possible to teach about culturally specific practices to a student who hails from a culture without any such cultural equivalent? In such situations it can be helpful to consider if such ‘culturally alien’ practices were in fact the norm at some historic time in a student’s own culture, so that this abstract concept might be rendered functional to this student. This example elucidates the importance of filtering the knowledge through the student’s culture of reference. In some contexts, it could even be possible to use a particular community or culture as the basis of a curriculum (Lason-Billings, 1995). Educators who understand the cultures of diverse students are likely to be more successful in teaching them than those who do not (Gay, 1998:12).

## 4.2 Being sensitive to cognitive structures and learning styles

From previous discussions, it is also quite clear that students from diverse ethnic and cultural backgrounds also exhibit different learning styles and cognitive structures (Gay, 1998; Hofstede et al., 2010:262). It was discussed previously that students from high LRO cultures are more adept at solving defined and closed problems, whereas students with low LRO are more concerned with the ‘why of things,’ which is more conceptual. People from different cultures could also have differences in their preferences for auditory, visual or kinesthetic learning styles. For example, it has been discussed that since Chinese children have to learn their scripts at an early age, this develops their ability of pattern recognition but also increases their need for rote learning. What we are adept at learning is often determined by the environment in which we grow up, and is also largely a product of culture (Hofstede et al., 2010: 394). This would mean that because of differences in learning styles of students from different cultures, different students would require variety in teaching techniques to gain the same academic understanding at the same level. It could be essential to match the learning styles of students from different cultures with corresponding teaching styles (Felter & Silverman, 1988). This might also mean that arrangements of classrooms should also be multidimensional and multimodal to reflect the variety in learning styles (Gay, 1998:18).

## 4.3 Culturally sensitive instructional materials

Similarly, it can also be argued that students learn from instructional materials that correspond to their cultural experiences. It then might be necessary to present instructional materials that present positive views of different cultural groups to increase the learning of students belonging to those groups (Gay, 1998:12). This could also provide other students opportunities to know, appreciate and participate in cultures different from their own. In certain situations, when the subject of discussions is culturally relevant, a student with authority in the subject by virtue of being part of that community or culture can be given the possibility to share their expertise (Lason-Billings, 1995). Making instructional material that reflects cultural diversity to all students regardless of their personal cultural identity should be the ideal aim of any educator (Gay, 1998:18).

## 4.4 Reflexivity toward validity of knowledge claims

The validity of most knowledge claims has cultural repercussions, and such claims are always relative (The New London Group, 1996). This also indicates that presenting views from only a single cultural viewpoint is actually legitimizing only one cultural system and engaging in cultural hegemony and ethnocentrism (Gay, 1998:13). Besides being inclusive of different cultural viewpoints in instructional materials, an educator should also be careful to not sideline those issues that hold particular significance to a cultural group. For example, a textbook about the Second World War without a discussion of the Holocaust is marginalizing the Jewish viewpoint. A discussion of American history without the slavery and suffering of African people would amount to social exclusion of this group. Problems could also arise when a teacher, especially if he/she is an expatriate, discusses irrelevant materials from the student’s cultural perspective. For example, the business management education that is useful for succeeding in a highly developed country is not necessarily equally relevant in a developing country. Hofstede et al. (2010: 394) ask: “What interest

does a future manager in an Indian company have in mathematical modeling of the US stock market?” To think that what is relevant for one’s own culture is equally important to another’s culture is just another instance of ethnocentrism.

#### 4.5 Sensitizing oneself to verbal and non-verbal communication

Language, both verbal and non-verbal, is an intrinsic part of a culture. Language is also in many ways the vehicle of teaching. For an expatriate teacher, when it is necessary to teach students in their own language, this also requires the adoption of someone else’s cultural frames, because language and culture are intrinsically tied together (Hofstede et al., 2010:389). It also means that if the teacher has to teach in student’s language, much of their control over the learning situation is lost (Hofstede et al., 2010:393).

Similarly, the verbal language used can include words which have both denotative and connotative meanings (Lustig & Koester, 2006:174–207). For example, some students, when they hear the word “test”, react with panic, whereas other students might react very casually. “Chips” for a British student is “French fries” for an American student. Using “boy” to address a Nigerian student is acceptable and may even convey a sign of friendliness, whereas addressing an African-American as a “boy” can be seen as derogatory.

Additionally, the information provided during teaching is more than just ‘words’ and should resonate with the cultural framework of the student. What might feel like an important message in one language may not be so when translated to another language. What sounds funny in one language may not sound as funny in another language. In fact, humor is highly culture-specific (Hofstede et al., 2010:390). Some researchers (Lason-Billings, 1995) illustrate this with several examples which show that when language interaction patterns similar to or culturally congruent with a student’s home culture pattern are used, teaching can be more effective, leading to higher academic performance in students.

Non-verbal communication is also a major issue for a teacher in a multicultural environment. Often non-verbal mannerisms and kinesics convey different meanings to people from different cultural backgrounds (Lewis, 1999). What is a rude or lewd gesture in one culture can be quite normal in another. How respect is displayed across cultures through the use of titles and politeness rituals differs. Facial expression, eye contact, body posture can have different meanings across cultures (Lustig & Koester, 2006:72–77). An awareness of both verbal and non-verbal components of communication and what they signify in different cultures is required to operate as a teacher in a multicultural environment.

#### 4.6 Making the curriculum more diverse

Many proponents of multicultural education also think that the main way to produce truly multicultural teaching is to internationalize the curriculum (Räsänen, 1998). What this signifies is that teaching should not consider specific societies and cultures in isolation but should also explore their interrelatedness to the broader world. An economics teacher, for example, should not only discuss a focal economy as if it exists in isolation but should relate it to the broader world and explain to students how different economies are interdependent upon each other. A mono-cultural or mono-national curriculum should be changed to include diversity so as not to marginalize students from other cultures. In everyday

teaching, a teacher should be able to infuse the value to students that besides belonging to a particular nation or a culture, they are also citizens of the world (Räsänen, 1998:35). They should be able to convey to the students that despite our cultural differences, as psychological and physical beings, we all face the same predicaments (Pitkänen, 1998:44).

#### 4.7 Cultural influences on group processes

Our pedagogical tools are also largely based on cooperative group projects. Cultural elements can have an overarching influence on group work processes (Brewer & Yuki, 2013). For one, culture influences the concept of time in students. Depending upon their cultural belonging, students could have different concepts of punctuality. For some students, a meeting scheduled at a certain time means exactly so, whereas for students from other cultures, it could easily mean somewhere thereabouts. As is apparent, this can cause problems in scheduling, attending meetings on time and agreeing on and performing within a deadline (Lewis, 1999).

Culture can also affect the concept of 'group performance' (Brewer & Yuki, 2013). While for collectivist students, performing well in the group may refer to the performance of the group as a whole, for students from more individualistic cultures, individual performance in the group could be more important (Hofstede, 1980). Obviously, if a group consists of members from different cultural backgrounds, that can also lead to misunderstandings and conflicts (Jackson et al., 2003). The way in which people handle stress, their likes and dislikes, the motivation driving them to engage in group work, all of these can be different according to cultures. If a group is characterized by a large number of people from similar cultures, the danger could also arise of 'cultural domination' in the group against the minority group or individual.

Similarly, it is quite well understood that culture influences the understanding of hierarchy and leadership (Lee, 1966). While people from collectivist cultures tend to perform better under authoritarian leadership and even expect some form of hierarchy in the group, most students from individualistic cultures may prefer a flat hierarchy in the group. They perhaps expect everybody to have an equal footing in the group. Obviously, when the personalities and cultural backgrounds of group members interact, it can have significant effects on group processes (Jackson et al., 2003; Brewer & Yuki, 2013). One might also argue, however, that culture is always not the source of conflicts, but sometimes diversity in cultural background can encourage different perspectives and stimulate creativity (Jackson et al., 2003). Nonetheless, it should make us think as educators that there should be equal representation from different cultures when creating a group to avoid most of these problems.

#### 4.8 Classroom practices

Some classroom practices can also ensure that students from a particular culture are not being marginalized. Avoiding cultural stereotyping and passing judgments based on that should be avoided. As a teacher, it is not a good idea to say, for example, "This person X is always late, because he is from Y," in front of the class. This legitimizes cultural stereotypes.

Alternatively, one should not show favoritism to students that belong to the same culture. Being open to ideas and values from other cultures reduces ethnocentrism (Lee, 1966).

As a teacher, it is also necessary to examine one's own conscious or unconscious cultural biases, and be aware of existing social inequities and their causes. Assessments should also be multifaceted, reflecting on and incorporating multiple forms of excellence that are culturally relevant (Lason-Billings, 1995). Perhaps teacher education and other pedagogical training should also sensitize student teachers toward cultural differences and ways to handle them (The New London Group, 1996). More practically, some course weeks or projects can be devoted to multicultural issues and integrated in all aspects of coursework (Räsänen, 1998:36). On a broader scale, increasing social, ethnic, cultural and linguistic diversity in the composition of a class or a school as a whole can also increase awareness and understanding of different cultures.

## 5 Improving intercultural competence as an educator

It is obvious that some cultural differences are easier to manage than others. To understand underlying attitudes and values of people from different cultures demonstrates intercultural competence (Lustig & Koester, 2006). Intercultural competence can be reflected as cognitive competence to understand different cultural perspectives, as affective competence to empathize with people from different cultures, or as behavioral changes so that one is able to fulfill different cultural roles (Räsänen, 1998:38). In this section, some ways to be sensitive toward cultural differences are elaborated further.

### 5.1 Understanding diversity of cultural values

When there is a need to interact between people with increasingly diverse cultural backgrounds, first, understanding different layers of culture can provide a common framework to understand various individuals' behavior. For example, the concept of 'punctuality' is different across cultures. In low-context cultures, punctuality is considered as extremely important, whereas elsewhere there is a somewhat looser understanding of punctuality (Lewis, 1999). Similarly, in more 'informal' cultures it might be customary to hand out business cards in a very casual manner, whereas in South Asian countries and Japan it is a much more orchestrated event (Hollensen, 2011). Our prejudices are subject to natural dynamics of bias, and we cannot accurately judge others without sharpening our own self-awareness (Lee, 1966). However, this is easier said than done in practice.

### 5.2 Examining one's own cultural biases

Avoiding cultural insensitivity can be a way in which to increase intercultural competence. Lack of cultural sensitivity can be of many types. It mostly stems from our own subconscious cultural stereotypes that can hamper cultural assessments. Since these are deeply ingrained, it is also difficult to identify them. One such trap is 'ethnocentrism,' the belief that one's own culture is superior to another (Lee, 1966; Hollensen, 2011). Another related concept is the self-reference criterion (SRC) (Lee, 1966). This is an unconscious tendency of people to use their own cultural experience and value systems to evaluate any given

situation. For example, we intuitively perceive more traditional societies to be 'backward' or 'unmotivated'. SRC suggests a four-step mechanism to identify cross-cultural differences and cope with them. This involves: defining the problem in terms of our own cultural traits, customs or values; defining the problems in terms of the second culture's traits, customs and values; isolating the SRC influence from the problem and examining scrupulously how it leads to the incorrect definition of the problem; and finally, redefining the problem without the SRC influence and finding the optimal solution (Lee, 1966). Constant reflection through this method while interacting in a multicultural classroom could prove beneficial.

### 5.3 Understanding institutional underpinnings of cultural values

As a teacher, it is also important to realize that due to institutional differences in the societies from which the students have come, they have different expectations related to the educational process. Do they come from a place where the curriculum needs to be detailed? Do they come from a society where teachers have high status and pay? Do they come from a culture where all education is nationalized (Hofstede et al., 2010:394-95)? All of these factors build their expectations about the educational process they are going to participate in and contribute to their positive or negative experiences. In addition, a teacher should also be proactive in preparing and training professionally to deal with situations borne from multicultural situations (Gay, 1998:20). An effective teacher must demonstrate both intercultural competence and sociopolitical awareness.

### 5.4 Constant learning

Lastly, developing intercultural competence is a lifelong process. It can be enhanced by wide reading, interacting with people from different cultures, being aware of the cultural artifacts (such as literature, music) of different cultures and traveling widely. It can also be enhanced by participating in different qualitative and quantitative assessments of intercultural competence. Teachers can also make conscious choices to be part of the community and culture from which their students come; this not only improves understanding but also communicates the belief that the student's community is also important and worthwhile (Lason-Billings, 1995). Moreover, intercultural competence can be developed through informed empathy, role-taking and dialog (Räsänen, 1998:38). As a teacher, one should socialize constantly to increase these competences and acquire diverse cultural knowledge. It is also important to realize that, although the focus of this article was on culture alone, it is by no means the sole defining condition of one's identity. Cultures coexist in the same place and time, and we all have multiple social identities. In some situations, some identities are prominent, which might or might not be defined solely by culture but which can give us the feeling of belonging or exclusion (Bourne, 1998).

## 6 Conclusions

Culture is the amalgam of beliefs, attitudes and values and helps distinguish one category from another. There are several ways to categorize culture, among which Hall's taxonomy of high-context and low-context cultures (Hall, 1960), Hofstede's dimensions of culture (Hofstede, 1980), and Schwartz's classification (Schwartz, 1994) are the most used. Using these frameworks of classification, it is easy to see that these cultural dimensions are manifested in educational settings in one way or another. This in turn can help educators to explore culturally informative pedagogical practices and reduce the perpetuation of cultural inequities in educational systems. As an educator, one might also use this knowledge to understand the institutional underpinnings of natal cultures and show developed intercultural competence in everyday pedagogical practices.

Apart from these points, the major contention of this article is not that 'source cultures' be used as a guide to design educational programs but rather, that they should also be sensitized in order to elicit academically desired behaviors from students in a multicultural environment and to ensure that educational institutions do not become vehicles for perpetuating socio-cultural inequalities (Lason-Billings, 1995). This will only become more relevant as we become part of increasingly globalized world and teach an internationalized curriculum. As an amalgam of cultural values, the interpersonal contexts, expectations, institutional and societal contexts between teachers and students should be included in effective pedagogical practice. In a nutshell, the goal of a culturally sensitive pedagogy should be to maintain both cultural integrity and academic excellence.



## REFERENCES

- Bourne, J. (1998) Teaching and learning in a multicultural context. In Häkkinen, K. (Ed.), *Reflections on Theory and Practice* pp. 54–65. Jyväskylä: University of Jyväskylä,
- Brewer, M. B. & Yuki, M. (2013) Culture and group processes. In Yuki, M. & Brewer, M., (Eds.) *Culture and Group Processes*. Oxford: Oxford University Press.
- Dicken, P. (2011) *Global Shift: Mapping the Changing Contours of the World Economy*. Sixth Edition. New York: The Guilford Press.
- Felter, R. M. & Silverman, L. K. (1988) Learning and teaching styles in engineering education. *Engineering Education*, 78(7): 674–681.
- Gay, G. (1998) Principles and paradigms of multicultural education. In: Häkkinen, K. (Ed.) *Multicultural Education: Reflection on Theory and Practice*. Jyväskylä: University of Jyväskylä.
- Hall, E. T. (1960) *The Silent Language*. New York: Doubleday.
- Hofstede, G. (1980) *Culture's Consequences: International Differences in Work-Related Values*. Beverly Hills, CA: Sage.
- Hofstede, G., Hofstede, G. J. & Minkov, M. (2010) *Cultures and Organizations: Intercultural Cooperation and Its Importance for Survival*. London: McGraw-Hill.
- Hollensen, S. (2011) *Global Marketing: A Decision-Oriented Approach*. Fifth Edition. Essex: Pearson Education Limited.
- Jackson, S. E., Joshi, A. & Ernhardt, N. L. (2003) Recent research on team and organizational diversity: SWOT analysis and Implications. *Journal of Management*, 29(6): 801–830.
- Lason-Billings, G. (1995) Towards a theory of culturally relevant pedagogy. *American Educational Research Journal*, 32(3): 465–491.
- Lee, J. (1966) Cultural analysis in overseas operations. *Harvard Business Review*, March-April: 106–114.
- Lewis, R. D. (1999) *When Cultures Collide: Managing Successfully Across Cultures*. London: Nicholas Brealey Publishing Limited.

Lustig, M. W. & Koester, J. (2006) *Intercultural Competence: Interpersonal Communication Across Cultures*. Fifth Edition. Boston: Pearson Education Limited.

Pitkänen, P. (1998) Judgement, education and multiculturalism. In Häkkinen, K. (Ed.) *Multicultural Education: Reflection on Theory and Practice* pp. 43–53. Jyväskylä: University of Jyväskylä.

Räsänen, R. (1998). The present situation and future challenges of multicultural education in Finland. In Häkkinen, K. (Ed.) *Multicultural Education: Reflection in Theory and Practice*. Jyväskylä: University of Jyväskylä.

Schwartz, S. H. (1994) Beyond individualism/collectivism: New cultural dimensions of values. In Kim, U. et al. (Eds.) *Individualism and Collectivism: Theory, Methods and Applications* pp. 85–119. Thousand Oaks, CA: Sage.

The New London Group (1996) A pedagogy of multiliteracies: Designing social futures. *Harvard Educational Review*, 66(1): 1–26.

Sirkka Komulainen

# The social, sociological and practical in research with young disabled children:

## Mutual learning from multiple perspectives

### Abstract

This article is concerned with learning from multiple perspectives. It presents a case study by revisiting a sociological PhD research project conducted in the UK in the early 2000s with an updated commentary. The social constructionist and ethnomethodologically informed ethnographic study was concerned with communication difficulties of young disabled children who received various therapeutic services. Reflecting the policy and sociological interests of the time, the adoption of the Social Model of Disability instead of the Medical model, as well as agency and voice approaches were important starting points for the original research.

Since then, it has been possible to move away from sharp juxtapositions between different models, and there are indeed a range of approaches to disability and childhood studies. However, it is argued that there remains a need to define and reiterate the 'social' and the 'sociological', taking into account what is practically achievable in research with children who have multiple and profound disabilities, with particular reference to (minority) rights-based arguments.

Keywords: Young disabled children, social, sociological, rights, interdependence

## Introduction

This article aims to make a case for mutual learning between different paradigms that affect the lives of young children with multiple and profound disabilities. It reflects on a PhD study conducted in the early 2000s in the UK that looked into the communication difficulties of young disabled children. The study was simultaneously concerned with the potential *social* exclusion of these children and the new *sociological* studies of childhood. More precisely, ‘social’ referred to social politics and rights concerning children – the most vulnerable – and ‘sociological’ to new emerging conceptualizations of childhood, with a strong emphasis on children’s agency and participation.

Whilst carrying out the study, however, it was noticed that this simultaneous aim of combining the ‘social’ and ‘sociological’ was highly problematic. Several complex phenomena to do with children’s voices, agency and participation emerged from the field data, some of which seemed outright contradictory to one another. The vulnerabilities of disabled children – which were considered as real and consequential – did not fit very well with the rather individualistic demands of children’s voices. Moreover, Disability studies at the time seemed more focused on the lives of adults than on those of children, and on criticizing the so-called Medical Model of Disability (e.g. Oliver, 2013). The ‘social’, as in the Social Model of Disability, in itself seemed not to fit the study results.

However, more recently, new debates (and new versions of old debates) have emerged within both Disability studies and the new social studies of childhood (e.g. De Lamo White & Yin, 2011; Solomon-Rice & Soto, 2011; Nind et al., 2010). This is promising, even though children with multiple and profound disabilities may have remained at the margins of research agendas. Recently, the different meanings of the Social Model of Disability have also been discussed beyond the juxtaposition between the Social and the Medical model. In addition, instead of a political emphasis on agency and voice, Wyness (2013), for instance, has usefully discussed the concept of *interdependence*.

The article thus starts off with the definitions of the ‘social’ and ‘sociological’ as they were defined in the PhD research. They will reflect the key emerging childhood social/sociological arguments in the 1990s and early 2000s in the UK. The research results will not be detailed in full, as they have previously been published elsewhere (e.g. author, 2005; 2007). The focus is narrowed down to the case of young disabled children, in which the Disability studies paradigm (involving the then-juxtaposed Social and Medical models of disability) is involved. Finally, the juxtapositions will be reflected upon from a present-day perspective (2015), considering what has changed since the early 2000s and what can be learned from the scenario today.

## Context and theoretical background to the PhD research

The PhD study was carried out in 2000–2004 in the UK in two special needs settings: a special needs day nursery and a multidisciplinary child assessment center providing early intervention and care. This article practically refers to the day nursery where some of the children had multiple and profound disabilities. The day nursery offered physiotherapy, occupational therapy, speech therapy and hydrotherapy to children, usually aged 2–5

years. Many children visited the center as outpatients over a period of several years. Around 20 children attended the nursery during the time of the observations.

'Communication difficulties' were a frequent concern in both settings. In the research design, disabled children in general were considered as vulnerable and being potentially at risk. Developmental and intervention research in the last 25 years has suggested that early language and communication impairments place children at risk for problems in social development and reading. Systematic intervention has been regarded as necessary to ensure positive social and academic outcomes for children with such impairments (e.g. Kaiser & Roberts, 2011: 304).

The PhD thesis focused on *the 'socialness' of face-to-face communication*. It described the intertwining of discourses and practices which both constructed and sustained dominant understandings of good and normal communication. At the time, this particular focus had not been addressed in this manner in the new sociology of childhood, Disability studies or Communication Theory (Cobley, 1996). Furthermore, little was known at that point about participation of preschool-age children with physical disabilities, which appears to still be the case today (Chiarello et al., 2012:4).

The *social* perspective at the time was defined as follows: there had been widespread assumptions that disabled children lack the skills, not just to act in their own best interests, but also to make their views known in a comprehensible way. One aspect was that the child and his/her physical disability were seen as the source of the communication difficulty, rather than the adults who were not familiar with, for example, methods of augmentative and alternative communication (Marks, 1999). This represented a Medical model – the power of medical knowledge – at play.

The *sociological* approach at the time started from a 'traditional' sociological interest, i.e. from an interest in the Foucauldian (1973) knowledge/power. During the fieldwork, the aim was to *'carve out the social'* (author, 2004) by way of prolonged ethnographic observations of interventions, participatory, social and other activities in the two settings to see where else one might locate the 'communication difficulty' but in the child\*.

The key *sociological* starting points for the research are summarized in the following quotation from Nick Watson (2012) outlining the most important shifts in both Disability studies and the new social studies of childhood since the late 1990s:

*The focus has shifted from an exploration of impairment to one that prioritises the social with disabled children themselves placed at the centre of the research. Disability studies and the new social studies of childhood, whilst both different in their approaches and ideologies, share some common themes; both are driven by a desire to turn those they work with, children and disabled people, from the objects of study to the subject and to present them as active agents, and both approaches are also firmly wedded to the concepts of rights and participation. (192; emphasis by author).*

The next section will review the common themes that the new social studies of childhood and Disability studies share in the conceptual context of the PhD study. After that, a num-

---

\* An MREC ethical approval alongside other required permissions for the observations from the staff and parents of the children were obtained for the PhD study.

ber of other conceptual issues that have been developed more recently will be discussed to see what might be harnessed in research on/with young disabled children with multiple and profound disabilities.

## Some definitions of the 'social' in the new studies of childhood

The PhD research emerged in a certain kind of political climate in the late 1990s where a rise in the 'culture of consultation' and the changes in child law as push factors for the recognition of children's 'voices' had been witnessed (Aitken & Millar, 2002). Internationally, the UN Convention on the Rights of the Child Articles 12 and 13 introduced a discursive dimension to children's well-being, and children were to have 'voice'-based rights that may give them better opportunities to articulate their interests (Wyness, 2013: 432).

Around the same time, childhood sociology had made efforts to document not only how children are shaped by society but also how they shape it (Prout, 2000; James & Prout, 1997). Where children were the subjects of professional and judicial activity which was concerned with their welfare needs, their rights were eroded by assumptions about their lack of cognitive, emotional and experiential competence to make decisions in their own best interests (Parton & Wattam, 1999). Thus, children were seen as being denied agency and subjecthood because they were deemed vulnerable and incompetent. From this standpoint, *children were positioned as a political minority*, excluded from society's decision-making processes (e.g. Qvortrup et al., 1994).

The 'new paradigm' sought to challenge pervasive developmental and other preoccupations with children's biological age and associated abilities. The notion of the '*social competence*' of children was introduced as an alternative viewpoint, with an emphasis on children's ability to manage their social surroundings and to engage in meaningful social action within given interactional contexts. The notion of 'social competence' constituted children as having a potential to act agentially (e.g. Hutchby & Moran-Ellis, 1998). From this perspective, practice views, such as those in child protection, disability or childhood illness typically construed children as dependent and in need of adult help, overlooking children's agency.

What childhood studies really aimed to do at the time – as I interpret it today – was to deconstruct notions of (disabled) children as passive recipients of adult worlds and stress them as having capabilities that are worthwhile in themselves, even if they are not always the same ones that adults possess. At least in the case of my PhD study, there was initially a presumption that the problems, for example, in adult-child communication were not simply due to the children's impairments but to the adult-led working cultures in the services provided. Literature concerned with listening to children at the time suggested that – potentially – adults were not either willing to listen to children; did not take children seriously because they considered them as inferior/immature; or did not have appropriate means to listen despite good intentions (e.g. Middleton, 1999). The new paradigm for childhood sociology, also noted in research with disabled children, aimed to unpack social, cultural and environmental structures, practices and barriers and such adult behaviors, which potentially excluded children with impairments (Watson, 2012: 194; Carpenter & McConkey, 2012).

## Disability studies, the 'social', and the Social Model of Disability

In the early 2000s the child welfare *practice* definitions of children's 'social-emotional competences' were not as concerned with children's agency as the aforementioned sociological ones, and were more clearly impairment-based in the case of disabled children (see e.g. Brown & Conroy, 2011: 311). As the PhD research was conducted in the UK, it first looked into the critiques of impairment-based models from within the British Social Model of Disability. The model had made a distinction between the impairments that people have and the oppression which they experience in societies. Similarities could be found between the model and childhood sociology's view on children as an 'oppressed and silenced group', as well as to the North American approach to disability that positioned people with disabilities as a 'minority group' (Shakespeare & Watson, 1998; Pfeiffer, 2001).

As the PhD research took place in health and social care settings, theories on the medicalization of disability were acknowledged at the outset as essentialist perspectives to 'disability' (Oliver, 1999; Priestley, 1998). The thesis then went on to explore Medicine as a 'regime of truth' in relation to disabled childhoods in particular. The study was concerned with how children were identified, counted, surveyed and contrasted to the 'normal' (Foucault, 1973). In this view, Medicine had become an institutionalized discourse, where 'experts' are produced as subjects with particular authority, knowledge and skills that are superior to those of lay people (Corker & French, 1999). For Middleton (1999), disabled children in particular were marginalized, because the medicalization of disability created 'special needs.'

Within the (bio)Medical model, people were considered disabled on the basis of being unable to *function* as a 'normal' person does and rehabilitation had an important role to play in bringing the person closer to the norm (Mitra, 2006: 237). Where young children had communication difficulties, as in the PhD research, the aims of therapies and assistive technologies were to bring their communication closer to societal norms for 'good communication' (author, 2005; 2007).

## Complicating the juxtaposition between the Social and Medical models of disability

More recently it has become clear that understanding 'disability' as a concept is not as simple as presenting a dichotomy between a Medical model and a Social model (Mitra, 2006: 237; Pfeiffer, 2001). For Mitra (2006), for example, 'disability' has been subject to many definitions in different disciplines and for different purposes from medical, sociological and political perspectives (236). The Social model in itself as contrasted to the Medical model has been said to involve at least nine different versions: (a) the social model of the United Kingdom, (b) the oppressed minority model, (c) the social constructionist version of the United States, (d) the impairment version, (e) the independent living version, (f) the postmodern version, (g) the continuum version, (h) the human variation version, and (i) the discrimination version.

Since the mid-2000s there have been useful developments in theories concerning disability that help in re-addressing my original study conceptually, ethically and politically. It is



here where it all begins to point toward the concern at the beginning of this article: at the heart of the problem is the notion of *individual agency* that involves free will, clearly defined personal interests and *freedom/competences/capabilities* in pursuing them in neoliberal societies. Next, 'I' as an author will intentionally reflect on my field observations in a first-person perspective.

## Problems with the PhD in light of juxtapositions and some of the solutions at the time

In the ethnographic observations at the day nursery, with my layperson's 'eye', I quickly noticed that children had different kinds of physical, communicative and other 'functionings': some had no speech or very little control over their physical movements, whereas others were verbal and physically mobile.

The heterogeneity of 'communication difficulties' and their specific manifestations in each individual child supported the idea that an experienced, qualified professional is required to understand the different nuances of various 'disorders', let alone have knowledge of children's developmental milestones. As much as the medical 'norms' and developmental hegemonies were to be deconstructed by sociologists, there seemed not to be many alternatives as to how the children's care could have been organized better or differently. As far as I was concerned – in my layperson's view – the children in the two research settings were well cared-for (author, 2004). At the same time, I was not in the field to evaluate the quality of the services but to make a sociological analysis of the social.

As a solution, what I ended up doing was very similar to what was suggested by Dewsbury et al in 2004 regarding research with disabled people. In an article presenting an anti-social model of disability, the writers promoted a certain kind of ethnomethodologically informed social constructionist research. For Dewsbury et al. (2004: 150; paraphrased), social constructionist research with political aims has typically aimed to show that:

1. Definitions of a given concept [such as Disability or Capability; author's remark] are shifting, especially historically. Many social constructionist studies draw attention to the ways in which explanations that were accepted as matters of fact were embedded in the ideologies or discourses of the time and can now be clearly seen as absurd or wrong.
2. 'Things could be otherwise' insofar as new and 'constructionist' models can be used contrastively with models that have preceded them.
3. This challenges the 'social reality' of the concept in question.
4. This has important political consequences and the social constructionist is pivotal in the realization of these consequences.

However, like Dewsbury et al., I concluded that no matter how constructionist the research might be, deconstructing 'Disability' or 'Capability' or 'Competence' might not be enough. It is also imperative to look into everyday action with significant consequences for disabled people:

*This perspective makes the investigation of 'common sense' and situated understandings the focus of inquiry and thus advances a potentially different approach to understanding disabled people by attending to their ordinary, practical and procedural concerns, rather than their political interests (ibid: 147, emphasis by author).*

During the research process, I indeed ended up finding various social mechanisms operating around communication difficulty as disability, but found that these were not simply about resisting medical 'hegemony'. Not only various medical and therapeutic gazes but also the gazes and standpoints of sociologists – and indeed the 'social' – became deconstructed. This was possible through an ethnomethodologically informed ethnography describing the situated 'commonsensical' (inter)action as well as practical concerns in the everyday lives of disabled children and their professional carers. Like Dewsbury et al., I noted that political interests (e.g. recommendations for rights-based practice) may have underpinned some of the adult actions, but situational, practical accomplishments ultimately seemed most significant for the welfare of the children.

In other words, the political interests of the Social Model of Disability – or new social studies of childhood – that were concerned with the 'personal interests' of the children, or positioning children as a minority group under oppression, did not suffice. Although I did not know of the terms at the time, in the field I was observing processes of *interdependence* and *co-construction* (of meanings in communication).

## Discussion

From a present-day view, it can be seen that any sharp juxtapositions between the Social and the Medical, and indeed the social, sociological and practical, were too black and white, perhaps a little naively so. For instance, Michael Oliver (2013) has recently responded to some of the criticisms of his earlier version of the Social Model of Disability:

*At no point did I suggest that the individual model should be abandoned, and neither did I claim that the social model was an all-encompassing framework within which everything that happens to disabled people could be understood or explained. (ibid: 1024).*

Barnes and Mercer (2010) have also responded to these critiques of the Social model by arguing that the model never claimed completeness and was never intended to be a social (or sociological) theory of disability.

In light of these recent arguments, a number of propositions will be outlined where there could be *opportunities for mutual learning* between and within different approaches to the welfare of children who have multiple and profound disabilities. Neither any new 'model' nor completeness is claimed here. However, without in any way overlooking the individual experiences of impairment (e.g. Corker & French, 1999), in the case of research with young children, the importance of *combining* the social, sociological and practical is brought to the fore.

## 1. The problem of multiple perspectives could be turned into a potential

Taking a critical realist approach to disability, Bhaskar and Danermark (2006) have argued that research on disability can be explored at least at the following levels: Physical, Biological, Psychological, Psycho-social and emotional, Socio-economic, Cultural, and Normative. In the past, it could be argued that much research on childhood disability from within the Disability studies paradigm has tended to engage with the latter three areas and has either downplayed or ignored the first four categories (Watson, 2012: 199).

Multiple perspectives matter because, as in the case of this particular PhD study, young children with multiple and profound disabilities are likely to be identified and referred for early intervention. Certain disabilities may involve limitations in motor functioning, sensation, perception, cognition, *communication*, behavior, and other health conditions that influence activity and *participation*. For example, young children with cerebral palsy have been reported to receive the greatest number of individual services and to require more specialized interventions compared with other children being served in early intervention (Chiarello et al., 2012: 4; emphasis by author).

The differences between the communicative abilities/capabilities of these children need to be taken into account in research practices. For instance, practice literature has drawn a difference between different kinds of communicators. Although all children might be considered as ‘communicators’, there will be differences in how they may express ‘intent’ (e.g. Kaiser & Roberts, 2011; Ogletree et al., 2011). Different kinds of capacities of children to do so may be professionally categorized into groups – i.e. communicators with intent or communicators without intent – but these are first of all subject to adult interpretations, and the boundaries between each group are not absolute. Practice literature has also recognized the multifaceted nature of communication. It has been suggested that assessment and intervention must expand beyond the needs of individuals with disabilities (i.e. the learner) to their communication partners and environments (Ogletree et al., 2011: 165-166; Siegel & Bashinski, 1997).

Similar to the findings of the PhD study, Vorhaus (2013) has also noted that some people with multiple and profound disabilities provide no consistent response to stimuli aimed at initiating dialog; it can take years to learn how to interpret and elicit responses so as to enable successful communication (1051). In such cases, the battle between the social model and the individual impairment might not be the topmost priority, which would be instead the matter of *mutual learning* between the child and their communicative partners. This is where any Social model might learn from practice contexts.

Child welfare practice can equally learn from social research approaches. For example, ethnographic methods used in research can be applied to and have been recommended for assessment practices with young disabled children (De Lamo White & Yin, 2011). This is important in clinical settings, where there is often an interest in the ‘systematic’ and ‘generalizable’. For example, Kovarsky (2008: 51) has suggested that, “an exclusive reliance on objective data is at odds with the very nature of what it means to participate in the life world and how communication disorders manifest themselves”. She has suggested a need for both experimental and qualitative modes of inquiry to gather evidence for clinical practice (McCormack et al., 2012: 144).

## 2. Participation, voices and agency can and should be deconstructed – things could be otherwise

The multiple perspectives *within* the social sciences that are to do with different epistemological and political interests might also require some clarification. At present, children's participation continues to be a debated concept across child welfare disciplines and has indeed already been deconstructed many times over. However, a consistent theory of child participation seems still be missing (e.g. Stoecklin, 2013). It could be added that this is the same problem as that found in the so-called voice approaches in childhood research.

For Wyness (2012), one argument – such as that that children have individual voices but are mediated by adults - need not undercut the other. In making the case for children's participation in English schools, Fielding (2007: 304) has argued that there is too sharp and too exclusive a focus on the standpoints of children and young people. Often this focus has led to a search for more authentic forms of children's participation – and voices – with adult involvement receding into the background. There has also been an overarching focus on the child as a rights-bearing individual, in the process neglecting the *interdependent* relationship between children and adults in a range of diverse settings (Fielding cited by Wyness, 2012: 43).

For Wyness (2013), in political and legal terms children are disaggregated or separated from their families as 'rights-bearing individuals'. However, *sometimes adults are in a better position to promote children's interests than are children themselves*. It is argued that this might particularly be the case with young children, as in my research findings (author, 2007). To move away from individualistic rights perspectives, it may make sense to look into research with disabled children (among others) that has considered adults as *co-constructors* of what children 'say'.

Thus the need for defining, re-defining and reiterating the 'social' and the 'sociological' remains; not simply as juxtaposing with other kinds of model but by reflecting on changing social circumstances, what we can know about disability and disabled children's lives through social science research methodologies, and what kinds of practical actions may follow together with others who work with and/or care for children.

## Conclusion

This article has aimed to make a case for mutual learning between all of the different approaches and disciplines that affect the lives of young children with multiple and profound disabilities. The arenas where such learning could take place are thus as follows:

1. The social in terms of the political;
2. The sociological in terms of 'ways of seeing';
3. Related to the first two - the practical.

The 'social' calls for action – by policy makers and researchers alike – to work toward more just and equal societies. The 'sociological' refers to the methodologies applied to 'representing others'; not necessarily in terms of representing their voices/choices through participation, but of understanding the multiplicity of issues affecting their lives. It is about the dependencies, interdependencies, interrelationships and co-constructions which the social fabric of everyday lives consist of between and amongst children and adults, be they sociologists, medical professionals or carers. Finally, considerations of everyday life practicalities might situationally override neoliberal arguments for (minority group) rights. The aforementioned issues are certainly still applicable to most research and practice with children today, but particularly to that on young children who have multiple and profound disabilities, including communication difficulties, as with the children in the PhD study in question.

## References

- Aitken, S. & Millar, S. (2002) *Are We Listening? Book 1 of Listening to Children with Communication Support Needs*. Glasgow: Sense Scotland and Edinburgh: CALL Centre.
- Barnes, C. & Mercer, G. (2010) *Exploring Disability*. Cambridge: Polity.
- Bhaskar, R. & Danermark, B. (2006) Metatheory, interdisciplinarity and disability research: a critical realist perspective. *Scandinavian Journal of Disability Research*, 8: 278–297.
- Brown, W. H. & Conroy, M. A. (2011) Social-emotional competence in young children with developmental delays: Our reflection and vision for the future. *Journal of Early Intervention*, 33(4): 310–320.
- Carpenter, J. and McConkey, R. (2012) Disabled children's voices: The nature and role of future empirical enquiry. *Children & Society*, 26: 251–261.
- Chiarello, L. A., Palisano, R. J., Orlin, M. N., Chang, H.-J., Begnoche, D. & An, M. (2012) Understanding participation of preschool-age children with cerebral palsy. *Journal of Early Intervention*, 34(1): 3–19.
- Cobley, P. Ed. (1996) *The Communication Theory Reader*. London: Routledge.
- Corker, M. & French, S. Eds. (1999) *Disability Discourse*. Buckingham: Open University Press.
- De Lamo White, C. & Jin, L. (2011) Evaluation of speech and language assessment approaches with bilingual children. *International Journal of Communication Disorders*, 46(6): 613–627.
- Dewsbury, G., Clarke, K., Randall, D., Rouncefield, M. & Sommerville, I. (2004) The anti-social model of disability. *Disability & Society*, 19(2): 145–158.
- Fielding, M. (2007) Beyond 'voice': New roles, relations and contexts in researching with young people. *Discourse: Studies in Cultural Politics of Education*, 28(3): 301–310.
- Foucault, M. (1973) *Birth of the Clinic*. New York: Vintage.

- Hutchby, I. & Moran-Ellis, J. Eds. (1998) *Children and Social Competence: Arenas of Action*. London: Falmer Press.
- Kaiser, A. P. & Roberts, M. Y. (2011) Advances in early communication and language intervention. *Journal of Early Intervention*, 33(4): 298–309.
- Kovarsky, D. (2008) Representing voices from the life-world in evidence based practice. *International Journal of Language and Communication Disorders*, 8(S1): 47–57.
- Marks, D. (1999) *Disability; Controversial Debates and Psychosocial Perspectives*. London: Routledge.
- McCormack, J., McAllister, L., McLeod, S. and Harrison, L. (2012) Knowing, having, doing: The battles of childhood speech impairment. *Child Language Teaching and Therapy*, 28(2): 141–157.
- Middleton, L. (1999) *Disabled Children: Challenging Social Exclusion*. Oxford: Blackwell.
- Mitra, S. (2006) The capability approach and disability. *Journal of Disability Policy Studies*, 16(4): 236–247.
- Nind, M., Payler, R. & Hewitt, J. (2010) The social experience of early childhood for children with learning disabilities: Inclusion, competence and agency. *British Journal of Sociology of Education*, 31(6): 653–70.
- Ogletree, B. T., Bruce, S. M., Finch, A., Fahey, R. & McLean, L. (2004) Recommended communication-based interventions for individuals with severe intellectual disabilities. *Communication Disorders Quarterly*, 32(3): 164–175.
- Oliver, M. (2013) The social model of disability: Thirty years on. *Disability & Society*, 28(7): 1024–1026.
- Oliver, M. (1999) Capitalism, disability and ideology: A materialist critique of the Normalization principle. First published in Flynn, R. J. and Lemay, R. A. (Eds.) *A Quarter-century of Normalization and Social Role Valorization: Evolution and Impact*. Internet publication URL: <http://www.independentliving.org/docs3/oliver99.pdf>
- Parton, N. & Wattam, C. Eds. (1999) *Child Sexual Abuse; Responding to the Experiences of Children*. Chichester: Wiley.
- Pfeiffer, D. (2001) The conceptualization of disability. In Altman, B. M. & Barnartt, S. (Eds.) *Exploring Theories and Expanding Methodologies: Vol. 2. Research in Social Science and Disability* (pp. 29–52). Oxford: Elsevier.
- Priestley, M. (1998) Constructions and creations: Idealism, materialism and disability theory. *Disability & Society*, 13 (1): 75–94.
- Prout, A (2000) Childhood bodies: Construction, agency and hybridity. In Prout, A. (Ed.) *The Body, Childhood and Society*. London: MacMillan.

Prout, A. & James, A. (1997) A New paradigm for the sociology of childhood? Provenance, promise and problems. In James, A. & Prout, A. (Eds.) *Constructing and Reconstructing Childhood*. London: Falmer Press.

Qvortrup, J., Bardy, M., Sgritta, G. & Wintersberger, H. (2004) *Childhood Matters*. Aldershot: Avebury.

Shakespeare, T. & Watson, N. (1998) Theoretical perspectives on research with disabled children. In Robinson, C. & Stalker, K. (Eds.) *Growing up with Disability*. London: Jessica Kingsley Publishers.

Siegel, E. & Bashinski, S. (1997) Enhancing initial communication and responsiveness of learners with multiple disabilities: A tri-focus framework for partners. *Focus on Autism and Other Developmental Disabilities*, 12: 105–120.

Solomon-Rice, P. & Soto, G. (2011) A discourse analytic study. Co-construction as a facilitative factor in supporting the personal narratives of children who use augmentative and alternative communication. *Communication Disorders Quarterly*, 32(2): 70–82.

Stoecklin, D. (2013) Theories of action in the field of child participation: In search of explicit frameworks. *Childhood*, 20(4): 443–457.

Vorhaus, J. S. (2013) Capability, freedom and profound disability. *Disability & Society*, 28(8): 1047–1058.

Watson, N. (2012) Theorising the lives of disabled children: How can disability theory help? *Children & Society*, 26: 192–202.

Wyness, M. (2013) Children's participation and intergenerational dialogue: Bringing adults back into the analysis. *Childhood*, 20(4): 429–442.



Ari Lindeman & Petra Vogler

# Leadership development for the Agile environment

## Abstract

With the Digital Age being a reality there is significant impact on organizational and work culture. Paradigm change has become a fact that penetrates all aspects of life. With respect to that, leadership is getting a new focus. Self-organization has to be deepened and Agile structures have to be implemented appropriately and concisely. The Digital Age and Agile organizational development have become a single holistic unit on an emergent level. This evolution must be reflected in the way in which universities define, deliver, and develop their leadership programs. After presenting the nature and challenge posed by Agility in the Digital Age, the article goes on to explore how university-based leadership programs could be developed, using as an example a set of Master's level management and leadership courses organized in a Finnish university of applied sciences for eight years.

## Introduction – Agile leadership in the Digital Age

Why and how can the preoccupation with the topic of Agile\* leadership and its content be of relevance for the growth of students in today's business environment?

When talking about Agile leadership, we first of all would like to understand why the term has become popular in current discussions related to the global economy, dynamic and volatile market reality and technological change as well as to digital transformation, reorganization of work and restructuring of organizational setups. After having witnessed humanity experiencing the Agricultural Revolution in the ancient world and proceeding further through the Industrial Revolution that led to the growth of industrial cities in the 19th century, we are now part of the on-going Digital Revolution (through social media), known as the Third Industrial Revolution. The Information or Digital Age is first of all characterized by a shift from mechanical and electronic technology to digital and communication technology, and might therefore most probably signify changes and challenges for the interaction of digital technology, organization and employment as well as for naming examples of the ways in which leadership and associate roles and ways of working are defined and practiced.

The revolutionary nature of the digital era and its impact on work culture and organization, knowledge management and leadership style have been analyzed and discussed by many (see Zysman & Newman, 2006; Brynjolfsson & McAfee, 2011; Apelo, 2014; Buhse & Reinhard, 2009; IBM Global CEO Study, 2012; Skillssoft-Studie, 2012; DDI-Studie, 2013; Kahnemann, 2011; Bosch & Bosch-Sijtsema, 2014; Bosch, Hanssen & Alves, 2014; Häusling & Von Gloeden, 2013; Vogler, 2014). These studies have debated the need for a change of leadership style and made suggestions for a style that is based on principles such as Agility, creativity, ability to adapt and improvise, systemic literacy, relationship focus and strong customer and stakeholder orientation, cosmopolitanism and a global mind-set, intuitive and interdisciplinary working style, strong mentoring and coaching capabilities as well as humane orientation, diplomacy and empathy.

Content-wise, Agile leadership seems to build on the elements of transformational leadership (Bass, 1990), strategic leadership (Davies & Davies, 2004), situational and learning focused leadership models (Hersey et al., 2001), social leadership (Guglielmo & Palsule, 2014) as well as more systemic perspectives such as leadership based on complexity thinking (Uhl-Bien et al., 2007), intuitive leadership (Vogler, 2014) and distributed and shared leadership (Gronn, 2002; Pearce & Conger, 2003; Juuti, 2013). Agile leadership seems to underscore the fact that in today's mosaic work culture, leadership development draws ideas from a mixture of theories, perspectives and sources, which shifts the focus from the (fixation on the appropriate) content of leadership toward pragmatic ways in which people could lead better despite the constant flux in their workplaces and careers. This trend – which may be described in the words of Uhl-Bien et al. (2007) as “leadership in the contexts of dynamically changing networks of informally interacting agents” – has given rise to individualized and integrated personal and leadership development, with coaching becoming a more

---

\* The word Agile (from Latin *agilis*, m) can be described as something that can be easily moved, is easily movable and light, also something that moves easily, rapid or quickly and is active, busy and prompt. See: <http://en.wiktionary.org/wiki/agile>. In the context of Software Development (Scrum) for example, to be Agile means to be able to adapt to changing general conditions in a flexible and dynamic way (see Häusling&Von Gloeden, 2013: 62).

prominent method of leadership development (see Virolainen, 2010). Since approximately 1990, more and more scientists have been paying attention to the topic of corporate Agility (see Womack et al., 1992). In the field of organizational research, Agility has furthermore been described as “ability to detect opportunities for innovation and seize those competitive market opportunities by assembling requisite assets, knowledge, and relationships with speed and surprise” (see Sambamurthy et al., 2003: 245), as “capacity to react quickly to rapidly changing circumstances” (see Brown & Agnew, 1982: 29) and/or as “a successful exploration of competitive bases (speed, flexibility, innovation pro-activity, quality and profitability) through the integration of reconfigurable resources and best practices in a knowledge-rich environment to provide customer-driven products and services in a fast changing market environment” (see Yusuf et al., 1999: 37). Being responsive and flexible, increasing the speed (time-to-market relevance) and having the competency to be visionary, innovative and strategic are also emphasized (see Zhang & Sharifi, 2000).

In the context of software development for example, as thoroughly discussed in the Agile Manifesto\*, to be Agile means to be able to adapt to changing general conditions in a flexible and dynamic way. As an example of an Agile method in organizations, Scrum enables a team to have a more open form of interaction and communication, and encourages self-organization, commitment and transparency as well as fast feedback circles and vision focus. The introduction of Agile methods naturally also triggers considerable organizational changes related to corporate structure and corporate culture.

Agile transformation processes from ‘classical’ to ‘Agile’ usually happen on three levels: processes, structure and culture. Processes become lean and more transparent, the organizational structure supports interdisciplinary and self-organized teams and lateral leadership and enables faster decision-making and higher flexibility, and the development of a culture of openness, trust, respect and commitment. Compared to the classical form of centralized leadership responsibilities, these are distributed to a diverse set of roles in an Agile work context such as the product owner, Scrum Master or the team itself. Emphasis lies on the areas of strategy development and personnel management as well as employee development. The Agile manager is able to let go and give trust to their team, lives a collaborative partnership with his employees, values and respects them and communicates in a transparent and appreciative way (see Häusling & Von Gloeden, 2013: 62).

Considering the fact that we are still at the beginning of the Digital Age, it is to be assumed that Agile leadership will gain more and more relevance in the coming years. Of course, this development will have positive and negative impacts on certain fields of work. Brynjolfsson & McAfee (2001), for example, are of the opinion that digital technological developments might potentially have negative impacts on some types of employment, such as routine information processing work. They hold the view that collaborative partnership between computers and humans is the key to future job creation. “In medicine, law, finance, retailing, manufacturing and even scientific discovery,” they write, “the key to winning the race is not to compete against machines but to compete with machines” (see Lohr, 2011: 1).

---

\* See <http://www.agilemanifesto.org/principles.html>

## The challenge of Agile leadership localized

Agile Leadership has developed in high value-added high-tech work environments, such as software development, which need to align themselves with a hyper-competitive global business environment. Small entrepreneurial companies can naturally adopt an Agile approach if their entrepreneur leader's background and style happens to support it, as it needs to do if the company wants to break through from among the mass of SMEs. Big tech companies incorporate Agile leadership development programs into their organization development toolkit in order to cultivate and retain talent and to keep pace with competition. Both small and large high-tech firms have clear external drivers to take the Agile movement seriously.

Another kind of case with respect to the Digital Age and the Agile movement shows up if we look at local and regional companies in traditionally low-tech or people-to-people service industries or regional public sector organizations. These kinds of entities are typically deeply embedded in local and national cultures which are often less compatible with Agile ways of working because of the lack of a direct competitive threat. Unlike the aforementioned high-tech firms, the latter are just awakening to the digital transformation and changes in work cultures from hierarchies to lean platforms requiring a new type of leadership and a new type of leadership development.

The need for Agile leadership with the coming of the Digital Age and the gap between the natural habitat of Agility, the hyper-competitive high-tech environment, and local cultural lock-ins pose a serious challenge for regional universities trying to educate the workforce of the future. Even if both teachers and students intellectually grasp what it means to be or become an Agile leader and foster Agility in an organization, it would be difficult to apply this knowledge, particularly if one remains within local lock-ins, as many students from regional universities do. This holds especially true for part-time Master's students who are in the middle of their careers, often with families, seeking new perspectives on work and some improvement in their career situation but less likely to embark upon radical career moves. A content-based education on Agile leadership may certainly benefit those few who continue their career in the global high-tech world, but what about the rest? Moreover, what about the higher education institution's aim of transforming the community and culture around it to keep abreast of global trends, not just producing competent graduates?

## Agile leadership development in a university-industry context

Let us envision means of Agile leadership development in connection to part-time Master's programs at a Finnish regional university of applied sciences. The visioning begins with two premises. First, the focus must be shifted from the content of leadership (we assume ideas of Agility and Agile leadership described above) to the delivery context of leadership development and how it enables Agility to grow in students. Second, in the Digital Age there is a need to bridge the gap between the realm of global high-velocity work environments and that of slow-paced and often low-tech local work cultures. Furthermore, the envisioning builds on the author's experiences of running a management and leadership

development course set (two 5 ECTS courses) for a fairly large multidisciplinary cohort of part-time Master's students (50–90 students per course) for eight years. In this respect, the following discussion charts the next phase of these capstone courses, given the Agile challenge in the Digital Age.

The central ideas of the course set have been to integrate the study of (strategic) management and leadership and to do it in a multidisciplinary group in order to balance gender differences and engage participants in inter-professional dialog on the topic. The key components of course delivery include observation exercises (observing one's own management environment and sharing and comparing observations with others), reading recent literature on management and leadership, following lectures on unit-level management and leadership (the coaching type of leadership in particular), writing an extensive Personal Leadership Narrative (PLN) and a shorter meta-reflection based on the PLN, both of which integrate personal and leadership development across the life-span, and group counseling in a small dialogical and multidisciplinary group (7–10 members/group, 6×1.5 hours, once a month) assigned by teachers.

Regarding content, there are many aspects of Agile leadership already in place. The existing arrangement places a strong emphasis on working in interdisciplinary groups, and lectures focus on the coaching type of leadership. The group counseling sessions at the end of each contact day enhance humane orientation, diplomacy and empathy in addition to these groups' inherent enforcement of the relationship focus. This is reported on every year in different ways by the participants in their reflective PLNs. Indeed, the students have nicknamed the course the "From an engineer to a human being course," largely due to the effects of the group counseling sessions and fruitful interdisciplinary interaction between engineers, maritime managers, social workers, and nurses. Furthermore, writing the Personal Leadership Narrative adds an important layer to the humane development by cultivating intrapersonal skills and historical understanding of one's personal and professional identity.

Agile leadership as described at the outset also includes creativity, ability to adapt and improvise, systemic literacy, and strong customer and stakeholder orientation, cosmopolitanism, a global mind-set and transparency. The course content and delivery have been weaker on those scores as we approach the difficult task of integrating management and leadership, and the development of a certain outlook or skill-set is highly dependent on the natural teachings found in the students' operating contexts. The course has been constrained with respect to these aspects in particular, due to the large size of the group compared to the number of lecturers/coaches involved and the language and culture of the participants (only Finnish). One could argue that the current course content and arrangement have relied on the assumption that meta-skills learned during the course through the PLN, for example, would transfer into any leadership situation students may encounter in their future career, and thus also help them to navigate more cosmopolitan environments. The danger is that the world of improvisation, cosmopolitanism and global mind-set will remain too far away with respect to students' range of realistic possibilities and thus without real import for the path toward Agile leadership\*.

---

\* See Jonathan Glover's view that not all future possibilities are equally real for all people. People are bound by a certain horizon of possibilities in their lives, depending on their circumstances and earlier choices. This would mean in leadership development at university should take students at least to the

The course set is delivered through contact sessions, lectures and small groups, sharing of information and feedback and submission of assignments through a closed Moodle e-learning platform and emailing and chatting within smaller observation groups. So far, there have been no attempts to work more extensively online or to open up the work of the whole study group on a more transparent platform, such as Facebook, LinkedIn or Blogger. Thus the question of digitalization and subsequent demands for transparency of leadership have remained on the level of talk. Global leadership challenges are present to a certain extent in every student cohort, because some participants work for global corporations and thus have first-hand experience of the global pulse and ways of working. These experiences come to the discussion quite accidentally – although very importantly when they do, for instance, in group counseling settings. There have been no deliberate attempts to connect participants with a global outlook to participants with a local and domestic perspective.

In light of the motivation for and the brief description of Agile leadership in the first section together with the description of the development of the management and leadership competences of part-time Master's students in the second section, we will now list a few development ideas that would improve the attainment of Agile leadership competences by future student cohorts and would also function as guidelines for transforming the delivery of management and leadership education in any university needing to bridge the global vs. local gap.

Ideas for improving Agility – both content and delivery– and connectedness of global and local realms of leadership:

1. Bring the question of Agility and Agile Leadership more into the fore of the course content. Have the courage to open up new vistas of leadership with the students.
2. Maintain and develop the humane strengths of the course set: that is, refine the experience of group counseling sessions and build on the personal intensity of writing the PLN. In particular, invest more in individualized feedback on the PLNs.
3. In addition to closed group counseling sessions and very private narrative writing, create common transparent and digital forums for sharing ideas and experiences and hints for development which enable the students to engage with the rest of the leadership community in the world. Support this with strategic partnerships with foreign partners who have an interest in intercultural Agile leadership.
4. Connect students with a global background and exposure with students with a more local outlook in a more deliberate but intelligent manner to bridge the digital divide, among other possible benefits.
5. Increase the use of web-based methods of delivering and sharing information and insights between contact-based group counseling sessions and experimental live learning sessions. Develop own webinars, blog series, virtual coaching, etc. with local and global partners and utilize existing offerings of Internet-based leadership development material on a pre-selected and free-choice basis.

As indicated at the end of the first section, the Digital Age and Agile leadership may of course also have negative societal effects. This warrants us to critically review the ideas for

---

beginning of the path toward global contexts in order to provide them with real new options for their future toward Agile leadership.

leadership development presented above. What might go wrong in the context of a regional university and how? First of all, the idea of transparency of leadership education which would mimic the transparency requirement of Agile leadership may come as a threat to some students if the orientation and motivation for the approach fails. Transparency may be something that you need to build from scratch, as it were, throughout the course set. Second, connecting students with a global outlook with those with a local perspective may conflict with students' individual learning and career goals. Tackling this requires a careful and justified vision-based argument for the benefits these connections can bring in the Digital Age, even to the most local perspective and vice versa. This may require a call for greater reciprocal responsibility, too. The third critical point concerns the boundaries of education and the university institution. The Agility envisioned here for leadership development is inherently such that interconnectedness of actors becomes the norm in a way that makes it difficult to determine, for instance, who owns this leadership development program and what its boundaries are. In many ways, boundaries are quite important for human beings and the requisite institutional stability, and therefore a process of constant negotiation may need to be accepted as the new norm of boundary setting in the midst of complexity and "informal interaction agents," as Uhl-Bien et al (2007) write.

## Conclusion

Global economics as well as technological and demographical realities are today resulting in the development of a new paradigm that is based on networks and communities rather than on hierarchies and demand and control mechanisms, as was predominantly the case during the Industrial Age. The shift from the industrial paradigm toward the complex Digital or Social Age is leading to new approaches to the way we see work, view collaboration and also define leadership.

Agile leadership is therefore one path to describe a leadership style that is strongly community and network-based as well as relationship-focused. Leaders according to this understanding place a strong emphasis on social interaction, mindfulness and authenticity. Certainly, this new era of interrelatedness and connectedness will fundamentally transform the way in which we think about successful leadership and how we develop leaders. It might be apt to underline the opinion that the shift to the Digital Age "involves thinking of leaders more as mayors and less as generals" (Guglielmo&Palsule, 2014: introduction).

The Agile paradigm shift affects even the most local or regional leadership developers. Universities among other nationally-based institutions need to transform their course delivery toward a more transparent and international mode, regardless of language. They can build on their strengths in student engagement and a grand mission of promoting reciprocal responsibility for development across the digital divide.

## References

- Apelo, J. (2011) *Management 3.0 Leading Agile Developers, Developing Agile Leaders*, Addison-Wesley Signature Series (Cohn). Boston: Addison-Wesley Professional.
- Bass, B. M. (1990) From transactional to transformational leadership: Learning to share the vision. *Organizational Dynamics*, Winter, 18(3): 19–31.
- Bosch, J. & Bosch-Sijtsema, P. M. (2014) ESAO: A holistic Ecosystem-Driven Analysis Model. In: Lassenius, C. and Smolander, K. (Eds.): *ICSOB 2014, LNBI 182*, pp. 179–193. Switzerland: Springer International Publishing.
- Brynjolfsson, E. & McAfee, A. (2011) *Race Against The Machine: How the Digital Revolution is Accelerating Innovation, Driving Productivity, and Irreversibly Transforming Employment and the Economy*, Digital Frontier Press. Research Brief: [http://ebusiness.mit.edu/research/Briefs/Brynjolfsson\\_McAfee\\_Race\\_Against\\_the\\_Machine.pdf](http://ebusiness.mit.edu/research/Briefs/Brynjolfsson_McAfee_Race_Against_the_Machine.pdf) [Accessed 03.04.2015].
- Buhse, W. & Reinhard, U. (2009) *DNAdigital – Wenn Anzugträger auf Kapuzenpullis treffen: Die Kunst aufeinander zuzugehen*. Neckarhausen: whois verlags- & vertriebsgesellschaft.
- Davies, B. J. & Davies, B. (2004) Strategic leadership. *School Leadership and Management*, 24(1): 29–38.
- DDI (2012) Studie. *Führungskräfteversagen im zwischenmenschlichen Umgang*. In: Development Dimensions International – DDI, 10.02.2012, URL: <http://www.ddiworld.de/ddi-weltweit/europe/germany/germany-press-room/studie--fuhrungskraefte-versagen-im-zwischenmenschl> [Accessed 30.03.2015].
- DDI (2013) *Five Leadership Development Trends You Can't Ignore*. 7.03.2013, URL: [http://www.imakenews.com/ddi/e\\_article002675854.cfm?x=b11,0](http://www.imakenews.com/ddi/e_article002675854.cfm?x=b11,0) [Accessed 30.03.2015].
- Duke (2013) Duke Corporate Education – 2013 *CEO Study: Leading in Context*, URL: <http://www.dukece.com/elements/docs/LeadingInContext.pdf> [Accessed 30.03.2015].
- Glover, J. (1999) *Humanity: A Moral History of the Twentieth Century*. London: Jonathan Cape.
- Gronn, P. (2002) Distributed leadership as a unit of analysis. *The Leadership Quarterly*, 13: 423–451.
- Guglielmo, F. & Palsule, S. (2014) *The Social Leader, Redefining Leadership for the complex Social Age*. Brookline: Bibliomotion.



Hanssen, C., Alves, C. & Bosch, J. (2014) Special issue editorial: Understanding software ecosystems. *Information and Software Technology*, 7: 7.

Hay Group (2011) *Kooperativ, vielfältig und hierarchieunabhängig: die neue Art der Führung*. 25.01.2011, URL: <http://www.haygroup.com/de/press/details.aspx?id=28962> [Accessed 30.03.2015]

Hersey, P., Blanchard, K. H. & Johnson, D. E. (2001) *Management of Organizational Behaviour: Leading Human Resources*. Eighth Edition. Upper Saddle River, NJ: Prentice Hall, Inc.

Häusling, A. & Von Gloeden, D. (2013) *Die Relevanz agiler Personal- und Führungsinstrumente: Agile Führung als entscheidende Erfolgskomponente*, URL: <http://hr-pioneers.com/wp-content/uploads/2014/01/scan0001.pdf> [Accessed 30.03.2015]

IBM Institute for Business Value (2012) *IBM Global Chief Executive Officer Studie (CEO) 2012 - Deutschland*. 2012, URL: <http://www-935.ibm.com/services/de/c-suite/series.html> [Accessed 30.03.2015]

Juuti P. (2013) *Jaetunjohtajuudentaito* [The skill of shared leadership]. Jyväskylä: PS-Kustannus.

Kahnemann, D. (2011) *Thinking, Fast and Slow*. London: Penguin Group.

Lohr, S. (2011) More Jobs Predicted for Machines, Not People, book review, *The New York Times*, 2011.10.23, [http://www.nytimes.com/2011/10/24/technology/economists-see-more-jobs-for-machines-not-people.html?\\_r=0](http://www.nytimes.com/2011/10/24/technology/economists-see-more-jobs-for-machines-not-people.html?_r=0) [Accessed 03.04.2015].

Martinuzzi, B. (2009) *The Agile Leader: Adaptability*, URL: [http://www.mindtools.com/pages/article/newLDR\\_49.htm](http://www.mindtools.com/pages/article/newLDR_49.htm) [Accessed 21.11.2015].

Mendenhall, M. & Osland, J. (2002) Mapping the Terrain of the Global Leadership Construct, Paper presented at the *Academy of International Business*, San Juan, Puerto Rico, June 29th, 2002.

Pearce, C. L. & Conger, J. A. (2003) *Shared Leadership: Reframing the Hows and Whys of Leadership*. Sage, Thousand Oaks.

pwc (2011) Growth Reimagined – Prospects in emerging markets drive CEO confidence - *14th Annual Global CEO survey 2011*, URL: <http://www.pwc.com/gx/en/ceo-survey/pdf/14th-annual-global-ceo-survey.pdf> [Accessed 30.03.2015].

pwc (2012) Delivering results – Growth and value in a volatile world - *15th Annual Global CEO survey 2012*, URL: <http://www.pwc.com/gx/en/ceo-survey/pdf/15th-global-pwc-ceo-survey.pdf> [Accessed 30.03.2015].

pwc (2013a) Dealing with disruption – *16th Annual Global CEO Survey*, URL: [http://www.pwc.com/gx/en/ceo-survey/2013/assets/pwc-16th-global-ceo-survey\\_jan-2013.pdf](http://www.pwc.com/gx/en/ceo-survey/2013/assets/pwc-16th-global-ceo-survey_jan-2013.pdf) [Accessed 30.03.2015].

pwc (2013b) Dealing with disruption – *16th Annual Global CEO Survey - Key findings in the metals industry*, URL: <http://www.pwc.com/gx/en/ceo-survey/2013/pdf/pwc-global-ceo-survey-2013-metals-key-findings.pdf> [Accessed 30.03.2015].

Sambamurthy, V., Bharadwaj, A. & Grover, V. (2003) Shaping agility through digital options: reconceptualizing the role of information technology in contemporary firms. *MIS Quarterly*, 27(2): 237–263.

Skillsoft (2012) *Die 7 “Must-Haves“ der idealen Führungskraft*, URL: [http://www.skillsoft.de/Aktuell/WP\\_Musthaves\\_Fuehrungskraefte/regform.asp](http://www.skillsoft.de/Aktuell/WP_Musthaves_Fuehrungskraefte/regform.asp) [Accessed 30.03.2015].

Uhl-Bien, M., Marion, R. & McKelvey, B. (2007) Complexity leadership theory: Shifting leadership from industrial age to the knowledge era. *The Leadership Quarterly*, 18(4): 298–318.

Virolainen, I. (2010) *Johdon coaching: Rajanvetoja, taustateorioitajaprosesseja*. ActaUniversitatisLappeenrantaensis, 394.

Vogler, P. (2014) Intuition at the Heart of Intercultural Management – On the self-conception of Intercultural Managers, in edoc-server *publications Humboldt University Berlin* (2014) 1-4, URL: <http://edoc.hu-berlin.de/oa/articles/reJ4IszIY3M/PDF/28roKacE9aIew.pdf> [Accessed 04.09.2015].

Womack, J., Jones, D. & Roos, D. (1992) *Die zweite Revolution in der Autoindustrie: Konsequenzen aus der weltweiten Studie aus dem Massachusetts Institute of Technology*. Frankfurt a./M., New York: Campus.

Yusuf, Y., Sahardi, M. & Gunasekaran, A. (1999) Agile manufacturing: The drivers, concepts and attributes. *International Journal of Production Economics*, 62(1–2): 33–43.

Zhang, Z. & Sharifi, H. (2000). A methodology for achieving agility in manufacturing organizations. *International Journal of Operations and Product Management*, 20(4): 496–513.

Zysman, J. & Newman, A. (2006) *How Revolutionary Was the Digital Revolution? National Responses, Market Transitions, and Global Technology*. SERIES: Innovation and Technology in the World Economy, Redwood City: Stanford University Press.

E. V. Kuchumova

# Communicative strategies in international advertising: issues and trends

These days, intercultural communication lies at the heart of many areas of international business relations. Therefore, studying its trends becomes important for international business as a whole and the advertising industry in particular.

The effectiveness of an advertising message largely depends on the understanding of its target audience's psychological characteristics.

C. Bovée and W. Arens, authors of the celebrated text 'Contemporary Advertising', define advertising as follows: "the nonpersonal communication of information usually paid for and usually persuasive in nature about products, services or ideas by identified sponsors through the various media" (Bovée & Arens, 1995: 5).

V. V. Uchyonova and N. V. Starykh, Russian authors of a guide to the history of advertising, adhere to the culturological concept of advertising, defining it as the form of mass communication, in the context of which informational figurative texts and expressive suggestive texts are produced and distributed among groups of people in order to encourage the sort of choice or behaviour that the sponsor demands (Uchyonova & Starykh, 1999).

Analyzing the given and numerous other definitions, the following conclusion can be drawn: virtually all authors (J. J. Lamben, R. Harris, D. Rossiter and L. Percy, C. Sandidge, W. Freiburger, K. Rotzoll, A. Dejan, I. Y. Rozhkov, O. A. Feofanov, E. V. Romat) agree that advertising is a form of mass communication, the key feature of which is the nature of the advertising message and the impact that advertising texts have on public and individual perception.

It is also worth mentioning that in the past decade, advertising has been viewed not independently, but rather as part of a wide array of channels and tools for product promotion and delivery from the manufacturer to the consumer. In this regard, literature uses the term 'integrated marketing communications', which basically means increasing the effectiveness of the impact on the consumer by adding new forms of communication to traditional advertising, each form having its own method for product promotion. 'Integration' involves different forms of communication merging into an integral whole within the framework of a common marketing strategy as they all serve to reach the same goal. Advertising perfectly fulfils its communicative function (i.e. providing feedback) as long as it is included into the system of integrated marketing communications.

Thus, advertising is a specific form of communication serving a certain purpose that generally comes down to altering consumer attitude or behaviour. Advertising communication can be viewed from several perspectives: as public information, as an economic tool, as a form of psychological impact, as pop culture, or even as art. Therefore, the key concept in the study of advertising can change depending on the purpose of the research: it can be information, a product, a motive, or an image. In this particular research, advertising is mainly viewed in the communicative (in terms of effectiveness) and sociocultural aspects of intercultural communication.

Examining the diagram of advertising communications, one can not but observe that it generally similar to known models for social communication, sharing the same basic elements:

- communicator (source of information, its status and structure);
- communication content (text, symbol, image, etc.);
- communication media (channels for information distribution);
- message recipient (audience and its main characteristics);
- communication effect (response, feedback).

The study of advertising communication involves analysis of these elements taking into account their specific features and goals, while its implementation includes numerous intermediate factors mediating the process. These factors are considered as obstructions and filters in the communication theory as they cause various sorts of obstacles and have significant impact on the effectiveness of the perception of advertising messages.

The communication theory distinguishes three groups of factors: physical, psychological, and semantic. The first factor is associated with advertising campaign organization and technical capacity of information channels. Psychological obstacles are associated with special aspects of advertising perception across different target audiences. The main reason of semantic obstacles is the audience's ambiguous interpretation of linguistic features of the text, notions, terms, or names.

Most researchers once concluded that advertising text is a case of functional use of linguistic semiotic systems in activities. The copywriting activities must take into account both goals and conditions amid which these activities are carried out. Thus, pragmatic orientation of the text depending on its goal becomes a crucial factor. It is the goal that defines whether the advertising text should contain any sort of speech act (invitation, affirmation, promise, request, etc.)

Subjects of advertising communication have certain objective features depending on the affiliation to a sociodemographic or professional group, and they only apply in a particular sociocultural and economic space. On the one hand, advertising communication process is based on certain sociopsychological characteristics of the audience. On the other hand, it tries to alter them to a certain extent. One of the main components of a communication act is its effectiveness, which generally means changes in the behaviour of the advertising message recipient. There are "three major types of communication results:

1. change in knowledge;
2. change in paradigm, i.e. change in the audience's lasting perception;
3. change in the recipient's behaviour" (Korolko, 2000:19).

The effectiveness of advertising as a social communication tool depends on the understanding of its nature. The nature of advertising as a communication process is as follows: it is influence with the purpose of creating a positive attitude to the advertised object, making it preferable to the competing objects so that the consumer would choose in its favour.

It should also not go unnoticed that advertising often fulfils sociocultural functions even better than other forms of communication do. This is achieved not only through advertising messages, but also due to financial support for other, non-advertising forms of social communications (e.g. TV programs, movies, printed media, etc.).

Therefore, identifying the functions that advertising fulfils in social relations, one can define advertising as a sociocultural phenomenon determined by subjective pragmatic goals that is basically mass communication, a phenomenon that objectively contributes to social integration, development, and transformation of material and spiritual culture. Notably, all these features are inherent to advertising not only within one country, but in the intercultural space as well, where business contacts continuously expand and become more intensive.

Numerous international projects have emerged and are now developing in different areas of society. However, despite robust international communication, the parties not always manage to reach consensus on some questions, not only due to substantial, fundamental divergence of views, but also owing to different cultural traditions or even habits that stem from a culture-specific world view, perception and interpretation of events, and prevent the parties from adequately perceiving information. They don't want to understand and accept each other's viewpoint or they can not do this due to objective reasons, which is even more common.

This happens also because at the heart of this viewpoint lie other cultural values, religious views, and lifestyle. Hence the negative perception of the partner in conversation as an 'outsider' (different from 'friendly') when their behaviour, habits, cultural traditions are surprising or even provoke negative reaction at an emotional level rather than rational. Strange and unlike our own, these differences are rejected by us who were brought up according to different traditions under the influence of 'our' steadfast cultural stereotypes. This naturally hinders mutual understanding and resolution of various issues that are resolved within the framework of more than one culture.

Thus, for interaction between representatives of different cultures to be effective, it should be based on the knowledge of intercultural communication principles. Based on research and practices in this field, intercultural communication these days is viewed as "an aggregate of various forms, relations, and communication between individuals and groups belonging to different cultures" (Golovlyova, 2008:25).

The nature of intercultural communication is often determined by the fact that representatives of different cultures interact with each other according to their own cultural norms, unconscious of their own cultural stereotypes and paradigms, supposing that the representative of another culture views the world just the same. If the parties are unconscious of this inherent cultural background, meaningful understanding becomes problematic.

Customs and traditions, historical memory, education and upbringing, rules imposed by society, language people speak – all this creates a system of social orientation. People's life and relations are determined by norms that exist in the culture and govern human behaviour and way of thinking to a great extent, having huge impact on perception and estimation of certain events and messages.

"International influence and experience will suggest a lot of norms, logical explanations, and patterns, but they will invariably be displaced in a short term by the impregnable local ideas of human values and interaction rules" (Golovlyova, 2008: 187).

One of the major challenges of advertising as a whole and international advertising in particular is the problem of conversational understanding between the sponsor and the audience (the consumer)

Advertising is generally an external reflection (and expression) of the culture. With the world becoming more and more homogeneous, each country is looking to preserve its cultural identity. This is bound to be reflected in advertising. The country's unique features find expression in it as well: advertising is more likely to be successful if it builds upon local colour.

The world of advertising is different in each country. It depends on the overall picture (array) of residents' demands and consumer behaviour, as well as their attitude to advertising in general. Different (positive or negative) reactions to both domestic and foreign advertising is determined by numerous sociocultural factors that need to be considered during its development.

Once too often, differences boil down to simple stereotypes: American advertising is straightforward, English is humorous, German is persuasive, French is exquisite and creative, Japanese is esoteric. In fact, the differences between them are more subtle and profound. They appeared as international advertising developed and have a history of their own.

The expansion of transnational corporations in 1950s caused intensive development of international marketing structures and, consequently, international advertising. However, along with the consolidation of the global community that began in 1960s in the economic, political, legal, and cultural sectors, reverse processes took place: due to the development of the mass communication system, cultural differences were more often manifested. The more intense world's globalization and unification grew, the more divisive tendencies appeared. Modern society has been characterized by stronger ethnic self-consciousness as opposed to current global communications. It is ethnoscapes and various ethnic groups that are the bearers of their culture and their language that go back generations. These days, it has become impossible to ignore the existence and actual importance of intercultural differentiation, which means the issues of intercultural communications, including advertising, have now got the attention.

Under new international conditions, advertisers often face the issue of internationalization and globalization of advertising campaigns: whether advertising needs to consider national peculiarities of a country, its cultural context, or generic advertising can be universally successful.

Marketing literature published in Russia (both foreign classics and domestic) commonly defines international advertising as the form of communication that contributes to the promotion of products and services at foreign markets. It seems interesting to examine the variety of major approaches to the definition of international marketing.

Some authors apply a strictly 'marketing' approach, which comes down to increasing communication effectiveness (and, consequently, profit) while minimizing costs. According to this concept, there are no significant differences between international and local advertising in terms of the understanding of advertising nature, its goals, functions, principles,

and media. “We associate the peculiarities of international advertising with the transfer of general advertising principles from the domestic market to the international economic space” (Seyfullayeva, 2006:120).

William Wells, John Burnett, Sandra Moriarty analyze the emergence of global advertising as a relatively new phenomenon in international business and define it as “advertising intended for the promotion of a single product in a number of countries” (Wells, Burnett & Moriarty, 1999:692).

A. N. Mudrov points out that “international (global) advertising is a derivative of the world’s major economic trend today - global integration and specialization processes that take place in the world economy. It is owing to these conditions that this term could be coined when supranational processes made their way into advertising” (Mudrov, 2008:238).

S. V. Karpovoy describes the essence of the marketing approach to international advertising in the most clear-cut manner :

“Being one of the essential components of the international marketing complex and international communication complex, international advertising eventually contributes to the achievement of the company’s marketing goals. That is why communication goals should be viewed as an integral part of the system of marketing goals. The main goals in this system are ensuring the company’s steady position in the foreign market, implementing a strategy for its growth, and maximizing profit. Specific communication goals are inferior to these goals” (Karpova, 2010:15).

Other specialists focus on sociocultural differences in the perception of the advertising message by foreign consumer audiences. Thus, F. Kotler warned that upon the introduction of international marketing activities, “differences between countries may prove to be so profound that an agent in the international market would have to understand foreign environment and foreign institutes and be ready to reconsider fundamental ideas of how people react to marketing incentives” (Kotler, 1991:612).

Courtland L. Bovée and William F. Arens believe that consumer demand characteristics vary for different products in different countries, so this must be considered in international advertising. (Bovée & Arens, 1995:636).

R. B. Nozdreva points out the communicative side of advertising: “International advertising somewhat contributes to the mutual understanding and rapport between countries, being a form of communication and advocating the sale of products, services, ideas, political positions, beliefs and values” (Nozdreva, 2005:663).

Marketologists consider it proper to define advertising as a process of communication aimed at organizing sales in foreign markets, an economic and social process with the purpose of promoting products and services that can provide a higher standard of consumer value to the foreign consumer, and, consequently, higher standard of living. Along with truly ‘advertising’ reasons, reasons of global economic nature also contribute to intensive development and increasing effectiveness of international advertising. The most important reasons are:



- increasing production values and market globalization, which allows international companies to standardize advertising campaigns;
- lower packaging and marking costs due to standard approaches to creating a package with information printed in different languages;
- emergence of a global segment of consumers with homogeneous demand for international brands;
- convergence of different cultures, implementation of uniform cultural standards;
- accelerated development of global media (Seyfullayeva, 2006:119).

Thus, the distinctive feature of modern international advertising is that demand is not just created, it is controlled within a target group of foreign consumers. Study of domestic market demands has been displaced by research on preferences, buying motives, character of income use among foreign consumers.

However, the specific character of operation in foreign markets adds certain features to the development of the company's advertising strategy. It should be remembered that determining the features of international advertising requires keen understanding of socioeconomic and cultural conditions in the country that would be the subject of the international company's advertising activities. Each country has its own cultural peculiarities in terms of advertising perception and different models of consumer behaviour. There can be significant differences in legislative methods for advertising regulation, applicable prohibitions and restrictions. Therefore, the main objective of international advertising is to study the 'cultural factor' in all its bearings in comparative context, analyze and assess market opportunities and restrictions that the cultural phenomenon comes laden with in any field of the company's foreign activity.

Thus, the most crucial issue to consider in modern international advertising in the context of intercultural communication is the choice between the strategy of its standardization and the strategy of adaptation. Since the 70s, the advertising community has been arguing which of the two opposite approaches was correct - the global approach or the cultural approach. During brand export procedures, many international manufacturers adhere to the strategy of standardization, using the same product name, advertising design, and slogan, which allows them to effectively tackle the following challenges:

- create an international product image;
- cut down expenses on the development and production of advertising;
- advance simultaneous market entry in different countries;
- avoid confusion of messages in case of overlapping media and consumers moving from one country to another;
- increase the effectiveness of advertising impact, since the advantages of a product or service (advertising 'promise') are perceived the same way in any country, backed by identical positioning ('mainstream advertising') (Seyfullayeva, 2006:121).

These days, there's a clear trend of convergence of consumer tastes and appetites, considering the expansion of popular culture that has no limits. In this regard, young people is the audience that requires the foremost attention. They are most susceptible to the global

cultural influence expressed in music, clothes, food, and spots fashion. This is despite the fact that they often exercise different religions. They generally travel a lot and study foreign languages. Considering all this, it is obvious that advertising targeted at this audience is uniform in many countries. A universal advertising approach can also be found for men's and women's products. This is evidence of the fact that although there are significant differences, consumers all around the world are becoming more and more alike, and advertising agencies keep track of such trends, taking them into account when developing advertising campaigns.

The increasing homogeneity of consumer appetites in recent year is based on growing popularity of certain brands in the world. Such brands become acknowledged symbols of modern life, for example: Coca-Cola and Pepsi-Cola drinks, Wrangler and Levi's jeans, Marlboro and Winston cigarettes, Japanese, American, and European cars. Moreover, if the brand is global, consumers tend to trust it more as the product is considered high-tech and, therefore, high-quality (Adme.ru, 2015).

Despite all differences, there are common consumer groups in most countries. For example, the category of consumers with high income who tend to buy luxury cars and expensive jewellery. There are other consumer groups united by common desires and needs. A similar, sometimes even single advertising approach can be used to make advertising impact on such groups as young mothers, computer geeks, sportspeople, photographers, etc. Each country has from five to seven groups of consumers with similar life indicators such as life goals, intentions, and values, financial state, etc. These indicators became the platform for advertising campaigns. In this case, manufacturers and advertisers face a single task, arguably the most difficult one: to study the special aspects of such groups in order to come up with a single advertising idea.

Professional advertisers say: "Plan global, act local!" Following this rule, advertising agencies try to centralize and standardize their activities in a way that would allow them to save money for research, preparations, and production of advertising (Mudrov, 2008:243).

Having come up with a single advertising concept, agencies start to suit it for different countries taking into account the specific character of local consumers: the first challenge is to localize activities, add a national touch to it. The main thing advertising agencies have to compromise on is various standards applied in the country, when product advertising is coordinated with the culture of consumers. According to the research, advertising campaigns developed for some countries can be successfully implemented in other markets. This allows local branches of advertising agencies to produce advertising campaigns for their respective countries. Figures suggest that 50% of sponsors use local agencies, rehashing the advertising strategy according to the traditions and lifestyle of consumers in different countries (Adme.ru, 2015).

Deciding to which extent the advertising campaign can be standardized, advertisers always take into account special aspects of particular product categories in the local market.

Hi-tech goods and such products as cars, computers, photo- and video devices, as well as luxury goods designed for emotional and image perception (cosmetics, jewellery, brand clothes) are more prone to standardization. Besides, standardized strategies for advertis-

ing campaigns are more effective if the product is utilitarian, its advertising is informative, or if the product's appealing qualities are closely associated with the peculiarities of national character.

It is easier to standardize advertising campaigns in the markets of countries with a similar level of economy rather than drastically different.

Advertising campaigns for food products and drinks can hardly be standardized as eating habits and traditions are closely associated with the national culture.

Plus, it proves to be easier to standardize the advertising for a new brand rather than an old and well-known one. The truth is that the old brand is at different stages of its life cycle in the market, making advertising campaigns incompatible.

However, we should turn our attention to the reasons that make conducting a single advertising campaign in all countries impossible: even with the standardized choice of advertising media, distribution method, and advertising message text, it may be required to change characters, ensure translation accuracy, adapt advertising story.

*First, differences in culture and behaviour in customers* in different countries are a significant obstacle in the way of wide use of global (standardized) advertising campaigns. The sociocultural background of the advertising message is the combination of social relations, religious beliefs, languages, consumer expectations and habits, taste and colour preferences. All this impacts the distribution and perception of information. Therefore, the advertiser must be aware of the peculiarities of the local culture. Disregarding it leads to low communicative effectiveness or even complete failure of the manufacturer's advertising strategy. For example, a company handling the export of American dishwashers to Switzerland advertised them as machines that save time and energy of housewives for a more productive pastime. They achieved little success in sales. According to the research, Swiss women consider it obligatory to work hard at home in order to keep the house comfortable and clean. The advertising of these dishwashers made them feel guilty at a subconscious level. In Sweden, Helene Curtis Industries had to change not only the advertising, but also the name of the shampoo from 'Evening' to 'Daily', because Swedes only wash their head in the morning. McDonalds opened their first restaurant in Europe in the suburb of Amsterdam, but the revenue was disappointing despite extensive advertising. The American company didn't consider that in Europe most citizens live in the city centre and are less mobile than Americans. The advertising campaign for the Pepsodent toothpaste in Southeast Asia fell on its face as it promised people to make their teeth snow white, while in their culture black and yellow teeth are considered status symbols. Maxwell House has been advertised in Germany as the best American coffee for a long time without any success, until General Foods, the exporter, found out that Germans disdain the American way to make coffee. It is considered that 80% of family decisions on purchases are made by the women of the middle class. It is true, but only in Russia, USA, Canada, and most of Europe. In Latin America, women are inferior when it comes to decision-making, even more so in Islamic countries. For example, in Saudi Arabia, serious and even common purchases are made in groups, so the advertising must focus on the approval of the elder family member in order to be successful. Advertising messages that focus on individuality and detachment are doomed to failure (Pesotsky, 2003:80–82).

That is why during the development of the international advertising strategy, advertisers often compare national cultures in terms of such criteria as people's adherence to customs and traditions; degree of belief in advertising information; focus on individuality, mutual dependence, or kinship, etc. (Adme.ru, 2015).

*Second*, there is a major *problem of adequate translation* or adaptation of advertising for the audience of the different culture. It is practically impossible to find an advertising message that would be equally effective in the markets of countries with different cultures without further adaptation. By nature, advertising is a complex combination of its elements that are conceptually interdependent. It consists of graphical and verbal components. The system of verbal components includes a verbal designation of the trademark (brand), slogan, and advertising text itself. In the age of intensification of intercultural connections and global internationalization of media, advertising is often translated, i.e. an authentic advertising message is borrowed from another sociopsychological and cultural environment. This fact may hinder its perception due to cultural peculiarities of verbal and non-verbal information processing typical for residents of different countries that preserve their ethnocultural traditions. That is why advertising texts need to be adapted to sociocultural peculiarities of the consumers of foreign advertising.

An advertising text generally contains a lot of the so-called culture-specific vocabulary, i.e. words and set phrases that have no full equivalents in translation. That is why advertising often can not be simply translated: advertising texts are frequently hardly translated due to their originality. The translated text loses its brilliance, emotions, sometimes even the point of the advertising message, ruining the mechanism of psychological impact on the consumer.

In order for the advertising text to fulfil its communicative function, it is not enough to simply translate it into another language: it needs to be integrated into the sociocultural environment of the target language. Advertising is basically recreated anew, in each case tackling the challenge of adequate translation of the advertising message considering the cultural context and background information.

On the one hand, focusing on the average consumer, copywriters should avoid using technical terms, substandard language, or dialects in the advertising, since they can be wrongly interpreted or negatively perceived. On the other hand, these elements of the advertising message can serve as an additional marking of the product, increasing the effectiveness of advertising considering the specific target audience: e.g. slang in a youth-oriented advertising, archaisms in the advertising for senior citizens.

In the 60s, American advertising agencies conducted a number of campaigns in Europe for the largest national corporations such as Coca-Cola, Levi Strauss & Co., Procter & Gamble. These campaigns used unified communications strategies and identical advertising media for all countries. However, the place reserved for video sequence in the advertising message allowed to define the boundaries of this strategy straight away: The language of the video sequence turned out to be different in some places, associated with the cultural identity of the country.

Pointing out this problem, Jean-Marie Dru, distinguished advertiser, managing director of the BBDO communication group, stated that only an agency consisting of employees from the region where the advertising campaign is conducted can develop a better advertising

strategy for product promotion in the local market, because “ideas are rooted in the reality. They stem from the designer’s and copywriter’s daily routine. A big idea always comes from the viewpoint of the person native to the region. Even if you send ten experts to Brussels to develop an advertising campaign, you will fail. Organize five creative teams in five European capitals and task them with creating the best local campaign - then you will probably be lucky enough to see a campaign that can export itself... We should change the old saying: “Think local, act global” (Bovée & Arens, 1995:536).

*Third*, international advertising requires adaptation due to such major factors of the international marketing macroenvironment as *legislative norms and restrictions*. Legal adaptation is associated with legislative requirements concerning advertising practices that apply to both domestic and foreign advertisers.

For example, comparative advertising is prohibited in Great Britain, Germany, France, Sweden, and Italy. A number of countries impose restrictions on advertising of kids’ wares. For example, in Italy children can not be shown eating, while in Sweden kids can not be shown in a dangerous situation. In many countries, advertising of alcohol is restricted. It can not be shown on TV in the Netherlands, Italy, Finland, and Germany. It can in England, but only at a specific time. In Sweden, such ads are under strict control. In Switzerland, advertising of alcohol is prohibited in all mass media. In Western European countries, advertising of tobacco goods is considerably restricted, particularly on radio and television (Belgium, England, Germany, France). In Sweden and Switzerland, this prohibition applies to all mass media. In Sweden, advertising of prescription medicine is prohibited. In England, Italy, Finland, and France the text of the advertising video and printed advertising of medicine are subject to control (Adme.ru, 2015).

Thus, informational opportunities are drastically different in different countries due to specific aspects of legislation and government regulation.

Having analyzed the whole variety of modern international advertising, three categories can be distinguished:

1. *fully standardized* advertising,
2. *partly standardized* advertising,
3. advertising *adapted* to national conditions.

It is logical that advertising as a form of intercultural communication best fulfils its functions being partly standardized as it therefore maintains a common spirit and a common advertising strategy, at the same time having the opportunity to be closer to local conditions for better communication with foreign target audience.

## REFERENCES

- Bové, C. L. & Arens, W. F. (1995) *Contemporary Advertising*. Dovgan Publishing House.
- Golovlyova, E. L. (2008) *Fundamentals of Intercultural Communication: Textbook*. Rostov-on-Don: Phoenix.
- Karpova, S. V. (2010) *International Advertising. Textbook*. Second Edition. Moscow: KNORUS.
- Korolko, V. G. (2000) *Foundations of Public Relations*. Moscow.
- Kotler, P. (1991) *Principles of Marketing*. Moscow: Progress.
- Mudrov, A. N. (2008) *Foundations of Advertising: Textbook*. Second Edition, revised and enlarged. Moscow: Master.
- Nozdreva, R. B. (2005) *International Marketing*. Moscow: Economist.
- Pesotsky, E. (2003) *Contemporary Advertising: Theory and Practice*. Rostov-on-Don: Phoenix.
- Seyfullayeva, E. B. (2006) Concept of international advertising. *Marketing in Russia and Abroad*, 6.
- Uchyonova, V. V. & Starykh, N. V. (1999) *History of Advertising and Metamorphoses of Advertising Images*. Moscow: UNITY-DANA.
- Wells, W. Burnett, J. & Moriarty S. (1999) *Advertising: Principles and Practice*. SPb.: PITER.
- Adme.ru (2015) Review of information available at <http://www.adme.ru/articles/>

Evgeny Pyshkin & Mikhail Glukhikh

# Teaching Program Flow Validation: A Case Study of Branch Coverage Testing

## Abstract

This paper is focused on software testing as an essential domain in CS curriculum. The objectives with this research are twofold. First, we examine how to lead students to better understanding of testing level proportions in software lifecycle stages with highlighting the role of direct and regression unit tests. Second, we introduce a CFG based approach for constructing test sets which are aimed to assure control flow test coverage for a code with logical complexity. The material is organized in order to fit classroom situations for using while teaching primary courses of programming and software engineering.

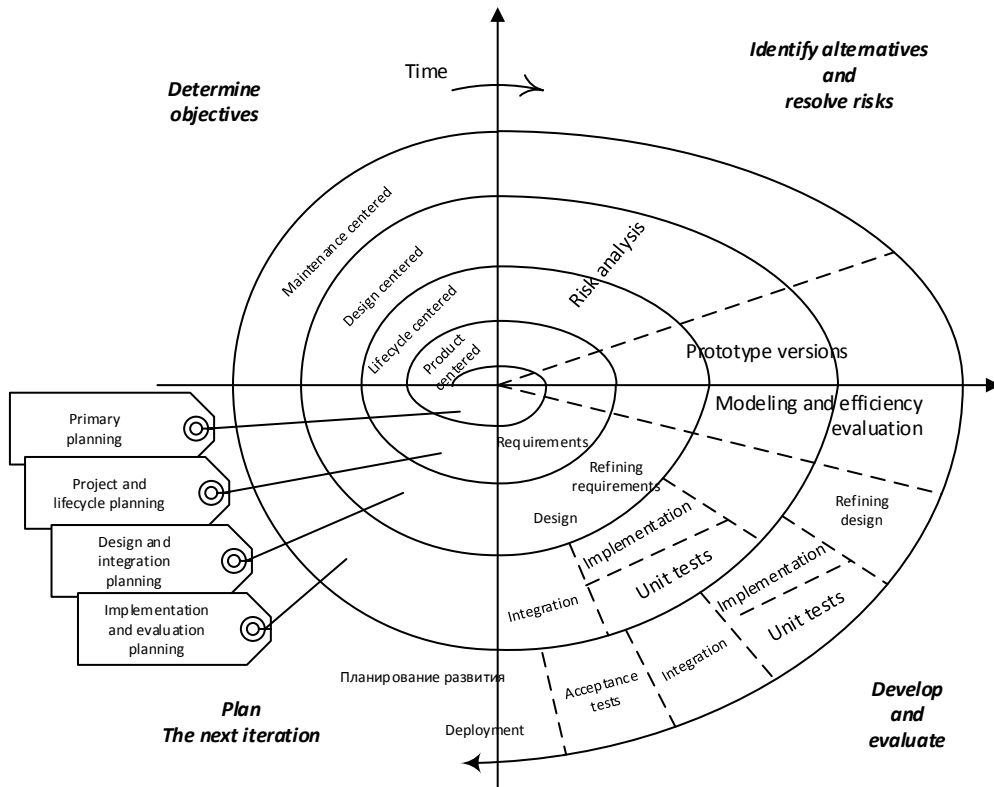
Keywords: Software Testing, Software Education, Program Flow Models.

# 1. Introduction

Software testing is one of critical stages of the software development process. For almost every software project, be it an academic task or an enterprise scale application, implementation defects (including missed or incorrectly interpreted requirements) are inevitable fall-outs of the development process. Despite tests can't guarantee the software product quality, they are necessary artifacts which affect software quality and reliability. Current understanding of software validation leads us to the conclusion that testing is not a separate stage of software lifecycle any more; testing exists at fast every software development stage (Maciaszek, 2007). Shifting testing to the earlier stages of software project lifecycle is reasoned by exponential rise of software change cost in time when the system progresses from one development stage to another (Boehm, 1981). As far as Boehm introduced a software lifecycle spiral metamodel, the testing (including unit testing) is considered to be an important activity which is necessary at every stage, whether it relates to a project prototype, a final release, deployment or maintenance process (see Fig. 1).

In iterative design (often considered as a software production practice implementing a spiral metamodel), testing is an integral part at every iteration. Fig. 2 represents a kind of "enlarged" view of the spiral model where we examine the testing levels with regards to the iteration focus. At earlier stages the direct unit tests are uppermost. Later, while requirements are being refined and the implementation is being developed, the proportion of regressive tests is rising. As far as project components are being deployed and integrated, the integration tests become dominating. However there is still space for unit testing. Finally, at the maintenance stage the focus is being shifted to fixing bugs and defects discovered during the initial start-up and further application usage.

Fig. 1. A spiral model view inspired by Boehm's concept





## 1.1. Role of Unit Testing

Unit testing is a testing technique considered mostly as a dynamic method of software quality assurance. Though in most cases unit tests are aimed to verify that the test code matches the functional requirements, there are tests oriented to validate separate methods and classes from developer's point of view. That's why we often construct unit tests on the base of so-called white-box testing model, or structured testing. At this testing level some tests might not refer directly to system requirements. Structured tests serve such problems like checking whether an object is in a desired state, whether its data are arranged in the right order in data containers, whether an expected exception is thrown, whether a method call contract or invariant is valid, etc.

The educational aspects of unit testing should also be taken into consideration. Students like writing programs, but at the same time they are often not so enthusiastic about testing. Test driven approaches give a compromise: constructing unit tests is still code writing (Pyshkin, 2011). Another issue is their industrial orientation. If our students use unit testing frameworks, they get experienced to use enterprise scale techniques of source code validation which are usual for real life projects. Testing frameworks (like behavior driven development) provide a communication framework allowing developers rediscovering the customer context better (Pyshkin, 2012).

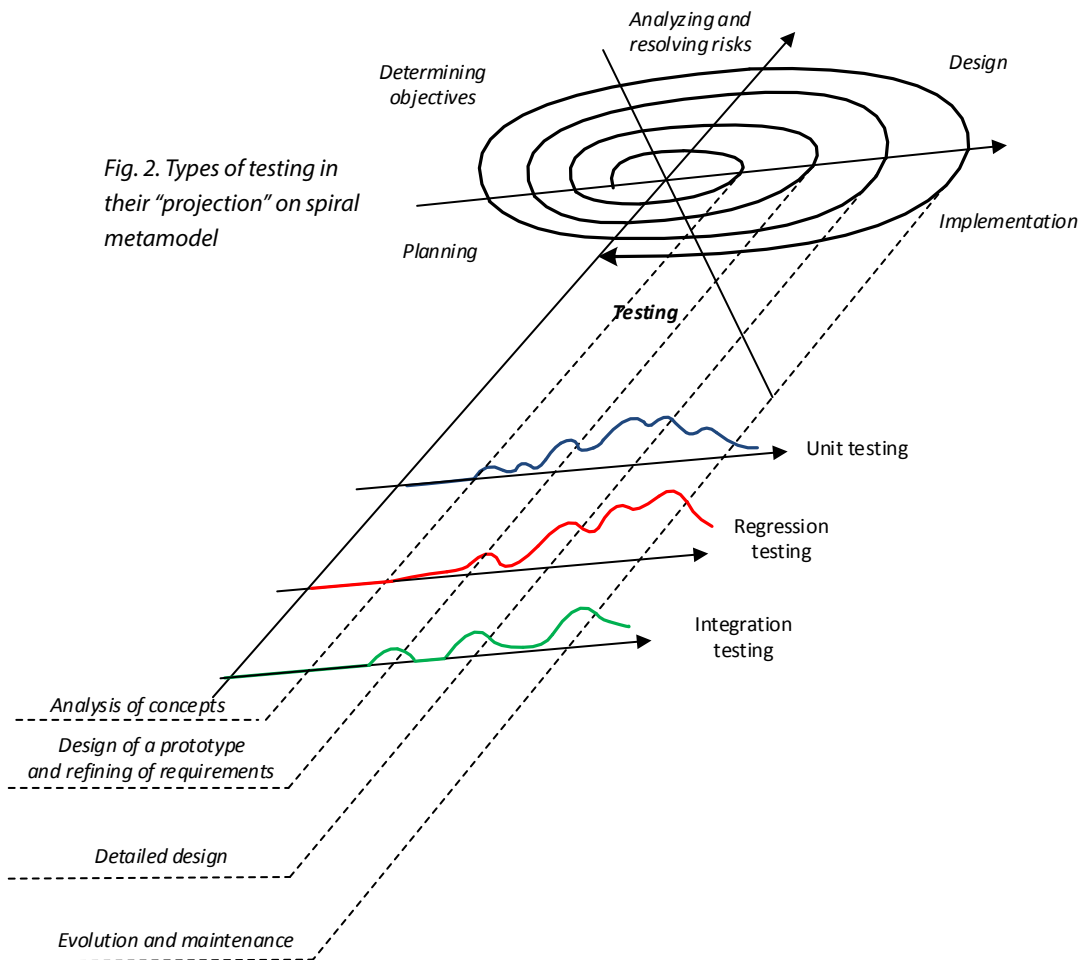


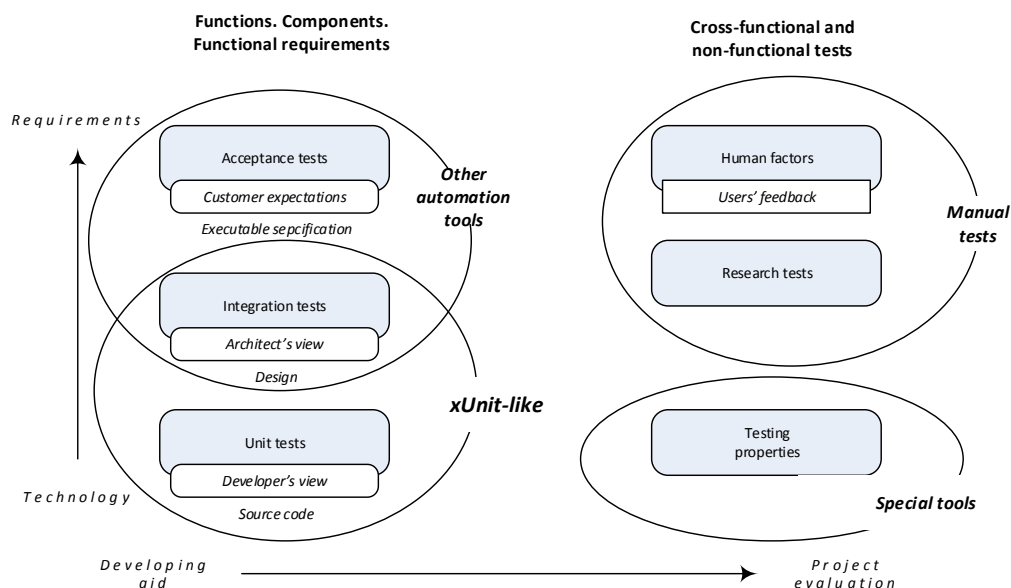
Fig. 2. Types of testing in their "projection" on spiral metamodel

Writing tests is connected synergistically to requirements management. Tests should follow the requirements which are examples of client code for the functionality to be tested. Indeed, specifying requirements is another challenging problem of computer education. Thus, tests are aimed not only to find bugs but to verify and improve the requirements.

### 1.2. Testing automation and branch coverage

Today probably nobody opposes that software development automation (particularly, in software testing) is a crucial aspect of software engineering. Due to using test automation techniques developers are assured in a greater degree that their code modifications are safe. Many share the hypothesis that software changeability is one of the most important software immanent qualities – easier modification helps improving other software qualities. Furthermore, testing automation is extremely important since it ensures test repeatability and reduces human factor dependencies. Fig. 3 shows main test types in their relation to automation processes and artifacts.

Fig. 3. Test types and automation (adopted from (Meszaroz, 2007))



With respect to software quality assurance, there is another important aspect of testing automation: automation of development process metrics acquisition. Despite process artifacts measure interpretation might be subjective, the metrics deduced directly from the product states make possible to obtain the consistent formalized knowledge required for efficiency evaluation. Even metrics related to measuring the source code characteristics (e.g. number of lines changed during bug fixing) help to evaluate the process and the management quality, not the source code quality only.

There are specific metrics related to the testing process. Here is a list of metrics which are in general use:

- *Test coverage* is a percentage of source code instructions executed at least once if a given test set is used.
- *Successful tests to failures ratio* delivers information for evaluation of current software quality level. It also provides data that could be used to analyze how project defects are being discovered and fixed.
- *Excluded and ignored tests to active tests ratio* draws attention to unresolved project problems, since ignored tests are often connected to failures.
- *Bugs detection intensity* is an average number of bugs per one project change. This metric is useful for team leaders in order to estimate project perspectives and teammates' performance.
- *Open bugs to fixed bugs ratio* is aimed to estimate level of acceptable quality.
- *Reopen bugs to fixed bugs ratio* helps to make decision on teammates' performance.

One of known measures is test coverage evaluation. This measure is related strongly to branch coverage testing. Indeed, one of possible applications of structured tests is to check whether all code branches are reachable during program execution, and there is no dead code. Branch coverage analysis and its opposite – infeasible or unused code detection are important current areas of software verification (Nikolić 2014, Madhusudan 2012) which relate not only to software quality but also to software maintenance (Eder 2012).

## 2. Constructing and Marking Up the Control Flow Graph by Example

Fig. 4. Java implementation of *genPrimes()* method

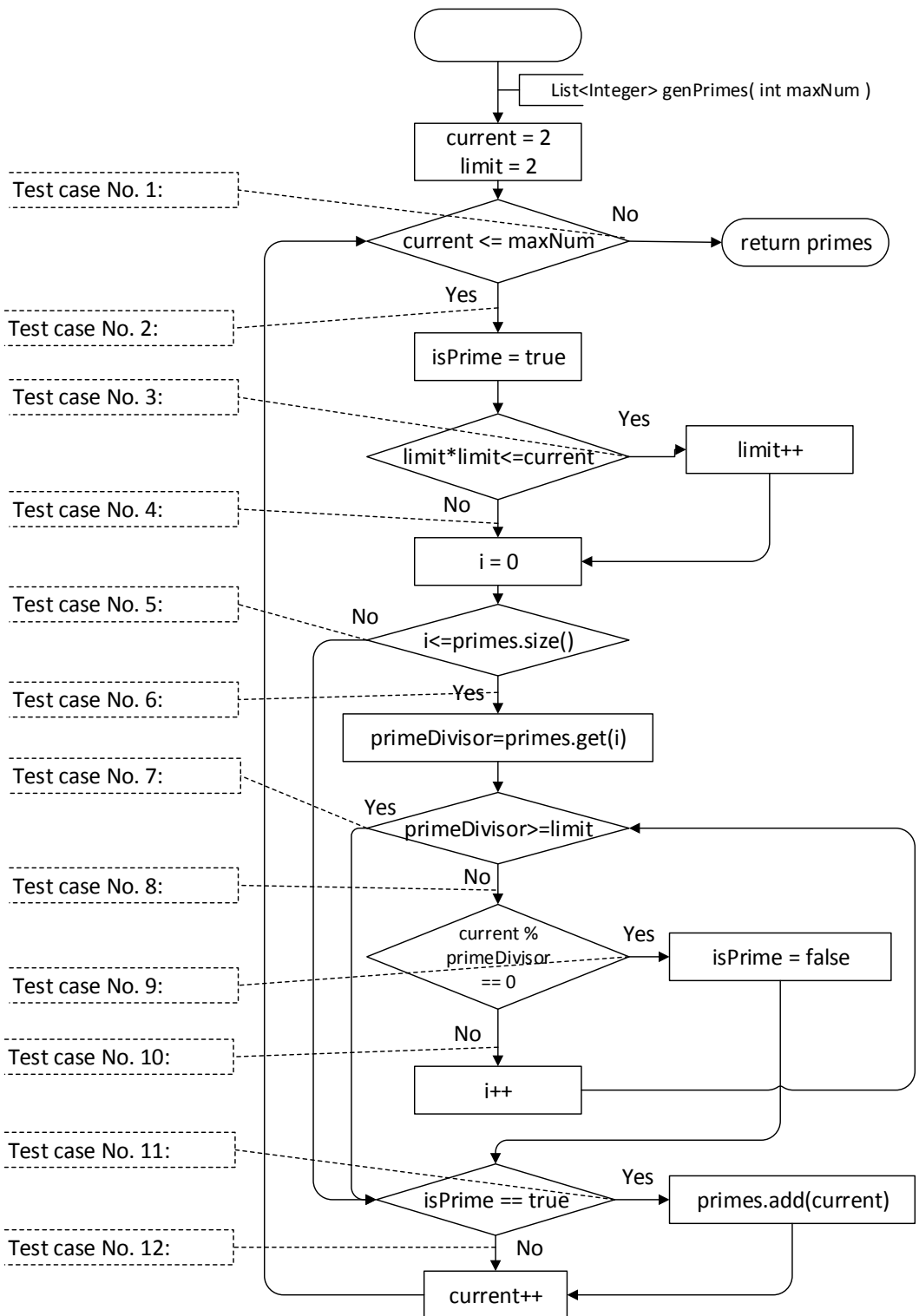
```
static List<Integer> genPrimes( int maxNum ) {  
  
    List<Integer> primes =  
        new ArrayList<Integer>();  
  
    int current = 2; // Current value to check  
  
    int limit = 2; // Limit for divisors  
                // that should ne checked  
  
    while( current <= maxNum ) {  
        boolean isPrime = true;  
        if( limit*limit <= current ) limit++;  
        for( int simpleDivisor: simples) {  
            if( primeDivisor >= limit) break;  
            if( current % primeDivisor == 0 ) {  
                isPrime = false;  
                break;  
            }  
        }  
        if( isPrime ) primes.add(current);  
        current++;  
    }  
    return primes;  
}
```

Branch coverage testing is also known as a control flow testing since it uses a control flow graph (CFG) as a code structure representation.

Since a source code is a textual form of a programming code (therefore these two types of codes are often supposed to be synonyms), the primary difficulty of code understanding is its interpretation as a textual artifact (Berry, 2011).

Truly, source code is a kind of visual formalisms too. Let us have a look at one example. Probably the first one who used the below mentioned task to illustrate structured approach to software code construction was Wirth in his classical monograph on systematic programming (Wirth, 1973).

Fig. 5. The CFG marked up with branch coverage test cases



Suppose we have a Java implementation of an algorithm yielding a sequence of prime numbers which are not greater than  $maxNum$  (see Fig. 4). After CFG construction we are able to define test cases in order to assure that all branches are reachable as shown in Fig. 5.

### 2.1. Branch Coverage Test Cases

After discovering the test situations let us propose values which fit each test case. Table 1 lists all the test cases that we constructed with paying attention to the following values:

- $maxNum$  contains the  $genPrimes()$  function parameter;
- $primes$  is the output array of produced prime numbers.

As we can see from Table 1, some cases require the same input data. It means that we are able to recognize test equivalence classes as it is shown in Fig. 6. In particular, the expected output values are the same for the test methods  $N_3$  and  $N_4$ , hence one of them may be considered as a subclass. Thus, we get test methods which provide the minimal branch coverage test set.

These methods can't guarantee full testing integrity, since repeated fragments execution might depends on operation results obtained at the earlier stages, therefore testing of one or two steps may be insufficient.

Fig. 6. Test equivalence classes for the  $genPrimes()$  function

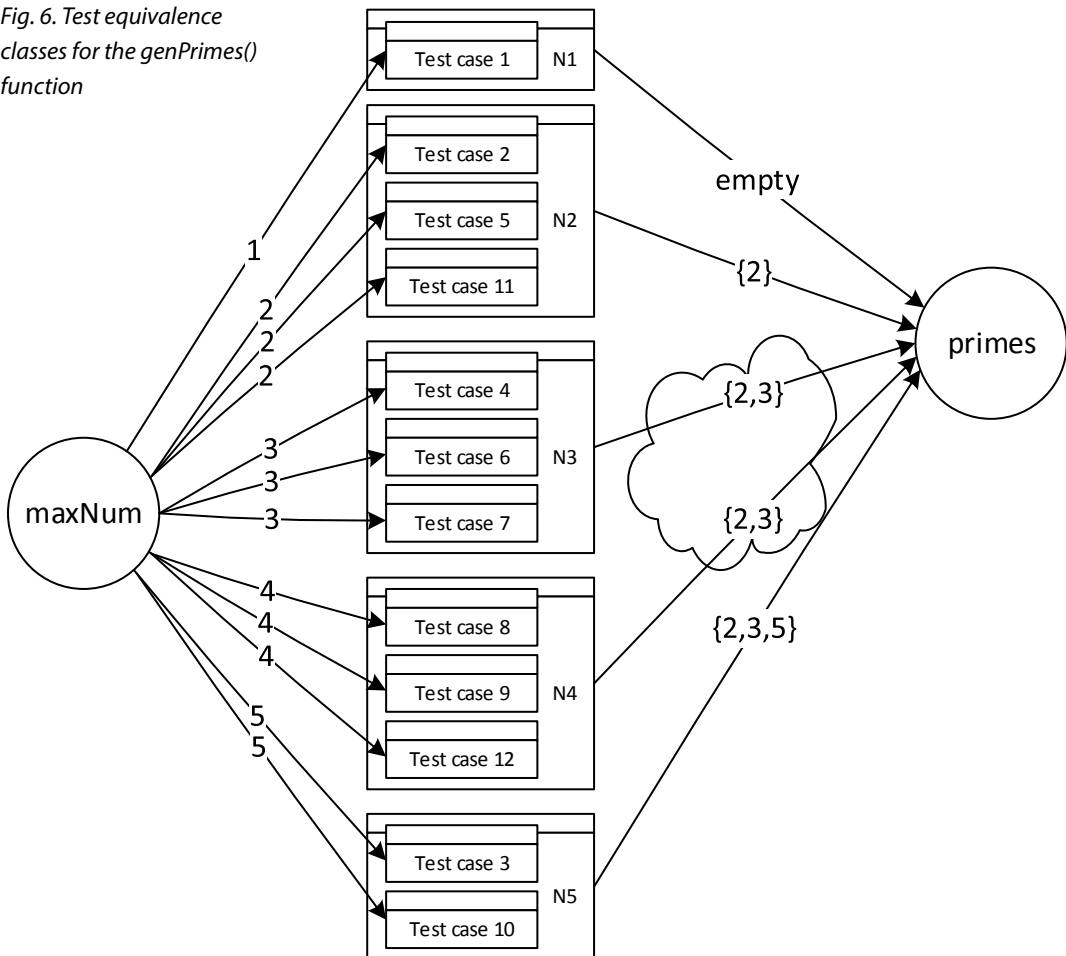


Table 1. Test cases constructed by using CFG definition

No.	Test cases		
	Description	Input	Output
1	current > maxNum	maxNum = 1	primes.isEmpty()=true
2	current ≤ maxNum	maxNum = 2	primes.size()=1 primes.get(0)=2
3	limit*limit ≤ current	maxNum = 5 (first possible value)	primes.size()=2 primes.get(0)=2 primes.get(1)=3
4	limit*limit > current	maxNum = 3	primes.size()=2 primes.get(0)=2 primes.get(1)=3
5	primes is empty	maxNum = 2	primes.size()=1 primes.get(0)=2
6	primes is not empty	maxNum = 3	primes.size()=2 primes.get(0)=2 primes.get(1)=3
7	primeDivisor ≥ limit	maxNum = 3	primes.size()=2 primes.get(0)=2 primes.get(1)=3
8	primeDivisor < limit	maxNum = 4 (first possible value)	primes.size()=2 primes.get(0)=2 primes.get(1)=3
9	current mod primeDivisor = 0	maxNum = 4 (first possible value)	primes.size()=2 primes.get(0)=2 primes.get(1)=3
10	current mod primeDivisor ≠ 0	maxNum = 5 (first possible value)	primes.size()=2 primes.get(0)=2 primes.get(1)=3
11	isPrime = true	maxNum = 2 (first possible value)	primes.size()=1 primes.get(0)=2
12	isPrime = false	maxNum = 4 (first possible value)	primes.size()=2 primes.get(0)=2 primes.get(1)=3

## 2.2. Static Analysis Issue

There is an important thing concerning a control flow graph model. Despite a CFG represents program functional dynamics, it can be constructed (at least partially) by using methods of source code static analysis. It means that it is possible to generate the accessibility tests even without program execution. The cases where the dynamic program semantics can not be resolved during static analysis procedures include such constructions as function calls using pointers to function, polymorphic calls using dynamic binding, throwing exceptions and computing addresses in direct jump constructions. Let us note that many dependencies between objects can be computed even by methods of static analysis (Glukhikh, 2012).

Static analysis methods are used not only to detect defects in pure software projects. They are widely used in hardware design for testing e.g. SystemC constructions used to describe hardware (Moiseev, 2011). Static analysis is also used as a foundation for software reliability evaluation, for example, in (Glukhikh, 2011) the authors adopt a CFG model by extending the graph based notation with special edges representing program states.

## Conclusion

We quoted a simple example of unit tests constructed in order to check branch coverage in the code illustrating an idea of logically complicated program. This study shows how the minimal test set can be generated on the basis of control flow graph marking up procedure and how the test equivalence classes are recognized in order to minimize the test set which is sufficient to reach all the source code branches at least once.

Visual models and examples introduced in this study can be used in classroom environments while preparing and teaching computer science and programming courses within the framework of computer science and software engineering university curriculum.

## References

- Berry, D.M. (2011) *The Philosophy of Software*. London: Palgrave Macmillan.
- Boehm, B. (1981) *Software Engineering Economics*. Englewood Cliffs, NJ: Prentice Hall.
- Eder, S., Junker, M., Jurgens, E., Hauptmann, B., Vaas, R. & Prommer, K. (2012) How much does unused code matter for maintenance? *Proceedings of the 34th International Conference on Software Engineering (ICSE 2012)*, pp. 1102–1111.
- Glukhikh, M., Moiseev, M., Karpenko, A. & Richter, H. (2011) Software reliability estimation based on static error detection. *Proceedings of the 7th Central and Eastern European Software Engineering Conference in Russia (CEE-SECR 2011)*, pp. 1–9.
- Glukhikh, M., Itsyson, V.M. & Tsesko, V. A. (2012) Using dependencies to improve precision of code analysis. *Automatic Control and Computer Sciences*, 46(7): 338–344.
- Maciaszek, L. (2007) *Requirements Analysis and System Design*. Third Edition.. Pearson Education Canada.
- Madhusudan, P. & Seshia, S. (2012) Joogie: infeasible code detection for Java. *Lecture Notes in Computer Science*, 7358: 767–773.
- Meszaroz, S. (2007) *xUnit Test Patterns: Refactoring Test Code*. Addison-Wesley.
- Moiseev, M., Zakharov, A., Klotchkov, I. & Salishev, S. (2011) Static analysis method for deadlock detection in SystemC designs. *Proceedings of the 2011 International Symposium on Systems on Chips (SoC)*, pp. 42–47.
- Nikolić, Đ. & Spoto, F. (2014) Reachability analysis of program variables. *ACM Transactions on Programming Language Systems*, 35(4), 14:1–14:68.
- Pyshkin, E. (2011) Teaching programming: what we miss in academia. *Proceedings of the 7th Software Engineering Conference in Russia (CEE-SEC(R) 2011)*, pp. 1–6.
- Pyshkin, E., Mozgovoy, M. & Glukhikh, M. (2012). On requirements for acceptance testing automation tools in behavior driven software development [online]. *Proceedings of the 8th Software Engineering Conference in Russia (CEE-SEC(R) 2012)*. Available: [http://2012.secr.ru/2012/presentations/pyshkin-mozgovoy-glukhikh\\_8o\\_article.pdf](http://2012.secr.ru/2012/presentations/pyshkin-mozgovoy-glukhikh_8o_article.pdf) [accessed 03.10.2015].
- Wirth, N. (1973) *Systematic Programming: An Introduction*. Upper Saddle River, NJ: Prentice Hall.



Riabova Anna

# The creation of public opinion

## Abstract

This article considers the way meaning has been theorized in relation to the media in two key approaches that have often been pitched one against the other: political economy and cultural studies. It also describes the creation and role of public opinion.

Key words: political economy, cultural studies, mass media, public opinion, propaganda, migration, democracy

The importance of public opinion cannot be ignored by any political regime that claims to be democratic. Traditionally political economy has tended to read the state and other super structural forces from the specific configuration of capital at any one time and insists that this is the starting point of social analysis. Cultural studies reminds political economy that the substance of its work, the analysis of communication, is rooted in the needs, goals, conflicts, failures and accomplishments of ordinary people attempting to make sense of their lives. Cultural studies have recognized the energizing potential of multifaceted forms of social agency, each of which brings with it dimensions of subjectivity and consciousness that are vital to political praxis.

In a critical political economy, audience responses to texts are related to their overall location in the economic system. This approach stresses that nobody has access to a complete range of cultural goods without restriction. Political economy

tries to explain these constraints by recourse to material, social and cultural barriers. For example, communications and facilities rarely come for free, their access is dependent upon a person's spending power and disposable income is significantly different between different groups in society. Cultural differences are also relevant to readings of media texts.

The meanings of mediated imagery are tied to a community and its shared experiences and to the actual ability of individuals to actively interpret it. This ability may depend on many things not least educational and cultural capital, national, local and personal socio-economic realities. Mass media texts can, however, still be understood in ideological terms, as forms of communication that privilege certain sets of ideas and neglect others. Those who argue that media texts include contradictory messages that at once present the dominant ideology but also undermine it, point to the challenge of newer politics based on gender, ethnicity and sexuality that reveal a society of difference both in terms of identity and interpretation. Cultural studies teach us that difference is ever present albeit incorporated into mainstream culture in a way that is unchallenging rather than radical. It also teaches us that power is not uniform nor is it uniformly applied and accepted. But while inequality and difference is ever more apparent the concept of ideology still has a central role to play in suggesting connections between media and power.

Choices made by the audience must be looked at within the social context of their daily life and the content itself must be interpreted according to the social and political circumstances of its production. To focus largely or exclusively on the structure and content of media messages and attempt to read off the impact of these messages cannot possibly interrogate the consequences. So, rather than just looking at how the mass media may exert an ideological or hegemonic effect on the behavior and attitudes of individuals, it is crucial to consider the functioning of the mass media within the larger sociological perspective of culture, social structure and social groups. It would be foolish to ignore that we still live in deeply unequal capitalist societies, driven by profit and competition operating on a global scale.

It is also undeniable that we live in a media dominated world with many different ideas and identities in circulation at any one time. We need to understand the former to appreciate the latter. It is vital to appreciate the relation between individual autonomy, freedom and rational action on the one hand and the social construction of identity and behavior on the other. There may be a struggle between competing discourses but it is far from being a

free-for-all. To understand the role of the mass media in society we need to consider it in its social entirety – however difficult that may seem.

It is in the 1920s when the notion of “Public Opinion”; gains serious currency, its emergence appears to have relied on the extraordinary success of American and British propaganda during World War I. It only became possible to speak of something called “public opinion” after national elites succeeded in using radio and newspapers to hammer millions of diverse hearts and minds into a mass public desire for war against Germany.

Views on the use and role of public opinion in forming policy can often be as diverse as the opinions themselves. Winston Churchill took the view that there was “no such thing as public opinion. There is only published opinion”. While Abraham Lincoln’s take was simply: “Public opinion in this country is everything”.

Today, the concept of “public opinion,” as it is used by journalists and political scientists tends to refer to an aggregate variable, a social average, which reflects the ebbs and flows of individuals, thoughts and attitudes toward some societal issue. Today, we are taught that “public opinion” refers to how the public answers the big social questions which a democratic populace must decide for itself in order to indicate the path politicians must follow. But the history of this concept reveals that, historically, the answer came before the question. At least in its founding, the answers of “public opinion” to the most important political questions of the time were quite explicitly decided by state elite’s first newspapers and radios among other increasingly “mass” media were used to merely pose the right questions.

We are all capable of adding our share of thought to the resource of an enlightened public opinion. It has been said that “nothing can stop an idea whose time has come.” Anyone who has struggled to work with ideas, to think them through into constructive forms, knows well that preceding the emergence of an idea into clear life expression is a long, often arduous process of thought, application and repeated rethinking, and relating of the idea to daily circumstance. This holds true within the world body as well. An idea whose time has come within the public mind has done so because deep, responsible thought by many individuals has prepared the way for its inclusion into the arena of world events.

To the typical university student today, to speak of elite-driven propaganda in formally democratic societies may begin to sound like conspiracy theory. Also, it is worth noting that to speak of propaganda only smells of conspiracy theory precisely because of this conceptual history: it only because propaganda has been widely recast as a sinister, conspiratorial type of messaging which supposedly only authoritarian governments engage in. To speak of propaganda in democratic societies with a “free press” often raises eyebrows. But to this we should simply recall that propaganda is actually quite a basic and common type of messaging which has always been a part of mass media society, including and perhaps especially in democratic societies.

Talking about the media is like talking about a mission. A source of information and education that will shape the daily choices in people’s life. That will shape the thinking, and the perception of things. But Media is a political power and tool, occupied in a way by the big powers, international corporations, big agencies using for their political and economic objectives that control and can pay.

Public opinion is the growing responsiveness to mass ideas by the rapidly evolving human mentality. Mass psychology and mob determination have been exploited down the ages, for the unthinking and the emotional are easily swayed in any direction. The problem before us therefore is the creation of enlightened public opinion based upon spiritually sound principles as a force for good within the world. The role and the mission of the media is to commit itself to values that are imperative for today, and it is possible to achieve this goal only if civil societies commit themselves into risks and understand the need for it and encourage agencies that can play this role.

Both poles of the world have misleading information and negative perceptions and misconceptions of each other. The North does not know enough the South and vice versa, the South has negative perception of the North and rejects every ideology that comes from it. Both need to understand clearly that there are ways to understand and interpret Islam or Democracy, different spirit of understanding religion, a spirit of peace and mercy, and Democracy, a spirit of human rights, and respect for human beings.

Today's neighborhood is one of complex human association of mistrust and insecurity, exclusion, isolation and fear of the other, loneliness in a multitude of people. Global village should be inherent of other values as well; it should not incur economic or political hegemony, as the world is not a market-controlled environment for international corporations.

For the emergence of new world society and for the securitization of migration issues it is necessary to grow and spread the understanding of a global citizen, global society with global ethics of human rights values, with principles of democracy that are consistent in words and in practice. The analysis of such a society would provide information to grasp the geo-politic and socioeconomic breakdown of the situation in the North and the South and a better understanding of the migration crisis and therefore better develop dialogue between North and South for dissipation of myths, enhancement of democracy and cooperation of the poles.

The role of the media thus is the pursuit of truth, to constantly transmit the reality and uncover the 'beneath' and the 'underlying' facts of things, develop a just society that will abide by the rule of law and govern by the ethics of human rights, develop and encourage the idea of world citizenship. It is for the media to remind constantly to the ruling powers their role of governing the world justly and fairly, as they have the privilege and the opportunity to make history by creating world order and a global society with universal human rights values and the rule of democracy.

## Literature cited

1. Aldrich, J. H., Gelpi, C., Feaver, P., Reifler, J. & Sharp, K. T. (2006) Foreign policy and the electoral connection. *Annual Review of Political Science*, 9: 477–502.
2. Baker, W. D. & Oreal, J.R. (2001) Patriotism or opinion leadership? The nature and origin of "rally 'round the flag" effect. *Journal of Conflict Resolution*, 44 (5): 661–87.
3. Berinsky, A. (2007) Assuming the costs of war: Events, elites and American public support for military conflict. *Journal of Politics*, 69: In Press

Alexandr Chusov & Konstantin Kriulin

# Development of the Open Drainage Network of St. Petersburg Suburbs on the Basis of GIS Technologies

## Abstract

The article discusses the methodology of solving problems associated with the forecast of the future state and ways of development of open drainage networks, which includes: assessment of the current and future state of open drainage network, calculation of the potential economic damage and prioritizing of repair works on the elements of open drainage network. These solutions were used to forecast the development of open drainage network of St. Petersburg suburbs.

Keywords: open drainage network, land reclamation system, geographic information systems, integrated assessment, economic assessment of damage

## Introduction

With a view to develop the measures of reconstruction of the open drainage network in the area immediately adjacent to St. Petersburg (within the city administrative boundaries), the St. Petersburg administration has commissioned to carry out works on assessment of the present state of the main drainage channels and hydraulic structures located on them.

In the period since the early 60's to mid 80's last century, there was an intensive development of agricultural production in the Leningrad region and, in particular, in the area directly adjacent to Leningrad. One of the methods to increase the productivity of agricultural land was the construction of drainage systems to improve the conditions of crop development by limiting the soil moisture. In the early 90's, the construction of new drainage systems was stopped. In the early 2000's, the areas directly adjacent to St. Petersburg faced a boom in construction of industrial facilities, highways, private housing and cottage building. So, these problems arise due to the lack of the integrated systems of administrative decision-making (Zhilnikova, 2002), and also demands the solution of problems with treatment of megacities land drainage and land runoff features (Chechevichkin & Vatin, 2014; Vatin et al., 2014).

The zones allocated for the transport, industrial and residential facilities were, in many cases, located in areas of former drainage systems. This loss of functionality of drainage systems occurred not only in the areas of construction sites, but also in the upstream drainage zone. The repair and refurbishment works at the drainage reclamation systems in the period of 1990–2010 were mainly focused on maintaining of the minimal required operation of basic elements of the systems, which include the main drainage channels: trunk channels, transporting collectors, open collectors.

As a result, to date, the open drainage network (a complex channels and hydraulic structures) is characterized by partial loss of functionality and, as a consequence, the elevated groundwater levels. Many cities and municipalities face such problems (Amaral Haddada & Teixeiraa, 2015; Morellia et. al., 2012; Foudia, Osés-Erasob & Tamayoc, 2015; Shen'kman, Sholokhov & Shen'kman, 2011). The impacts and the resulting problems are described in (Makhova, 2010; Prawiranegara, 2014).

## The technique works

This paper presents an approach to solving problems associated with the forecast of the future state and ways of development of open drainage network, which includes:

- assessment of the current state of the open drainage network (land use and technical condition);
- assessment of the prospective use of the open drainage network;
- calculation of the potential economic damage resulting from the lowering of performance of each channel;
- sequencing the repair and refurbishment works on the elements of the open drainage network or the absence of the need for reconstruction.
- There are several methods for assessing the risk and damage from flooding (Chen, Hill, & Urbano, 2009; Alekseev & Shishkin, 2012; Romanenko, 2011; Kuranov et

al., 2004; Kuzmin et al., 2008; Kuzmin & Chunosov, 2010; Kurbatova, Myagkov & Shnyparkov, 1997). The proposed methodology consists of three main sections – field survey of the open drainage network, creation of GIS system, analysis of the results (Shishkin, Antonov & Epifanov, 2013) – and includes several consecutive stages:

- interpretation of satellite images to determine the location of drainage systems and their mapping;
- determination of the areas boundaries (according to the results of interpretation) where the aerial photography of drainage channels should be carried out;
- digital aerial photography of the areas with the identified systems of channels, with subsequent topographic binding of aerial photographs to the digital map;
- field survey of the open drainage network;
- integrated assessment of the state of the trunk channels and adjacent areas;
- economic assessment of damage from the unsatisfactory condition of trunk channels;
- identification of areas that require first priority measures to restore the integrity and water conveyance capacity of drainage channels.

Below, you can find the discussion of the stages of works in several districts of St. Petersburg.

## Works on the Open Drainage Network of Saint-Petersburg suburbs

The works were carried out on the territory of several districts of St. Petersburg, both in the agricultural territories and in the developed or built-up areas: Kurortny, Primorsky, Vyborgsky, Kronshtadtsky. The works affected both the resort construction areas and forestry areas of St. Petersburg: Pesochinskoye, Sestroretskoye, Primorskoye and Molodezhnoye.

For the purposes of channels interpretation, the researchers have used publicly available data of Google maps and Yandex.Maps. Then, the researchers used the software of ESRI ArcGIS Desktop 10.0 to perform scaling and binding of the images to Gauss Kruger coordinate system used by the City. According to the results of interpretation, the researchers identified the main channels and areas that should get a more detailed aerial photography. An example of satellite images processing is presented in Fig. 1.

The total number of channels detected during interpretation is 12 119 channels with a total length of 2 502 km.

The location and parameters of minor channels were more precisely specified by topographic map-boards (Fig. 3.).

After a comprehensive study of maps and aerial photographs, the routes of field surveys were defined.

During the field survey, the researchers identified the main parameters of trunk channels: length, width at the top, width along the bottom, depth of the channel, depth of water in the channel, average speed, state of the bed, availability of wetland areas in the drainage basins of channels, causes of soils waterlogging, siltation of channels, places of destruction of channels lining, destruction of slopes, destruction of craters, crossing of utilities lines, size of land lots allocated for temporary and permanent use, conformity of the lands





Fig. 1. Interpretation of satellite images

In the next stage the researchers obtained sets of actual map-boards of aerial photography. The images make it possible to identify the channels by their type and to determine the main parameters: length, width, availability of pipeline crossings. Fig. 2 presents the methodology for identification of channels using aerial photography on the example of the Kurortny district.



Fig. 2. Aerial photo of part of Kurortny district



Table 1. Comparison of land use structure of drainage basin

	Land use structure of drainage basin [%]	
	2011	2025
Built-up areas	15	55
Gardeners partnerships and recreation zones	11	11
Agricultural lands	74	34

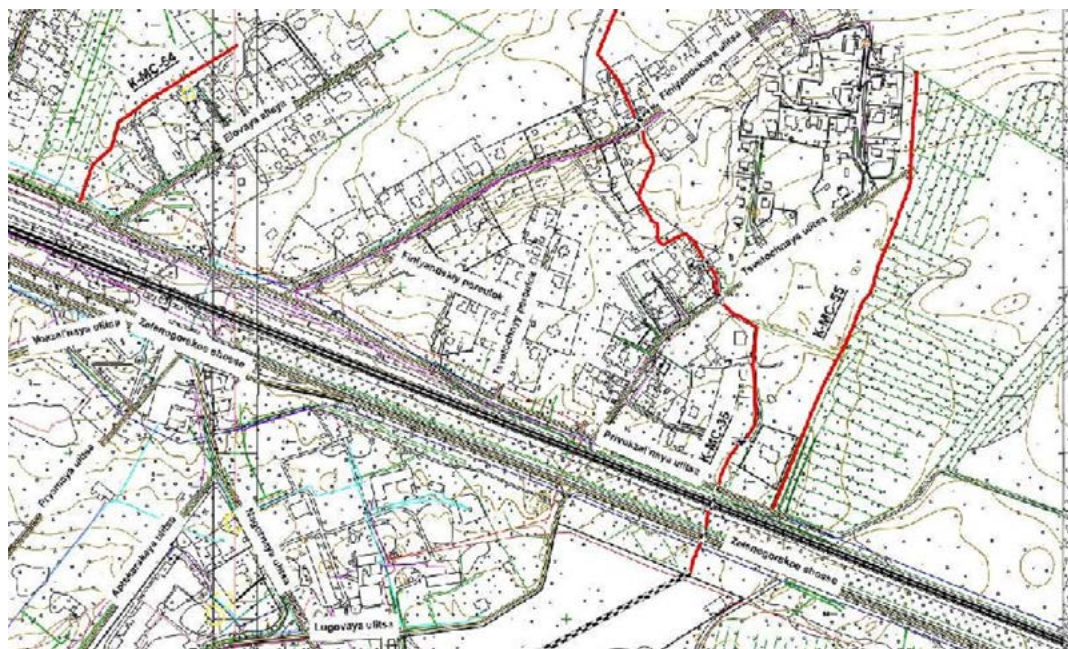
allocations to the land regulations, drainage basin. Also the researchers examined pipeline crossings on trunk channels and filled the registration forms that contain: name of the channel, length and diameter of pipeline crossing, condition of head walls.

For each of the trunk channels, the researchers determined the width of lands allocated for permanent and temporary use in accordance with the regulations for land allocation for open drainage channels.

The researchers designed and created the structure of geographic information system in the ArcGIS Desktop 10.0 software. This system is widely used for resolving the problems of environmental regulation, assessment of flood-prone areas and evaluation of environmental quality (Kriulin et al, 2012; Shishkin, Antonov & Epifanov, 2012; Antonov, Shishkin & Chusov, 2014; Honghai Qia & Altinakar, 2011).

Fig.3. Precise specification of channels boundaries by topographic map-boards

The created GIS contains the following data layers: Channels (linear features); Pipeline crossings (point features); Points of craters destruction; Points of slopes destruction; Points of destruction of slopes lining;



Wetlands areas; Crossings with engineering networks; Points with no movement of water; Points vegetal invasion of channel beds; Wet spots; Drainage basins of trunk channels; Points with violation of hydrological regime; Bridges.

In addition, 697 photos that reflect the state of open drainage systems facilities were uploaded to ArcGIS.

The shape format was selected as the vector format of spatial data. The spatial data were created in the locally used coordinate system - Gauss Kruger projection. All information from the registration forms was entered into the attribute tables of the respective data layers.

The layer of open drainage channels contains channels of the following types: Trunk channels (rch); Transporting collectors (TC); Open driers (OD); Roadside ditches (RD). Such a composition is caused by the absence of more detailed information about the types of channels in these areas. On the basis of the developed GIS, the researchers completed the registration forms containing information about the channel parameters measured during field surveys.

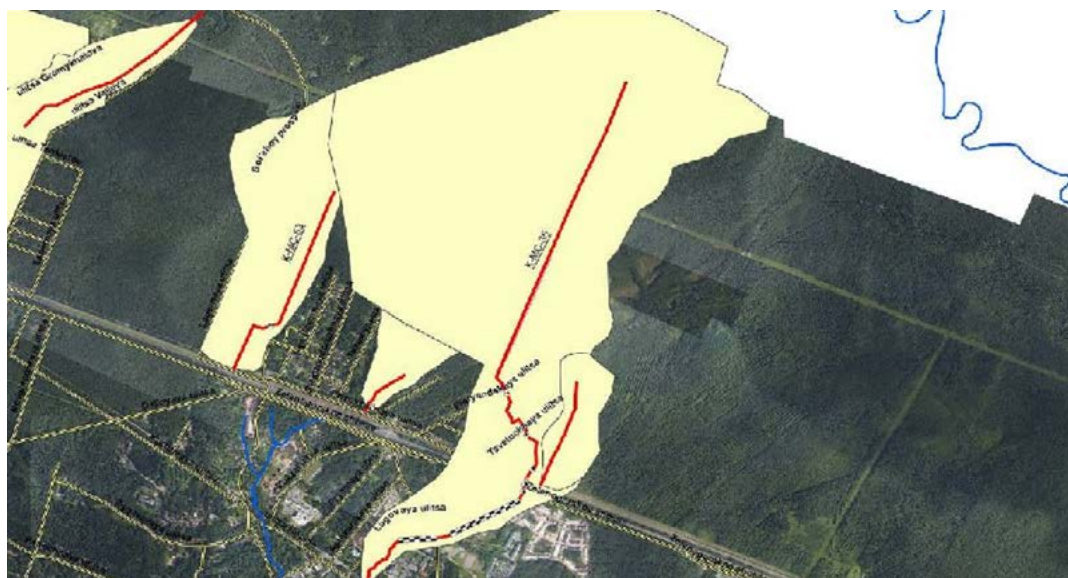
During the field surveys, 110 trunk channels were identified.

Also, as a result of the field surveys and analysis of topographic map-boards and images, the boundaries of drainage basins of the trunk channel were identified (Fig. 4).

Analysis of the field survey results showed:

- present and future land use structures are presented in tab. 1; One should note the decrease in the proportion of agricultural land from 74% to 34%, and the increase in building area from 15% to 55%. In this connection, one should emphasize the significant decrease in the number of “reclamation” channels, i.e. the channels which increase crop productivity. At the same time, one should note the increase of the number of channels that provide drainage of rain and snowmelt runoff from built-up areas, i.e. the channels of the “open drainage system of urban areas”;

*Fig.4. Construction of drainage basins of trunk channels*



- the main causes of decrease of efficiency of the open drainage network is the destruction of the designed profiles of channels, growth of channel vegetation, littering of channels with fallen trees and household waste, siltation of the channel beds, destruction of structures and sedimentation pipeline-crossings;
- almost all channels (~100%) are invaded by grass and shrubs, more than half (~60%) of the channels are overgrown with trees;
- lining of trunk channels is missing or destroyed except in cottage areas where channels beds are strengthened by geogrids, gabions, stones, etc.

The next step was to make an integral assessment of condition of channels of the open drainage network, with the following gradation:

1. “Good condition”: the channel is free from vegetation, no erosion and earth flow in slopes, no bottom erosion and silting, no backwater of the closed drainage collectors (cc), no stagnation of water along the channel’s length. Pipeline crossings are in a satisfactory condition, movement of water is not impeded, no backwater.
2. “Satisfactory condition”: the channel is in operating condition, channel opening is visible, no backwater, there are slight earth flows in slopes and siltation of bottom, overgrown shrubs and hygrophilous vegetation along the length does not exceed 30%, bottom lining is not destroyed and not silted, no stagnant water in channel. There are traces of operational activities. Pipeline crossings are in a satisfactory condition, movement of water is impeded, backwater available.
3. “Unsatisfactory condition”: the channel bed is overgrown with shrubs and hygrophilous vegetation for more than 30% along the length, opening of closed channel is not visible, there are washouts and earth flows in slopes, erosion and siltation of bottom. Movement of water is negligible or unavailable due to the high roughness. Pipeline crossings are in unsatisfactory condition, movement of water is greatly impeded, strong backwater.
4. “Very poor condition”: the channel is overgrown with shrubs, trees and hygrophilous vegetation for more than 30% along the length, erosion and destruction of slopes up to full stop of water movement. Pipeline crossings are in unsatisfactory condition, there is virtually no movement of water.

The analysis of results of the field survey showed that no channel may be assessed as in “good condition”, and 80% of the surveyed channels are rated as in “unsatisfactory condition”.

The economic assessment of the consequences of the loss of functionality of drainage systems was carried out on the basis of the calculation of the potential economic damage from the flooded areas. The assessment took into account the information on the future land use of the drainage area of each channel (the type of use of fragments and the size of the drainage). The assessment was performed for all channels and watercourses in the territories directly adjacent to St. Petersburg and under the City administrative control (Kriulin, 2013).

The calculated value of the potential loss in the aggregate with the value of the integral assessment of channels performance enabled the researchers to sequence the measures to restore the operability of channels of the “open drainage system of urban areas”.

The channels, which need to take major repairs and reconstruction in the first place and in the shortest possible time, were identified as the channels with a minimum integral rating of performance (“unsatisfactory” and “very poor”) and as the channels that lost their operability which will result in the future maximum economic loss. The results of functional zoning of the adjacent territory and the assessment of the channels conditions show that 39 open drainage channels should be restored during the first stage of works, 107 channels have to be repaired within the second stage and 28 channels within the third one.

## Conclusions

This paper presents an integrated approach to solving problems associated with the forecast of the future state and ways of development of the open drainage network on the example of St. Petersburg districts. The basis of the developed algorithms is the use of modern geographic information technologies for processing and interpretation of satellite images and topographic map-boards, spatial analysis and solutions of functional tasks of the drainage network development (Ramlala & Babanb, 2008). The developed geographic information system helped to resolve the spatial hydrological problems of the determination of optimal configuration of the surface drainage network within the development of St. Petersburg area. The works performed allowed to define the engineering activities for restoration and improvement of the surface drainage network, and consequently to prevent the flooding of St. Petersburg area.

## References

- Alekseev, V. V. & Shishkin, I. A. (2012) Geoinformatsionnaya sistema otsenki sostoyaniya tekhnicheskikh sooruzheniy zashchity territoriy ot podtopleniya [Geographic information system of assessment of technical structures for protection of areas from flooding]. *Bulletin of PNU*, 4 (27): 69–78. (rus)
- Amaral Haddada E. & Teixeiraa, E. (2015) Economic impacts of natural disasters in megacities: The case of floods in São Paulo, Brazil. *Habitat International*, 45: 106–113.
- Antonov, I. V., Shishkin, A. I. & Chusov, A. N. (2014) Methodology of rationing of admissible dumps on the basis of geoinformation modeling system. *Construction of Unique Buildings and Structures*, 3(18): 25–37.
- Chechevichkin, V. & Vatin, N. (2014) Megacities land drainage and land runoff features and treatment. *Applied Mechanics and Materials*, 641-642: 409–415.
- Chen, J., Hill, A. A. & Urbano, L. D. (2009) A GIS-based model for urban flood inundation. *Journal of Hydrology*, 373: 184–192.
- Foudia, S., Osés-Erasob, N. & Tamayoc, I. (2015) Integrated spatial flood risk assessment: The case of Zaragoza. *Land Use Policy*, 42: 278–292.
- Honghai Qia, Altinakarab, M. S. (2011) A GIS-based decision support system for integrated flood management under uncertainty with two dimensional numerical simulations. *Environmental Modelling & Software*, 26: 817–821.
- Kriulin, K. N. (2013) Tekhniko-ekonomicheskoe obosnovanie ocherednosti rekonstruktsii kanalov [Feasibility study of priority of channels reconstruction] *Science and Education in the XXI century. Proceedings of the International Scientific-Practical Conference*, pp. 130–132. (rus)
- Kriulin, K. N., Epifanov, A. V., Antonov, I. V. & Selivanov V. S. (2012) Otsenka i monitoring sostoyaniya meliorirovannykh zemel' v prigorodnoy zone g. Sankt-Peterburg [Assessment and monitoring of reclaimed lands in St. Petersburg suburban area]. *Materials of the International Conference on Trends in the Development of Agrophysics in the Conditions of the Changing Climate. (80 anniversary of the Agrophysical scientific research institute)*, pp. 332–334. (rus)
- Kuranov, N. P., Kriksunov, Y. Y. & Hohlatov, E. M. (2004) Podtoplenie i drenirovanie zastravaemykh i zastroennykh territoriy [Flooding and draining of the built-up areas and areas of ongoing construction]. *Water Supply and Sanitary Technique*, 2: 34–37. (rus)
- Kurbatova, A. S., Myagkov, S. M. & Shnyparkov, A. A. (1997) Prirodnyy risk dlya gorodov Rossii [Natural risk for the cities of Russia] *RDASI City Ecology*, 240 (rus)
- Kuzmin, V. M., Timofeeva, E. A. & Chunosov, D. V. (2008) Otsenka riska negativnykh vozdeystviy pri podtoplenii urbanizirovannykh territoriy [Risk assessment of the negative effects of flooding in urban areas]. *Water Supply and Sanitary Technique*, 6: 44–50. (rus)



Kuzmin, V. M. & Chunosov, D. V. (2010) Obosnovanie effektivnosti meropriyatiy po zashchite ot podtopleniya urbanizirovannykh territoriy na osnove teorii riska [Study of the effectiveness of protective measures against flooding in urban areas on the basis of the risk theory]. *Bulletin of the Saratov State Agricultural University n.a. N.I. Vavilov*, 1: 44–49. (rus)

Makhova, S. I. (2010) Sravnitel'nyy analiz tekhnogennogo podtopleniya territoriy [Comparative analysis of man-made flooding of territories]. *Ecology of the Urbanized Territories*, 4: 51–56. (rus)

Morellia, S., Segonia, S., Manzoa, G., Erminic, L. & Catania, F. (2012) Urban planning, flood risk and public policy: The case of the Arno River, Firenze, Italy. *Applied Geography*, 34: 205–218.

Prawiranegara, M. (2014) Spatial Multi-criteria Analysis (SMCA) for basin-wide flood risk assessment as a tool in improving spatial planning and urban resilience policy making: A case study of Marikina River Basin, Metro Manila – Philippines. *Procedia - Social and Behavioral Sciences*, 135: 18–24.

Ramlala, B. & Babanb, S. M. J. (2008) Developing a GIS based integrated approach to flood management in Trinidad, West Indies. *Journal of Environmental Management*, 88: 1131–1140.

Romanenko, O. N. (2011) Kolichestvennykh kharakteristiki podtopleniya urbanizirovannykh territoriy [Quantitative characteristics of flooding of urban areas]. *The Polzunovsky Bulletin of the Altai State Technical University of I.I. Polzunov*, 1: 249–253. (rus)

Shen'kman, B. M., Sholokhov, P. A. & Shen'kman, I. B. (2011) Podtoplenie Irkutskaya grunтовymi vodami [Flooding of Irkutsk by groundwater]. *Geography and Natural Resources*, 2: 54–62. (rus)

Shishkin, A. I., Antonov, I. V. & Epifanov, A. V. (2012) Normirovanie sbrosa stochnykh vod pri proizvodstve tsellyulozy i produktov ee pererabotki s primeneniem GIS tekhnologii [Rationing of dump of wastewater by manufacture of pulp and products of its processing with application GIS of technologies]. *Cellulose. Paper. Cardboard*, 1: 66–74. (rus)

Shishkin, A. I., Antonov, I. V. & Epifanov, A. V. (2013) Methodology of inventory of meliorative canals of state farms of St. Petersburg on the basis of geoinformation systems. *Collection of Materials XIV of the International Ecological Forum “Day of the Baltic Sea”*, pp. 66–67.

Vatin, N. I., Chechevichkin, V. N., Chechevichkin, A. V., Shilova, Y., & Yakunin, L. A. (2014) Application of natural zeolites for aquatic and air medium purification. *Applied Mechanics and Materials*, 587–589:565–572.

Zhilnikova, N. A. (2002) Problemy vnedreniya sistem upravleniya okruzhayushchey sredoy (ekologicheskogo menedzhmenta) v Severo-Zapadnom regione Rossii [Problems of implementation of the environmental management systems (ecological management) in the North-Western region of Russia]. *Regional Ecology*, 3–4 (19): 12–15. (rus)

Alexander Chusov, Viacheslav Zhazhkov & Vladimir Maslikov

# Biogas Emission Assessment of Municipal Solid Waste Landfills in Regions of the Russian Federation with Severe Climatic Conditions

## Abstract

The paper presents the results of field researches of emission and composition of biogas on municipal solid waste (MSW) landfills in a region of the Russian Federation with severe climatic conditions. Biochemical processes of decomposition of wastes with the biogas emission with a high methane concentration (50 and more vol%) proceed actively in MSW landfills under the conditions of severe climate. Preferable areas of the landfills for biogas potential usage were selected.

Keywords: municipal solid waste, MSW, landfill, biogas, biogas emission, field experiments, biogas potential, field researches

## Introduction

Currently there are more than 1 300 municipal solid waste (MSW) landfills in the Russian Federation, where the greatest part of annually produced waste is landfilled. A considerable amount of Russia's MSW landfills do not meet sanitary-hygienic and environmental standards. Not only while MSW landfills are in operation but also after their closure, they pose a danger to the environment and population health for a long period due to the pollution of air by biogas emission and of surface and groundwater by toxic leachate, because there are not required systems of environmental protection (Chechevichkin & Vatin, 2014; Ryzhakova et al., 2014; Livshits & Gurvich, 1999). The especial significance of MSW landfills exploitation's problem is referred to the northern regions of Russia, which occupy about 60% of its territory and where 15% out of the commonwealth overall size is inhabit. The exploitation of MSW landfills in harsh environmental conditions in freezing of shaft's zones and notable degree of peat formation edits peculiarities into processes of wastes' breakdown, polluting substances' emission and expansion in the environment (Fedorov & Maslikov, 2003). Limited economic opportunities of many northern regions do not allow to accomplish to the extent necessary environmental protection measures and to ensure proper monitoring of MSW landfills. Constructing biogas collection and utilization systems will not only help produce electric and heat energy for off-grid loads, but is also an effective way to protect the environment (Fedorov, Korablev et al., 2008; Fedorov, Zinchenko et al., 2008).

During waste decomposition processes biogas is produced, the main components of which are methane, carbon dioxide and also hydrogen sulphide, ammonia and other impurities (more than 100 points). Intensity and composition of biogas emissions are the most important indices of landfilled waste condition, their degree of decomposition and fire hazard, because of the fact that more than 5% of methane in the atmosphere can cause explosive mixture. Different waste volumes and morphological composition of wastes, time and landfilled type, climatic parameters and temperature condition and etc determine variability of composition, mosaic distribution of gas emissions on the surface of the landfill, seasonal and annual fluctuations in emissions of biogas (Savvichev, 2005; Vavilin et al., 2005; Russian Federal Agency for Science and Innovation, 2009).

Atmospheric temperature and amount of precipitations at landfills area have a designate significance for waste decomposition, and as a consequence, for dynamic of biogas emission and its composition. MSW landfills located in the Russian regions with low air temperatures and relatively low rainfall are considered unpromising objects for usage biogas potential. However, reliable evidence for this is not.

The assessment of biogas emission needs the pursuance of the special researches, hence the mathematical models are not able to reflect the particular characteristics of the concrete landfills (SniP, 1996; Chusov, Maslikov & Molodtsov, 2013; Maslikov et al., 2012).

This paper present the results of the investigations to assessment the biogas potential of the two MSW landfills located in one of the regions of the Russian Federation with severe climatic conditions. The average annual temperature of the atmosphere in the landfills location zone is 0.4°C. Atmospheric temperature of the coldest 24-hour period reaches -42°C. Average annual precipitation is 560 mm, whereof 28% refers from November to March (SniP, 1999).



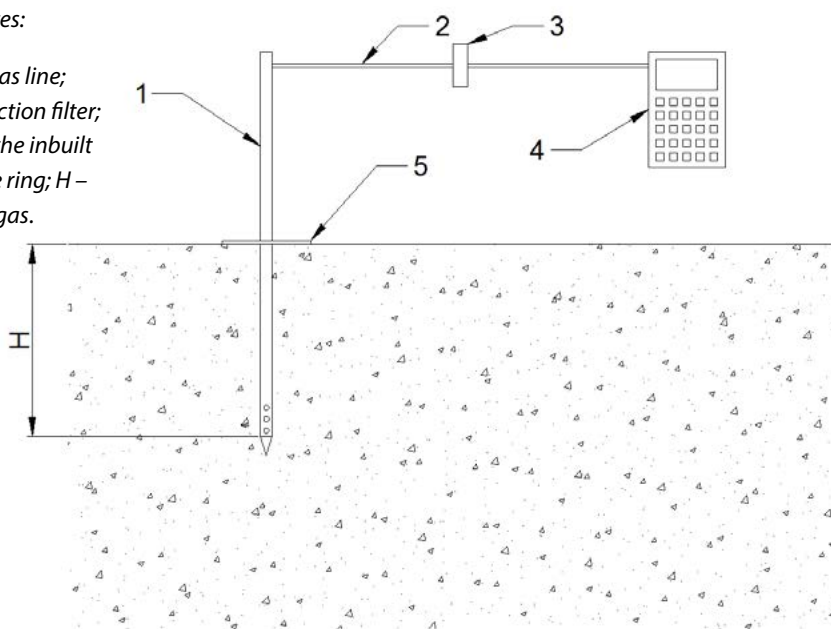
The objects of the research are MSW landfills №1 and №2. The land area of MSW landfill No. 1 is about 33 ha; its exploitation begun in 1971 year. More than 700 thousands m<sup>3</sup> per year of waste are landfilled where now. The landfill almost exhausted the resources of the capacity during the operation. The area of MSW landfill No. 2 is about 11 ha. The exploitation of the landfill begun in 1966 year, its closing is suggested to accomplish in 2015.

## The equipment set for measurements and sampling procedure of subsoil gas from MSW landfill body

Gas-chemical mapping of a landfill's body is made by biogas sample collection from the upper layer of landfilled waste (Fig. 1).

Figure 1. The scheme of biogas sample collection from the upper layer of landfilled wastes:

1 – sampling rod; 2 – gas line;  
3 – gas-analyzer protection filter;  
4 – gas-analyzer with the inbuilt gas pump;  
5 – distance ring; H – sampling depth of biogas.



The sampling method based on insertion a sampling rod into the layer of waste on the definite depth, the following pumping out and analyzing of the gases by a portable gas analyzer.

For instance, GA2000 plus, (Chusov, Maslikov & Molodtsov, 2013) is assigned for the analyzing the composition the different biogas compositions and their origin in situ of dimension, the characteristics of which are reduced below:

- gases measured: CH<sub>4</sub>, CO<sub>2</sub>, O<sub>2</sub>, CO, H<sub>2</sub>S;
- range: CH<sub>4</sub> – 0-100%; CO<sub>2</sub> – 0-100%; O<sub>2</sub> – 0-25%; CO – 0-2000 ppm; H<sub>2</sub>S – 0-500 ppm (0-5000 ppm with external H<sub>2</sub>S gas pod);
- response time: CH<sub>4</sub> ≤ 20 s, CO<sub>2</sub> ≤ 20 s, O<sub>2</sub> ≤ 20 s, CO ≤ 60 s, H<sub>2</sub>S ≤ s;

- display of peak concentrations of CH<sub>4</sub> and CO<sub>2</sub>;
- operating temperature range: 0°C–40°C;
- ATEX Certified.

Before start measurements with a gas analyzer it is necessary to make zero calibration with nitrogen of high frequency and change gas-line filters. A sampling rod, tube form 16 mm in diameter and with a meter bearing length, made from corrosion resistant stainless steel, is used for sample collection. Optionally the temperature in sampling depth is defined by electronic digital thermometer with the remote sensor, for instance using IT-17 K.

Preliminary in the site layout plan of a landfill in concern with the operation organization the sample collection's networks are set out, no more than 50x50 m. The concrete points of sample collection are defined on the spot and depend on the probability of conduct of measurements. High-duty guarded (IPX7-compliant) digital GPS Navigator (Garmin GPSMAP 62s or its analogue) with triaxial compass and topographical maps of the region, which provides positional accuracy no more than for 3 meters, is used for fixed sampling points on the map. Temperature is measured on surface of MSW landfill to identify possible areas of subsurface waste combustion to ensure the safety of work in determine the sampling points. The method of contactless temperature measurement using a pyrometer, for example, Center 350 is preferable.

With a view to ensuring the accuracy requirement of measuring the sampling time is 90 seconds. After each measurement the gas line's blowing-off within 30 seconds by means of external air is provided in order to prevent the influence of residue gas. Logging analysis has to be carried out to the devices memory and log of measurements (Tab. 1).

*Table 1. An example of measurements log format*

Point №	Latitude [WGS °N]	Longitude [WGS °E]	Concentration				
			CH <sub>4</sub> [%]	CO <sub>2</sub> [%]	O <sub>2</sub> [%]	H <sub>2</sub> S [ppm]	CO [ppm]
1							
2							
...	...	...	...	...	...	...	...

The following up of the investigation is defining the current efficiency of zones with high concentration of methane in the upper layer of wastes. For this purpose the following methods might be used: «analytical», «well», «via flux box» (Di Trapani, Di Bella & Viviani, 2013; Rettenberger, 1991; Fedorov, 2001; Fellner, Schöngrundner & Brunner, 2003; Babilotte et al., 2010).

Taking into account the Russian Federation landfills conditions, it should be recommended to appraise emission rate from the upper layers with the help of relatively simple method on the basis of gas catcher in the form of flux box 50 liters of extent (Rettenberger, 1982; Biszek, Pawłowska & Czerwiński, 2006), which collects biogas on the sections under tested. Gas analyzer, which is working in closed-loop mode, is connected up to the flux box. Within a given period it switches on and the majority components density of biogas is

specified. On the grounds of controlling methane's concentration change within a period of time, product gas of the section under tested may be defined [mg/(m<sup>2</sup>·s)].

The methane flux  $F$  [g/(m<sup>2</sup>·d)] can be calculated using Equation 1 (Sauri-Riancho et al., 2010):

$$F = \frac{P \cdot V \cdot M \cdot U \left( \frac{dC}{dt} \right)}{A \cdot T \cdot R,}$$

where:

P – pressure [atm];	A – area covered by the chamber [m <sup>2</sup> ];
V – flux box volume [L];	T – gas temperature [K];
M – molar mass of methane [16 g/mol];	R – gas constant [0.08205 L atm K <sup>-1</sup> mol <sup>-1</sup> ];
U – units conversion factor [0.00144 L min μL <sup>-1</sup> d <sup>-1</sup> ];	

Figure 2. The site plan of the municipal solid waste landfill No. 1 with an indication of sample collection points: 1 – the operated areas, 2 – the repository of hazardous waste, 3 – the building area, 4 – the preferable area with high methane concentration for biogas potential usage, 5 – the areas of wastes combustion, 6 – the areas with high methane concentration

To predict information about gas emission from Municipal solid waste landfill it is necessary to use experimental method of waste's sample decomposition in bioreactors (Maslikov et al., 2012).



## Sample collection of biogas on the municipal solid waste landfill No. 1

On the municipal solid waste landfill No. 1 the operations were conducted in autumn 2014. The temperature was +5°C during sample collection. The measures were made in closed sections of the landfill's body, in 49 available points at a pitch of 50 meters. (Fig. 2). The sample collection was hold in 50 cm depth. The methane, carbon dioxide, hydrogen sulphide, oxygen and carbon monoxide gas content was defined.

In accordance with biogas investigation findings, the areas with high methane concentration (50 and more vol%) were discovered (4,6). The preferable for gas-collecting system creation is area 4. One of the advantages of its reclamation is the absence of carbon monoxide, and, what's more, lower concentration of hydrogen sulphide. The areas 6 is immediately adjacent to the section of wastes combustion, and for this very reason is inaccessible for gas-collecting system creation.

## Sample collection of biogas on the Municipal solid waste landfill No. 2

In the same period the analogous sample collection was hold on the Municipal solid waste landfill №2. The atmospheric temperature was +2°C. The measurements were made within 24 points on the landfill's body (Fig. 3). The sample depth was 50 cm.

In accordance with biogas investigation findings, the area with high methane concentration (50 and more vol%)

*Figure 3. The site plan of the municipal solid waste landfill No. 2 with an indication of sample collection points: 1 – the operated area, 2 – the preferable area with high methane concentration for biogas potential usage. 3 – the areas of wastes combustion*



was discovered (2), preferable for gas-collecting system creation. The absence of carbon monoxide is fixed there, and lower concentration of hydrogen sulphide is observed in some particular cases (30 ppm).

## Summary

The field researches on the MSW landfills No. 1 and No. 2 show that biochemical processes of decomposition of wastes with the biogas emission with a high methane concentration (50 and more vol%) proceed actively in MSW landfills under the conditions of severe climate.

Preferable areas of the landfills for biogas potential usage were selected.

The researches discovered that the areas of wastes' combustion on landfills are adjacent to areas with high methane concentrations that indicates the urgent need to work on degasification of the landfills.

## References

- Babilotte, A., Lagier, T., Fiani, E. & Taramini, V. (2010) Fugitive methane emissions from landfills: Field comparison of five methods on a French landfill. *Journal of Environmental Engineering*, 136(8): 777–784.
- Biszek, M., Pawłowska, M. & Czerwiński, J. (2006) Evaluation of measurement methods and estimation of biogas emission from landfills. *Rocznik Ochrona Środowiska*, 8: 27–43.
- Chechevichkin, V. N. & Vatin, N. I. (2014) Megacities land drainage and land runoff features and treatment. *Applied Mechanics and Materials*, 614–642: 409–415.
- Chusov, A. N., Maslikov, V. I. & Molodtsov, D. V. (2013) Researches of Biogas Composition on Landfill. *Safety in Technosphere*, 6: 24–28.
- Di Trapani, D., Di Bella, G. & Viviani, G. (2013) Uncontrolled methane emissions from a MSW landfill surface: Influence of landfill features and side slopes. *Waste Management*, 33(10): 2108–2115.
- Fedorov, M. P. (2001) Monitoring za vozdeystviem poligona tverdykh bytovykh otkhodov na okruzhayushchuyu sredu [Monitoring the impact of a municipal solid waste landfill on the environment]. *Regional Ecology*, 3–4: 48–51.
- Fedorov, M. P. & Maslikov, V. I. (2003) Problems of recycling of municipal solid waste in conditions of northern regions. *Science and Technologies for Sustainable Development of the Northern Regions: International Scientific-Practical Conference St.-Petersburg 23 April 2003*, pp. 197–200.
- Fedorov, M. P., Korablev, V. V., Maslikov, V. I. & Ioksha, E. O. (2008) “Uglerodnye” investitsii v energeticheskoe ispol'zovanie poligonov TBO [“Carbonic” investments into energy use of MSW landfills]. *Ekologiya i zhizn': nauchno-populyarnyy i obrazovatel'nyy zhurnal*, 4(77): 16–22.
- Fedorov, M. P., Zinchenko, A. V., Korablev, V. V., Maslikov, V. I., Chusov, A. N. & Ioksha,



E.O. (2008) Energeticheskoe ispol'zovanie emissii metana na poligone tverdykh bytovykh otkhodov Sankt-Peterburga dlya sokrashcheniya parnikovykh vybrosov i privlecheniya investitsiy v rekul'tivatsiyu [The energy usage of methane emissions from a municipal solid waste landfill in St. Petersburg to reduce greenhouse gas emissions and attracting investment in recultivation]. *St. Petersburg State Polytechnical University Journal*, 6(70): 135–142.

Fellner, J. Schöngrundner, P. & Brunner, P. H. (2003) Methanemissionen aus Deponien Bewertung von Messdaten (METHMES). Wien: Technische Universität Wien.

Livshits, A. B. & Gurvich, V. I. (1999) Utilizatsiya svalochnogo biogaza -mirovaya praktika, rossiyskie perspektivy [Utilization of landfill biogas-world practice, Russian prospects]. *Chisty gorod*, 2: 8–17.

Maslikov, V. I., Chusov, A. N., Molodtsov, D. V. & Ryzhakova, M. G. (2012) The area based determination of biogas emission from msw landfill for the geoecological conditions assessment and substantiation of management of waste decomposition in the process of recultivation. *St. Petersburg State Polytechnical University Journal*, 2-1(147): 260–265.

Maslikov, V. I., Chusov, A. N., Negulyaeva, E. Y., Cheremisin, A. V. & Molodtsov, D. V. (2012) Laboratory research of waste decomposing in bioreactors for assessment of biogas potential and choice of measures for aftercare phase. *St. Petersburg State Polytechnical University Journal*, 2-2(147): 229–235.

Rettenberger, G. (1982) *Grosstechnische Entgasung der Deponie "Am Lemberg". Teilbericht 2 zu: Rettenberger, Gerhard: Untersuchung zur Entstehung, Ausbreitung und Ableitung von Zersetzungsgasen in Abfallablagerungen*. Berlin: Umweltbundesamt.

Rettenberger, G. (1991) Die Bedeutung der Methan-, Kohlendioxid- und  $\text{H}_2$ -Emissionen von Deponien für die Atmosphäre. In Rettenberger/Stegmann (Eds.) *Deponiegasnutzung. Trierer Berichte zur Abfallwirtschaft* Bd. 2. Economica Verlag, pp. 9–26.

Russian Federal Agency for Science and Innovation (2009) *Metan so svalok TBO* [Methane from msw landfills]. Moscow: Russian Federal Agency for Science and Innovation.

Ryzhakova, M. G., Maslikov, V. I., Chusov, A. N. & Korablev, V. V. (2014) The environmental problem of household hazardous waste generation and treatment. *Applied Mechanics and Materials*, 675–677: 761–769.

Sauri-Riancho, M. R., Gamboa-Marrufo, M., Reza-Bacelis, G., Cahuich-Poot, N. & Méndez-Novelo, R. (2010) Superficial Methane Emissions from a Landfill in Merida, Yucatan, Mexico. *Ingeniería Investigación y Tecnología*, XIV(3): 299–310.

Savvichev, A. S. (2005) Bioreaktor na meste svalki [Bioreactor on landfill site]. *Khimiya i zhizn*, 11: 20–23.

S NiP [construction norms & regulations] (1996) 11-02-96 *Engineering Survey for Construction*. Basic Principles.

SNiP [construction norms & regulations] (1999) 23-01-99\* *Building Climatology*.

Vavilin, V. A., Lokshina, L. Y., Nozhevnikova, A. N. & Kalyuzhnyy, S. V. (2003) Svalka kak vobudimaya sreda [Landfill as excitable environment]. *Priroda*, 5: 54–60.

Aleksey Tsyb

# “Alexandria school” in II–III centuries A.D.\*

## Abstract

The article covers a whole set of cultural and historical features of the II–III centuries A.D. that most strikingly characterize Alexandria of Egypt, once one of the most prominent culture phenomena of the Roman and Hellenistic world picture.

Keywords: History of philosophy, history of antique philosophy, Plato’s teaching, Alexandrian exegesis, Clement of Alexandria, Origen.

---

\* The project “Alexandria School of Clement and Origen and its Heritage” is being developed with financial support of the Russian Foundation for Humanities, grant № 15-03-00813a.

*Times of Clement and Origen.* The II and III centuries A.D. mark both the end of Hellenism and the beginning of the Roman–Hellenistic period of the world history with its tendency to absolute universalism (30; 28: 112–140; von Cäsarea, E., 1984: 49–72; 44: 73–87). In the state sphere, this trend reveals itself in the creation of the Empire, in the economic sphere – in the establishment of a single Mediterranean market, in the cultural sphere – in the syncretic fusion of formerly incompatible multiethnic cultural elements. Cultural syncretism affected all aspects of spiritual life. Syncretic religion transformed ancient cults into new ones (Serapis in Alexandria, Isis in Greece and Rome (59: 209–273)). Syncretic arts borrowed plots and means of expression while syncretic philosophy created new mega-metaphysical teachings arising after a long period of skepticism and philosophical relativism.

Alexandria of Egypt, one of the largest centers of the Roman-Hellenistic world, unites all this complex of cultural historic facts. The most intense and interesting period for the Alexandrian phase of philosophy is the second part of the II–III centuries A.D. Historiography divides Alexandrian teachings into three branches: pagan Neo-Platonism, early Christianity and Gnosticism, all of which, though opposed formally and externally, possess similar structural paradigms. Now there are various viewpoints giving classification of these late philosophical doctrines of the Roman and Hellenistic world. One of the viewpoints refers to the three overall trends of their formation. Each trend strove to eliminate every possible contradiction between Aristotle and Plato as well as between Holy Scripture and the pagan philosophy. These trends are eclecticism, harmonization and syncretism (Von Stein, 1875: 57). The philosophical trends typical of the Alexandrians had different levels of self-identification regarding the above-mentioned Neo-Platonism, Gnosticism and Christianity.

*“Christian school” of Alexandria in the II–III centuries A.D. viewed from historical and philosophical perspectives.* The question is necessary: to what of the specified tendencies (eclecticism, harmonization and syncretism) Alexandria’s Christian theological School belonged more? (13; 9: 305; 10; 45; 41; Meinfort, 1928; Hoffman, 1975; Kreuger, 1843; 60; 43) A vast amount of the research literature on exegesis (48: 43; 32: 50–53; 2: 247–268) suggests that a new type of a Platonist-Christian synthesis was formed in Alexandrian exegesis, the so-called “Middle Platonism” (50; 33: 94–96; Weber, 1962; Origène, 1948: 98). Clement and Origen should be viewed as two representatives of the Alexandrian school since the founder of the school, Pantene, a former stoic, did not seem to leave any written evidence of his activity (Hammerstädt, 1991; 5; 15: 281–282; 58: 68–77; Taulers Medulla, 1843).

*Clement of Alexandria. Biography and teaching.* Born in Athens ca. 150 A.D. to pagan Greek parents, he was brought up as a Hellene, initiated into the Eleusis mysteries and educated in Greek. Following the example of many ancient thinkers, he undertook a long journey visiting the major cultural centers of the Mediterranean, travelling across Greece, Palestine and Egypt, and working with different spiritual mentors. After Pantene’s death, Clement became the head of the Christian School in Alexandria where he stayed until 202–203 A.D., when, after the persecution of Septimius Sever, he went to Cappadocia and Antioch (Kelber, 1958: 203).

We know of only four Clement’s works: “Protrepticus”, “Paidagogos”, “Stromata”, and a brief commentary on the Gospel of Mark (10: 17–31) “Who is the rich man that shall be saved?”. The first three of the above-mentioned books are the parts of a trilogy. The structure of the trilogy is presented in the first chapter of “Paidagogos” (20: 205). The contents of



the first part are an invitation to Christian holiness meant to inspire and enrich the spirit with divine grace. The second part refers to the will and the movements of the soul as the tools to form the Christian's character. These two works contain philosophical problems, mostly of the logosophical and theological nature, that are further developed and finalized in the main work by Clement the "Stromata" (Clemens Alexandriner, 1906). This is the work where Clement presents a complete set of philosophical and Christian ways of the knowledge of God (49: 125; 50: 52–58; 51: 168–177; 52: 80–81).

The demarcation between Hellenistic philosophy and the Eternal Logos requires revealing the nature of "true gnosis": the three books of this treatise (I, II, V) are devoted to problems associated with obtaining the knowledge of the Truth. Neither inductive nor deductive reasoning allows knowing the parts unless you know the whole (Strom. I 14).

Analyzing preceding epistemological theories, Clement delineates his conception of the Logos, the principle of Christian Gnosis, partly similar to Plato's capacities of the human soul from the "Republic" (YI 509d–533d). Plato's conception is radically modified by Clement towards mystical intuitivism. What in the antique Platonic tradition is represented as an intellectual faculty, ability to comprehend by rational powers (Plato's dialectical thinking), Clement describes only as Christian faith-intuition that enables "understanding the essence of knowledge" (Strom. II 4). This faith is a necessary stage before comprehending the Divine Logos. While describing "gnosis" Clement sharply criticizes Epicurean Atomism for denying providence and the Stoics for their teaching that presents the Deity as "a body pervading the vilest matter" (Strom II 11).

Unlike his follower Origen, Clement believes that rational forms of kataphatic descriptions of God are not so important as apophatic ones. He focuses on the theological and metaphysical characteristics of Logos – Christ who takes forms of "word", "law", divine energy and the Cosmic Instructor, providing the link between the human gnosis and the possibility of comprehending the Creator. From time to time, Clement poses as a mystagogue and explains the possibility of such a link through obtaining ecstatic and ascetic states. He tends to explain "Christian Gnosis" from a common sense perspective and by simplifying religious practices accumulated in pagan cults, which makes Clement a predecessor of European "Personalism" and Intuitivism (1; 12; Bejarano, 1927: 182–196).

Stoical semantics, borrowed by Clement, states that Logos is a sign, truth, idea, thought, that God grants to a human being for knowing, and the Creator is interpreted by the Church Father platonically: being the source of all good thing, he is "the good Monad" (Strom. IV 23; IV 16). Good is the finest and the most non-relational definition of God, logically preceding his definition as the Creator; God created the world and rules it through his Logos. As a being, he is far from the world, because the Created cannot be close to the Uncreated, but he is close to the world of its energy – Logos. Clement's Platonism is developed and supplemented by the peripatetic synthesis in the works of his follower Origen.

*Origen. Biography and teaching.* The astonishing fact that Origen wrote 6,000 books puzzled his contemporaries and was remarked on by Vladimir Soloviev, the author of one of the best-written articles on Origen (54: 141–145). Even in the times of the most prolific writers, such fame was achieved by very few. Origen, who was close to 70 when he died (189–254), was among those few. Born in Alexandria, he lost his father in 202, when he was martyred as a Christian during the persecution of Septimus Sever. When Origen was 17,

he went broke and started teaching grammar and elocution. Later, he was invited to the school where Clement of Alexandria had previously taught. In 228, he traveled to Greece, and in 231, he had to move to Caesarea in Palestine. Then, he made a trip to Athens and another journey to Arabia. During the Decian persecution (249–251), he was imprisoned in Tyre where he died around 253–254.

Naturally, only a fraction of Origen's works has come down to us. The most famous of them are treatises "Letters of Origen", "Against Celsus", "Commentary on Matthew", "Homilies" (Origenes 1978–1984; 1911; 1967–1969; Meinfort, 1928; Origenes, 1935–1955; Redepenning, 1841), and some others. Numerous biblical commentaries were written by Origen in his early years *ad marginem* (Origenes, 1967–1969: 379–380), which invoked the allegations of there being "two Origenes" (46).

The first work in this succession is Origen's "Commentary on John" [Origenes, 1964–1992; Preuschen, 1908: IX–XI], which probably took a few years to create. It has become his most substantial work but, most importantly, it is instrumental in understanding his philosophy as it has barely been altered over the years and remains closest to the original. Despite the fact that the great majority of both domestic and foreign divine interpreters engaged in researching "Commentary on John" tended to present one-sided views, the works of A.F. Losev (31: 860–862; 32) and K.O. Weber (1962) have proven that it offers some insight into the antique philosophical origins of Origen's thought.

According to E.R.Redepenning, biographical information concerning the creation of the "Commentary" is scarce [Redepenning, 1841: 379–380]. It is known that it was in Alexandria where Origen wrote his first five books and began working on the sixth. However, it is still not known when exactly he wrote the rest of his books. E.R.Redepenning was right to point out inconsistencies not only in this early work but also in his many other treatises, which refutes the common opinion that Origen systematized Christian creed (48: 43).

Nevertheless, the contents of most of his treatises indicate that the central problem for Origen is forming a tripartite divine hierarchy. He solves this problem by actively using the philosophical language of Aristotle and Plato in his theology. It is impossible to define the full range of the theologian's philosophical problems as one and the same topic can be discussed in different works. On the other hand, a number of such concepts as sin, the nature of salvation, the essence of God, and Trinity can be reconstructed only from separate extracts as they are nowhere presented in full.

*Defining Platonic and Aristotelian concepts.* The theorizing done by Clement and of his follower Origen is aimed at solving the problem of the first "theological" stage of Christian philosophy (6: 301–305). Moreover, this theorizing concentrates on both God the Mediator (Christ) and the theories of cosmogenesis and cosmology. Cosmogonic noology (a teaching on the cosmic mind) viewed from the standpoint of Plato and Aristotle has become a common epistemological field or, as M.Foucault put it, "an operational zone" (5) for the experiments of the Alexandrian interpreters of the Old and New Testaments, Gnostics, Neo-Platonists. Though there are several ways to identify the philosophical schools of the II–III centuries, only one approach seems to hold the most promise - regarding the differences as a degree of Orthodoxy and Heterodoxy in the orientalized Platonism (47: 64). This statement refers to the contents of "Paidagogos" by Clement and Origen's "Letters" by enabling "orthodox" Platonism and Aristotelianism to penetrate into Christianity (20: 58–76).

## Sources and References

1. Аврелий Августин. - Исповедь (7 X, 10 X). - М., 1991.
2. Афонасин Е.В. «Агностикос тхеос»: учение о трансцендентном божестве в Строматах Климента Александрийского // Историко-философский ежегодник. - М., 1996. - С.247–268.
3. Bejarano, M. M. (1927) *Historia de la filosofía en España hasta el siglo XX*. Madrid,.
4. Berchman R. M. (1984) *From Philo to Origen: Middle Platonism in Transition*. Brown Judaic Studies 69. Scholars: Chicago.
5. Болотов В.В. Учение Оригена о Святой Троице.- СПб., 1897.
6. Болотов В.В. Лекции по истории Древней Церкви., М.: Издание Спасо-Преображенского Валаамского Ставропигиального монастыря, 1994. Т.2. - 474 с.
7. Clemens Alexandriner (1906) *Stromata*. Ed. Staehlin, O. Vol. 2, Books 1–4. Leipzig.
8. Stählin, O. (1934-38) *Des Clemens von Alexandria ausgewählte Schriften aus dem Griechischen übersetzt*. Bibliothek der Kirchenväter. Set II, Vol. 7, 8, 17, 19, 20. München.
9. Виндельбанд В. История Древней философии. - СПб, 1902.
10. Гэтч Э. Эллинизм и христианство // Общая история европейской культуры. - СПб., 1903, т.УІ.
11. Origène, D. J. (1948) *Génie du Christianisme*. Ed. Mauriac, F. Paris: Éditions de la Table Ronde.
12. Дионисий Ареопагит. Мистическое богословие. – Киев: Издание христианской благотворительно просветительской ассоциации «Путь к истине», 1991. – 390 с.
13. Дмитриевский В.П. Александрийская школа. Очерк из истории духовного просвещения от I до начала V века по Р.Х. - Казань, 1884.
14. Егоров А.Б. Социально-экономическое и политическое развитие ранней Римской империи // История древнего мира. Упадок древних обществ (под ред. И.М.Дьяконова, В.Д.Нероновой, И.С. Свенцицкой). М.: Главная редакция восточной литературы, 1989. - С.49–72.
15. Евсевий Памфил. Церковная История, V, 10-12 // Сочинения Евсевия Памфила, перевод с греч. При СПб Духовной Академии. - СПб.: В типографии Е.Фишера. Т.І. - С. 281–282.
16. von Cäsarea, E. (1984) *Kirchengeschichte*. Ed Kraft, H., Haeuser, P. & Gärtner, H. A. Darmstadt.
17. Историко-критический очерк // Ориген. О началах. - Самара, 1991.
18. Hammerstädt, J. (1991) *Der trinitarische Gebrauch des Hypostasisbegriffs*. Jahrbuch für Antike und Christentum, 34..

19. Hoffman, E. (1975) *Platonismus und christliche Philosophie*. Zuerich; Stuttgart.
20. Каптен Г.Ю. Критика Оригенизма в философии Максима Исповедника // АКАДΗΜΕΙΑ: материалы и исследования по истории платонизма, Выпуск 9.-- СПб. - 2014 –С.58–76.
21. Каптен Г.Ю. Критика оригенизма в философии Максима исповедника. Диссертация на соискание ученой степени кандидата философских наук / Российский государственный педагогический университет им. А.И. Герцена. Санкт-Петербург, 2010.
22. Каптен Г.Ю. Критика оригенизма в философии Максима Исповедника. Автореферат диссертации на соискание ученой степени кандидата философских наук / Российский государственный педагогический университет им. А.И. Герцена. Санкт-Петербург. - 2010.
23. Каптен Г.Ю. Заметки по гносеологии Св. Максима Исповедника // Вестник Русской христианской гуманитарной академии. 2007. Т. 8. № 1. - С. 18–26.
24. Каптен Г.Ю. Гносеологическое значение учения об обожении в критике оригенизма максимом исповедником // Вестник Ленинградского государственного университета им. А.С. Пушкина. 2010. № 2 (1). - С. 16–23.
25. Kelber, L. (1958) *Die Logoslehre. Von Heraklit bis Origenes*. Stuttgart.
26. Климент Александрийский. Строматы (перев. Н.Н. Корсунского). - Ярославль, 1898.
27. Климент Александрийский. Педагог (перев. Н.Н. Корсунского и Г.Чистякова). - New York, Москва, - 1996.
28. Кнабе Г.С. Римское общество в эпоху ранней империи // История древнего мира. Упадок древних обществ (под ред. И.М. Дьяконова, В.Д. Нероновой, И.С. Свенцицкой). - М.: Главная редакция восточной литературы, 1989. - С.112-140.
29. Krueger, L. (1843) *Ueber Vaerhaeltniss des Origenes zu Ammonius Sakkas. Zeitschrift fuer histor. Theologie*, 13(7).
30. Левек П. Эллинистический мир. Пер. с франц. Е.Н. Чиковой. Коммент. и послесл. Г.А. Кошеленко. - М.: Наука. Главная редакция восточной литературы, 1989 // Levéque P. *Le monde hellenistique*. - Paris, Armand Colin, 1961.
31. Лосев А.Ф. Очерки античного символизма и мифологии. - М.: Издательство «Мысль», 1993.
32. Лосев А.Ф. История античной эстетики. Итоги тысячелетнего развития. - М.: Издательство «Мысль», 1992.
33. Майоров Г.Г. Формирование средневековой философии. - М.: Издательство «Мысль», 1979. - 430 с.
34. Meinfort, Y. (1928). *Der Platonismus bei Clemens Alexandrinus.. Heidelberger Abhandlungen zur Philosophie und ihrer Geschichte*. Tuebingen.

35. Origenes (1978-1984) *De principiis* (On First Principles): Henri Crouzel and Manlio Simonetti, eds., Origène: *Traité des principes*, 5 vols., Sources chrétiennes 252 (Books 1–2), 253 (Commentaries and fragments of Books 1–2), 268 (Books 3–4), 269 (Commentary on and fragments from Books 3–4), 312 (index) (Paris: Éditions du Cerf, 1978–1984). See also Vol. 5 of Origenes Werke, GCS 22 (Leipzig: Hinrichs, 1913).
36. Origenes (1911) *Scolienkommentar zur Apokaypse Johannis*. Ed. Diobouniotis & Harnak. Leipzig.
37. Origenes (1967-1969) *Contra Celsum* (Against Celsus): Marcel Borret, ed. Origène: *Contre Celse*, Sources chrétiennes 132 (Books 1-2), 136 (Books 3-4), 147 (Books 5-6), 150 (Books 7-8) (Paris: Éditions du Cerf, 1967-1969)
38. Origenes (1964–1992) *Commentarii in evangelium Johannis* (Commentary on the Gospel of John): C. Blanc, ed., Origène: *Commentaire sur saint Jean*, 5 vols., Sources chrétiennes 120, 157, 222, 290, 385 (Paris: Éditions du Cerf, 1964-1992). See also vol. 4 of Origenes Werke, GCS 10 (Leipzig: Hinrichs, 1903).
39. Origenes (1935–1955) *Commentarium in evangelium Matthaei* (Commentary on the Gospel of Matthew): R. Girod, ed., Origène: *Commentaire sur l'Évangile selon Matthieu*, Sources chrétiennes 162 (Paris: Éditions du Cerf, 1970), vol. 1 [x–xi]. See also Vols. 10, 11, and 12.1–2 of Origenes Werke, GCS 38, 40, 41 (Leipzig: Hinrichs, 1935–1955; vol. 3 revised, 1968).
40. Preuschen, E. (1908) *Einleitung. Die griechischen christlichen Schriftsteller der ersten drei Jahrhunderte*. Origenes Werke, IY Bd., Der Johanneskommentar S.IX–XII. Leipzig.
41. Пфейдерер О. Подготовка христианства в греческой философии. - СПб., 1908.
42. Redepenning, E. R. (1841) *Origenes. Eine Darstellung seines Lebens und seiner Lehre*. Vol 1–2. Bonn.
43. Саврей В.Я. Александрийская школа в истории философско-богословской мысли. Издательство «КомКнига». - М., 2005.
44. Свенцицкая И.С., Кобельман А.Б. Восточные провинции Римской империи // История древнего мира. Упадок древних обществ (под ред. И.М.Дьяконова, В.Д.Нероновой, И.С. Свенцицкой). М.: Главная редакция восточной литературы, 1989. - С.73–87.
45. Сергиевский А. Отношение апологетов Восточной Церкви к языческой философии // «Вера и разум», №86, 1–2.
46. Серегин А.В. К вопросу о двух Оригенах // Богословские Труды, Вып. 42. М.: Издательство Московской Патриархии, 2009.
47. Сидоров А.И. Плотин и гностики // Вестник древней истории. 1879. №1.
48. Соколов В.В. Средневековая философия. - М., 1979.
49. Соколова М. И. Концепция уподобления у александрийцев (Филон Александрийский, Климент Александрийский, Ориген, Плотин)// Античный мимесис. Сб. статей. СПб.: Санкт-Петербургское Философское общество, 2008. С. 116–148.

50. Соколова М.И. Пайдеия в платоновском «Государстве»: социальное и абсолютное // ΠΛΑΤΩΝΟΠΟΛΙΣ: философское антиковедение как междисциплинарный синтез философских, исторических и филологических исследований Материалы 5–7 летних молодежных научных школ 2008–2010 г., научные отчеты СПб Платоновского философского общества. - Санкт-Петербург. - скифия-принт. - 2012, - С.125–130.
51. Соколова М.И. Гносеологические и этические основания понимания символизма в «Строматах» Климента Александрийского // Материалы IV Летней международной молодежной научной школы ΠΛΑΤΩΝΟΠΟΛΙΣ: философское антиковедение как междисциплинарный синтез философских, исторических и филологических исследований. Отв. ред. канд. филос. наук А.В.Цыб. - Санкт-Петербург. – 2005 - С. 52–58.
52. Соколова М.И., Бытие как φύσις и бытие как ιδέα (М. Хайдеггер Введение в метафизику) и Строматы Климента Александрийского. Δόξα и τέλος // «Универсум платоновской мысли. Платоновская и аристотелевская традиции в античности и в европейской философии: Материалы XIII международной историко-философской конференции. Отв. ред. канд. филос. наук А.В.Цыб. Санкт-Петербург, 2005, С.168–177.
53. Соколова М.И. Естество и образ. Образование в Средние века и в Новое время, // Научная сессия ГУАП: Сборник в 4-х ч. Ч. III. Гуманитарные науки, - 2009. - С. 80–81.
54. Соловьев В.С. Ориген // Энциклопедический словарь Ф.А. Брокгауза и И.А. Ефрона, XII, с.141–145
55. Taulers Medulla (1843). *Taulers Medulla animae oder von der Vollkommenheit aller Tagenden*. Frankfurt am Main.
56. Универсум Платоновской мысли: рационализм или философская религия. Эпистемология Платона: материалы IV-й историко-философской конференции 14 мая 1996 г. и историко-философского семинара 29 марта - 2 апреля 1997 г. - СПб.: Издательство С.-Петербургского университета, 1997. – 152 с. // Санкт-Петербургское Платоновское философское общество научно-образовательный информационный ресурс URL: [http://www.platoakademeia.ru/index.php/ru/conferences/itemlist/category/14-upt\\_4](http://www.platoakademeia.ru/index.php/ru/conferences/itemlist/category/14-upt_4) (дата обращения 24.04.2015)
57. Foucault, M. (1966) *Les mots et les choses. Une Archeologie des sciences humaines*. Paris: Callimard.
58. Цыб А.В. Античная философия в александрийской экзегетике II-III веков н. э.: дис. ... канд. филос. наук. - СПб. 1999. – 154 с. // Научная библиотека диссертаций и авторефератов disserCat URL: <http://www.dissercat.com/content/antichnaya-filosofiya-v-aleksandriiskoi-ekzegetike-ii-iii-vekov-n-e#ixzz3YDQHTw9S> (дата обращения 24.04.2015).
59. Шичалин Ю.А. Возникновение европейской комментаторской традиции // Историко-философский ежегодник. - М. : Наука, 1989. - С.68–77.

60. Шгаерман Е.М. Социальные основы религии Древнего Рима. М., 1987.
61. von Stein, H. (1875) *Verhältniss des Platonismus zur Philosophie der christlichen Zeiten*. Göttingen.
62. Weber K. O. (1962) *Origenes der Neuplatoniker. Versuch einer Interpretation*. München: C.H.Beck'sche Verlagsbuchhandlung.
63. Wynand de Beer (2015) *The Platonist Christian cosmology of Origen, Augustine, and Eriugena* // Режим доступа: [http://www.earlychurch.org.uk/pdf/origen\\_de-beer.pdf](http://www.earlychurch.org.uk/pdf/origen_de-beer.pdf) (accessed 24.04.2015).





