Qualitative Research in Psychology
Publication details, including instructions for authors and subscription information:
http://www.tandfonline.com/loi/uqrp20

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Version of record first published: 03 Jun 2009.

To cite this article: Cathrine Hasse & Stine Trentemøller (2009): The Method of Culture Contrast, Qualitative Research in Psychology, 6:1-2, 46-66

To link to this article: http://dx.doi.org/10.1080/14780880902900903

Qualitative Research in Psychology, 6:46–66, 2009

ISSN: 1478-0887 print/1478-0895 online
DOI: 10.1080/14780880902900903

Routledge
Taylor & Francis Group

The Method of Culture Contrast

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In this article, we suggest that research is a practical activity building on local category systems belonging specifically to research (etic categories) as well as categories belonging specifically to the national culture of the researcher (emic categories) (Pike 1967). Much cross-cultural research can be argued to rest on what has been called implicit comparisons (Nader 1994) of such categorisations. We assume that research of local activities, such as schooling and higher education, is influenced by the researcher's emic and etic categorisations. To get beyond the risk of reproducing the researcher's cultural background (i.e., emic categorisations) in the analysis of cross-cultural comparisons we suggest that the categorisations the researcher use in her tests and fieldwork descriptions are taken to be part of the research itself, rather than simply being an underlying (taken for granted) framework on which the research is conducted.

First we present a recent study of European universities as culturally diverse working places and we present an approach in which the researcher's emic and etic categorisations can be challenged when contrasted with each other (Hasse & Trentemøller 2008). Second, we argue for the need for a shared understanding among researchers in international projects. We present the method of culture contrast as one way of dealing with the inevitable problem of different perceptions of words and their meanings. This method does not rest on the approach employed in traditional cross-cultural studies where a generalized category, as a tertium comparationis, is identified and tested in two (or more) different cultural settings. Through a reflexive process of research, we show how patterns of connections can be contrasted and thus made explicit leading to new and surprising challenges of the researcher's emic categorisations. We illustrate the case with examples of different understandings of three terms, hierarchy, family, and sexual harassment, in the Understanding Puzzles in the Gendered European Map (UPGEM) project.

Keywords: culture; word meaning; activity systems; cross-cultural studies; connectivity; cultural models; culture contrasts

Introduction

Since the 1930s there has been an interest in cross-cultural studies of education and learning. Many of these studies have been constructed as comparable tests (Levinson & Ember 1996, p. 262).[1] In cultural historical activity theory, this approach has been criticized for not taking learning in everyday situations into account. This critique can be found in early

[1]These cross-cultural studies have been considered to belong to the wide field of cultural psychology. Cultural psychology as it is presented by, for example, Michael Cole (1996), is in some ways entwined with cross-cultural psychology in so far many of the questions raised in cultural psychology are also debated in cross-cultural studies. However, the two approached can also be distinguished from each other in so far cultural psychology is mainly interested in how local social practices create psychological processes – often discussed as the formation of psychological processes in cultural historical activities, whereas cross cultural studies in general aim at testing generalizations about human psychological processes.

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works by, among others, Michael Cole and Jean Lave. One example is the learning of the Liberian Kpelle children, who performed badly in tests compared with American children in school mathematics. However, in farming practices centering on amounts of rice, rather than problems set by the school curriculum, Cole and his team found a coherent system of measurement appropriately coded in the Kpelle language. Using this system, the researchers found circumstances in which non-literate Kpelle outperformed Yale college students (Cole et al. 1971; Sharp et al. 1979; Scribner & Cole 1973). This incited a new interest in the relation between activity, learning and cultural context which is still at the core of much cultural psychology. It is from this research we learn that local category systems are embedded in practical activities and that informants may be unable to construct the same categories when used in a different type of activity such as those of a conceptual sorting experiment (Cole et al. 1971). Although the results of this research have widely enhanced our understanding of learning in cultural contexts, there has been little debate of the wider methodological implications of these findings. In the international Understanding Puzzles in the Gendered European Map (UPGEM) research group, we came to face the methodological implications of how category systems are embedded in local practices in the research process and our discussion here builds on the new insights gained through that process.

The UPGEM Project as Case

The UPGEM Project was a European research collaboration among Denmark, Estonia, Finland, Italy, and Poland. It was financed by the European Union's sixth framework programme, "Structuring the European Research Area, Science and Society; Women and Science" and ran from 2005–2008 (www.upgem.dk).

Need for Diversity

Empirically, the project has limited its area of research to physics departments and institutes in five partner countries which differ greatly regarding cultural historical background. On the basis of interviews and participant observations in the partner countries, the group has compiled a database of more than 16,000 relevant quotes from 208 interviews (including 50 from Poland and Italy and 36 from Denmark, Estonia, and Finland) with physicists from different subdisciplines such as experimental, theoretical, and applied physics.

The interviewed physicists are either active or have left physics research after having embarked on a Ph.D. degree, as a minimum. These informants represent physicists at different stages of their career and with different aims and interests in physics research.

Approximately half of our informants look back on their career in academia from their present position as outsiders ("leavers"), while the other half talk from their position as stayers, that is, scientists who are still active in physics research in academia. Our broad definition of a leaver is a physicist who has begun or finished a Ph.D. in physics but has left physics research in academia in his or her home country. By including interviews with leavers in the empirical data material, UPGEM adds a hitherto unexplored dimension to the understanding of gendered career paths in academia as it allows the project to obtain a unique insight into the local context from an external retrospective perspective. Moreover, we get the opportunity to contrast statements from stayers and leavers about identical topics within the same national cultural context. This approach opens up the possibility of challenging the researcher's etic categories in similar ways as contrasting across national

contexts does. The reason for incorporating this range of diversity in the research design is to encompass and thereby explore different cultural contexts in the hope of capturing different culturally formed connections within the chosen area of research.

The research team behind UPGEM was structured around a core group of qualitative researchers with a senior partner and one or two research assistants in each country. In all, the research group consisted of 18 research assistants covering interests and disciplinary backgrounds from anthropology, philosophy, gender, culture studies, psychology, and linguistics. The UPGEM project is a collaboration between researchers with very different working conditions and research backgrounds, which added a level of complexity to the research work. The purpose of bringing in different nationally formed cultural perspectives was to use the diversity as the basis for a cross-cultural exploration of how universities as workplaces create different possibilities for researchers' career paths (Hasse, Sinding & Trentemøller 2008a).

During the research process it also became an aim to challenge the UPGEM researchers' etic and nationally formed emic categories. Thereby, we as researchers were also integrated into the object of study as an inevitable construction of the empirical data. In that process, it was an advantage that the empirical data included different levels of complexity in relation to the researchers' disciplinary background, the researchers' and informants' nationality, and the informants' position as either stayer or leaver. At one level, the diversity is present in the group of researchers. At another level, the diversity consists in the range of informants.

Need for a Shared Understanding

In spite of the difficulties handling the methodological implications inherent in an international research group conducting cross-cultural studies, we managed to turn the complexity into one of the strong points, as we were able to develop and employ the culture contrast method in the research work.

The research work in UPGEM was developed in three phases. The first phase was initiated by a six-week long Innovation Seminar in Denmark, where all project members met to develop a shared understanding of the common objective in the project and to refine the project design by developing a shared interview and field guide. Moreover, we were working toward gaining a shared understanding of thematic, practical, methodological, and theoretical issues in the project and working with the central etic categories male/female, stayer/leaver, physics, activity, and culture.

The ideology of the Innovation Seminar was first to create a shared understanding of the project objective in order to facilitate our discussions of data and analyses throughout the period of research work in the home countries. Second, it derived from a wish to ensure a platform to explore and discuss in detail the culture contrasts in our research material. Though the latter did not serve as a direct aim in the first phase of the project, it has been explored throughout the project, which is inevitable when so many people enter into a truly close collaboration.

In the second phase, the empirical data (mostly interviews) were gathered. To be able to conduct collaborative research that integrates research assistants and partners, with a broad diversity of academic training, it is crucial to ensure and uphold a shared motive and understanding of the analytical tools used in the project. For that reason, the project design also involved a number of working seminars in the respective partner countries at which research assistants and partners met to learn from each other and work together.

As mentioned, UPGEM is a study in which the researchers became the object of study in different ways. Like our informants, we too are researchers, and the conditions of the physicists' research context can in many ways be applied to our own contextual conditions as researchers in academia. Moreover, we also constituted part of the object of study because the project investigates the impact of culture on everyday life at the university workplace. Since we, as researchers, are also bearers of nationally formed culture, it is relevant to make use of the diversity in the research team to discuss and contrast the different national cultural contexts inherent in the project. The project takes its point of departure in the complexity of everyday life and from this position aims at reflecting the life of both the informants and the researchers.

The initial national analyses (based on the common set of analytical tools but not necessarily a common set of theoretical perspectives) formed five national reports compiled in one publication (Hasse, Sinding & Trentemøller 2008a).

In the third phase, the Danish research team analysed and wrote up aspects of culture contrast in the data material by drawing on the previous work of the project members and through feedback and discussions with the research assistants concerning their views on the aspects called forth by the culture contrast analysis.

Both the field guide and the interview guide were formulated in collaboration in English but translated into local languages when used in the local national contexts. To be able to decode the deeper levels of supposedly shared semantic meaning in the spoken words, it was decided to conduct the interviews in the local languages and then translate these into English. To have English as the working language in the project was necessary for the shared discussions of data and the cross-cultural analysis that was built into the project design. During our discussion of theoretical concepts and formulations for the interview guide, we as researchers already explored our own learned connections or unquestioned meaning ascriptions.

Method of Culture Contrast

The culture contrast method builds on a model of analysis in which culturally formed connections are contrasted. Over time, the researcher acquires a (limited) understanding of the local context, which is absolutely necessary to understand everyday meaning making, the culturally formed connotations, and tacit knowledge. Through the informants' descriptions of their everyday life in the interviews, we have reduced the described dynamics to selected tendencies and coded these (in Atlas.ti) with research (etic) categories in our analysis.

Figure 1 is a simple illustration of some of the initial etic categories to be contrasted in the UPGEM project design. These etic categories served as a starting point for the analysis but were in line with the analytical strategy, later dissolved in order to let the

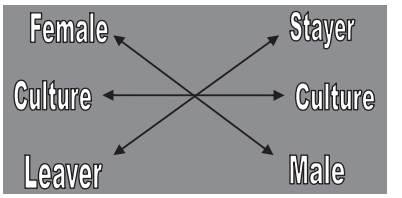

Figure 1. Model for culture contrast analysis of fundamental etic categories in UPGEM.

physicists' statements about different perceptions of and different ways of relating to the everyday work life be in the foreground.

An illustrative example is the word *hierarchy*, which is an example of one of the surprising challenges connected to the researchers' assumption of shared categorisations. We assumed hierarchy to be a common word in all our languages with a relatively common denotative meaning and relatively few connotations. Consequently, we expected to share immediate understanding of the word with our informants and fellow researchers. However, in the interview situation (where the researchers asked into the unknown world of physics), a number of situations arose where the concept of hierarchy was seemingly not shared but had to be explained by the interviewer.

Interviewer: *How's the hierarchy here at this working place?*
P14, F, DK: *What do you mean by that?*
Interviewer: *Who decides what and why for instance?*
P14, F, DK: *I've got my own money so I'm not subject to anyone, but I don't have my own equipment so therefore I'm subject to them (. . .).* (Hasse & Trentemøller 2008, p. 36)

Through the need to explain what the interviewer means by hierarchy, she learns about the emic categories from her informants, and becomes able to ask more sensitive questions, which have added richness to our analysis. The exchange of words quoted above shows that even though the researcher and informant share and agree on the lexical dimension and some degree of the semantic content of the word *hierarchy*, they do not fully share the local cultural (i.e., emic) meaning. Consequently, the interviewer explains the connections she imagines relevant for the informant to be able to understand and answer the question. As mentioned, it turned out that even within the group of UPGEM researchers the term *hierarchy* carried different connotations and triggered different associations of possible connections in relation to its workings in our respective academic structures.

The Theoretical Framework

The theoretical framework of cultural historical activity theory constituted the starting point of our research process, but over time our methods changed our understanding of the theoretical framework as well as the field of research. We were inspired by the theoretical approach suggested by Yrjö Engeström in *Learning by Expanding* (1987). Here Vygotsky's original triangle of subject, object and mediating artefacts (tools) is expanded to include rules, the division of labour, and the community. Together they constitute the social world of activity (Engeström 1987, 1990). We shall not go into how we have used this theoretical approach in our analysis but instead discuss how our lack of possibility to follow Engeström's intervention strategy connected to the theoretical framework led to new insights.

The method of developmental work research is shaped as a number of research cycles beginning with the ethnographic field aiming, among other things, at identifying contradictions inherent in the activity system. This approach has worked well in many cases even though it presupposes access to do ethnographic fieldwork. Ethnographic fieldwork is, however, not easy to arrange in a cross-cultural comparative international project with researchers from many diverse disciplines and backgrounds. Though some degree of participant observation was employed in the research work, the core of the project research is based on interviews constructed around a field guide including an interview guide that the researchers developed together in English, translated into the respective mother tongues, and used for interviews in the different partner countries.

As the core empirical data in UPGEM consists of interviews with physicists around Europe, the meaning of words came to play a central role in our collaborative process of analyzing the data material. Using this approach, it became clear that activities produce word meanings. It also became clear that this level of word meaning, even of common sense words, may be shared by the informants (as they have participated in the same activities) but not necessarily fully understood by either informants or researchers who have not participated in the activities producing the specific word meanings. Subsequently, the method of culture contrast materialized as a new approach to study human activity. If performed thoroughly and systematically, culture contrasts will (over time) lead to a deeper insight into locally formed emic categories including the complex connections made between meaning, word, and actions in activity. This can be seen as a supplement to researchers, who wish to use the theoretical framework of cultural historical activity theory and still be able to work cross-culturally using interview material.

Culture is an essential concept for our study, but it is also difficult to define in any simple way. On the one hand, we look at the connections described by the physicists in the activity of physics as an expression of "physics *as* culture." On the other hand, we also find it useful to perceive this activity as embedded in a jumble of national cultural activities. Hence we also look at "physics *in* culture."

We define empirical data on culture as formed by the researchers together with their informants, and this empirical data on culture can be contrasted with comparable empirical data generated by other researchers working in other (and in our case national) contexts. When we find something to be contrasted—either due to the absence of the comparable data or because the meaning ascribed to the comparable data differs—we define this something as an empirical fact of culture. As mentioned, this empirical fact can only be found in the analysis of contrasted relations. In this analytical process, implicit cultural comparisons (Hasse 2002, p. 17) are made explicit as the (emic) meanings the informants' and the researchers' share and take for granted are challenged. Thereby, culture comes to function as a tool for the analysis and an empirical fact.

We also argue that cultural meaning can be understood as something other than an analytical process. It can also be seen as empirical or actual clusters of connections that form a directive force in people's lives, and which can include or exclude people from certain workplace activities (Hasse 2002, p. 14). These clusters of connections are central to the method of culture contrast. The notion of clusters of connections is inspired by the theoretical framework of cultural models, which was developed by a group of anthropologists in the 1990s (D'Andrade 1995; Holland & Quinn 1987).

In the UPGEM project, we have perceived clusters of connections that are taken for granted as the foundation for "implicit comparisons" (Nader 1994). One aspect of learning processes is that we learn to make new connections which over time become obvious, unquestioned connections. The implicit comparison occurs when such taken for granted (self-evident) connections, related to, for example, marriage or family, are contrasted with a different pattern of connections. This type of learning and acquiring new knowledge is often an unreflected process.

In our understanding of the research process, these implicit comparisons can be used constructively if the informants' statements are allowed to challenge (and thereby make explicit) the researchers' assumptions about obvious, unquestioned connections. If researchers allow themselves to be challenged, and in this process explore the change in what is taken for granted, new connections and thereby new understandings of local organizations of meaning can also be formed (Holland 1992).

A researcher's often implicit comparison in the field and in the analysis can also be made explicit by making a track-record of what challenges the underlying assumptions of the researchers' comprehension and hypotheses as the researchers learn (together with their informants) to attribute new meaning to, for example, physical space and otherwise common sense words (Hasse 2002, p. 122). It is, however, a very slow and complex process of reflection, which is almost impossible to use as a starting point in a big international project such as UPGEM. From our experience with research in the physicists' community and our own cultural learning process, we have discovered that many culturally formed (here delimited by nationality) meanings in activities can go unnoticed in cross-cultural research if they are not challenged explicitly in a culture contrast analysis.

Our notion of culture as a directive force is tied to the notion of cultural learning processes, which form clusters of self-evident connections that change over time and thereby challenge our perceptions of the world. The very progress of research in what comes to constitute culture is thus a process which is as emergent and movable as culture itself. Following this principle, our analytical strategy was to look for patterns of meaning that were taken for granted in the local (national) analyses made by the local researchers in the five UPGEM countries and question them by using the culture contrast method.

In the culture contrast method we combine activity theory with the theory of cultural connectionism to grasp diverging cultural and national inputs in the research process. The method is to contrast the clusters of connections, which we define as cultural models (Holland & Quinn 1987). These clusters are constructed through national activities and shape (like a real force) notions of possible conduct, moral judgment, and motivation to act in areas of everyday life such as education, family, and work. Thus, we employ, as a novel aspect, the theory of cultural models in a cross-national culture contrast analysis, and we find clusters of cultural models that function as selection mechanisms in (inclusions and exclusions from) the activity of physics.

Our approach is a mix between a social constructivist and a critical realist approach (Aull Davies 1999; Bhaskar 1998), which we believe fits well with cultural historical activity theory. We acknowledge that in the UPGEM project we carry (diverse) theoretical backgrounds into the research field, and this will inform the etic analytical categories we operate from and within (such as gender, artefacts, but also family). Contrary to many postmodernists (e.g., Gergen 1992), we believe in empirical results and that methods can inform research and the subsequent analysis for better or worse in relation to a knowable social world. We also see research and researchers as situated and thus contextualised. We acknowledge that no matter how much we believe ourselves to be driven by interest and passion for basic research, someone (in ministries or research councils) has, to some extent, contributed to the formulation of our research questions and the themes we research. In that way, our field design and research guide are always embedded in politics (in our case gender politics). Knowledge can never be neutral, objective, or freed of power relations (Foucault 1982).

The reason for this can be found in the social fact that knowledge and learning are mainly social and cultural phenomena. Therefore, any research should take the implication of knowledge and learning into account when designing the research work (Nicolini, Gherardi & Yanow 2003, p. 3). According to this practice-based approach, "knowing" is tied to community and habitus, that is, dynamic processes of situated learning (Lave & Wenger 1991). From this position, these questions concern how to move from knowing in practice to knowing in research. One answer is to regard research as knowing in practice—and take seriously that any engaged researcher will be challenged in his or her knowing if the research process allows for it. Thereby, the researcher's categorisations

and the very relation between thought and language (Vygotsky 1987) must be explained at a deeper level than just by referring to how the researcher's position influences the creation of data due to, for example, nationality, gender, and age. A deeper understanding of how nationality, gender, age, and a number of other categorisations influence the co-creation of data is necessary. Yet, we do not argue to find culture contrast in the "labels" Danes or Italians but in the categorisations formed by lived experiences. In UPGEM these experiences are formed by national cultural historical processes and we challenge these when we allow the research to turn our implicit comparisons explicit. The aspect of culturally formed implicit comparisons does not solely apply to qualitative research. Research in categorisation has shown that even the categories used by quantitative researchers, such as their concept of numbers has been culturally formed.

> "My contention is that natural numbers is a cultural construct, differently formulated in different societies. I argue that the categories adopted by mature language users become evident when one understands that predication leads language users to refer in particular ways and thus determine what kinds of objects their language defines as constituting the universe." (Watson 1990, p. 283)

These categorisations, however, largely remain the invisible presupposition on which we base our research. To call forth these presuppositions (e.g., about sexual harassment or the constitution of hierarchies), we must begin by acknowledging that when we claim that our informants construct categories this is also a precondition for research and that researchers build on preformed categorisations belonging partly to a research practice different from the one they set out to investigate, partly to practices they might share with local national informants.

The issues raised by this contention can be boiled down to three questions:

1. What do researcher's categorisations do to informant's categorisation?
2. What do informants' categorisations do to researcher's categorisation?
3. What do researcher's categorisations do to other researchers' categorisations?

Many answers have been given to the first question since the dawn of postmodernism. One is that, researcher's categorisations and subsequent findings at macro level influence how people come to think and act at a micro level, but in fact there might be no distinction between the two levels. In the lingo of Actor Network Theory, "actors" macro construct reality and researchers help them in this endeavour (Callon & Latour 1981; Latour 1983). As an established genre of rhetoric, which makes moral as well as scientific claims, research language has the power to construct identities and legitimize power relations (Lather 1992; Densin & Lincon 1994). Moreover, as noted by Steinar Kvale, interviewees may discover new connections and relations as they talk to interviewers (Kvale 1988).

In our discussion here, the second and the third questions are in fact the ones that interest us the most. In interview situations, researchers use language as a representational system through which the informants present their version of their everyday life reality, but researchers must also be able to make sense of the words (Stainton Rogers 1996). Researchers also use language as a representational system when they communicate with other researchers, particularly if they make use of the same theoretical etic and empirical emic concepts. Social science has undergone a "linguistic turn" which places more emphasis on conversation and negotiation of meaning than on focussing on findings in nature (Kvale 1992). Yet if categories are socially constructed (Bowker & Star 1999) and

continuously negotiated, we must examine the implications for methods, methodology, and research as well as examine how well researchers actually understand each other when communicating.

If researchers and informants do collaborate on the construction of research data, in what way do the informants influence the researchers? Where does this influence meet its limit? These are the questions raised by our research in UPGEM and which led to the explicit investigation of culture contrast as a method.

Hands-On Examples of Culture Contrast Analysis

In the following, we present a number of examples of how contrasting sets of implicit comparisons (e.g., different understandings of the notion of family) from different cultural contexts can call forth the researchers' culturally implicit/unquestioned meaning categorisations. In making categorisations, which are taken for granted, explicit, new, and surprising challenges are likely to emerge, which can lead to an expanded meaning.

Cultural Models for Family

An example of contrasts in connections associated with a specific term is the concept of family. *Family* was discussed as an etic category from the onset of the project, and the answers to the questions concerning family in the UPGEM interview guide (Hasse, Sinding & Trentemøller 2008a, p. 377) revealed that some connections to family were strong in one context but weaker in another. In this case, the contrast emerged in the trans-national discussions of data material, and it became clear that certain (implicit) connections with family were rarely questioned by the researchers as they were typically shared and accepted as self-evident. Yet, the realisation that the concept of family carries different emic meanings in the different national cultural contexts has been essential for the analysis.

The majority of our interviewees across nations explain the low number of women in physics because women fit the physics research culture less perfectly than men, and because women give birth (which entails time away from research) and take on the primary responsibility of the children (e.g., maternity leave, pick up from kindergarten).

A significant number of our informants note that reconciling a scientific career and family life is challenging for both men and women. Some of the physicists "go even further arguing that being successful in one field excludes the possibility of reaching the top in the other" (Chudzicka-Dudzik, Diekmann, Miazek & Oleksy 2008, p. 386). Because the physicists generally do not connect family with work other than pointing to children as the main obstacle to their career, we expected to find more parents among our leavers and a majority of women among these leavers (as we presumed the female physicists to be connected with the heaviest burden of childcare and household chores). Yet, a correlation of the parenthood status of our informants with their status as stayer or leaver revealed a surprising pattern. In Denmark, Finland, and Estonia the percentage of parents were highest among the leavers, while the stayers constituted the majority of the parents in Italy and Poland. On the basis of the physicists' common conviction that it is impossible to be both a mother and (top) physicist, a proportionally higher number of stayer mothers was expected (bearing in mind the degree of public childcare facilities) in the three Nordic countries compared with Poland and Italy. Yet Denmark, Estonia, and Finland had a higher percentage of mother leavers than mother stayers, while the opposite was the case in Italy and Poland. The two extremes are Denmark and Italy; here the mother stayers

(primarily at the level of associate professors or full professors) constitute 24.0% in Italy and only 8.3% in Denmark. The mother leavers amount to 27.7% in Denmark and only 8.0% in Italy (Hasse & Trentemøller 2008, pp. 63–64). In other words, the numbers from the UPGEM data material do not entirely support the physicists' view on children as the barrier to a career in physics.

Nevertheless, the qualitative analysis of quotations showed a pattern of connections which suggest that female physicists have more difficulties making careers in Italy and Poland (and to some extent Estonia) because they are closely connected to family obligations and household chores. When analysing the deeper levels of emic meaning implicit in the concept of family, it appeared that in the Polish and Italian context women are largely expected to take on the main responsibility for caring for the family but receive more help and support from their parents, husband, other family members, or nannies compared with the women in the Nordic countries where husband and wife share daily chores. Among the Danish and the Finnish (and to some degree the Estonian) physicists the division of labour in the private sphere was for instance often described as a negotiation based shared responsibility.

P24, F, DK: *We sometimes have different opinions, and then you have to discuss that and see what you can get through.* (Hasse & Trentemøller 2008, p. 68)

In this context, men are not connected to family as "helpers"—they take part in household chores. Thus, this contrast in connections point to one conception of family in which responsibilities for family life can be negotiated between men and women and another in which the overall responsibility rests on the woman. She may receive help but cannot negotiate chores.

Another contrastive pattern of connections emerged in the informants' reference to their family. Some point out that the term family can be understood both as the "first" or "the domestic family" (Ajello, Belardi & Calafiore 2008, p. 279; i.e., the physicist's parents) and the "second" or "the new family" (Ajello et al.; i.e., spouse and children). This distinction is also reflected in the following quotation from a Polish interview:

Interviewer: *Did your family support you in your scientific career?*
P96, F, PL: *Family or husband?* (Hasse & Trentemøller 2008, p. 78)

This cultural model for family differs much from the Danish, Finnish and Estonian cultural models where the informants' conception of family is primarily connected to their spouse and children. In situations where the informants' are not in a stable relationship, they stress that they have not yet started a family.

Thus, a distinction between first and second or domestic or new family never comes up in the Danish, Finnish, or Estonian data material. Rather than being satisfied with the initial refinement in the conceptions of family, we turned to the statements (stripped of previously discussed etic categories) of the informants. We found that when the female physicists live in a culture with fixed gender roles and in a national context which offers little state supported childcare facilities, the extended (first and second) family comes to play a noteworthy role in connection with children. The Polish and Italian mothers largely rely on help from grandmothers in reconciling work and family, but other family members such as aunts, sisters, and sisters-in-law are also mentioned as providing support in relation to child care.

P58, F, IT: *[M]y daughters, now that school is over, must stay with their grandmother in [one town] and then with their grandmother in [another town], it is obviously hard but it is possible.* (Hasse & Trentemøller 2008, p. 79)

For the Danish and Finnish physicists, grandparents are only very rarely mentioned as having a crucial impact on making the everyday life of the family run smoothly. On the basis of analyses of numerous statements, a distinction between a cultural model of family as the extended family network (in Italy and Poland) and a cultural model of family as the nuclear family network (in Denmark and Finland) established itself.

Figures 2 and 3 illustrate the different cultural models of family based on the woman's relation to children, husband and other family members.

Turning to the relation among women, motherhood, and workplace, we found yet another contrast within the UPGEM data material. When focussing on the Danish data material, we saw that despite good maternity leave arrangements, etc., motherhood is described as something that must not come in the way of research in the physics activity. The contradiction between this attitude within research activity and society in general is commented upon.

P4, F, DK: *[In Denmark] employees are expected to have children and you are expected to go on full maternity leave as opposed to the expectations within the scientific research milieu. There you do research even though you are on leave. You do not put your work aside for a year of breastfeeding; you work and publish papers while you are on maternity leave.* (Hasse & Trentemøller 2008, p. 86)

In Italy, however, the connection between women, motherhood and workplace appears to be less problematic as the integration of motherhood responsibilities with work life is described as hard work but acceptable. In contrast with the Danish cultural model, the Italian women are, as we have just seen, strongly connected to children, and it may make it easier for the people who are directed by this cultural model to accept that motherhood also has consequences within working hours. With respect to support of female physicists with children, it seems that family as well as workplace culture sustains the mother in the

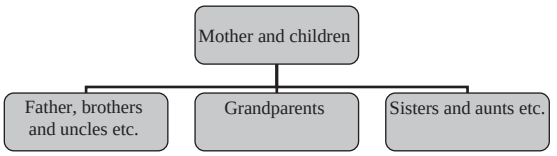

Figure 2. Cultural model for the extended family.

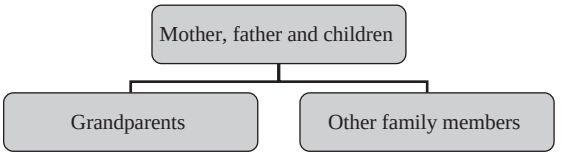

Figure 3. Cultural model for nuclear family.

fixed gender role, but at the same time make it easier for women to be accepted as working mothers.

P132, M, PL: *Well, there are much fewer ladies, but yes, yes, it would happen. It would. Actually, among those research workers we had two ladies, and they indeed more often benefited from this motherhood, or not only motherhood, but of the fact that they were of a different sex.* (Hasse & Trentemøller 2008, p. 86)

Sexual Harassment

As in the case of family, part of the discussions and analyses among the project researchers pointed to examples of contrasting (emic) meanings, and in some cases almost absence of (emic) meaning, in relation to the term *sexual harassment*. Employing culture contrast as a method and as a strategy for analysis entails embracing these differences to better understand the different meanings of the same sound wave in different contexts. In order to investigate sexual harassment as an etic category, all informants were asked the following question: *Would you be surprised if any of your colleagues ever mentioned sexual harassment or other kinds of harassment as a problem at the workplace?* (Hasse & Trentemøller 2008, p. 199).

When contrasting the various statements on the basis of nationality, a clear pattern emerges in which the Danish physicists and the researchers talk and ask more explicitly about cases of sexual harassment and not least notions of appropriate conduct in situations of potential sexual harassment. In comparison, the transcripts of the Polish and Estonian interviews hold few examples of recollections of or attitudes to sexual harassment and little effort on the part of the interviewers to probe further into the matter than by asking the question listed in the interview guide. Consequently, the informants seem to have ascribed little emic meaning to the term. Moreover, the transcripts also reveal different interview styles in spite of the shared interview guide. One may consider whether this difference is indicative of different nationally formed connections on the part of the researchers in relation to the category sexual harassment.

Contrasting Danish and Italian data material, a more subtle diversity emerged, that is, a diversity which, on the basis of our etic categorisations, was not expected. By embracing the diversity, we were able to see that the notion of *sex* and *femininity* triggers different associations and is ascribed different emic meanings in the Italian and Danish contexts. An important point in the culture contrast method is that by contrasting different sets of national data, culturally formed (and to some extent self-evident) meanings are called forth in their diversity.

The following two quotations illustrate the predominant point in the Italian data material versus the Danish data material:

Italian Interviewer: *Do you think that your career would have changed if you had been a man?*
Maria: *Honestly, I have to say that when a committee to guarantee the same possibilities to men and women was created also here in this institution, many female colleagues came to me and asked me "when do you begin?/when do you travel abroad?", but I think I have never been discriminated, on the contrary I had some advantages because in a surrounding where they are all men, there is always some kind of pleasure in being kind to a woman, in giving her a bonus, in making her a favour. So there was no discrimination towards me. I remember that I had a female university mate who always opened a button more in her blouse when she sat an exam and she used to say: "Look, this is a point*

> *more that I get," it is not always like this but sometimes you can - in a surrounding where there are a lot of men, there are advantages for a woman, but there can also be some disadvantages*. (Hasse & Trentemøller 2008, pp. 201–202)

We learn that the Italian male physicists can compliment the female physicists on their appearance and women can, in some situations, play on their femininity without perceiving it as degrading. A similar situation appears unthinkable among the Danish female physicists who often refer to an unwanted sexualisation of their body, as it is pointed out by the female stayer physicist quoted below.

Zindy: *. . . but there is something - I mean - I have - what I find hard is - when you travel to conferences and - what becomes difficult is actually eh - that you sort of get seen.*
Interviewer: *As a woman?*
Zindy: *Yes. I mean, you get - it is like you have a flashlight in your forehead [laughs]. I mean, it can be [unclear] but sometimes it is very demanding . . . and you talk to them and they talk to you just because you are a woman. . . . and when you talk to them then they think you are interested just because you talk to them [laughs].*
Interviewer: *Yes*
Zindy: *and that can be really hard.* (Hasse & Trentemøller 2008, p. 202)

When the majority of the interviewed Danish female physicists refer to being too visible, the Danish researchers did not question this or probe further into the matter. In retrospect, our interpretation of this situation is that the implication of female visibility was taken for granted by both the interviewers and the interviewees. In contrast with the Italian female physicists' comments, it became clear that the women's visibility is not necessarily perceived as overshadowing their abilities as physicists. Consequently, the unquestioned categorisation of meaning by the Danish researchers and their informants was called forth in the analysis, which enabled the researchers to go behind the initial understanding of the spoken words. A further interpretation of the Danish implicit comparison (the unquestioned visibility) may be that natural sciences are connoted with masculinity in the Danish context (Hasse 2008). Therefore, female scientists may, solely due to their sex, be perceived as not truly belonging to the discipline and consequently more likely to be exposed to sexual harassment by their male colleagues.

As the above quotations are part of a pattern in their national cultural context, it indicates that contrary to the Polish and Estonian informants the Danish and Italian informants have ascribed more levels of emic meaning to the term sexual harassment. It must be mentioned, however, that we cannot know whether the little data material relating to sexual harassment in the Estonian and Polish interviews is due to taboo or whether the informants have in fact not ascribed workplace related emic meaning to the term. Second, the pattern indicates that the emic meaning, which is ascribed to the notion of *sex* in the Danish context, differs from the local emic meaning ascribed in the Italian context.

One of the emic connotations that is ascribed in the Danish data material is the conviction that the woman is responsible for noticing and preventing potential sources of sexual harassment by drawing the line. We, as researchers, draw this conclusion on the basis of numerous narratives in which the act of *drawing the line* is referred to as a self-evident precaution (Hasse, Sinding & Trentemøller 2008a).

Sexual harassment against professionals does also occur in the other national contexts, but in the Danish the female informants automatically, and systematically,

connect being perceived as a sexual being and being pursued on that account with exclusion from the professional community of practice. In this way, the connotations associated with the term generate a pattern of actions which deems it more problematic in the Danish context, compared to, for instance, the Italian context.

As the connection between natural sciences and masculinity appears to be taken for granted in a Danish context, only a different culturally formed connection (from another frame of interpretation) was able to call forth this self-evident connection for the Danish research team. The reason is that in this situation the Danish researchers and their informants share the emic meaning, and the researchers did not think of questioning the self-evident emic category as long as the research and analysis were restricted to their common cultural context. By employing the culture contrast method, we were, however, able to call forth connections of meaning which were taken for granted and which the researchers would not have noticed had they not been contrasted with different connections in a comparable setting in another cultural context.

The above examples illustrate that we as researchers are bearers of our national culture in which we have learned, and take for granted, some cultural connections that appear highly controversial to other researchers who have learned to make other connections in their national context.

Empirical Feedback

The employed method obviously influences the production of data (Holloway 1989) just as our presuppositions and theoretical stance influence our choice of methods, but the empirical feedback on our final analysis is less obvious. If good research is research that allows feedback, we must focus on methods and theories, which allow our unquestioned categorisations to be challenged.

The research methods of UPGEM may resemble those of grounded theory where the categorisations are believed to originate from the data (Strauss & Corbin 1998) rather than putting the data into pre-existing theoretical boxes. Yet this approach overlooks the fact that researchers will always have pre-existing theoretical categories and categorisations formed in national cultural historical activities as their point of departure for the research. Therefore, it is important to understand the processes through which the researcher's theoretically preformed categorisations are allowed to be *transformed* in the process of research. To achieve a better understanding of this we must combine knowledge of how categories are formed in social life with an understanding of how the researcher's categories are formed in social life.

The discussion of the social construction of categories (Bowker & Star 1999) is not confined to the cultural historical activity theoretical field; yet to narrow down the discussion it will be our point of departure here. Beginning with the work of Lev Vygotsky, we can argue that thought and language do not run as two separate strands, but spoken words (understood as physical sound waves) and meaning-making are completely entangled in everyday learning processes (Vygotsky 1987). This amalgamation is a product of the historical development of human consciousness. In the words of Riitva Engeström, "[T]he unit of analysis expands by the historically constituted social/collective action of meaning construction, with contexts of practical activities in which the language has lived its intense social life" (Engeström 1995, pp. 197–198).

We find the amalgamation of the intramental (i.e., thought) and intermental (i.e., social activity) embedded in the artefact (Cole 1985). For Vygotsky the most important artefactual tool for human interaction is language. Language is a tool in which we

find a combination of physical materiality (words are sound waves) and meaning (thought). Thus, language and thought are not separate strings but entwined and entangled in social relations (physical human beings) as well as with other kinds of material artefacts.

Thought and speech cannot be analysed as two unrelated processes that run parallel or cross and influence each other in a mechanical way. No less than water can be reduced to two separate analyses of hydrogen and oxygen, can verbal thought be broken down to component elements, argues Vygotsky (1987, p. 244). This approach generalizes all findings of water from a raindrop to the Pacific Ocean irrespective of the complexity of the presence of water in real life nature. Similarly, intellectual processes cannot be separated from speech functions removed from the complexities of verbal thought in all its (dynamically changing) manifestations in the complexity of everyday life.

Vygotsky proposes a different approach namely to "replace the method based on decomposition into elements with a method of analysis that involves partitioning the complex unity of verbal thinking into units. In contrast to elements, units are products of analysis that form the initial aspects not of the whole but of its concrete aspects and characteristics. Unlike elements, units do not lose the characteristics inherent to the whole" (Vygotsky 1987). Therefore, Vygotsky argues, we should replace analysis into elements with analysis into units, which retains all the properties of the whole and he calls the unit of verbal thought "*word meaning"* (Vygotsky 1987).

The meaning-artefact amalgamation which lies behind meaningful categorisations is in this perspective a dynamic, changeable word meaning produced by social and material interactions in everyday life. This psychology of understanding opens up new questions to any kind of created data as well as the categorisations forming questionnaires in cross-cultural studies. If the reality we talk about is dynamic rather than static, can we speak of social constructions at all? Are social constructions identified in research stable enough to be called constructions? Is social research a kind of point of impact in other peoples' lives? Is this at all possible when all claims of social constructions might already be transformed into new social constructions? In the past post-modern era, this has kept many researchers from giving any lasting credibility to empirical findings. Their Archimedean point has been the theoretical approach, applied or mapped onto a flux of everyday life which has not been given or ascribed a voice in itself—simply because any claims of findings could be met with counter claims.

We do not operate from a dualistic material-ideal distinction as we also take in Vygotsky's perspective on how the entanglement between materiality and thoughts is formed in social learning processes in activity. Thus, any spoken word, for example, the word "love," is a sound wave to which meaning is ascribed in activity.

Vygotsky gives an example of how word meaning can be brought to an extreme when a particular relation among a group of people can make them understand each other and preserve the predicate even when external speech is void of the subject in question and all words connected with it. Such communication would be very confusing for listeners who have not participated in the activity creating the word meaning. To give an example: a group of people are waiting for a bus. As the bus approaches one exclaims: "coming!" and all the people waiting understand his intention while a newcomer to the group might not. Another example given by Vygotsky is taken from an episode in the writer Leo Tolstoy's life where he proposes to his wife-to-be in a manner which is later recounted in the novel *Anna Karenina*. In the novel, Kitty and Levi express their love for each other by means of initial letters of the words:

> "I have long wanted to ask you one thing."
> "Please, ask."
> "Here," he said, and wrote the initial letters: *W, Y, A, M, I, C, B, D, T, M, N, O, T.* These letters meant: "When you answered me "It can not be," did that mean never or then?" It seemed impossible that she would understand this complex phrase. Blushing, she said: "I understand."
> "What is this word?" he asked, indicating the N that represented the word "never."
> "That word means never," she said. "But that is not right." He quickly erased what was written, gave her the chalk, and waited. She wrote: *I, C, N, A, O, T.* He quickly brightened; he understood. It meant: "I could not answer otherwise then." (Vygotsky 1987, p. 268)

Vygotsky concludes that the role of speech can be reduced to a minimum when the thoughts of the speakers are identical (Vygotsky 1987). If Vygotsky is right and we learn word meaning (whether abbreviated or not) through participation in everyday life activity, we could also expect that when an activity changes the meaning of certain sound waves (recognized as a word) the meaning of words may change. Thus, when the researcher exchanges his or her everyday life activity with that of the informants, the researchers must be willing to learn new word meanings. In cross-cultural studies, such as PISA (Mejding et al. 2004), the process of learning the (for the researcher, new) word meaning of informants is rarely allowed. Consequently, research will remain focussed on general and generalised elements like oxygen and hydrogen and remains without tools to combine and amalgamate the processes of complexity.

Studying activity systems helps us regain access to complexity, but here it is often overlooked that researchers are engaged in two activities at once. One is studying the activity of the informants while the other is engaging in the research of activity systems. If we take seriously that a theory of activity systems, as proposed by Yrjö Engeström (1987), is a useful approach to study and gain insight into the complexity of peoples' everyday lives, we must allow the researcher's position to be included in the analysis as more than a reference to gender, age, and so forth. We must allow for an inclusion of how research activities also become entangled in informants' activities, leading to the learning of new word meaning. Systems of activities can be compared cross-culturally, but it cannot be done by using generalizing categorisations in which the word meaning solely rests on lexical definitions or belong to the research activity. The comparison must include the researcher's process of learning new word meanings, rather than comparing elements which would lose the characteristics inherent to the whole.[2]

We were not aware of this issue when we began the UPGEM study, but it gradually presented itself for us during the research. We set out by applying the theoretical framework of activity to our research design wherefore our etic categorisations came from this framework and from gender studies. During the research processes, we gradually came to understand that activities can be argued to be embedded in national cultural historical processes and that we, as researchers, can in many ways also be argued to be embedded in the same cultural historical processes as our informants. In the research process, we learned new word meanings to words which we had hitherto taken for granted in our analysis of our local activities. The new word meanings emerged when we contrasted our analysis with the other researchers' analysis of the local activities in their national cultures. Put differently,

[2]Examples of generalization that level out complexities of everyday life can be found in the research presented in *The Handbook of Cultural Psychology* (Kitayama & Cohen 2007).

in the meeting (which turned out to be a contrast) of the researchers' understanding of given words, the implicit meaning making was called forth and new word meaning emerged. In finding this process necessary for the research work, we gradually developed the method of culture contrast, which underlies the analysis presented in the publication *Break the Pattern!* (www.upgem.dk).

Research knowledge is embedded in our theoretical perspective. We are creators of data, but at the same time we have to learn new word meanings from our informants, and that makes us situated learners. Knowing as a researcher or an informant is entangled with the cultural historical activity systems, which produce new word meaning which are units (not elements) of verbal thinking with concrete aspects and characteristics (in our analysis specific connections) which retains the properties of the whole as *word meaning*.

> "Understanding the words of others also requires understanding their thoughts. And even this is incomplete without understanding their motives or why they expressed their thoughts. In precisely this sense we complete the psychological analysis of any expression only when we reveal the most secret internal plane of verbal thinking – its motivation." (Vygotsky 1987, p. 283)

When researchers' and informants' respective meaning making is contrasted, new word meanings are produced for both. This process teaches the researcher a mechanical connection between a material sound wave and its meaning for informants.

Conclusion

Though the notion of word meaning is well known in cultural historical activity studies, its implication for research has yet to be unfolded. Our argument here is meant as a budding attempt to call for more and more thorough analysis of the problems called forth by the method of culture contrast.

One of the problems is that the researchers' participation in their informants' activities is always peripheral, and therefore we need theories to guide our way. Though it is necessary to base the employed methods and methodologies on theories (which are expressed in preformed categorisations), we run the risk of being blind to the limitation of our etic categorisations if we are not able to leave our own research activity and learn new word meanings from the informants' activities. Researcher's categorisations can undoubtedly affect informant's categorisations and the way informants are categorised by researchers. This is a much discussed research aspect. Therefore, it has not been the focus of this article. Instead, we have, from our perspective, focussed on the two less clarified aspects:

What do the informants' categorisations do to the researcher's categorisation?
What do the researcher's categorisations do to other researchers' categorisations?

First, if one takes a critical realist perspective on social worlds, the researcher and his/her informed etic categories alone should not define the word meaning in informants' everyday life. Following this perspective, the researcher must be open to the possibility that new connections can be learned through research in everyday life and be aware that the research process does not conflate the words of informants with the researcher's etic word meaning. Second, when researching cross-cultural issues/topics through international collaboration, researchers may believe they share the word meaning (etic as well as emic) of everyday words. If the group does not investigate the presumed shared word meaning, the research may not be able to capture the complex

diversity of everyday life activities and may produce generalised conclusions that do not reflect the empirical field.

Researchers must acknowledge that unquestioned connections influence the etic research categories (for the very reason that they are unquestioned), and that they must make this influence explicit. If we wish to go beyond the generalizations of many cross-cultural studies, we must not let our etic understandings overshadow our possibilities to learn new and emic word meaning. Instead, we must embrace the possibility of challenging our understanding of word meaning, which may seem self-evident to us. One way of letting the research process challenge connections or categorisations that we take for granted may be to incorporate the method of culture contrast in the research design. In the UPGEM project, the method emerged as a consequence of the project design.

The implicit comparisons (at the researcher level) were made explicit by contrasting evident connections (formed by national cultural historical processes) in cross-readings and discussions of the interview data. To give an example, in the Danish research context, the shared meaning of the notion of sexual harassment, which was taken for granted, was called forth as a particular (and to the other researchers not self-evident but surprising) cultural construction.

Contrary to many interesting studies of discourse analysis in cross-cultural settings, the culture contrast method does not *concentrate* on negotiation of meaning making. Thereby it differs from studies in this field in two ways. First, when researchers study the different meanings of categories in different cultures, as for example Wierzbicka (2006), the culture contrast method is similar in the sense that meanings are analyzed as opposites (like East vs. West). But these types of analyses rarely take the researcher's position, nor the possibility for the researcher to learn new meaning, into account.

Second, in relation to discourse analysis of how informants use and negotiate the meaning of categories (e.g., Berg, Wetherell & Houtkoop-Steenstra 2004), we differ in the sense that we do not perceive the interaction between the researcher and informant (interviewer and interviewee) as a co-production of meaning. This is because our focus is on the very elements of meaning that are taken for granted and shared by both the researcher and the informant and therefore will not be reflected upon as important for the analysis unless it is contrasted. This contrast can be of many different types and is not necessarily reduced to national cultural differences, even though that has been our perspective here. The method of culture contrast can apply to any kind of analytical framing within which the researcher expect to find contrasts. One example may be meaning making in underground hip hop culture contrasted with the culture of classical ballet or the expected cultural contrasts of rural vs. urban living. It is of main importance that the researcher is not guided by a priori (etic) categorisations and has not determined beforehand *which* categories are to be contrasted. For the same reason, we also do not define the learning process of the researcher (and possibly also the informant) as a negotiation of meaning, but rather a process in which surprises challenge and expand the established meaning of the researcher. Thus, this method requires the researcher's possibility and ability to let herself be surprised. It should be noted that this way of being surprised is in fact rare and somewhat accidental, even when the deliberate aim is to use the method of culture contrast.

In retrospect we can see that the shared field guide, interview guide and the inbuilt working seminars are all prerequisites for a successful use of the culture contrast approach. Yet the overruling prerequisite was a gradual acknowledgement of our own implicit comparisons and our willingness to make these implicit comparisons explicit by embracing and understanding surprises brought about by other researchers' nationally formed everyday life experiences.

We recognize that at this stage the suggested method holds a number of weak points. One is the question of whether the culture contrast approach has the potential to be an applicable method, as what is to be contrasted cannot be defined in general terms before hand. Furthermore, at this point it is still uncertain how contrastive word meanings can be called forth in projects which have not integrated national culture contrast in the research design. It may be that the applicability is to be defined in each individual research project rather than in general terms. Consequently, the method may appear unpredictable as it is uncertain what will be called forth.

Nevertheless, if the aim of research is to capture the lived complexities of social worlds the method of culture contrast may be a step in the right direction. Through culture contrasts, we will be able to achieve a deeper and critical examination of the taken for granted presuppositions on which we base our research work.

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About the Authors

Cathrine Hasse is professor at the Danish School of Education, University of Aarhus. She has studied higher education and universities as workplace cultures with a particular focus on physics education and research. Her Ph.D. focused on "cultural learning processes" in a physics institution where she followed a group of young male and female physicist students in their first year of study. This project developed into a longitudinal study where she has followed the same group of students more than six years. In her next project, "The Cultural Dimensions of Science," she compared physics institutions in Denmark and Italy and she has been the coordinator of the EU project, UPGEM, financed by EU sixth framework programme. In her work she takes a special interest in research as a learning process, methodology, and the relations among learning, gender, culture creativity, and workplace culture.

Stine Trentemøller has been working as a research assistant at the Danish School of Education, Aarhus University in the UPGEM project since 2006. She graduated at the Department of English at Copenhagen University and has a minor in anthropology. In her master thesis she conducted a meta-analysis of empirical studies investigating workplace talk. Her research interests extend from general issues of sociolinguistics, pragmatics, the interplay of language and gender, cultural studies, learning, and competence. In addition to co-authoring *Draw the Line!* and *Break the Pattern!*, she has contributed to UPGEM with two papers: "The Interplay of Language and Gender – with a focus on feminine linguistic behavior" at the Sixth European Gender Research Conference in Lodz, 2006, and "Kulturkontrast som metodetilgang" (Culture contrast as methodological approach), in Kragelund, L. and Høyrup, S., editors, *Metoder til arbejdspladsforskning – muligheder og dilemmaer* (forthcoming in Danish).