

## “Qualitative” Neuropsychology

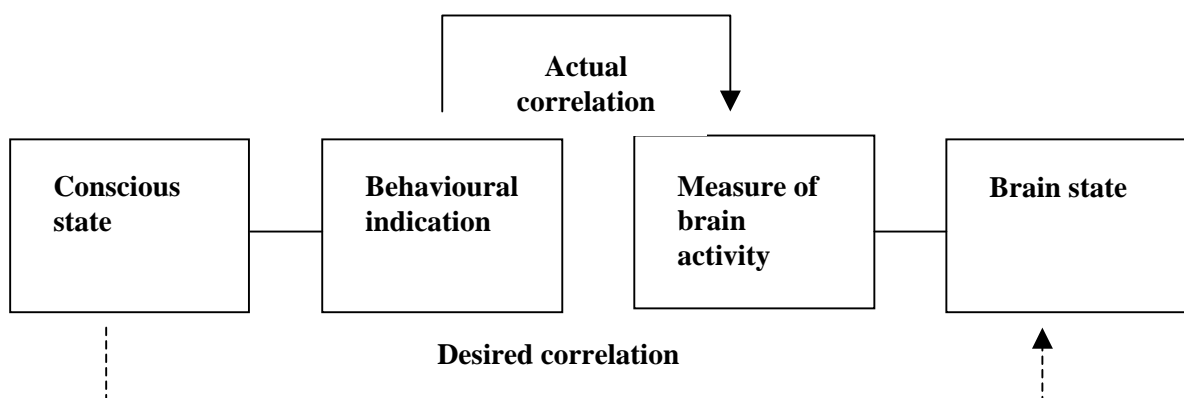
### - Integrating first person data in quantitative research

Morten Overgaard, Cand.psych., Ph.D., Hammel Neurocenter

In recent years, it has been an emerging view that if experimental psychology is to go further than to study mental states defined as single functional units and include conscious experience as its object of study, it is necessary to develop more elaborate “first person methods” than what has been common in cognitive science the last fifty years. During this long period, there has been immense resistance among psychologists and neuroscientists against the use of first person methods, as it has been standard to think of first person reports as not intersubjectively accessible and thus not intersubjectively verifiable.

It has recently been argued that 1) psychology has only abandoned first person methods rhetorically – results of cognitive science have always been dependent on the validity of first person methods, and 2) the dominant view in psychology of objective and subjective data is confused.

1) Although cognitive scientists have claimed to conduct experiments regarding specifically *mental* states (often defined as *inner* states), the dominant argument has been that we should refine “indirect measures” of mental states using behavioural data. With this paradigm, looking for the neural correlates to some or other mental state, we apply a model like this (adapted from Overgaard, 2003a):



The model suggests that the validity of the “behavioural indication” rests upon the certainty with which one can postulate the existence of a certain mental state based upon its observation. Given it is true (as I have argued in Overgaard, 2003b) that this model is implicitly present in modern “neuro-cognitive oriented” psychological research, we cannot make sense of

any “behavioural indication” without actually referring to those first person states one wishes to make claims about.

2) It is a common conception that a scientific object is an object that can be studied from a third person perspective. From this can be deduced either that 1) consciousness is a “tangible” physical object, or 2) consciousness cannot undergo a scientific analysis (it is simply not the kind of thing that can be studied in a third person way). If one accepts physicalism, one can also accept suggestion 1. However, there is at present no consistent suggestion of how to reduce qualia, intentionality, and subjectivity<sup>1</sup>. If one does not accept monism, one is forced to accept suggestion 2.

The problem can be stated as a problem of subjectivity versus objectivity: subjectivity is defined as the condition of being bound to a single perspective. Objectivity is captured in the title of Thomas Nagel’s book *The View from Nowhere* (1986), according to which the ideal perspective for natural science is one detached from any perspective – that is centreless and subjectless. So, the problem appears, how can there be an objective understanding to something subjective in nature? The argument can be stated, according to Ronald Chrisley (2001), that the essential subjective nature of experience prevents its full inclusion in an objective worldview.

Nagel’s own answer to this is, however, that one can have a centreless objective phenomenology in which experiences are included although each subject’s perspective is only “one manifestation” of the mental (Nagel, 1974). Nagel himself admits the paradox of trying to have a centreless description of subjectivity, and, in 1986, he concludes that mental and physical objectivity cannot be integrated in a common framework. While such a view makes a science of consciousness possible (hence the objective side of phenomenology), it leaves little hope for an integrated framework with neuroscience and the cognitive sciences.

One can, however, obtain a less pessimistic view by going against the notion of scientific observation as a view from nowhere, and adopt Chrisley’s (2001) suggestion that scientific observation is a view “from anywhere”. One might say that subjectivity is a necessary precondition for “objective” observations. Why is this more than just another paradox? Because if all observation – scientific as well as unscientific – is dependent on a perspective and a subject, then all reports (in a direct or in a loose sense) refer to an observer’s experiences. Or, put another way, if one accepts a scientist’s report about, say, observed isotopes in a rock as being a scientific report, one seems forced to also accept reports about conscious experiences as scientific. With this approach, one would say that the gathering of observations from subjects about their “conscious events” and the collecting of data from, say, the brain scanner are based upon the same basic criteria for observation. This idea does not exclude certain methodological problems specifically related to the study of consciousness, but it does provide a framework where the same scientist principally can address both kinds of data.

## **Qualitative neuropsychology**

---

<sup>1</sup> In this context, this is a mere assertion. In Overgaard (2003b), this is argued in more detail.

By the term “qualitative neuropsychology”, I wish to open up the possibility of having a theoretical, experimental and clinical neuropsychology based upon the methodological considerations above. That is, a neuropsychology with the double intention to:

- 1) Gain knowledge about the relationship between neural activation and mental states using modern research techniques and well-known quantitative models for research.
- 2) Not lose the richness of the experiential character of mental states that may be expressed using qualitative methodology.

Intuitively, there are two ways to realise qualitative neuropsychology:

- 1) One may design an investigation so that it contains two parts – a “standard experimental” part, and a “standard interview” part. Information gained from the two parts would then be integrated post hoc.
- 2) One may try to integrate qualitative methodology into standard experimental designs without violating basic rules of quantitative research.

As the latter possibility is the most challenging but also the potentially most promising, I will discuss this in the following.

As it has become still more acceptable to speak of first person methods in the cognitive sciences, several suggestions regarding an integrated methodology and theoretical framework have emerged. As today, these suggestions stand in opposition. Below, I will look at the central tenets of a selection of what may be considered the most prominent suggestions so far. In addition, I will focus on the methodological and fundamental part of the project rather on the clinical side, as the latter (at least principally) should emerge from the first.

### **Review of recent first person integration**

#### *Neurophenomenology*

Neurophenomenology, as suggested by Varela (1996), is equally theoretically inspired by modern cognitive science and classical transcendental phenomenology in the tradition of Edmund Husserl.

Neurophenomenology follows Husserl in the understanding of phenomenology as a methodologically guided reflective examination of experience. Specifically, Varela and his colleagues argue that both the experimenter and subject should undergo some level of training in phenomenological method, including learning to practice the phenomenological reduction – the ‘bracketing’ of beliefs or theories one might have about an experience or consciousness per se. The training should not consist of teaching subjects in e.g. the writings of Husserl or the phenomenological tradition in general, but rather an explicit training in attending to the appearance of objects and delivering consistent and clear reports of these experiences. Varela suggests that such a method should be based on some basic steps:

The core phenomenological method is the suspending of beliefs or theories about experience, or, as Varela puts it: “(...) a sudden, transient suspension of belief about what is being

examined, a putting in abeyance of our habitual discourse about something, a bracketing of the pre-set structuring that constitutes the ubiquitous background of everyday life". The purpose of this action is to turn a subject's attention away from the typical and habitual object-oriented perception of everyday life and toward the phenomenal appearance of objects. It does thus not suppose a suspending of normal thinking or stream of thought, but opens up "new possibilities within our habitual mind stream". Adding to the pre-training of the subjects, such an orienting can occur through the experimenter's use of a specific approach to query the subject about his or her experience. Instead of asking "Do you think this experience is like X or Y or Z?" the experimenter should ask, "How would you describe your experience?" (Gallagher 2003, p. 87). Such a question allows the subject to produce responses that are more complex and to redirect attention towards the experiences of an external object. There is, in other words, a shift from *what* we experience to *how* we experience it. But the change from predefined categories to open questions poses a difficulty for the experimenter when the reports are to be compared to quantitative data, such as functional neuroimaging data. One way is to gather those reports that are "qualitatively similar" and categorise them in order to translate them into quantitative data. Such a *phenomenological clustering* thus makes the phenomenological reports available to quantitative analysis and comparison to other measures.

It is vital for the neurophenomenological examination that the subject gains intimacy with the domain of investigation. As a part of the reduction, a field of one's experience becomes more vividly present as well as less restrained. As Varela (1996) points out, this is vital since it is the "basis of the criteria of truth in phenomenological analysis, the nature of its evidence" (page 337).

Based upon this first-person intimacy, subjects are to offer descriptions as intersubjective validations of their experiences to the investigator.

One experiment that especially has been considered based directly on the methods of neurophenomenology is Lutz et al. (2002). Subjects were instructed to press a button when a visual shape had fully emerged on a computer screen. After the button push, the subjects gave a brief verbal report of their experience. Before the experiment, subjects developed their own refined verbal reports of their own experiences using a series of preliminary trials. Here, subjects were asked to focus on their own experiences and reported on the presence or absence or degree of distractions, inattentive moments, and cognitive strategies. The self-developed descriptive categories were used to divide the trials into phenomenologically based clusters, which represent the intersubjective invariables (Gallagher & Sørensen, in press). Subjects reported in their own terms if they were ready or unprepared, or if they were surprised or interrupted by the stimulus in the middle of an unrelated thought. All these intersubjectively determined categories were used for reporting during the main experimental trials when the experimenters also recorded EEG and reaction time from the subject. The correlated of all parts of the recorded data revealed relations between attention level, reaction times, and dynamic descriptions of synchrony patterns between oscillating neural groups.

The experiment can be seen as realising neurophenomenology because subjects were trained in phenomenology prior to the experiment. Subjects were asked to suspend beliefs about experience, they gained intimacy with their perceptual experiences and offered subjective descriptions.

### *Indirect phenomenology*

As a criticism of Neurophenomenology, Braddock (2001) asserts that Varela's position is too demanding to be a realistic suggestion to an improvement in cognitive science in near the future. Neurophenomenology would demand a whole paradigmatic movement in order to have any noticeable effect. Instead, Braddock finds inspiration in the works of Merleau-Ponty to apply so-called "indirect" (or back-loaded, in Gallagher's term) phenomenology to experimental results. Braddock mentions synaesthesia as example, the phenomenon where certain subjects experience joint sensations, e.g. hearing colours or tasting shapes. Whereas experimental scientists observing synaesthesia might think of it as a pathological or "abnormal" phenomenon, Merleau-Ponty uses synaesthesia to rethink what normal perception is like. He argues (1962) that when applying phenomenology in asking "what is it precisely that I see" rather than relying on what one expects to see we will get the information we need about the "first person aspects" of the empirical investigation. Braddock asserts that such an indirect use of phenomenology is a viable and more pragmatic alternative to Varela's Neurophenomenology that is built upon Husserl's theoretical projects.

The main difficulty with Braddock's approach in this context is however that it does not introduce actual methodological changes in the experimental set-up. Rather, it is a tool for theoretical interpretation, which actually places the proposal outside the framework of experimental methodology. Of course, Braddock's approach is a methodology in its own right, but since indirect phenomenology is an after-the-fact reinterpretation of empirical findings, and since it does not give away any practical guidelines for studying and reporting experiences in the experimental setting, the method will not prevent further research from repeating the errors that Braddock's method may reveal.

### *Front loaded phenomenology*

Shaun Gallagher (2003; Gallagher & Sørensen in press) suggest to incorporate considerations about phenomenology and how to study experience as an active part of classical experimental procedures, from the design of the experiment and throughout the run and collecting of data. Gallagher calls this orientation a "front-loaded phenomenology", in that insights from phenomenology are used in the design of an experiment to influence the way that the experiment is set up (Gallagher, 2003). Gallagher also calls this "phenomenologically enlightened experimental science" (p. 89). This means that questions concerning the phenomenology of the subject should be addressed and expressed as practical and testable methods and measures that the experimenter can apply during the study.

Gallagher's approach differs significantly from that of Francisco Varela. It does not demand of the subjects to learn Husserlian techniques for reduction or even to explicitly use first person reports in experiments. A good example of Gallagher's method could start with a pheno-

menologically inspired re-analysis of an experiment, a “back loading phenomenology” as Braddock would have done. Gallagher & Sørensen (in press) mention an experiment by Farrer & Frith (2002) to exemplify this, even though the experimental paper makes no direct reference to phenomenology. The background first person observation is a distinction between feelings related to bodily movements one has caused oneself and movements performed by oneself but caused by someone or something else. In phenomenological terms, the feelings of ownership of movement and agency characterize pre-reflective, non-conceptual self-awareness implicit to experiencing action. Farrer & Frith (2002) let subjects manipulate a joystick to move an image on a computer screen during fMRI scanning. Although the subjects in each case move the joystick corresponding to the movements of the image, in some trials the screen movement is caused by the subject and in others, the experimenter causes it. This allows, Gallagher & Sørensen argue, for an experimental separation between the sense of agency and the sense of ownership. Here, phenomenology has contributed to the experimental design in the form of distinctions between phenomenological categories.

Interestingly, even though Gallagher presents his approach as different from Varela’s neurophenomenological approach, and, furthermore, even though he accepts the experiment by Lutz et al. as a direct application of neurophenomenology, he also considers the experiment a good example of front loaded phenomenology. This is in fact also a reasonable interpretation: The choice of stimulus set-up is most likely based on a re-interpretation of classical studies of the appearance of visual shapes (e.g. Julesz, 1971). What makes this experiment different is the built-in realisation that we cannot beforehand know about details regarding the experimental subjects’ experiences during the experiment. This is, essentially, a front-loading of phenomenological insight into an experimental paradigm.

### **Phenomenology and introspection**

We should distinguish between two understandings of “phenomenology”, a stronger and a weaker sense of the word (Gallagher & Sørensen, in press; Overgaard, 2004).

The “strong sense” of phenomenology follows an ontological programme outlined by Husserl where the phenomenological reductions are part of a programme that should lead us to a perspective from where we may make conclusions about the nature of things in the world. That is, it is attempted to make ontological claims via systematic descriptions of experience. Consciousness, thus, becomes ultimate starting points of an investigation in which no ontological or methodological division between mind and world is accepted. The attempt to combine this takes on phenomenology with cognitive science, as is attempted by Varela, has been criticised for making logically impossible background assumptions. For instance, cognitive science cannot be practised (at least as we today know of cognitive science) without presupposing a split between mind and world, and mind and brain. These pre-theoretical divisions are implicit part of every methodology in cognitive science and cognitive neuroscience as it is logically impossible to experimentally correlate relations between phenomena if you have not defined them as different. Thus, the study of the relation between stimulus and response, between stimulus and mental phenomenon (e.g. conscious experience), and between brain process and mental phenomenon must in every instance presuppose that these phenomena are dif-

ferent. Furthermore, in order to accept the theoretical frameworks of cognitive science and cognitive neuroscience – primarily functionalism, varieties of representationalism, and identity theory – one must believe that mental phenomena in a stronger or weaker sense depend on the activations of brains. That is, one accepts that brains constitute a “more fundamental” ontological level of the world than consciousness does. It has been argued that these disagreements in background assumptions make the very idea of using “strong phenomenology”, or transcendental phenomenology, in the same context as cognitive science impossible (Bayne, 2004; Overgaard, 2004).

“Weak phenomenology”, or phenomenological psychology, makes no specific ontological claim but understands phenomenology as a methodological guideline only. Here, the attempt is a scientific enterprise based upon a fully-developed vocabulary of words and descriptions that refer to conscious experiences. Ideally, one would have a vocabulary with a one-to-one relationship between each description and each possible experiential state. Although certain difficulties in the relation to cognitive science also can be pointed out in this approach, the difficulties are not as fundamental as in “strong phenomenology” (Overgaard, 2004). Thus, methodologies resting on “weak phenomenology” should be a more usable point of departure for an integration of first person methods in experimental psychology.

Although “introspection” and “phenomenology” are often taken to mean the same in experimental contexts, certain classical differences between phenomenological reflection and introspection should be pointed out. In the classical experiments on introspection (Wundt, 1907) as well as in newer experiments using introspection (Overgaard & Sørensen, 2004), subjects are asked to report directly about their experiences as different from reporting about a stimulus. Although this practice may sound more or less identical to phenomenological methods, “strong phenomenologists” would hardly accept the comparison. Phenomenology in the ontological Husserlian tradition would consider introspective practice as based on an “inner-outer distinction”, which as mentioned cannot be accepted here.

One suggested methodological difference between weak phenomenology and introspection is that introspection relies on external methods: Subjects are given predetermined experiential categories, whereas, in phenomenology, subjects are free to create their own, following the phenomenological reduction. Whereas this may be true for “old-school introspectionism” as in Wundt (1907) and Titchener (1913), it seems not to be the case in newer versions of introspectionism, where subjects in some instances are asked to create their own experiential categories (as in Overgaard, Nielsen & Fuglsang-Frederiksen, 2004).

### **Jack & Roepstorff**

Jack & Roepstorff (2002) coin first person methods “introspection” in accordance with the traditions of Wundt and Titchener whose methodology for verbal reports founded experimental psychology.

The re-entry of introspection as a serious methodology in modern day experimental psychology is a controversial issue. Since the fall of introspectionism in the early part of the 20<sup>th</sup> century, introspection has been seen as fundamentally unscientific because of the lack of external validation. Historical classics such as Nisbett and Wilson (1977) have demonstrated

that we are quite unreliable when reporting e.g. what we believe what we do. For this reason, one line of strategy has been preferred in experimental psychology to deal with introspection. One has tried to avoid it by designing experiments in such a way that subjects never directly report or think about their experiential content, after which one has second-guessed what the subject experienced.

According to Jack & Roepstorff, introspection is unavoidable in practice. Because experimental subjects do not always follow instructions exactly, we need introspection as a “supplementary source of information”. They argue that there are two kinds of reports often used in introspection. One kind is the so-called first-order reports with which subjects can report about events in consciousness. Another kind is the second-order reports. Second-order reports reflect an awareness of the subject’s own conscious states. Although Jack & Roepstorff do not go into much detail regarding the exact status of introspective reports versus other kinds of reports, it seems clear in their argumentation that they consider introspective reports as different. The difference, it seems, is that introspective reports always reflect consciousness, be it a first or second order report.

Although Jack & Roepstorff give a careful methodological examination of experimental practice, they do not go into how, more exactly, introspection should be practiced. They do, however, say that introspective reports “should be used with care as it influences cognitive processing”. As such, and as opposed to the way “naturalised phenomenologists” speak of it, introspection is very much an “add-on” to cognitive experiments rather than an objective in itself. It is briefly discussed that one may use open or “semi-open” interviews retrospectively (after experiments, that is) or more closed scaling techniques during experiments.

Exactly as the phenomenological approaches did, Jack & Roepstorff mention Lutz *et al.* as an example of this approach, as the experiment uses introspective evidence (reports about experience) and use broader categories based on introspective insights which eventually are translated into quantitative categories. This, of course, indicates that what Jack & Roepstorff think of as operationalised introspection has important similarities with what is thought of as operationalised phenomenology in the approaches above.

### **Overgaard**

In Overgaard (2003b) a further account of introspection is outlined. Although it shares many similarities with Jack & Roepstorff, the main difference is that introspection here has a higher status than just an “add-on” to experimental practice.

In Overgaard & Sørensen, the relation between introspective and non-introspective reports is brought to experimental testing. Subjects were instructed to identify a displayed figure by pointing out its shape, colour, and location on three different scales. The responses of the subjects were treated as being either ‘correct’, ‘incorrect’ or ‘near correct’. ‘Near correct’-responses matched stimulus partially correct (e.g. when they pointed at the same colour as the one presented, but in a brighter or darker tone). It was shown that subjects in the non-introspective condition had significantly more correct *and* incorrect responses, whereas the intro-



spective subjects most often were ‘near correct’. In addition, subjects in the introspective condition tended to be more liberal about their reports of, say, colour, while the subjects in the non-introspective condition tended to show a more conservative style and conformed to specific colour categories.

Based on these findings, it is suggested that the researcher should distinguish clearly between reports where subjects introspect and reports where subjects base their report on “everyday perception”. The argument is that the directing of attention towards the experience involves different mental processes than directing attention towards a perceptual object.

Contrary to the suggested difference between introspection and phenomenology mentioned above, it is suggested (Overgaard, 2003b; Ramsøy & Overgaard, 2004) that subjects should create their own report categories. The procedure differs slightly from Varela’s relatively strict recipe, in that the experimenter had little influence on the reporting categories after the subjects’ open reports. In the experiment reported in Ramsøy & Overgaard, the subjects created the experimental categories themselves. However, in a following experiment, the categories were “exported” to be used by other subjects. The procedure seems to have less precise methodological rules than does Neurophenomenology. This is, following the critique of Braddock and Gallagher that Neurophenomenology is too “strict”, an advantage, though one could reasonably argue that a minimal set of explicit rules should be stated.

Overgaard (2003b) suggests that the creation of introspective categories is just one method to introduce first person reports in experiments. One may combine this effort with detailed interviews after the experimental sessions; keeping in mind that memory decay will affect these reports. The analysis of the result will normally consist in a comparison between groups created by the experimental variable, e.g. differences in stimulus input or in introspective report. New insights can however be reached by regrouping the results based on categories gained from the interview. A realisation of this idea can be found in Roepstorff *et al.* (2004) where neural activations related to perceiving and imagining a face were compared. An interview was performed afterwards, revealing that subjects differed in the interpretation of instructions. The experiment revealed late right ventral visual stream activation in imagination, while posterior visual areas and early left ventral visual stream activations were related to perceiving. These results were found when regrouping subjects after interview reports.

Apart from the already mentioned experiments, Overgaard (2003b) mentions the experiment by Lutz as an approach very similar to his own. The training in phenomenological reduction resembles the training in reporting “directly on experiences” and both before and after the actual experiment, subjects are grouped based on their experiential reports.

### **Price & Aydede**

Donald Price and Murat Aydede (in press) suggest a “new” methodology of introspection based on previous publications by Price & Barrell (1980) and Barrell & Barrell (1975). They claim that their approach is very much in resemblance with phenomenology, yet they consequently refer to their methodology as a method for introspection. Although they do not inves-

tigate the relation between the two concepts in detail, they clearly do not agree with Husserlian phenomenology, as they take it for granted that brain processes underlie consciousness and that introspection is a method to learn about “that which cannot be learned by objective means”.

Price and Aydede present their approach as consisting of two “phases” – a horizontal and a vertical phase. In the horizontal phase, four stages are separated out as follows: (1) questioning and observing, (2) describing experiences from a first-person perspective, (3) understanding experiences through discovering common factors and their interrelationships, and (4) application of quantitative methods to test generality and functional relationships between common factors. Price and Aydede claim that the first three steps are unique compared to other experimental approaches because the subject here is involved in creating his or her own report categories. Compared to the methods suggested above, this is an overstatement.

The first step involves posing a general question about how some given mental phenomenon “feels” or what it is like. They suggest “passively observing” the relevant mental phenomenon, however, without wanting to be associated too closely with the classical sort of introspectionism (especially Titchener’s version) who considered consciousness passive per se. In stead, the passive observation is meant as a method to avoid immediate prejudice or too fast conclusions about what is experienced, and it is to be followed by a retrospective attention based upon which the nature of the experience can be described in the following step. Here, Price and Aydede underline the importance that a full description entails not just a focus on the specific, say, sensory modality that is stimulated, but to all aspects of experience (passing thoughts, etc.). This method, of course, rests on the assumption that there is a limited, clearly identifiable number of conscious states that occur during, say, a perception that is available for report. After this, a step of “distillation” begins. Here, the experimenter and the subject “interpret” the report, e.g. the report (when stimulated with painful hot water on the hand): “Is it going to get stronger? Feeling of concern. I hope my hand isn’t going to be scalded” can be interpreted to a statement about concern about future consequences. This process aims to generalise the subjective reports in order to arrive at general factors. These factors, Price and Aydede argue, are of use both for defining the relevant conscious state and for giving functional hypotheses about it. From here, the subject “leaves over” the expert role to the investigator who applies quantitative methods, e.g. to count how often a given report is given etc.

The “vertical phase” regards the combination of the results from phase one with neuroscientific results. Price and Aydede say very little about this part of the research, but it seems they suggest to apply standard neuroscientific investigations to single subjects based on their reports, and that results are compared between subjects in following investigations.

Although Price and Aydede do not explicitly refer to the experiment by Lutz and colleagues, there is no doubt that this experiment follows the guidelines of the suggested procedure quite closely.

Anyone involved in theoretical consciousness studies, as the metaphysical discussion is led in leading journals as *Journal of Consciousness Studies*, knows that the discussion presently may be even more impossible to overview than ever. The present status of our understanding of the relation between consciousness and brain is characterised by so little knowledge about relevant empirical facts that very few constraints exist to what a theory about the relation should live up to. This makes it possible to have, in principle, as many theories about the relation as there are theorists. If this were the case, an increasing number of theorists involved in consciousness studies would contribute only to increase confusion instead of resolving it, which, to some degree, could be claimed to be the case.

### **General evaluation of the suggestions**

In the above, six suggestions for a first person methodology are presented. In the light of the status of the metaphysical debate on consciousness, one should be specifically cautious to avoid an unnecessary large diversity among applied methodologies – at least if the goal is commonly recognised scientific progress. The six suggestions (and more could have been included) present themselves as different in two ways: They present themselves as either “phenomenological” or “introspective” methodologies, and they all claim to be “unique” and new suggestions (thus different from the others).

The difference between phenomenology and introspection was discussed earlier. After the above review of the suggestions for experimental practice, however, it appears that the differences are much more of a theoretical nature than they are differences in methodology. All suggestions agree that valuable insights into consciousness can be achieved by examining subjective reports in experimental settings. Varela (1996), Overgaard (2003b), and Price & Aydede (in press) all argue that experimenters should teach subjects not to have implicit or explicit theories about consciousness before the experiment. Also, they give quite specific instructions that subjects should report freely about their experiences “as they occur to them”, after which more specific categories are created for use in the context of an experiment. Gallagher (2003) and Jack & Roepstorff join in agreement with Varela, Overgaard and Price & Aydede that insights into conscious experience should be addressed in experimental settings, and only Gallagher finds it not absolutely necessary that subjects explicitly report about their experiential state. Varela and Gallagher seem more in opposition to Braddock in his suggestion where conscious states only should be inferred in a post hoc analysis, than they are opposed to the “introspectionist” suggestions.

Overall, it could be argued that what classifies the suggestions as either “phenomenological” or “introspectionist” is rather the history and line of inspiration of the individual authors than it is the content of the actual methodology. Moreover, the theories surrounding the methods differ. Theorists inspired from the introspectionist tradition would tend to think of subjective reports as an “additional source of information”, or “the thing we have to use when standard scientific methods are not applicable”, whereas phenomenological inspiration will tend to go in the opposite direction and see “standard scientific methods” as an extra source of information added to the subjective reports. However, these differences in perspective need not have any visible influence on the methodology one chooses to apply. Looking at the suggestions

present, phenomenology versus introspection seems not to be a significant variable to account for the relatively few differences between them.

Regarding individual differences between all the suggestions, it is very striking that three out of six consider the experiment by Lutz and colleagues more or less a “direct application” of their ideas, one refers to Lutz as highly similar (Gallagher), and one could have said so as easily as the others (Price & Aydede). Although Lutz does explicitly ally with Varela’s neurophenomenology, the references to Lutz et al. just underlines how the differences in theoretical conceptions in this case have little impact on experimental procedure.

From the above, it follows that the differences between the suggestions to first person methodologies are rather theoretical or terminological than they are methodological. Some may worry whether this indicates that none of the “phenomenological suggestions” are “really phenomenological” but only disguised introspectionist suggestions as much of the original Husserlian thinking has been abandoned to fit a more experimentalist strategy. Again, however, such worries represent theoretical and terminological discussions rather than methodological ones.

### **Consequences for a qualitative neuropsychology**

From this we can conclude that it principally should be possible to extract more precise methodological suggestions for use by experimental scientists.

- 1) The re-interpretation of experimental results can open up alternatives about the character of mental states (Braddock). Thus, when reading and evaluating experimental results, one should carefully examine whether alternative interpretations of behavioural data can open up further empirical research questions.
- 2) Existing knowledge from phenomenology, introspection (and other first person methods) should be consulted before one decides for an experimental design, e.g. stimulus material, instructions, etc. (Gallagher).
- 3) The character of mental states cannot be predetermined by the subject having the state. Therefore, subjects should be trained to “observe experiences” without prejudice (Varela, Price & Aydede).
- 4) The character of mental states cannot be predetermined by the experimental scientist investigating them. Therefore, the scientist should gather open reports and suggestions for report categories from trained subjects (Varela, Overgaard, Price & Aydede).
- 5) Post hoc interviews should be carried out for retrospective examination of the subjects’ experiences during the experiment to gather information too rich or complicated to investigate during the actual experiment (Jack & Roepstorff, Overgaard).
- 6) The interview can inspire a re-grouping of data and new ways to look at data using quantitative methods (Overgaard).

It is my belief that the full or partial application of these guidelines would have considerable effects on neuropsychology in terms of paradigmatic discourse as well as choice of experimental set-up or concrete results. It is, as should be obvious, a “first take” on integrating qualitative and quantitative methods in experimental research. Beyond doubt, collaboration between experimental scientists, realising these ideas, and qualitative researchers, elaborating and re-thinking them, would make a further integration possible.

## References

- Barrell, J. & Barrell, J.E. (1975): A self-directed approach for a science of human experience, *Journal of Phenomenological Psychology*, 63-73
- Bayne, T. (2004): Closing the gap? Some questions for neurophenomenology, *Phenomenology and the Cognitive Sciences*, 3, 349-364
- Braddock, G. (2001): Beyond reflection in naturalized phenomenology, *Journal of Consciousness Studies*, 8, 3-16
- Chrisley, R. (2001): A view from anywhere: prospects for an objective understanding of consciousness, in: P. Pylykänen & T. Vadén (eds): *Dimensions of Conscious Experience*, John Benjamins
- Farrer, C. & Frith, C.D. (2002): Experiencing oneself vs another person as being the cause of an action: the neural correlates of the experience of agency, *NeuroImage*, 15, 3, 596-603
- Gallagher, S. (2003): Phenomenology and experimental design, *Journal of Consciousness Studies*, 10, 85-99
- Gallagher, S. & Sørensen, J.B. (in press): Experimenting with phenomenology, *Consciousness and Cognition*
- Jack, A. & Roepstorff, A. (2002): Retrospection and cognitive brain mapping: from stimulus-response to script-report, *Trends in Cognitive Sciences*, 6, 8, 333-339
- Jultesz, B. (1971): *Foundations of Cyclopean Perception*, University of Chicago Press
- Lutz, A., Lachaux, J.P., Martinerie, J. & Varela, F. (2002): Guiding the study of brain dynamics by using first-person data: synchrony patterns correlate with ongoing conscious states during a simple visual task, *Proceedings of the National Academy of Sciences USA*, 99, 3, 1586-1591
- Merleau-Ponty, M. (1962): *The Phenomenology of Perception*, Routledge and Kegan Paul
- Nagel, T. (1986): *The View From Nowhere*, Oxford University Press
- Nagel, T. (1974): What is it like to be a bat? *Philosophical Review*, 83, 435-51.
- Nisbett, R.E. & Wilson, T.D. (1977): Telling more than we can know: Verbal reports on mental processes, *Psychological Review*, 84, 231-259
- Overgaard, M. (2003a). On the theoretical and methodological foundations for a science of consciousness. *Bulletin fra Forum for Antropologisk Psykologi*, 13, 6-31.
- Overgaard, M. (2003b): *Theoretical and Empirical Studies of Consciousness*, Ph.D.-thesis, University of Aarhus
- Overgaard, M. (2004): On the naturalizing of phenomenology, *Phenomenology and the Cognitive Sciences*, 3, 365-379

- Overgaard, M., Nielsen, J.F. & Fuglsang-Frederiksen, A. (2004): A TMS study of the ventral projection streams from V1 with implications for the finding of neural correlates of consciousness, *Brain and Cognition*, 54 (1), 58-64
- Overgaard, M. & Sørensen, T.A. (2004): Introspection distinct from first order experiences, *Journal of Consciousness Studies*, 11, (7-8), 77-95.
- Price, D.D. & Aydede, M. (in press): The experimental use of introspection in the scientific study of pain and its integration with third-person methodologies: The experiential-phenomenological approach, *Consciousness and Emotion*
- Price, D.D. & Barrell, J.J. (1980): An experiential approach with quantitative methods: a research paradigm, *Journal of Humanistic Psychology*, 20, 3, 75-95
- Ramsøy, T.Z. & Overgaard, M. (2004): Introspection and subliminal perception, *Phenomenology and the Cognitive Sciences*, 3 (1), 1-23
- Roepstorff, A. Hohwy, J., Vuust, P., Overgaard, M. & Gjedde, A. (2004): Interaction between visual imagery and perception, the *10th Annual Meeting of the Organization for Human Brain Mapping*, Budapest [abstract]
- Titchener, E.B. (1913): The method of examination, *American Journal of Psychology*, 24, 429-440
- Varela, F.J. (1996): Neurophenomenology: A methodological remedy for the hard problem, *Journal of Consciousness Studies*, 3, 4, 330-349
- Wundt, W. (1907): Über Ausfrageexperimente und über die Methoden zur Psychologie des Denkens, *Psychologische Studien*, 3, 301-360