



Are “q-memories” empirically realistic?: a neurophilosophical approach

G. NORTHOFF

ABSTRACT *“Quasi-memories,” necessarily presupposing a distinction between an “experiencing” and a “remembering” person, are considered by Parfit and Shoemaker as necessary and/or sufficient criteria for personal identity. However, the concept of “q-memories” is rejected by Schechtman since, according to her, neither “content” and “experience” can be separated from each other in “q-memories” (“principal inseparability”) nor can they be distinguished from delusions/confabulations (“principal indistinguishability”). The purpose of the present paper is to demonstrate that, relying on a neurophilosophical approach, both arguments can be rejected. Neuropsychological research shows that “contents” of memories are classified according to the accompanying psychological state such that the same “content” can be classified either as auto- or heterobiographical by the respective “experience.” Since “content” and “experience” can be separated from each other, the argument of “principal inseparability” must be rejected on empirical grounds. In addition, as demonstrated in an example of a schizophrenic patient, “q-memories” can be distinguished from delusions/confabulations considering the ability to distinguish between different sources of autobiographical memories as a differential criterion. In conclusion, both arguments by Schechtman against the concept of “q-memories” have to be rejected on the basis of neurophilosophical considerations. Consequently, the concept of “q-memories” can be considered as compatible with current empirical knowledge.*

1. Introduction

In the current philosophical discussion about personal identity (see Quante, 1995, for an overview) memory is often considered as a necessary and/or sufficient condition for personal identity. However, memory itself may necessarily presuppose personal identity since memory may only be considered as a condition for personal identity if the “experiencing” and “remembering” person are identical. In order to escape this “argument of circularity,” by which means Butler already argued against Locke (Northoff, 1998, pp. 65–67), Parfit and Shoemaker introduced the concept of “quasi-memories,” i.e. “q-memories” where the “experiencing” and “remembering” person do not have to be necessarily identical. If the “experiencing” and “remembering” person are not necessarily identical, “q-memories” can be con-

G. Northoff, Department of Neuropsychiatry, Section for Neurophilosophy, Otto-von-Guericke University, Leipziger Straße 44, 39120 Magdeburg, The Netherlands, email: Georg.Northoff@Medizin.Uni-Magdeburg.de

sidered as a condition of personal identity since, unlike memories, they do not presuppose personal identity, thus escaping the "argument of circularity."

The concept of "q-memories" does, however, remain controversial. According to Schechtman (1990), "q-memories" do necessarily presuppose a distinction and separation between the "content" and the "experience" of memories which, according to her, is not the fact. Due to direct modulation and interferences between "content" and "experience," both are principally inseparable; we will call this the "principle of inseparability"; i.e. so that concept of "q-memories" has to be rejected. In addition, Schechtman claims that "q-memories" are not distinguishable from delusions/confabulations; i.e. we will call this the "principle of indistinguishability"; making the concept of "q-memories" senseless, which therefore should be rejected.

Both proponents and opponents of "q-memories" rely on thought experiments about memory transplantation which do not necessarily coincide with empirical reality. The purpose of the present paper is to relate the philosophical concept of "q-memories" to neuropsychological research about auto- and heterobiographical memory. Is the concept of "q-memories" as put forward by Parfit and Shoemaker compatible with current empirical data, or should it be rejected, as favoured by Schechtman? In addition, neuropsychiatric diseases like schizophrenia showing concomitant delusions and identity disturbances may provide a unique opportunity for an empirically based neurophilosophical investigation of the relationship between memory and personal identity. Combining philosophical concepts, neuropsychological processes, and neuropsychiatric phenomenology applying a "transdisciplinary" neurophilosophical methodology (Northoff, 1997, 1998) may thus allow complementary comparisons between theoretical terms and empirical facts. It will be demonstrated that relying on neuropsychology and neuropsychiatry "content" and "experience" of memories can well be distinguished and separated from each other so that Schechtman's claim about their inseparability must be rejected; i.e. the concept of "q-memories" is well compatible with current empirical data.

In the next section, the philosophical concept of "q-memories" as put forward by Parfit and Shoemaker as well as Schechtman's example of memory transplantation are presented, focusing predominantly on the relationship between memory and personal identity. Section 3 describes distinct neuropsychological processes involved in autobiographical memory and their relation to personal identity. In Section 4 philosophical terms are related to neuropsychological processes which are then applied on both "q-memories" and Schechtman's examples of memory transplantation, showing contrary to Schechtman the possibility of a distinction between "content" and "experience" of memories. Section 5 describes the case of a schizophrenic woman with concomitant delusions, memory alterations and disturbances in personal identity which is then compared with "q-memories" and Schechtman's example of memory transplantation, demonstrating the difference between "q-memories" and delusions/confabulations.

2. Memory and personal identity from a philosophical perspective: "q-memories"

Locke considered memories as a necessary and sufficient criteria of personal identity

(Locke, 1694, pp. 16, 27), which was rejected by Butler because of a "wonderful mistake" of circularity: "... self-evident, that consciousness of personal identity presupposes, and therefore cannot constitute personal identity, any more than knowledge in any other case, can constitute truth, which it presupposes" (Butler, 1736, p. 100). In order to avoid such a contradictory circularity, Locke's concept of memories as the sole criterion for personal identity was modified and replaced by the concept of the so-called "quasi-memories" (i.e. "q-memories") (Parfit, 1989, p. 222; 1971, p. 15; Shoemaker, 1984, pp. 24–27, 38; Shoemaker & Swinburne, 1984, p. 148). In the concept of "q-memories" two distinct persons are distinguished, the person which "experiences" ("experiencing person") an event and the person which "remembers" that event ("remembering person"). Unlike in "normal" memories, these two distinct persons are dissociated from each other in the concept of "q-memories" so that both do not have to be necessarily identical, as it is demonstrated in the following example of "Venetian memories" from Parfit (Parfit, 1989, pp. 220–221):

Venetian memories. Jane has agreed to have copied in her brain some of Paul's memory traces. After she recovers consciousness in the post-surgery room, she has a new set of vivid memories. She seems to remember walking on the marble paving of a square, hearing the flapping of flying pigeons and the cries of gulls, and seeing the light sparkling on green water. One apparent memory is very clear. She seems to remember looking across the water to an island, where a white Palladian church stood out brilliantly against a dark thunderland. What should Jane believe about these apparent memories? Suppose that, because she has seen this church in photographs, she knows it to be San Giorgio in Venice. She also knows that she has never been to Italy, while Paul goes to Venice often. Since she knows that she has received copies of some of Paul's memory traces, she could justifiably assume that she may be quasi-remembering some of Paul's experiences in Venice. Let us add this detail to the case. Jane seems to remember seeing something extraordinarily: a flash of lightening coming from the dark cloud, which forked and struck both the bell-tower of San Giorgio and the red funnel of a tug-boat passing by. She asks Paul whether he remembers seeing such an extraordinarily event. He does, and he has kept the issue of the *Gazzettino* where it is reported. Given all this, Jane should not dismiss her apparent memories as delusion. She ought to conclude that she has an accurate quasi-memory of how this flash of lightening looked to Paul. For Jane's "quasi-memory" to give her knowledge about Paul's experiences, she must roughly know how they have been caused. This is not required in the case of ordinary memory. Apart from this difference, quasi-memories would provide a similar kind of knowledge about other peoples past lives. They would provide knowledge of what these live were like, from the inside. When Jane seems to remember walking about the Piazza, hearing

the gulls, and seeing the white church, she knows part of what it was like to be Paul on that day in Venice.

In contrast to "normal" memories [1], "q-memories" do not necessarily imply that Jane personally "experienced" the events by herself which she vividly "remembers" as autobiographical. Jane "remembers" events which were "experienced" by Paul so that the "experiencing" and "remembering" person are no longer necessarily identical.

Consequently, Parfit claims that it is not necessary that we "remember" only events which we "experienced" personally, i.e. by ourselves, as is usually the case (i.e. "normal" memory): "It is not logically necessary that we only q-remember our own experiences" (1971, p. 16).

Shoemaker furthermore distinguishes between "quasi remembering from the inside" and "quasi remembering from the outside" (1984, pp. 24–27): "Quasi remembering from the inside" is a kind of memory where the sensoric–cognitive state during the actual experience of an event belonged to that person who "experienced" (and "remembered") that particular event.

"Quasi remembering from the outside" in contrast implies that the sensoric–cognitive state during the actual experience of a event does not belong to that person who "experienced" that event (and not to the one who "remembered" it) [2]. Thus Shoemaker does not only distinguish between the "experiencing" and "remembering" person but, in addition, between the person showing a particular sensoric–cognitive state (i.e. "sensoric–cognitive person") during the actual experience of an event and the person actually "experiencing" that event (i.e. "experiencing" person). The particular event can therefore be "quasi-remembered" either "from the inside" where "experiencing" and "sensoric–cognitive" person are identical or "from the outside" where both persons are no longer identical, i.e. they are dissociated from each other. Only if all three persons, the "sensoric–cognitive" one, the "experiencing" one, and the "remembering" one, are identical, one can speak, according to Shoemaker, of "normal" memory (Shoemaker, 1984, pp. 24–27). Consequently, "normal" memory has to be considered as a special case of "q-memories", the latter encompassing a variety of memories with distinct relationships between the distinct persons involved (i.e. only two possibilities without further characterization are given as examples).

Schechtman argues against the concept of "q-memories" because, according to her, it presupposes a separation between the "content of memories" on the one hand and the "experience of memories" (i.e. accompanying emotions, cognitions, etc.) on the other (Schechtman, 1990, pp. 82–85). "Q-memories" necessarily presuppose the possibility of separation between "content" and "experience" because otherwise the "experiencing" person cannot be distinguished from the "remembering" person. However, due to mutual interactions and interdependencies between "content" and "experience" (i.e. the "content" shapes the "experience" and the latter modifies the former), Schechtman rejects the assumption of their separability and, consequently, the concept of "q-memories". She illustrates her argument with an empirical example of memory transplantation. Either the "contents," derived from another

person, become transplanted without the concomitant "experiences" of this person, which would lead to a modification of the transplanted "contents" by the "experiences" of the implanted person so that the "contents" of the transplanted memories would no longer be the same and could therefore not be regarded as "q-memories" in the sense of Parfit and Shoemaker; or both the "contents" and the "experiences" of memories from another person, are transplanted, which, however, according to Schechtman, would lead to a state where "q-memories" could no longer be distinguished from paranoia, confabulation, or identity disturbances because distinction between memories of the implanted persons, memories of the person from which the transplant is derived, and mere fantasies would be impossible. Due to the interactions between "content" and "experiences" either kind of transplantation does not lead to "q-memories" in the original sense so that, according to Schechtman, the concept of "q-memories" should be rejected.

3. Memory and the self from a neuropsychological perspective

Neuropsychologically, memory cannot be regarded as a single entity but it must rather be differentiated into different systems and processes (Ungerleider, 1995). The various memory systems are oriented along distinct contents and different time scales which can be memorized. The main memory systems comprise systems for movements and actions (i.e. procedural memory), perceptual contents (i.e. perceptual representation system), short-term memory (i.e. working memory), and long-term memory including factual knowledge (i.e. semantic memory) and biographical events (i.e. episodic memory). Furthermore, one must distinguish between distinct memory processes. The contents must be encoded into the respective memory systems ("encoding"), they must be stored ("storage") either for a short (i.e. short-term memory) or for a long (i.e. long-term memory) time, and, if one wants to either recognize or recall the past facts or events (i.e. the contents), they must be retrieved ("retrieval") within the present context. The processes of "encoding" and "retrieval" of autobiographical (i.e. episodic) memory (in contrast to mere factual heterobiographical knowledge (i.e. semantic memory) are of particular importance in the present neurophilosophical context relating memory with personal identity.

3.1. "Conscious awareness" and "feeling of familiarity"

Episodic memory cannot only be defined by the content itself but by a particular psychological state accompanying the experience of these contents (Conway *et al.*, 1996; Wheeler *et al.*, 1997). The contents concern either a personal (i.e. autobiographical) or an impersonal (i.e. heterobiographical) event which occurred in the past (Fink *et al.*, 1996, p. 4278) of that particular person: "Episodic memory enables the individual to remember their personally experienced past, that is, to remember experienced events as embedded in a matrix of other personal happenings in subjective time" (Tulving, 1995, p. 841). As such, either personal facts (i.e. "personal semantic facts") or personal events (i.e. "autobiographical incidents") can be "encoded" and "stored" (Kopelman *et al.*, 1989) [3]. During retrieval, these

personal facts and/or events are reconstructed in "several retrieval cycles" which lead to modification of the emotional background of the past fact/contents by the present situation, whereas the facts/contents themselves remain unchanged. Due to such alterations in the emotional background of the unchanged "contents" the present "experience" of the past contents may differ from the past/original "experience" of the same "contents" (Conway *et al.*, 1996, pp. 76–78).

Similar to episodic memory in general (see above), retrieval of personal facts and/or events is accompanied by particular psychological states, a particular kind of "conscious awareness" ("remember," "conscious recollection"): "It depends on but transcends the range of capabilities of semantic memory. The most distinctive aspect of episodic memory is the kind of conscious awareness that characterizes recollection of past happenings. This awareness is unique and unmistakably different from the kinds of awareness that accompany perceptual experiences, imaging, dreaming, solving of problems and retrieval of semantic information" (Tulving, 1995, pp. 841–842). This special kind of "conscious awareness" can be best described as a particular "personal and subjective feeling" (i.e. "remember" in contrast to "knowing") which can also be characterized as a form of "self-knowing" ("auto-noetic" in contrast to "noetic" awareness) (Wheeler *et al.*, 1997, p. 333). The main difference between "remembering" as "auto-noetic awareness" and "knowing" as "noetic awareness" consists in the "re-experience and re-living of the past event including its spatio-temporal, cognitive, and sensory-perceptual details" (Conway *et al.*, 1996; Wheeler *et al.*, 1997, p. 335), present only in the former (i.e. remembering) but not in the latter (i.e. knowing) [4].

This particular kind of "conscious awareness" may be considered as one necessary condition for the retrieval of personal facts/events as autobiographical memory [5].

Memory contents which are not accompanied by "conscious awareness" (i.e. "remembering") but only by a "feeling of familiarity" (i.e. "knowing") may rather be considered as semantic and heterobiographical (Kopelman *et al.*, 1994). However, as soon as the same memory contents are accompanied by "conscious awareness" they can no longer be considered as semantic and heterobiographical but rather as episodic and autobiographical (Wheeler *et al.*, 1997, p. 349) [6].

3.2. *Autobiographical memory and the self*

In the last section autobiographical memory was defined by its content as well as by a particular accompanying psychological state during retrieval. The accompanying psychological state classifies the respective content either as auto- or heterobiographical. What are the exact criteria for the distinction between auto- and heterobiographical memories?

Conway *et al.* (1996) found that "true" autobiographical memories, in contrast to "false" ones [7], showed tighter integration between the "encoding knowledge base" and the "retrieval environment," stronger imagery and rather "conscious awareness" (i.e. "remembering") than "feelings of familiarity" (i.e. "knowing") [8].

Another psychological factor, important for the classification of facts/events as

either auto- or heterobiographical, may be, according to Markowitsch, the emotional component. On the basis of clinico-pathological observations [9] he assumes that the emotional component may be crucial for "processing information that impacts on the subject's view of his environment" (Markowitsch *et al.*, 1994, p. 1352) and, in particular, for the generation of autobiographical memory which *per se* is more emotional and complex than semantic memory (Markowitsch *et al.*, 1994; Calabrese *et al.*, 1996). Emotions may structure, select, and filter different informational contents according to the relevance for the individual (Markowitsch *et al.*, 1994, p. 1352), autobiographical or episodic memory showing *per se* a higher emotional involvement and relevance for the individual than heterobiographical or semantic memory. In addition, it has been demonstrated that high emotional involvement leads more often to "remembering" and "consciousness awareness" than low emotional involvement (Cahill *et al.*, 1996). Subsequently, these various factors (integration between encoding and retrieval, imagery, remember/knowing, emotional involvement) determine the classification of memory contents as either auto- or heterobiographical. Tight integration between encoding and retrieval, strong imagery, "conscious awareness" (i.e. remember) and strong emotional involvement rather lead to a classification of memory contents as autobiographical, implying a high level reference to the self (Conway *et al.*, 1996, p. 1996) [10]. The level of "self-reference" and the consecutive generation of personal identity via autobiographical memory may therefore depend on the kind of psychological state accompanying the respective memory contents.

4. Neurophilosophical account of "q-memories": separation between "content" and "experience"

Philosophical terms characterizing "q-memories" and their relation to personal identity will be compared with neuropsychological processes in order to develop a neurophilosophical account of the generation of personal identity (see Northoff, 1998, pp. 24–27 for discussion of such a "neurophilosophical methodology"). In addition, identity disturbances in our schizophrenic case are discussed and accounted for by neurophilosophical descriptions (see Northoff, 1997, in press, for an example of the collaboration between neuropsychiatry and neurophilosophy).

4.1. "Experiencing" and "remembering" person

Shoemaker and Parfit distinguish an "experiencing" person from a "remembering" person (see Section 2), which both may dissociate from each other. An analogous distinction is made in neuropsychological accounts of memory where "encoding" and "retrieval" are regarded as two separate and dissociable processes with distinct neuropsychological and neurophysiological substrates (see Section 3). The process of "encoding" usually (i.e. in the "normal" case) implies a person "experiencing" that event, whereas "retrieval" is closely related with the "remembering" person in a similar way. Consequently, philosophical terms ("experiencing"/"remembering") and neuropsychological processes ("encoding"/"retrieval") seem to point out com-

plementary aspects describing the involved processes (i.e. neuropsychological terms) and persons (i.e. philosophical terms) of the same function.

Though both accounts, the philosophical and the neuropsychological, are compatible with the possibility of dissociation (see Sections 2 and 3), the exact relationship between “encoding”/“experiencing” on the one hand and “retrieval”/“remembering” on the other remain unclear. Certainly, “encoding”/“experiencing” an event (i.e. either a personal or an impersonal one) is a necessary condition for correct “retrieval”/“remembering” (i.e. either as a auto- or heterobiographical event) because if an event is not “encoded”/“experienced” nothing can be “retrieved”/“remembered.”

In the “normal” case as shown above “encoding”/“experiencing” and “retrieval”/“remembering” are not dissociated from each other so that the “experiencing” person is identical with the “remembering” person. However, if necessary and/or sufficient conditions for correct “retrieval”/“remembering” are not met [11] the “experiencing” person does not have to be necessarily identical with the “remembering” person. This is the case in “q-memories” where “encoding”/“experiencing” and “retrieval”/“remembering” are dissociated from each other. However, in both cases, the “normal” case and the case of “q-memories”, the person is still able to distinguish between the different sources of her memories as well as between the “encoding”/“experiencing” and the “retrieving”/“remembering” person (see also Section 5).

In the case of “q-memories”, as described by Parfit and Shoemaker (see Section 2), heterobiographical facts/events, “encoded”/“experienced” by another person, are “retrieved”/“remembered” as “quasi-autobiographical.” From a neuropsychological perspective this would imply that these facts/events (i.e. which were originally “encoded”/“experienced” by another person) are accompanied by “conscious awareness” as a “re-living and re-experience” of that event (see Section 3) so that the “retrieving”/“remembering” person classifies it no longer as heterobiographical but as “quasi-autobiographical.” In this case, non-personal facts/events (i.e. from another person) are accompanied by psychological states which are usually associated only with “retrieving”/“remembering” of personally “encoded”/“experienced” facts/events. However, the new memories remain “quasi-autobiographical” since the person can still distinguish between the different sources of her memories as well as between the “encoding”/“experiencing” and the “retrieving”/“remembering” person (see also Section 5). In Parfit’s example of “q-memories”, Jane has the “feeling” that she had been to Venice but she still knows (according to Parfit, she lacks the “belief” of having been to Venice by herself; see Section 5) that she had never been to Venice by herself so that after transplantation her memories of Venice are not purely autobiographical but rather “quasi-autobiographical.”

The inverse case where personally “encoded”/“experienced” facts/events are “retrieved”/“remembered” as “quasi-heterobiographical” may also be possible (see Conway *et al.*, 1996, for an empirical demonstration). Due to the wrong accompanying psychological state (i.e. “feelings of familiarity” instead of “conscious awareness”) autobiographical facts/events are “retrieved”/“remembered” as “quasi-

heterobiographical," implying a dissociation between the "experiencing" and the "remembering" person in such a case of "inverse q-memories."

In addition to the distinction between the "experiencing" and "remembering" person, Shoemaker further distinguishes between a "sensoric-cognitive" person and an "experiencing" person (see Section 2). The "sensoric-cognitive state" accompanying "encoding"/"experiencing" of facts/events must therefore not necessarily be tied to the same person as the process of "encoding"/"experiencing" itself. From a neuropsychological perspective, the "sensoric-cognitive state," as described by Shoemaker, may be characterized as a particular psychological state accompanying "encoding"/"experiencing" [12] which determines the further classification of "encoded"/"experienced" events either as personal or impersonal.

Shoemaker's distinction between the "experiencing" person and the "sensoric-cognitive" person implies the possibility of dissociation between both kinds of person. A personal fact/event may consequently be accompanied by a sensoric-cognitive state which classifies this fact/event not as personal but as impersonal. The inverse case where impersonal facts/events are classified as personal may be also possible. Analogous to "q-memory", we want to use the term "q-experiences" for such states.

If the psychological states, accompanying "encoding"/"experiencing" and "retrieval"/"remembering" of the same fact/event, may not lead to analogous classification (i.e. personal and autobiographical, impersonal and heterobiographical), the same fact/event, for example, can be "encoded"/"experienced" as impersonal but "retrieved"/"remembered" as "quasi-autobiographical" and vice versa. Such a dissociation between the kinds of psychological states accompanying "encoding"/"experiencing" and "retrieving"/"remembering" implies distinct degrees of self-reference so that both processes may be related to distinct persons, i.e. the "encoding"/"experiencing" person may not be considered as identical with the "retrieving"/"remembering" person. It becomes clear now that "q-memories" are closely related with the classification of facts/events (as personal/impersonal and auto/heterobiographical during encoding and retrieving) by means of accompanying psychological states [13]. Subsequently, identity and/or non-identity of the distinct persons involved in memory predominantly depends on similarities and/or differences between the respective accompanying psychological states. The combination of "q-experiences" and "q-memories" may lead to even more complex disturbances in the generation of personal identity via memory, which will be discussed in further detail in Section 5.

4.2. Separation between "content" and "experience" in "q-memories": a neurophilosophical reply to Schechtman

From a neuropsychological point of view facts/events are determined as auto/heterobiographical not only by their "contents" but in addition by the respective accompanying psychological states modulating the "experience" of a particular content. Depending on the respective accompanying psychological state, either "conscious awareness" or "feeling of familiarity," the "contents" of memory are classified as

either auto- or heterobiographical. The accompanying psychological states thus modulates the “experience” of a particular “content,” whereas the “content” itself remains unchanged since only its classification as either auto- or heterobiographical is determined by the “experience.” Hence “content” and “experience” can be clearly distinct and separated from each. Consequently, Schechtman’s argument about the inseparability between “content” and “experience” (see Section 2) can no longer be maintained from an empirical point of view. Moreover, the “experience” can only determine the classification of the “content,” but it can neither interfere with nor modulate the “contents” themselves directly so that Schechtman’s assumption about the possibility of a direct modulation of the “content” by the “experience,” as presupposed in her examples of memory transplantation (see Section 2), can no longer be maintained either.

Her example with transplantation of (memory) “content” without “psychological experience” should be therefore reinterpreted. She is right in assuming that the post-transplanted person may show different psychological states (i.e. “experiences”) than the person from whom the “contents” (i.e. the transplant) are derived. But she is wrong in her assumption that the psychological states (i.e. the “experiences”) accompanying the transplanted “contents” in the post-transplanted person may directly modify and alter the “new” memory “contents.” Relying on current neuropsychological knowledge (see Section 3), only the classification of these “contents” but not the “contents” themselves may be altered by accompanying (psychological) “experiences.” According to the accompanying psychological states, the post-transplanted person may classify the transplanted “contents” in different ways. The post-transplanted person may be well able to distinguish between “own” autobiographical memory and transplanted memory so that the latter will thus be classified as heterobiographical. Or the post-transplanted person may classify the transplanted memory as “quasi-autobiographical,” making no distinction between pre-transplanted autobiographical and transplanted heterobiographical memory anymore, which would be similar to the case of “q-memories” (see Section 4.1). Or the post-transplanted person may classify her own autobiographical memory no longer as autobiographical but, similar to the transplanted memory, as “quasi-heterobiographical,” which would be similar to the case of “inverse q-memory.”

These examples show that, contrary to Schechtman’s assumption, “q-memories” in the original sense as described by Parfit and Shoemaker may well be generated in her example of memory transplantation since “content” and “experience” can dissociate from each other and are therefore separable. In addition, memory “contents” cannot be modified directly by psychological “experiences” but only be classified in different ways according to the respective accompanying psychological state while the memory “content” itself remains unchanged. We here showed examples of “q-memories” without “q-experiences”; in addition, various combinations of “q-memories” with/without “q-experiences” (see Section 4.1) are possible as well. Similar to cases of “q-memories” without “q-experiences,” these various combinations cannot, however, be distinguished from each other by different ways of modification of memory “contents” by accompanying “experiences” (as Schechtman must argue if she wants to maintain her hypothesis) but, as based on

current empirical knowledge (see Section 3), rather by distinct kinds of classification of the same memory "contents."

In summary, Schechtman is right in her assumption about the distinction between "content" and "experience" in "q-memories" but she is wrong in her claim about the principal inseparability between "content" and "experience" since she confuses different ways of classification of the same "content" by different "experiences" with direct modulation and changes of "contents" by "experiences." If Schechtman's claim of the "principal inseparability" between "experience" and "content" must be rejected, there can be no reason for her anymore to reject the concept of "q-memories". A second argument against the concept of "q-memories" by Schechtman concerned the impossibility of the distinction between "q-memories" and "delusions/confabulations," which will be discussed and rejected in the following section.

5. Neuropsychiatric account of "q-memories": distinction between delusions and "q-memories"

Schechtman argued on the grounds of her example of concomitant transplantation of "content" and "experience" for the principal impossibility of a distinction between delusions and "q-memories", rejecting the concept of the latter if they can no longer be distinguished from delusions (see Section 2).

5.1. Transplantation of "content" and "experience": delusions?

Similar to transplantation of "contents" without "experiences" (see Section 4.2), the transplanted "content" can be classified in different ways. In the case of concomitant transplantation of "content" and "experience," the possibilities of different ways of classification may be even more complex since, unlike in the case of transplantation of "content," the post-transplanted person has not only more "content" to classify by her own "experiences" but in addition he/she also has more "experiences" consisting in her own and the transplanted ones. Consequently, the post-transplanted person may have several possibilities to relate "contents" and "experiences." He/she may still be able to distinguish between autobiographical and heterobiographical, i.e. transplanted, memory or there will be "q-memories" or "inverse q-memories" (see Section 4.1).

What does this case of concomitant transplantation of "content" and "experience" tell us about the concept of "q-memories?"

First, considering the first way of classification where auto- and heterobiographical memories can still be distinguished from each other shows that concomitant transplantation of "content" and "experiences" must not necessarily lead to "q-memories". However, compared to a simple transplantation of "content" without "experience," in such a concomitant transplantation it may be more likely that "retrieval"/"remembering" of the transplanted material will rather be accompanied by "conscious awareness" than by "feelings of familiarity" (as it may be rather the case in transplantation of "contents" without "experiences"); this, however, does

not preclude the possibility of distinction between auto- and heterobiographical material.

Second, “q-memories” in this concomitant transplantation of “content” and “experience” may still be distinguishable from delusions/confabulations. Delusions/confabulations do necessarily require that the “encoding”/“experiencing” person and “retrieving”/“remembering” person can no longer be distinguished from each other, which, however, is not necessarily the case in “q-memories”. In Parfit’s example with Jane and Paul (see Section 2) Jane considers Paul’s memory from Venice as autobiographical, though she knows that she has never been to Venice by herself. Jane is still able to distinguish between the different sources of autobiographical and transplanted material and, consequently, between the “encoding”/“experiencing” and the “retrieving”/“remembering” person. This is also true in the case of consistent transplantation of “content” and “experience” where both kinds of persons can still be distinguished; i.e. the post-transplanted person is still able to distinguish between her own pre-transplanted “content”/“experiences” and the newly acquired transplanted “content”/“experiences” so that, similar to Jane with regard to Paul, he/she can still make a difference between the pre- and the post-transplanted person. According to Schechtman, there is no distinction between the pre- and post-transplanted person possible any longer in the case of concomitant transplantation of “content” and “experience” so that “q-memories” can no longer be distinguished from delusions/confabulations. Hence, according to Schechtman, criteria for the distinction between “q-memories” and delusions/confabulations are lacking so that she rejects the concept of “q-memories”. However, if one rejects her claim of the principal indistinguishability between delusions and “q-memories”, one first has to develop criteria for the distinction between “q-memories” and delusions and then to apply them on her case of concomitant transplantation of “content” and “experience.” Such criteria for the distinction between delusions and “q-memories” will be developed in the next section by means of a neuropsychiatric case with concomitant delusions and identity disturbances in a schizophrenic patient.

5.2. Delusions, “q-memories,” and identity disturbances: a neuropsychiatric account

Some schizophrenic patients with delusions experience themselves no longer as the original person but as another person; i.e. they take on the identity of another person in their subjective experiences, so that they experience the events of this other person as autobiographical. Often patients take on the identity of a past or present celebrity (for example, Jesus, Nofretete, etc.), as is also the case in our example of a schizophrenic woman who presented herself as the granddaughter of the czar [14].

The 52-year-old woman had suffered from chronic schizophrenia for 30 years. She claimed to be the granddaughter of the last czar and considered herself as the last survivor of the dynasty of the Romanoffs. She was dressed in the typical look of the Romanoffs, behaved like that, and told us everything about her autobiography. Her autobiographical memory was highly consistent with the facts known from the history of Russia and the Romanoffs. All autobiographical details of her personal history were reinterpreted by her within the context of her new personal identity.

Consequently, she regarded her relatives as other royal dynasties which, each time when they appeared in the television, were recognized by her. According to her, she realized that she was a Romanoff at the age of 44 years when a spiritual healer told her to contact some gods from South Asia. At the very beginning of her illness she often had the feeling that her own memories no longer belonged to herself, whereas simultaneously she felt that "foreign" memories from other people were inserted into her head. During her stay in our clinic she wrote down her entire autobiography which encompassed the whole Russian history, the fate of the Romanoffs and their parental relationships with other royal dynasties. It was impossible to argue with her about her personal identity; facts of her autobiography contradictory to the one of the Romanoffs were either reinterpreted or declared as false.

Such disturbances are called ego disturbances; the patients feel no longer to be themselves, take on the identity of another person and feel, behave, and interpret themselves within the context of that person. The exact neuropsychological [15] and neurophysiological [16] mechanisms of the generation of such ego disturbances are unclear, as is the case for personal identity in general.

How can we interpret this case with regard to "q-memories"?

Our schizophrenic patient does show alterations in her personal identity. Unlike in amnesic patients, the memorized facts/events (i.e. the "contents") are not lost but accompanied by different psychological states so that the same facts/events show distinct degrees of self-reference in her pre-schizophrenic and her schizophrenic life. In her pre-schizophrenic life "retrieving"/"remembering" of the history of the czar was accompanied by a "feeling of familiarity" (i.e. "knowing"; see Section 3.1) and therefore classified as heterobiographical.

In her schizophrenic life "retrieving"/"remembering" of the same content (i.e. the history of the czar) is however accompanied by "conscious awareness" (as "remembering" with "re-experience and re-living of the past event including the spatio-temporal, cognitive, and sensory-perceptual details"; see Section 3.2) and thus classified as episodic and autobiographical.

In addition, facts/events "encoded"/"experienced" as personal in her pre-schizophrenic life are no longer "retrieved"/"remembered" as autobiographical in her schizophrenic life because they are no longer accompanied by "conscious awareness" (i.e. "remembering") but only by a "feelings of familiarity" (i.e. "knowing").

Such alterations in accompanying psychological states in schizophrenia have been demonstrated also empirically, particularly deficits in "conscious awareness" (Bazin & Perruchet, 1996; Frith, 1992; Huron *et al.*, 1995; Lawrie *et al.*, 1995).

The impairment of conscious awareness is likely to have major implications for the psychopathology of schizophrenia because this state of awareness is a necessary correlate of context memory, which mediates an individual's awareness of his or her existence and identity in subjective time ... This impairment is therefore likely to induce an alteration of the sense of self. Moreover, unless conscious awareness accompanies an experienced event, one has not truly experienced this event" (Huron *et al.*, 1995, p. 1742).

A recent neuropsychological study demonstrated that schizophrenic patients show impairment in their autobiographical memories for their whole lifetime and particularly for their early adult years, usually the onset of the illness (Feinstein *et al.*, 1998). Neuropsychologically schizophrenic patients can thus be characterized by a unique pattern of deficits in autobiographical memories differing from the one in patients with Alzheimer's disease.

Alterations in psychological states accompanying "encoding"/"experiencing" may also be important in the generation of schizophrenic identity disturbances. The psychological state accompanying "encoding"/"experiencing" was described by Shoemaker as a "sensoric-cognitive state" determining whether facts/events are "encoded"/"experienced" "from the inside" or "from the outside." Considering our schizophrenic patient, "encoding"/"experiencing" may already be disturbed. She no longer "encodes"/"experiences" personal facts/events "from the inside" (see descriptions in Section 4) but rather "from the outside," while impersonal facts/events from another person (i.e. granddaughter of the czar) are "encoded"/"experienced" no longer "from the outside" but "from the inside." Empirical studies (Conway *et al.*, 1996) showed that the psychological state during "encoding"/"experiencing" may determine which kind of psychological state will accompany "retrieval"/"remembering" of the same facts/events. Thus facts/events "encoded"/"experienced" "from the inside" will rather be accompanied by "conscious awareness" than by "feelings of familiarity" during "retrieval"/"remembering" (and vice versa for facts/events "encoded"/"experienced" "from the outside").

The above mentioned alterations in "encoding"/"experiencing" in schizophrenia may consequently influence "retrieving"/"remembering" in the following way. Personal facts/events "encoded"/"experienced" "from the outside" will be "retrieved"/"remembered" as heterobiographical material ("from the inside" because originally it was a personal event), whereas facts/events from other persons (which were "encoded"/"experienced" "from the inside") will be "retrieved"/"remembered" as autobiographical memory ("from the outside" because originally it was an impersonal event). In the interplay between "encoding"/"experiencing" and "retrieving"/"remembering" personal facts/events will be transformed into heterobiographical material and impersonal facts/events into autobiographical material. It is the state where our schizophrenic patient takes on the identity of the granddaughter of the czar denying her original (i.e. her "old") personal identity (see Section 4).

Does our schizophrenic patient suffer from "q-memories" or delusions/confabulations?

Neglecting alterations in the sensoric-cognitive state during "encoding"/"experiencing" and considering only changes in the psychological states accompanying "retrieving"/"remembering," one might be inclined to regard identity disturbances in our schizophrenic patient as "q-memories". If, however, alterations in sensoric-cognitive states accompanying "encoding"/"experiencing" are considered, schizophrenic identity disturbances can no longer be compared with "q-memories". Due to "wrong" sensoric-cognitive states during "encoding"/"experiencing" impersonal facts events are "retrieved"/"remembered" as autobio-

graphical "from the outside" and personal facts/events as heterobiographical "from the inside." She subsequently can no longer correctly distinguish between the different sources of autobiographical memory, as for example between her own and the czar family's autobiographical memories. Though sensoric-cognitive and the "encoding"/"experiencing" person are not identical, the "encoding"/"experiencing" and "retrieving"/"remembering" person are, however, considered nevertheless to be as identical by her.

Unlike in "q-memories" and memory transplantation, where the "new" autobiographical memories were "encoded"/"experienced" by another person, both the "encoding"/"experiencing" and "retrieving"/"remembering" person can no longer be distinguished from each other in schizophrenia. Thus our schizophrenic patient shows the "belief" which, according to Parfit, is missing in "q-memories":

They come with a belief that, unless they are delusions, they are about our own experiences ... If like Jane we had quasi-memories of others people's past experiences, these apparent memories would cease to be automatically combined with this belief' (Parfit, 1989, p. 222).

Unlike Jane our schizophrenic patient can indeed be characterized by the belief that the experiences of the granddaughter of the last Russian czar are her own experiences and she thus takes on her identity. The memories of the Russian history and the czar can thus no longer be considered as "quasi-autobiographical" as it would be the case in "q-memories" but rather as purely autobiographical since she is unable to distinguish between the different sources of her memories as well as between the "encoding"/"experiencing" and "retrieving"/"remembering" person. Our schizophrenic patient shows thus no longer "q-memories" but rather delusions/confabulations characterized by the irresistible belief that facts/events/memories from another person are purely autobiographical.

Delusions can thus not be considered as an example of "q-memories" without "q-experiences." Due to alterations in the sensoric-cognitive state accompanying "encoding"/"experiencing" schizophrenia may nevertheless be considered as an example of "q-memories" with "q-experiences." If, however, the distinction between the "encoding"/"experiencing" and "retrieving"/"remembering" person is a necessary condition for the possibility of "q-memories" in the original sense, as put forward by Parfit and Shoemaker, the case of "q-memories" with "q-experiences" can no longer be considered as an example of "q-memories" because the "encoding"/"experiencing" and "retrieving"/"remembering" person are not distinguishable from each other. Similar to our schizophrenic patient, they should thus rather be considered as examples of delusions/confabulations. In contrast, "q-memories" with "inverse q-experiences" and "inverse q-memories" with "q-experiences" can be considered as examples of "q-memories" in this regard. In these cases the "encoding"/"experiencing" person is not identical with the "retrieving"/"remembering" person, although, due to their complexity, both cases do not fully correspond to the originally much simpler definition of "q-memories".

However, in its early stages, even our case of schizophrenia may be considered as an example of "q-memories". The transformation of her "old" "subjective

identity" into her "new" one is not a sudden shift but rather a gradual process with different stages as revealed by her own subjective experiences. At the very beginning she felt that her own memories became more and more estranged from her, which was followed by a feeling of insertion of "foreign" memories from the granddaughter of the czar. In this rather early stage she was still able to distinguish between the different sources of her memories because otherwise she could have not described the inserted memories as "foreign." This early schizophrenic stage with "foreign memories" is more or less similar to the case with the transplantation of "content" with "inverse q-memories" so that in this early stage one could speak of "q-memories" in schizophrenia because both necessary conditions (see above), distinction between different sources of autobiographical memories as well as between the "encoding"/"experiencing" and "retrieving"/"remembering" person, are somehow met.

Concerning the arguments by Schechtman, one consequently has to distinguish between the early and the late stages in our schizophrenic patient.

In the early stage the patient is still able to distinguish between different sources of autobiographical memories as well as between the "encoding"/"experiencing" and "retrieving"/"remembering" person since otherwise she would not be able to differentiate between her own and others' memories. Following Parfit and Shoemaker, the patient thus suffers in the early stage from "q-memories" that are not delusions because, unlike in delusions, the "foreign" memories lack a specific relation to and meaning for herself. Consequently, "q-memories" that are not delusions are empirically possible, thus contradicting Schechtman's "principle of indistinguishability" between "q-memories" and delusions/confabulations.

In the late stage our schizophrenic patient is no longer able to distinguish between different sources of autobiographical memories as well as between the "encoding"/"experiencing" and "retrieving"/"remembering" person. Hence following the original description by Parfit and Shoemaker, one can no longer speak of "q-memories" in this stage since the patient is no longer able to distinguish between her own and "foreign" memories. However, one can speak of delusions in this late stage because the "foreign" memories become specifically related to as well as meaningful for the patient. In addition, the patient considers the "foreign" memories as her own, and her own memories as "foreign," which thus goes along with identity disturbances [17]. Consequently, in the late stage our schizophrenic patient suffers from delusions that are not "q-memories," thus contradicting Schechtman's "principle of indistinguishability" between "q-memories" and delusions/confabulations.

In summary, both early and late stages in our schizophrenic patient demonstrate that, empirically, a double dissociation between "q-memories" and delusions/confabulations is possible. In the early stage "q-memories" dissociate from delusions, whereas in the late stage delusions dissociate from "q-memories". Thus the possibility of distinction between the different sources of autobiographical memories as well as the possibility of distinguishing between the "encoding"/"experiencing" and the "retrieving"/"remembering" person may be considered as

criteria for the differentiation between "q-memories" and delusions/confabulations. Hence if there are criteria for distinction between "q-memories" and delusions/confabulations as well as the possibility of double dissociation between them, Schechtman's claim of the "principal indistinguishability" between "q-memories" and delusions/confabulations must be rejected from an empirical point of view so that the concept of "q-memories" can be maintained.

6. Conclusions

Memory is often considered as a necessary and/or sufficient condition of personal identity. In order to circumvent the "argument of circularity" the concept of "q-memories" was introduced which, in contrast to memories, does no longer presuppose identity between the "experiencing" and the "remembering" person. However, the concept of "q-memories" as established by Parfit and Shoemaker relies solely on thought experiments, whereas it has never been investigated whether "q-memories" are empirically realistic. We therefore combined the philosophical concept of "q-memories" (i.e. its distinction between the "experiencing" and the "remembering" person) with empirical observations in neuropsychological processes in autobiographical memory and neuropsychiatric cases of delusions in schizophrenia. Relying on such a "transdisciplinary" neurophilosophical methodology, the following conclusions were drawn.

Memory cannot be regarded as one single entity but rather as a complex system involving different kinds of persons (i.e. the "experiencing" and the "remembering" person as presupposed in the philosophical concept of "q-memory") and distinct neuropsychological processes (i.e. "encoding" and "retrieval").

The distinct kinds of persons can be related to different neuropsychological processes; i.e. the "experiencing" person with "encoding" and the "remembering" person with "retrieval."

"Experiencing"/"encoding" and "remembering"/"retrieving" cannot only be characterized by memory contents but in addition by different kinds of accompanying psychological states; i.e. "conscious awareness" and "feeling of familiarity." According to the accompanying psychological state, the memory contents can be classified as either auto- or heterobiographical so that the "experience" determines the classification of the "content," whereas it can neither interfere nor modulate directly the "content" as is presupposed in Schechtman's criticism of the concept of "q-memories" in Parfit and Shoemaker. Hence Schechtman's main argument against the concept of "q-memories" consisting in her claim about the principal inseparability between "content" and "experience" can no longer be maintained since classification should not be confused with interference/modulation.

The possibility of distinguishing between the different sources of autobiographical memories and the dissociation between "encoding"/"experiencing" and the "retrieving"/"remembering" person may both be considered as criteria for the distinction between "q-memories" and delusions/confabulations. Hence contrary to Schechtman's second argument against the concept of "q-memories" consisting in her claim of the principal indistinguishability between "q-memories" and delusions/

confabulations, “q-memories” can be well distinguished from delusions/confabulations, which can be nicely demonstrated in her example of concomitant transplantation of “content” and “experience” as well as in a neuropsychiatric patient with delusions and concomitant identity disturbances.

Due to the rejection of Schechtman’s arguments against “q-memories,” the principal inseparability between “content” and “experience” as well as the principal indistinguishability between “q-memories” and delusions/confabulations, on empirical grounds, the concept of “q-memories” as established by Parfit and Shoemaker can be maintained and, moreover, seems well compatible with current empirical data, i.e. neuropsychological and neuropsychiatric findings.

Due to the fact that the concept of “q-memories” can be maintained, it may be considered as a necessary and/or sufficient condition of personal identity. In addition, the present investigation showed that the criterion of “q-memories” can be even more specified on empirical grounds. The possibility of distinction between different sources of quasi-autobiographical memories as well as the possibility of distinction between the “encoding”/“experiencing” and “retrieving”/“remembering” person may be considered as at least necessary conditions for personal identity. The example of our case with delusions showed that identity disturbances are present if these conditions are no longer fulfilled. It can be concluded that the concept of “q-memories” with its above shown empirical specifications may thus be considered as a necessary and/or sufficient condition of personal identity, circumventing the “argument of circularity” (see introduction) by distinguishing between the distinct sources of “quasi-autobiographical” memory as well as between the “encoding”/“experiencing” and “retrieving”/“remembering” person.

Acknowledgements

I am indebted to the German Research Foundation for a grant (no. 304–1/1) and to helpful comments by anonymous reviewers, Alexander Heinzl, Albert Neven, Dieter Birnbacher, and Rolf Kötter for critical review on the manuscript.

Notes

- [1] Swinburne insists on the “normal” case where the “experiencing” and “remembering” person are identical. As long as there are no empirical “counter-evidences,” one has to presuppose the identity between both persons. If, however, in a single case “q-memories” would be empirically realized, then the concept of “normal” memory could no longer be applied at least to that case (Swinburne, 1986, pp. 11–12, 170–171).
- [2] Shoemaker relates this distinction between sensoric–cognitive state and actual experience only with “experiencing” but not with “remembering.” However, as is shown in Section 3, “remembering” an event is accompanied also with particular psychological states.
- [3] The exact relationship between episodic and autobiographical memory is not clear because the latter term is rather defined by particular contents related closely with one particular person, whereas the former is characterized not by contents but rather by specific accompanying psychological states. Due to these differences in definition the terms “episodic” and “autobiographical” should not be used synonymously (Wheeler *et al.*, 1997).

- [4] "Remembering" and "knowing" can be distinguished not only neuropsychologically but neurophysiologically as well. Paller *et al.* (1995) and Düzel *et al.* (1997) found different electrophysiological characteristics during "remember" and "know" responses. Fink *et al.* (1996) found different neuroanatomical substrates in autobiographical memory compared to heterobiographical and semantic memory. Subsequently, the distinct neuropsychological processes may differ also in their underlying neurophysiological mechanisms.
- [5] Conway *et al.* (1996) investigated the close relationship between retrieval of autobiographical memory and "conscious awareness" and found the latter only during retrieval of "true" autobiographical events but neither in "altered"/"false" autobiographical nor in heterobiographical events.
- [6] This further underlines the importance of the distinction between the memory "content" itself and the accompanying psychological experience; the latter may be decisive for the classification of facts/events either as semantic/heterobiographical or as episodic/autobiographical (Moscovitch, 1995, p. 278).
- [7] Conway altered details in autobiographical diary events of persons. After altering some of the recorded events, "true" and "false" events were presented to the person which should retrieve and recognize both kinds of events. In addition, Conway investigated factors influencing the recognition of "true" and "false" events (Conway *et al.*, 1996).
- [8] Conway *et al.* (1996) found also that events, which were altered only in minor details, as well as 10% false events were recognized as "true" events. Subsequently, there is no "absolute accuracy in retrieval of autobiographical memory" but rather "relative person-dependent accuracy" (Conway *et al.*, 1996, p. 175). Similar findings were made in semantic memory so that the "relativity of accuracy" is not confined to autobiographical memory but apparently a characteristics of memory in general (Blaxton, 1996; Schacter *et al.*, 1996a,b).
- [9] Markowitsch describes patients with lesions of the temporo-frontal cortex, an area closely associated with the generation of emotions and conscious awareness which showed marked and selective deficiencies only in autobiographical but not in semantic memory (e.g. Markowitsch *et al.*, 1994; Calabrese *et al.*, 1996).
- [10] Conway presented adjectives with high personal relevance, adjectives with pure semantic relevance, and adjectives relevant to other persons. He found significantly higher numbers of "remembering" responses in personally relevant than in semantic and heterobiographical adjectives (Conway *et al.* 1996, p. 15).
- [11] The criterion of "encoding"/"experiencing" cannot be considered as a sufficient condition for correct "retrieval"/"remembering" because other criteria (i.e. integration between "encoding" and "retrieval, emotional involvement, "conscious awareness") must be regarded as necessary conditions as well. If these additional conditions are not met subjects may "retrieve"/"remember" personally "encoded"/"experienced" facts/events not as autobiographical but rather as heterobiographical memories which, empirically, has been demonstrated in a study by Conway *et al.* (1996).
- [12] A similar accompanying psychological state has been shown during "retrieval"/"remembering." Relying on Shoemaker's hypothesis, the existence of psychological states with analogous importance (for further classification of "encoded"/"experienced" facts/events either as personal or impersonal) may neuropsychologically be quite realistic.
- [13] From an empirical perspective the following remarks should be made. First, accompanying psychological states cannot only be characterized by consciousness (i.e. consciousness awareness) but by the kind of emotional involvement as well. Second, the distinct accompanying psychological states cannot only be distinguished neuropsychologically but neurophysiologically as well. Düzel *et al.* (1997) showed distinct electrophysiological substrates for "conscious awareness" and "feelings of familiarity" during "retrieval" of episodic and semantic material. Third, accompanying psychological states are related with different spatio-temporal activation patterns in the brain than the memorized contents (Düzel *et al.*, in press); i.e. psychological states (late activation in frontal cortex) and memory contents (early activation in medial temporal cortex) can be distinguished also neurophysiologically.

- [14] This case is derived from the time of my clinical residency in psychiatry at the University of Frankfurt.
- [15] Frith (1992) postulates a deficit of the inner monitoring in schizophrenia which may lead to false interpretations of others people's minds as well as of own mental states.
- [16] Spence *et al.* (1997) investigated the cerebral perfusion during motor activation in such patients and found increased cerebral blood flow in the right fronto-parietal cortex during the acute state compared to the post-acute, where they no longer experienced themselves as another person.
- [17] Such a distinction between delusions/confabulations and identity disturbances is further supported by current empirical neuropsychological research which considers delusions/confabulations as separate symptoms from identity disturbances in schizophrenia (Nathaniel-James & Frith, 1996).

References

- BAZIN, N. & PERRUCHET, P. (1996). Implicit and explicit associate memory in patients with schizophrenia. *Schizophrenia Research*, 22, 241–248.
- BLAXTON, T. (1996). Distinguishing false from true in human memory. *Neuron*, 17, 191–194.
- BUTLER, J. (1736). *The analogy of religion*.
- CAHILL, L., HAIER, R., FALLON, J., TANG, C., KEATOR, D., WU, J. & MCGAUGH, J. (1996). Amygdala activity at encoding correlated with long-term, free recall of emotional information. *Proceedings of the National Academy of Science*, 9, 8016–8021.
- CALABRESE, P., MARKOWITSCH, H.J., DURWEN, H.F., WIDLITZEK, B., HAUPTS, M., HOLINKA, B. & GEHLEN, W. (1996). Right temporo-frontal cortex as critical locus for the euphony of episodic memories. *Journal of Neurological Neurosurgery and Psychiatry*, 61, 304–310.
- CONWAY, M., COLLINS, A., GATHERCOLE, S. & ANDERSON, S. (1996). Recollections of true and false autobiographical memories. *Journal of Experimental Psychology*, 125, 69–95.
- DÜZEL, E., YONELINAS, P., MANGUN, G., HEINZE, H.J. & TULVING, E. (1997). Event-related brain potential of two states of conscious awareness in memory. *Proceedings of the National Academy of Science*, 94, 5973–5978.
- DÜZEL, E., CABEZA, R., PICTON, T., YONELINAS, A., SCHEICH, H., HEINZE, H.J. & TULVING, E. (in press). Task- and item-related processes in memory retrieval: a combined PET and ERP study. *Proceedings of the National Academy of Science*.
- FEINSTEIN, A., GOLDBERG, T.E., NOWLIN, B. & WEINBERGER, D.R. (1998). Types and characteristics of remote memory impairment in schizophrenia. *Schizophrenia Research*, 30, 155–163.
- FINK, G., MARKOWITSCH, H., REINKEMEIER, M., BRUCKBAUER, T., KESSLER, J. & HEISS, W.D. (1996). Cerebral representation of one's own past: neural networks involved in autobiographical memory. *Journal of Neuroscience*, 16, 4275–4282.
- FRITH, C. (1992). *The cognitive neuropsychology of schizophrenia*. Oxford: Erlbaum.
- HURON, C., DANION, J.M., GIACOMONI, F., GRANGE, D., ROBERT, P. & RIZZO, L. (1995). Impairment of recognition memory with but not without conscious recollection in schizophrenia. *American Journal of Psychiatry*, 152, 1737–1742.
- KOPELMAN, M.D., WILSON, B. & BADDELY, A. (1989). The autobiographical memory interview. *Journal of Clinical and Experimental Neuropsychology*, 11, 724–744.
- KOPELMAN, M.D., CHRISTENSEN, H., PUFFETT, A. & STANHOPE, N. (1994). The great escape: a neuropsychological study of psychogenic amnesia. *Neuropsychologia*, 32, 675–691.
- LAWRIE, S., INGLE, G., SANTOSH, C., ROGERS, A., NAIDU, K., BEST, J., EBMEIER, K. & JOHNSTONE, E. (1995). Magnetic resonance imaging and single photon emissions tomography in treatment-responsive and treatment-resistant schizophrenia. *British Journal of Psychiatry*, 167, 202–210.
- LOCKE, J. (1694). An essay concerning human understanding.
- MARKOWITSCH, H. (1995). Which brain regions are critically involved in the retrieval of old episodic memory? *Brain Research Reviews*, 21, 117–127.
- MARKOWITSCH, H., WÜRKER, M., DURWEN, H., KESSLER, J., BABINSKY, R., HEUSER, L. & GEHLEN, W. (1994). The amygdalae's contribution to memory. *NeuroReport*, 5, 1349–1352.

- MOSCOVITCH, M. (1995). Recovered consciousness: a hypothesis concerning modularity and episodic memory. *Journal of Clinical and Experimental Neuropsychology*, 17, 276–290.
- NATHANIEL-JAMES, D.A. & FRITH, C.D. (1996). Confabulation in schizophrenia: evidence of a new form? *Psychological Medicine*, 26, 391–399.
- NORTHOFF, G. (1997). *Neuropsychiatrie und neurophilosophie*. Paderborn: Schöningh Verlag.
- NORTHOFF, G. (1998). Neuophilosophische Untersuchungen zum Problem der personalen Identität bei operativ-implantativen Eingriffen in das Gehirn am Beispiel der fetalen Hirngewebs transplantation. Ph.D. thesis, University of Düsseldorf.
- NORTHOFF, G. (in press). Psychomotor phenomena as paradigmatic examples of functional brain organization and mind–brain relationship: do we need a “philosophy of the brain”? *Philosophy, Psychology, and Psychiatry*.
- PALLER, K.A., KUTAS, M. & MCISAAC, H.K. (1995). Monitoring conscious recollection via the electrical activity of the brain. *Psychological Science*, 6, 107–111.
- PARFIT, D. (1971). Personal identity. *Philosophical Review*, 3–27.
- PARFIT, D. (1989). *Reasons and persons*. Oxford: Oxford University Press.
- QUANTE, M. (1995). Die identität der person. *Philosophische Rundschau*, 42, 35–59.
- SCHACTER, D., ALPERT, N., SAVAGE, C., RAUCH, S. & ALBERT, M. (1996a). Conscious recollection and human hippocampal formation: evidence from PET. *Proceedings of the National Academy of Science*, 93, 321–325.
- SCHACTER, D., REIMANN, E., CURRAN, T., YUN, L., BRANDY, D., MCDERMOTT, K. & ILL, H. (1996b). Neuroanatomical correlates of veridical and illusory recognition memory: evidence from PET. *Neuron*, 17, 267–274.
- SCHECHTMAN, M. (1990). Personhood and personal identity. *Journal of Philosophy*, 87, 72–92.
- SHOEMAKER, S. (1984). *Identity, cause and mind*. Cambridge: Cambridge University Press.
- SHOEMAKER, S. & SWINBURNE, R. (1984). *Personal identity*. Oxford: Basil Blackwell.
- SPENCE, S.A., BROOKS, D.J., HIRSCH, S.R., LIDDLE, P.F., MEEHAN, J. & GRASBY, P. M. (1997). A PET study of voluntary movement in schizophrenic patients experiencing passivity phenomena (delusions of alien control). *Brain*, 120, 1997–2011.
- SWINBURNE, R. (1986). *The evolution of the soul*. Oxford: Clarendon Press.
- TULVING, E. (1995). Organization of memory: quo vadis? In M. GAZZANIGA *et al.* (Eds.) *The cognitive neurosciences*. Cambridge, MA: MIT Press.
- UNGERLEIDER, L. (1995). Functional brain imaging studies of cortical mechanisms for memory. *Science*, 270, 769–775.
- WHEELER, M.A., STUSS, D.T. & TULVING, E. (1997). Towards a theory of episodic memory: the frontal lobes and autonoetic consciousness. *Psychological Bulletin*, 121, 331–354.