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The Mind-Body Problem As Seen By Students of Different Disciplines

Abstract: The mind-body problem is a continuing issue in philosophy. No surveys known to us have been conducted about the actual preferences of, for example, psychology students for particular preconceptions about the mind-body relation. These preconceptions may have different practical implications for decisions concerning the object and method of research, the choice of explanatory device for psychological and other research data and for the approach of professionals in practice. A questionnaire comprising ten different preconceptions about the mind-body relation and other items was returned by 209 German students of various disciplines (including psychology) and by a second sample of 233 first year psychology students. Identity theory, interactionism, and complementarity were preferred most. The students clearly believed that the preference for certain preconceptions has important practical implications. There were no differences between the students of different disciplines in the choice of preferred preconceptions about the mind-body relation or in the view that these preconceptions are of practical importance.

The mind-body problem is one of the long-standing metaphysical issues of philosophy and concerns the relationship between that which is mental and that which is physical. Many solutions to this problem have been proposed, and to this day, old and new monistic and dualistic positions continue to be published in books and numerous articles. The contemporary debate on the mind-body problem engages the attention of philosophers, physicists, neurobiologists and science journalists. However, this debate attracts less interest in those disciplines which are particularly concerned with empirical psychophysical correlates, that is, in psychophysiology, psychosomatics, and psychiatry. In these disciplines the attitude is prevalent that the mind-body problem is a philosophical issue of no practical consequence, or an unsolvable problem.

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Indeed, the history of philosophy gives one to understand that a generally convincing answer to the metaphysical question about the existence of one, two or three ontological aspects and their relationship cannot be found. In a pluralistic world, the mind-body problem will probably also remain unsolved. However, in view of the absence of a solution to this problem, one might examine whether philosophical preconceptions such as monism or dualism influence and have particular consequences for research and practice.

Preconceptions about the mind-body problem undoubtedly shape the way in which human beings are conceptualised and religious issues are handled. But do these preconceptions also influence decisions on the object and method of research and the choice of explanatory device for psychological and other research data? Do psychologists with dualistic preconceptions generally prefer the approaches and methods used in the arts and humanities such as the phenomenological method? Do psychologists with monistic preconceptions tend to adopt approaches and methods particular to behaviourism and biological psychology? Are the consequences of such belief systems reflected in diagnostically and therapeutically important decisions?

In contrast to the wealth of general publications about the mind-body problem, hardly any investigations are known to exist that take up the questions outlined above, not even an investigation as how widespread the different preconceptions are. Do certain groups such as physicians, and psychologists, differ in their preconceptions about the mind-body problem? How significant are the practical implications of these philosophical perspectives judged to be?

Special hypotheses have not been formulated in the present investigation. However, the expectation is that students of theology and philosophy tend to prefer dualistic preconceptions more than students of psychology, whereas students of the natural sciences prefer dualistic preconceptions less than students of psychology. We also assumed that students of psychology more readily accept that these philosophical perspectives are of practical importance than students of other disciplines. This article seeks to contribute to the philosophical debate about the mind-body problem with a psychological and empirical approach by investigating individual differences in students' attitudes and the evaluation of such perspectives.

Questionnaire about the mind-body problem

Over many years, a questionnaire ("Auffassungen zum Leib-Seele Problem") has been distributed in the introductory lecture for students of psychology, with the aim of exploring perspectives on the mind-body problem. The questionnaire was limited to a selection of ten main preconceptions, each described in a few sentences (Fahrenberg, 1989). The choice of preconceptions and their definitions involved the difficult compromise of keeping the definitions necessarily brief whilst not rendering them indiscernible and deficient of clarity; the avoidance of specific philosophical terms was conducive to this end (see Appendix). The students were asked: To which view do you most subscribe? Which view would you reject most emphatically? The students were also asked to give an indication of the extent to which they had previously considered the mind-body problem and to estimate the extent of its practical importance in response to the following question: In your opinion, do any of the preconceptions about the mind-body problem influence professional activity in research and practice?

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This question was further qualified according to seven items regarding particular tasks within different professions. An additional five questions followed about supposed relationships of the mind-body problem to other ideological and religious attitudes and practices such as the attendance of church services.

From the outset, the debate about the mind-body relation has been burdened by the lack of agreement about the meaning of mind and body, as the review in Ritter's (1971) *Historical Dictionary of Philosophy* (*Historisches Wörterbuch der Philosophie*) demonstrates. The questionnaire was therefore supplemented until the last version in 1996 with a number of short introductory definitions and questions, these definitions serving to clarify the distinction between monism and dualism. The selection of ten main preconceptions was the same in the earlier and later versions of the questionnaire.

The choice of preconceptions and their definition was the result of having discussed the topic over a long period of time with colleagues from the fields of psychology and philosophy. (Peter Walschburger and Kornelia Wider were involved in the development of the questionnaire.) Keeping track of the literature on the mind-body problem is difficult; however, the following provided a comprehensive review (Bunge, 1980; Churchland, 1986; Dennett, 1991; Fahrenberg, 1979; Metzinger, 1985).

The Survey

In this survey, the questionnaire was distributed amongst psychology, biology, theology, philosophy, chemistry, and physics students. The psychology students received their questionnaire at the beginning of the third lecture 'Introduction to the history of psychology, philosophy of science, and professional ethics', which took place at Freiburg University, in the winter semester 1996/97. About 90% of the questionnaires were returned anonymously from the students in psychology (major). This amounts to 62 of the total of 209 completed questionnaires. The remaining 147 questionnaires were returned in the same semester from undergraduate students attending different lectures in the other disciplines.¹ The percentage of returns depended on the discipline and specific lecture in which the questionnaires were distributed. For example, a 50% return was achieved in the introductory lecture for biology for first year students; the return was lower in other disciplines. The questionnaires were completed in the psychology and biology lectures before the lectures actually commenced. Students of other disciplines filled out their questionnaires in their own time.

The statistical comparison was carried out using the completed questionnaires from students of psychology $n = 62$, biology $n = 43$, theology $n = 37$, philosophy $n = 23$, chemistry and physics $n = 44$, totalling $N = 209$ students.

In addition to this set of data from 1996, and for the purpose of comparison, a second set of data from a total of 233 students, who began psychology between 1992 and 1995 (about 60 students a year), was included. The two sets of data of psychology students were treated separately in the statistical analysis because the questionnaire used from 1992 to 1995 did not contain the complete set of introductory definitions and questions (see Appendix) included in the later questionnaire.

1) Thanks are due to Prof. Hertel, Biology faculty, for his interest and support, and to cand. phil. Gertrud Plasse and Stille Gabler for their assistance.

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All of the psychology students were “naive” in the sense that they had not experienced academic teaching on the mind-body-problem. It is conceivable that students from other disciplines, including second and third year students, may have been influenced by the academic instruction they had received. However, it is unlikely, except in philosophy and theology, that the mind-body-problem had been a subject of discussion in the lectures.

The statistical analysis was based on contingency tables (groups x statements) and Chi-Square Tests. In some instances, categories were combined to achieve adequately large cell frequencies. Degrees of freedom and the total number of observations will be reported in each case. Furthermore, Cramer's coefficient V, which has the standardised range 0 to 1.0 accounting for row and column distributions, provides an adequate coefficient of association. Chi-square tests were only used for the main issues of this investigation. Response distributions (percentages) of other items of the questionnaire will be presented descriptively, where appropriate.

Results

Differences existed in the five groups of psychology, biology, theology, philosophy, and chemistry & physics students in the proportion of men and women, in the distribution of age and in the number of attended semesters: There were relatively more women in psychology and relatively more men in physics and chemistry; theology and philosophy students were relatively older. These differences are reported here but will not be considered any further because there is no hypothesis or evidence of how such differences might affect our findings.

The overall response distribution to the question whether the students had previously considered the mind-body problem was as follows: ‘hardly’ 37%, ‘somewhat’ 52%, and ‘intensively’ 11%. The contingency table showed group differences (χ^2 (8, N = 208) = 22.6, p < .004; Cramer's V = 0.23); according to cell counts, theology and philosophy students tended to pay more attention to the mind-body problem. The 233 course beginners in psychology from the second set of data responded to the question about previous consideration of the mind-body problem as follows: ‘hardly’ 29%, ‘somewhat’ 64%, and ‘intensively’ 7%.

Preferences

The preferences for and rejections of certain preconceptions on the mind-body problem are shown in Table 1. Three preconceptions were particularly favoured by the students as a whole: identity theory, interactionism, and complementarity. Indeed, this finding was consistent in all of the five disciplines. On account of the low cell counts in some instances, a test for significance was only reasonable on a reduced (4 x 5) contingency table made up of the three most frequently expressed preferences, that is, identity theory, interactionism, complementarity, and a residual group comprising the other seven preconceptions, and the five disciplines: There was no significant group difference between the students of different disciplines (χ^2 (12, N = 209) = 12.8, p = .38; Cramer's V = .14; one of the 4 x 5 cells had an expected value < 5). Materialism and functionalism were rejected most frequently. Idealism was also rejected relatively frequently. The frequency distribution of the 233 psychology students from the previous years corresponded by and large to this set of results.

	P r e f e r e n c e s						R e j e c t i o n s						
	Psycho-logy	Bio-logy	Theo-logy	Philo-sophy	Che-mistry Physics	Total	Psycho-logy	Bio-logy	Theo-logy	Philo-sophy	Chemistry & Physics	Total	Psychology 92/95
<u>Monistic preconceptions</u>													
1	3	0	3	0	2	8	7	10	5	7	17	46	36
2a	1	2	1	0	1	5	35	12	16	8	14	85	80
2b	2	3	0	2	7	14	1	0	2	0	1	4	5
2c	0	1	0	0	0	1	9	10	9	3	2	33	58
2d	1	2	0	0	0	3	0	1	0	0	1	2	1
<u>Dualistic preconceptions</u>													
3a	24	13	9	3	13	62	3	1	0	0	0	4	2
3b	0	0	0	0	0	1	4	4	2	2	1	13	22
3c	1	0	0	1	0	2	2	1	0	0	0	3	18
<u>Psychophysically "neutral" preconceptions</u>													
4	14	11	11	6	7	49	0	1	1	0	2	4	1
5	16	11	13	11	13	64	1	1	0	0	3	5	3
Total	62	43	37	23	44	209	62	41	35	20	41	199	226

Note: in some of the questionnaires, none of the views were rejected explicitly.

Table 1

Preconceptions of 209 students of different disciplines about the mind-body problem: Preferences and rejections. The table also includes data from 233 course beginners in Psychology from 1992 till 1995.

More detailed information was extracted from the students' responses independently of their group to questions concerning the belief in or rejection of a spiritual existence, that is, an individual spiritual existence (possibly including life after death) not explicable by mechanical, chemical or physical principles and which exerts influence on the brain, or a unique force, that is, a force in addition to the mechanical, chemical or physical principles known to science and which influences the brain and causes physical and mental changes (see questionnaire). Many students expressed their belief in a spiritual existence (42% 'yes', 35% 'perhaps', 23% 'no'), others in the existence of a unique force (46% 'yes', 35% 'perhaps', 19% 'no'). Both preconceptions were associated ($\chi^2(4, N = 206) = 53.2, p < .001$; Cramer's $V = .36$). Subsequently, the responses to questions about the belief in spiritual existence or a unique force were analyzed. Only the groups' opinions about a spiritual existence differed significantly; this difference, according to cell counts, was mainly due to the overwhelming conviction of theology students that there is a life after death (86%). The second set of data from the 233 beginners in psychology confirmed the association between preconceptions held about a spiritual existence and a unique force ($\chi^2(4, N = 220) = 30.78, p = .001$; Cramer's $V = 0.26$).

An association between the assumption of a unique force and the three main preferences (interactionism, identity theory, and complementarity) was not evident ($\chi^2(6, N = 173) = 4.1, p > .05$; Cramer's $V = 0.11$). The idea of a spiritual existence, however, finds more approval from supporters of interactionism (54% 'yes') than identity (47% 'yes') or complementarity (33% 'yes'). This association is however weak ($\chi^2(6, N = 173) = 12.9, p = .045$; Cramer's $V = 0.19$) and finds no support in the second data set (233 beginners in psychology).

Practical Importance and Implications

The students thought that the various perspectives on the mind-body problem could have important practical implications for the general populations' attitude toward religion and the way in which psychologists, doctors or judges exercise their profession (see Table 2). At least half of those questioned believed that psychologists' choice of diagnostic and treatment methods was related to the psychologists' preconception of the mind-body problem, and that these preconceptions influence even the manner in which patients are treated and criminals sentenced. The students assumed that in the population as a whole these preconceptions are closely related to religious convictions, the belief in miracle cures, the evaluation of homeopathy and the attitude toward abortion. The students saw a small but nevertheless clear relation between mind-body preconceptions and religious activities.

The importance that the students attached to these preconceptions was not significantly related to the extent to which the students had previously thought about and considered this problem, to the discipline studied, or to the personal preference for one of the three most frequently preferred preconceptions. There were however two exceptions: Group differences did exist in the assumption that a judge's perspective is important when sentencing criminals ($\chi^2(8, N = 201) = 21.0, p = .007$; Cramer's $V = .23$). Psychology students, according to cell counts, tended to entertain this preconception more (52% 'certainly'), chemistry and physics students less (14% 'certainly'). Comparing only the three main preferences, a significant association was evident between preconception and diagnostic strategies in medicine ($\chi^2(4, N = 168)$

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	Is there an influence?		
	hardly	somewhat	certainly
<i>Influence on psychologists in:</i>			
their choice of experimental method	3	22	75
their choice of treatment method	2	18	80
the way they deal with patients	7	29	64
<i>Influence on doctors in:</i>			
their choice of experimental method	23	34	43
their choice of treatment method	18	30	52
the way they deal with patients	18	33	49
<i>Influence on judges in:</i>			
sentencing criminal offenders	25	41	34
<i>Influence on the general population in:</i>			
the relation between religious convictions	4	20	76
the participation in the church	33	34	33
the belief in miracle cures (e.g., Lourdes)	14	34	52
the evaluation of homeopathy	12	34	55
the attitude toward abortion	24	35	41

Note: The results are given in percentages.

Table 2

Possible influence of adopted preconception about the mind-body problem on professional behaviour and attitude, and on the general population, as seen by 203 students of different disciplines.

= 9.9, $p = .04$; Cramer's $V = .17$); supporters of identity theory tended to be the least convinced that a doctor's perspective influences the choice of investigative method (according to cell counts).

The results of the 233 beginners in psychology show that they also attached the same importance to these preconceptions as the students described above: The preconception favoured by a psychologist would 'certainly' influence his or her choice of diagnostic method (74%), of therapeutic method (84%), and the manner in which patients are treated (75%).

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Discussion

The majority of students who returned the questionnaire had already considered the mind-body problem more or less in detail and expressed a clear preference for identity theory, interactionism, and complementarity. Other preconceptions, some of which are important in the contemporary discussion about refined materialism and functionalism, were only accepted by a few and rejected decisively by a large majority of students. In fact, the distribution of answers to questions about preference and practical importance of students, who had previously considered the mind-body problem, was the same as the distribution of students who had not.

There were no clear group differences between students of different disciplines in their preferences and rejections. The expected differences between students of philosophy, theology, the natural sciences as well as psychology were not evident. However, this comparison should be considered with some reservation about the sampling of non-psychology students. Almost all of the students from the psychology lecture (and about 50 % in biology) filled out their questionnaires during the lecture, whereas the students of other disciplines, who were sufficiently interested in the subject, had to complete their questionnaires in their own time. The survey based on the introductory lectures in psychology had a high rate of return. For example, the number of participants at $n = 62$ in the winter semester of 1996/97 corresponded to around 90 % of the students attending the lecture, that is, about 80% of the students admitted to psychology. As far as students from other disciplines are concerned, the rate of return depends chiefly on the students' interest in the topic. However, it can not be determined whether this pre-selection had an effect on the frequency distribution of the preferences.

The most notable finding concerns the students' assessment of the practical importance and implications of these preconceptions. A clear majority of all students — without group differences between the disciplines — is convinced of the importance to be attached to psychologists', doctors', and judges' preferred perspective on the mind-body problem when making expert decisions.

How these convictions evolve is a matter of speculative discourse. For example, the Christian creed and the doctrine of the eternal soul address a mind-body dualism, despite the postulancy of the mind-body unity as formulated in the Church's Catechism. Identity theory and complementarity may be more attractive because they appear metaphysically more neutral. But the adoption of a particular preconception can also be influenced by popular books about the 'self and the brain', or by political and ideological trends. In fact, in an earlier version of this questionnaire used in a previous study some years ago, the psychology students rated the view 'dialectical materialism' in third place. This preconception now stands in seventh place. Following this, one might propose that popular preconceptions on the mind-body problem serve as a diagnostic tool for changes in and as a reflection of ideological convictions enjoying wider currency.

The objection could be raised that questions about the practical importance were formulated in such a fashion that they might have appeared suggestive within the context of the questionnaire. Nevertheless, it is readily apparent how decisively beginners of psychology viewed philosophical preconceptions as being of practical importance.

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This is interesting in view of the little attention paid to conceivable practical consequences of such preconceptions in debates on the mind-body problem.

In retrospect, the questionnaire was probably too lengthy and difficult for many of the students, despite its simplified format and presentation. The distribution of answers suggests that the questions should be restricted in future to the four most popular preconceptions.

Comparable data from other groups of persons are not available. Opinion surveys have been carried out on scientists (e.g., Larson & Whitman, 1997) and the general population (e.g., Spiegel, 1992). These have focused on ideological and theological themes but did not include questions about the mind-body problem.

The present investigation could not establish whether the belief in the practical importance of these preconceptions corresponds to empirical differences in professional performance. A necessary differentiation and exploration of the practical importance of the mind-body problem can only be achieved methodically with an explication of the concept of practical importance. The explication should give an account of the consequences of a specific view on the mind-body relation, indicating, according to specified criteria, for whom and for which activity this applies.

Following these considerations, the questionnaire was supplemented, in conjunction with Wider (1994), with a structured interview designed to explore psychologists' and doctors' preconceptions on the mind-body relation and their opinions about the practical implications of these preconceptions. Amongst other things, the interview contained decision-making-situations constructed to reveal the reasons underlying the choice of psychologists' and doctors' diagnostic and therapeutic strategies; these strategies were categorised as being either more somatically or more psychologically orientated. In a series of interviews, Wider (1994) documented 27 doctors' and 28 psychologists' individual preconceptions and thoughts on possible consequences of the mind-body problem. The doctors were specialists in various areas: neurology, surgery, internal medicine, psychosomatics, and homeopathy. Most of the psychologists worked in clinics, the others in private practice. Forty (55%) of the persons questioned had considered the mind-body problem to 'some' degree or in 'detail' (Wider, 1994, p.122). The distribution of the most preferred preconceptions was as follows: complementarity ($n = 24$), identity (20), idealism (5), interactionism (1), and functionalism (1).

In Wider's study, almost all of the participants questioned were convinced that these preconceptions affected the nature of the diagnosis ($n = 47$), treatment ($n = 52$), and interaction with patients ($n = 48$). However, difficulties were encountered by the participants in giving examples of consequences within the decision-making-situations: The scenarios were too simple, thus frustrating most attempts at proposing plausible consequences. The decision strategies in the diagnosis and therapy were also greatly influenced by the degree of expertise, that is, competing etiological concepts and research findings known to the psychologists and doctors. It is conceivable that within the setting of a neuropsychiatric or psychosomatic clinic, this investigative approach could certainly be methodically and empirically improved upon.

In the philosophy of science, basic epistemological and methodological assumptions (for example, the phenomenological perspective, positivism, or social constructivism) are largely seen as precursors of the choice and application of strategies used in empirical disciplines for forming concepts, formulating operational definitions and explanations, and selecting methods for

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testing hypotheses. The extent to which preconceptions about the mind-body problem influence these strategies is not known. In research and practice, actual methodological decisions on appropriate diagnostic and therapeutic strategies may be implicitly or explicitly determined by particular belief systems. There is however an obvious discrepancy between the level of interest in the philosophical debate on the mind-body problem and the absence of empirical investigations about the actual preconceptions shared by psychology and medical students and professionals. Indeed, the students clearly expressed their belief that preconceptions about the mind-body relation have important practical implications; this speaks in favour of further investigation.

Appendix: Questionnaire

To save space, this appendix contains the main parts only of the four-sided questionnaire, that is, the essential introductory definitions and the basic statements concerning the mind-body problem to which this paper and the tables refer. The items concerning practical importance of certain preconceptions are in Table 2.

Definition of important terms

‘Body’ and ‘mind’ are ambiguous terms and liable to be misunderstood. In order to ease their understanding, they are defined as follows:

Mankind is described in terms of attributes, which pertain to the physical (and bodily) or to the mental (and spiritual):

—Physical attributes refer to biological and material processes (including neuropsychological cerebral activity, and objectively observable, behavioural activity);

—Mental attributes refer to processes involved in consciousness, subjective inner-life, feelings, and intentions.

The distinction between physical and mental processes raises the basic philosophical question as to whether these processes are rooted in a single mode of being or reflect two essentially different aspects of being:

1. There is only one ontological aspect, the mental-spiritual;
2. There is only one ontological aspect, the material, that is, the physical to which biological systems like the brain belong;
3. There are two ontological aspects, the material and the mental-spiritual. Matter can not be reduced to mental-spiritual processes, and the mental-spiritual can not be reduced to biological-material processes. Any statement about man is only valid when it addresses both of these ontological aspects;
4. There is only one ontological aspect. The mental-spiritual and material processes are identical forms of expression of the one underlying reality;
5. The metaphysical question as to one or two ontological aspects remains unanswered. The mental-spiritual and biological-material processes as described

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6. can not be derived from each other. Any statement about man is only valid when it addresses both of these ontological aspects.

To which view do you most subscribe?

No. ()

In your opinion, is there such a thing as an individual spiritual existence after death ?

No ()

Perhaps ()

Yes, I am convinced ()

In your opinion, is there a unique force (in addition to the mechanical, chemical, and physical principles known to science) which could have an effect on the human brain or cause mental and physical changes?

No () Perhaps ()

Yes, I am convinced ()

Different views on the psychophysical problem

The following definitions of the different perspectives on the psychophysical relation, that is, on the relation between body and mind, have been greatly simplified. Even if you have not previously considered this problem in any detail, you might still lend yourself to the one or other opinion. Please read through the different points of view carefully and decide which of these you most prefer.

Begin with the view in the list below the number of which matches the number you chose above (e.g. you might have chosen No. 2 as the view to which you would most subscribe).

Compare the views denoted by this number (e.g., if you chose No. 2 you would now compare 2a, 2b, 2c and 2d) in order to select one of these. Please read the other views also because at the end you will be asked to choose the ones you most and least prefer.

1. Direct and real experience is only possible in a mental or spiritual realm. Any statements about physical processes and the external reality are derived from mental processes and are therefore of secondary importance. Material processes are of secondary importance in the acquisition of knowledge about mental activity. Mental (and spiritual) states are accessible by introspection and self-reflection, physical states by the research methods of the natural sciences.

2a. Mental (and spiritual) processes are physical, chemical (neurophysiological) processes in the brain. Inner experience is therefore accessible by the methods of the natural sciences. Progress in the neurosciences will enable mental processes to be explained as physical and chemical processes.

2b. Mental (and spiritual) processes like consciousness are functional features of the brain, which have emerged at higher levels of cognitive organisation during the course of a long biological evolution. Physical and chemical processes and the functions of biological subsystems can not explain these emerging features sufficiently, because, for example, social influences on the brain can not be described neurobiologically. However, mental processes are not features or effects of an independent mind. They form a special subset of brain functions.

2c. Mental (and spiritual) states are functional states of the brain. Each function can be defined in the context of its input and output and of the other systemic functions, provided that the principles governing these functions are fully known. Functions can be distinguished from physical structures. Functions can be found in the human brain or produced in advanced computers.

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2d. Mental (and spiritual) and physical processes represent two different ways of brain functioning. They integrate in a dialectical unity of form and content, materially energetic nervous activity, and information processing. Mental functions are more complex than brain functions, they have their own particular quality, and are not fundamentally different from neurophysiological (physical-chemical) processes.

3a. Mental (and spiritual) and physical processes are assumed to be two separate ontological entities obeying separate laws. Mental and physical processes can not be derived from each other, but they do interact and mutually influence each other. It is not known in detail how they influence each other, but it is assumed that this occurs in particular regions of the brain or in particular neural or synaptic (micro-) structures. Physical processes could have a mental cause and vice versa. Physical processes are accessible by the methods of the natural sciences, mental processes by introspection and self-reflection.

3b. Mental (and spiritual) and physical processes are assumed to be two separate ontological entities obeying separate laws. Mental and physical processes can not be derived from each other. Both processes run in parallel and synchronously, they are perfectly correlated elements, but they do not influence each other. A physical event has a physical cause, a mental process has a psychological reason. Physical processes are accessible by the methods of the natural sciences, mental processes by introspection and self-reflection.

3c. Mental (and spiritual) and physical processes are assumed to be two separate ontological entities obeying separate laws. Mental and physical processes can not be derived from each other. The causal relationship is one-sided. Physical processes influence mental processes. Mental processes accompany brain activity but cannot cause changes in physical processes. Physical processes are accessible by the methods of the natural sciences, mental processes by introspection and self-reflection.

4. Mental (and spiritual) and physical processes are two forms of expression of a single underlying entity. A particular mental and a particular physical proposition both refer to the same entity. The preference for either of these equivalent aspects of this psychophysical unity depends more on practical considerations or on the preference for a particular type of terminology.

5. The description of mental (and spiritual) and physical processes is methodologically different. The metaphysical question as to whether there are one or two aspects of being remains unanswered. Neurophysiological descriptions and introspective descriptions do not simply involve different terminology but two categorically different frames of reference. These self-contained frames of reference can not be derived from each other, each providing therefore only a partial view of a single underlying reality. They do however mutually complement each other, combining to form a complete picture.

To which view do you most subscribe? ()

Which other view could you advocate also? ()

Which view do you reject most emphatically? ()

References

- Bunge, M. (1980). *The Mind-body problem. A psychological approach*. Oxford: Pergamon Press.
- Churchland, P.S. (1986). *Neurophilosophy. Toward an unified science of the mind-brain*. Cambridge, Mass.: MIT.
- DER SPIEGEL (1992). *Nur noch jeder vierte ein Christ. [Every fourth only a christian.]* Volume 46 (No. 25), 36-57.
- Dennett, D.C. (1991). *Consciousness explained*. Boston, MA: Little, Brown and Co.
- Fahrenberg, J. (1979). Das Komplementaritätsprinzip in der psychophysiologischen Forschung und psychosomatischen Medizin. (The complementarity principle in psychophysiological research and psychosomatic medicine). *Zeitschrift für Klinische Psychologie und Psychotherapie*, 27, 151-167.
- Fahrenberg, J. (1989). Einige Thesen zum psychophysischen Problem aus der Sicht der psychophysiologischen Forschung. [On the mind-body problem: The perspective of psychophysiological research]. In W. Marx (Ed.). *Philosophie und Psychologie. Leib und Seele. Determination und Vorhersage. [Philosophy and psychology. Body and mind. Determination and prediction]*. Frankfurt a. M.: Klostermann.
- Fahrenberg, J. (1992). Komplementarität in der psychophysiologischen Forschung. [Complementarity in psychophysiological research]. In E.P. Fischer, H.S. Herzka & K.H. Reich (Hrsg.). *Widersprüchliche Wirklichkeit [Contradictory reality]*. (S. 43-77). München: Piper TB.
- Larson, E.J. & Witham, L. (1997). Scientists are still keeping the faith. *Nature*, 386, 435-436.
- Metzinger, T. (1985). *Neuere Beiträge zur Diskussion des Leib-Seele-Problems. [Recent contributions to discussing the body-mind-problem]*. Frankfurt/M.: P. Lang.
- Ritter, J. (Hrsg.) (1971ff). *Historisches Wörterbuch der Philosophie. [Historical dictionary of philosophy]*. Darmstadt: Wissenschaftliche Buchgesellschaft.
- Wider, K. (1994). Diagnostisch-therapeutische Strategien in Abhängigkeit von der Einstellung zum Leib-Seele-Problem. [Diagnostic-therapeutic strategies depending on attitude towards the mind-body problem. Unpublished Thesis]. Unveröff. Diplomarbeit. Psychologisches Institut. Freiburg i. Br.
- Wrightsmann, L.S. (1992). *Assumptions about human nature: implications for researchers and practitioners* (2nd ed.). Newbury Park: Sage.

Paper received November 1998; revised March 2000.