

Dualism Persists in the Science of Mind

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The relationship between mind and brain has philosophical, scientific, and practical implications. Two separate but related surveys from the University of Edinburgh (University students, $n = 250$) and the University of Liège (health-care workers, lay public, $n = 1858$) were performed to probe attitudes toward the mind–brain relationship and the variables that account for differences in views. Four statements were included, each relating to an aspect of the mind–brain relationship. The Edinburgh survey revealed a predominance of dualistic attitudes emphasizing the separateness of mind and brain. In the Liège survey, younger participants, women, and those with religious beliefs were more likely to agree that the mind and brain are separate, that some spiritual part of us survives death, that each of us has a soul that is separate from the body, and to deny the physicality of mind. Religious belief was found to be the best predictor for dualistic attitudes. Although the majority of health-care workers denied the distinction between consciousness and the soma, more than one-third of medical and paramedical professionals regarded mind and brain as separate entities. The findings of the study are in line with previous studies in developmental psychology and with surveys of scientists' attitudes toward the relationship between mind and brain. We suggest that the results are relevant to clinical practice, to the formulation of scientific questions about the nature of consciousness, and to the reception of scientific theories of consciousness by the general public.

Key words: consciousness; survey; dualism; materialism; religiosity; health-care professionals; neuroscience

Introduction

The scientific study of consciousness indicates that there is an intimate relationship between mind and brain.¹ However, surveys of highly educated samples have suggested that “dualistic” attitudes toward the mind–brain relationship remain very common.² These are revealed, for example, by religious beliefs that the mind or soul is separable from the body, or

by the conviction that some spiritual part of us can survive after death. Although some might expect that nowadays the existence of the supernatural would be denied by scientists, it has been reported that about 40% of this population believe in a personal God or in life after death, a similar figure to that obtained almost a hundred years ago.³ The clinical and theoretical implications of such figures have been stressed in a recent questionnaire survey: students from various disciplines reported that different perspectives on the mind–brain problem were likely to influence doctors' and psychologists' choice of research methods, treatment options, and their behavior toward patients.⁴

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Given the relevance of philosophical positions on the mind–brain relationship to practice and theory, we shall briefly review the most representative philosophies of mind. In the present chapter we use the terms mind and consciousness interchangeably to refer to the first-person perspective that we enjoy in our everyday experience.⁵

The “-isms” of Consciousness

Dualism

Rene Descartes developed the view that mind and matter involve different kinds of “substance,” a view now known as “substance” or “Cartesian” dualism. In this view, the brain belongs to the physical world, the mind to the nonphysical, yet they are closely related to each other.⁶ Physical events can cause mental events and vice versa. Dualism, however, notoriously fails to explain how physical and mental entities can interact.

Functionalism

This view, one of the varieties of physicalism, denies the “separateness” of mental and physical phenomena. Instead, mental phenomena are considered as states of the brain (beliefs, desires, feelings of pain, etc.) with a functional role. In this view, mind is analogous to the operation of a software package in the hardware in the brain. The key feature of mind, according to functionalism, is the algorithmic transformation of inputs into outputs.⁷ If so, computers and robots may one day be conscious.

Reductive Materialism (or “Identity Theory”)

This position holds that there are no “hard questions” to be answered and no “gaps” to be explained. The mind cannot be separated from the brain. It is the brain. Experience can be explained simply by revealing what happens within the brain, just as heat is explained by the motion of atoms. The difficulty for this perspective is that it seems to give no account of the subjective qualities of experience,⁵ why it

should be “like something” to undergo experience. This view, albeit convenient for neuroscience, has been accused of “leaving out the mind.”⁸

In the present chapter, we survey attitudes toward the mind–brain relationship sampled from two related surveys, the first conducted by the University of Edinburgh, UK, the second by the University of Liège, Belgium. The aim was to identify attitudes toward the mind–brain relationship and the variables that account for differences of views. The two surveys shared four key statements on which participants were asked to state their views.

Methods

Material and Procedure

The statements presented to participants were: (1) the mind and brain are two separate things; (2) the mind is fundamentally physical; (3) some spiritual part of us survives after death; and (4) each of us has a soul that is separate from the body.

In the Edinburgh survey, $n = 250$ participants were included. The sample was comprised of students from the University of Edinburgh, who came from eight academic disciplines: anthropology (33), astrophysics (19), civil engineering (32), computer science (30), divinity (36), medicine (30), mechanical engineering (34), and physics (36). The students were addressed as a class after their lectures and then asked to complete and return the questionnaire within the next 15 minutes. Participants’ views were expressed on a four-point Likert scale (Agree- Somewhat agree- Somewhat disagree- Disagree), which was collapsed into two categories (“agree” vs. “disagree”) for further analysis. The participants were also asked to provide information about possible belief in the existence of a God or Gods.

The Liège survey included $n = 1858$ participants, who were attending public or scientific meetings on consciousness. The majority were European ($n = 1293$) and U.S. ($n = 125$)

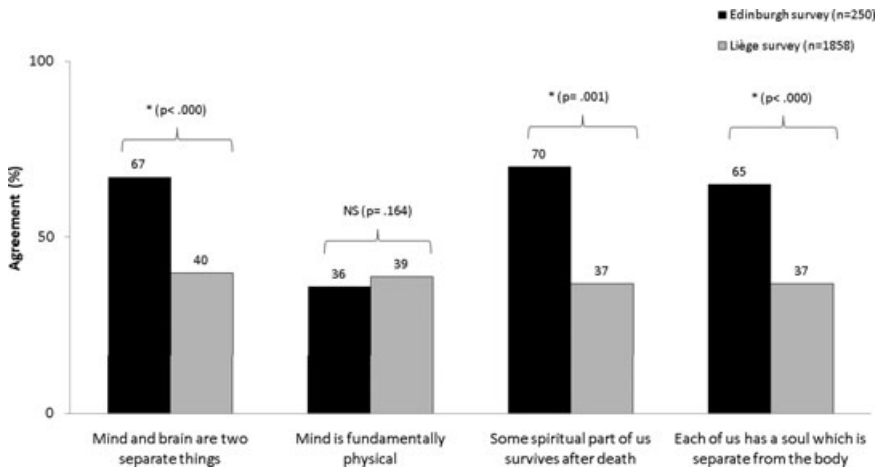


Figure 1. The attitudes toward mind and brain of the Edinburgh ($n = 250$) and the Liège survey sample ($n = 1858$).

citizens, as well as citizens from other countries around the world ($n = 86$) ($n = 354$, missing data on nationality). The sample was comprised of medical professionals (782/1858); paramedical health-care workers, such as nurses, psychologists, physiotherapists (290/1858); and other professional backgrounds (455/1858; 331 missing data on profession). The administration was oral and it took approximately 15 minutes for the completion of the questionnaire. The answers were expressed dichotomously (“agree–disagree”). Information about belief in a personal God was also collected.

The data were analyzed using SPSS 14.0 for Windows (SPSS, Inc., Chicago, IL, USA). Internal consistency was assessed by calculating interitem correlations. Chi-square tests for categorical data were used to test the differences in responses between groups. Logistic Regression analyses (method: backward stepwise) were ordered to describe the relationship between agreement on the four statements and a set of explanatory variables (i.e., age, gender, profession, and religiosity, tests thresholded at $P = .05$).

Results

The histogram of Figure 1 summarizes the initial results of the two surveys. The un-

dergraduate students were generally more inclined to dualistic views about the mind–brain relationship than the second sample (i.e., health-care workers, lay public). Internal consistency was satisfactory for both surveys (see Table 1).

Edinburgh Survey

Two hundred fifty participants, 144 (56%) men and 106 (44%) women, completed their questionnaires. The average age of the students was 20 years (SD: 5; range: 17–57), and 98% of them were doing their first degree. The results were: 168/250 (67%) of responders agreed that “mind and brain are two separate things,” while 158/248 (64%) disputed the statement that “the mind is fundamentally physical”; 161/246 (65%) agreed that “each of us has a soul that is separate from the body,” and 174/248 (70%) agreed that some spiritual part of us survives after death; and 150/239 (63%) believed in the existence of God or Gods.

Women were more likely than men to subscribe to the existence of the soul ($\chi^2(1, 246) = 8.277$, $P = .004$) and to deny that the mind is physical ($\chi^2(1, 248) = 8.810$, $P = .003$). Belief in God was strongly associated with belief in the soul and spiritual survival ($\chi^2(1, 237) = 101.310$, $P < .001$), and with

TABLE 1. Correlations between Responses to the Four Statements

Statements		Mind and brain are two separate things	Mind is funda- mentally physical	Some spiritual part of us survives after death	Each of us has a soul that is separate from the body
Edinburgh survey	Mind and brain are two separate things	1			
	Mind is fundamentally physical	−.345 ^a	1		
	Some spiritual part of us survives after death	.186 ^a	−.248 ^a	1	
	Each of us has a soul that is separate from the body	.292 ^a	−.252 ^a	.773 ^a	1
Liège survey	Mind and brain are two separate things	1			
	Mind is fundamentally physical	−.162 ^a	1		
	Some spiritual part of us survives after death	.235 ^a	−.196 ^a	1	
	Each of us has a soul that is separate from the body	.326 ^a	−.173 ^a	.518 ^a	1

NOTE: Statements 1, 3 and, 4 showed high positive correlation with one other, whereas all three were significantly anticorrelated with statement 2.

^aCorrelations are significant at the $P = .01$ level (two-tailed).

disagreement with the view that the mind is fundamentally physical ($\chi^2(1, 246) = 14.124, P < .001$). The differences between students of different disciplines were less striking on the whole, although students in the humanities were more likely than those in the sciences to believe that the mind is nonphysical ($\chi^2(1, 148) = 8.195, P = .0042$).

Liège Survey

In the Liège Survey, 1858 participants, 908 (49%) women and 840 (45%) men ($n = 110, 6\%$ missing data on gender), were included in the analysis. The average age of the participants was 41 years (SD: 15, range: 16–85). The results were: 737/1773 (42%) respondents agreed that “the mind and the brain are separate”, while 725/1766 (41%) disputed the statement that “the mind is fundamentally physical”; 686/1735 (40%) agreed that some spiritual part of us survives after death and 688/1741 (40%) that “each of us has a soul which is separate from the body”. The number of religious believers (789/1858) was approximately the same as the number of nonbelievers (783/1858) (286 missing data on religiosity).

Table 2 summarizes the results of the Logistic Regression models for each philosophical statement. The statement “The mind and brain are two separate things” was supported more often by religious than nonreligious responders and less often by middle-aged (31–49 years) and older (>50 years) responders as compared to younger ones (<30 years). The statement that “The mind is purely physical” was endorsed less often by religious participants, and more often by men as compared to women. Religious responders agreed significantly more often with the statement “Some spiritual part of us survives after death” more than nonreligious ones. The statement that “each of us has a soul that is separate from the body” received more support from religious responders and paramedical professionals than it did from from nonreligious participants and medical professionals. The interactions age/religiosity, age/gender, and gender/religiosity were also tested, but no significant effects were found in the Logistic Regression models.

Figures 2 and 3 summarize the effects of age, gender, religiosity, and professional background on agreement with the four statements.

A majority of medical (55%) and paramedical professionals (51%) stated that they were

TABLE 2. The Most Significant Predictors of the Logistic Regression Models (method: backward stepwise) on the Four Statements

Statement predictors	Odds ratio	95% CI	P-value ^a
The mind and brain are two separate things			
Religious	1.778	1.347–2.347	<.001
Middle age (31–49 yr)	.490	.336–.716	<.001
Older (>40 yr)	.535	.361–.795	.002
The mind is fundamentally physical			
Religious	.519	.395–.681	<.001
Men	2.186	1.664–2.871	<.001
Some spiritual part of us survives after death			
Religious	7.892	5.694–10.938	<.001
Each of us has a soul that is separate from the body			
Religious	5.456	3.987–7.465	<.001
Paramedical professionals	1.633	1.161–2.297	<.001

NOTE: An odds ratio greater than one implies that agreement is more likely in the predictor. An odds ratio less than one implies that agreement is less likely in the predictor.

^aP significant at $\alpha = 0.05$.

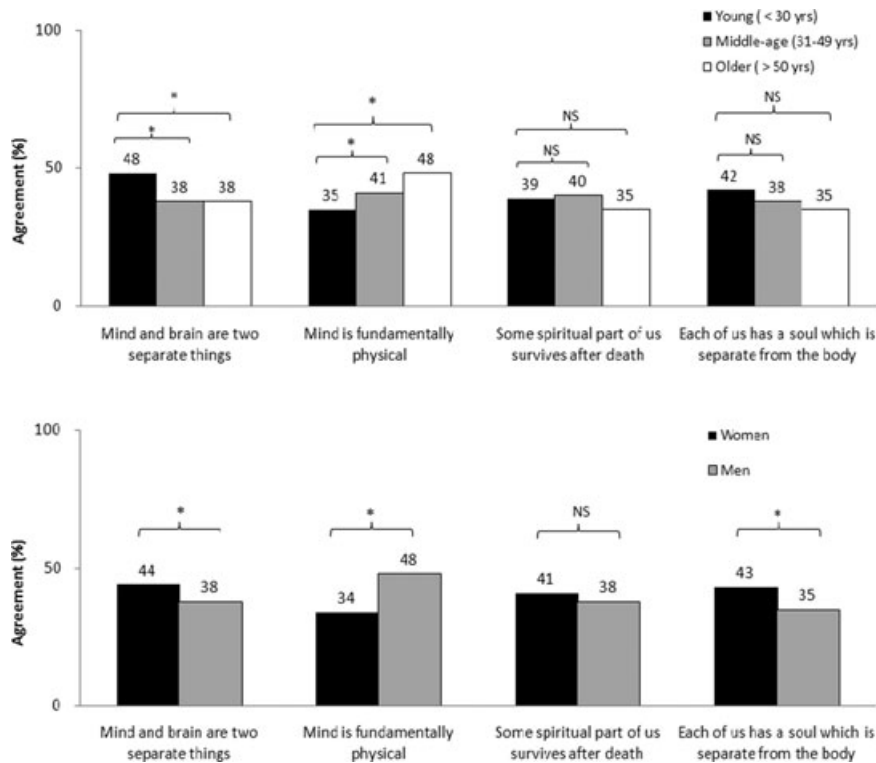


Figure 2. The effect of age and gender on attitudes toward mind–brain relationship (Liège survey, $n = 1858$).

religious. A substantial number of medical professionals (39.5%) ($n = 304$) endorsed the statement distinguishing mind and brain as separate entities as compared to 38.2% ($n =$

92) of the paramedical professionals. The physicality of mind was denied by 55.4% ($n = 425$) medical and 63.5% ($n = 153$) of paramedical professionals. The continuation of the

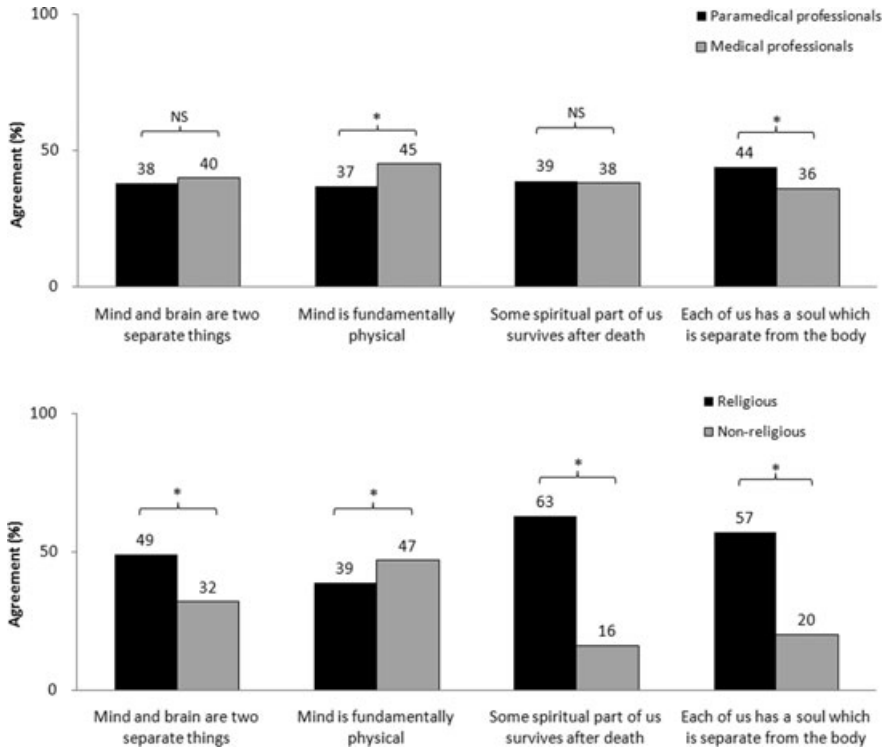


Figure 3. The effect of professional background and religiosity on attitudes toward mind–brain relationship (Liège survey, $n = 1858$).

spirit after death found support from 37.9% ($n = 285$) of medical and 38.5% ($n = 92$) of paramedical professionals. Finally, the view that that we have a soul that is separate from the body was supported by 36% ($n = 272$) of the group of medical workers and by 44.1% ($n = 105$) of paramedical professionals.

Discussion

The present article provides data from two separate but related surveys on attitudes on mind and brain, based in Scotland and Belgium. A majority of undergraduates, sampled in the Edinburgh survey, held a dualistic view of the relationship between mind and brain (i.e., mind and brain are separate). The majority disagreed that the mind is a purely physical entity and endorsed the existence of a soul that is separate from the body and survives death. The views of a wider group (health-care professionals, lay public, students), sampled in

the Liège survey, were less dualistic (Fig. 1), but nevertheless, over a third of health-care workers expressed dualistic opinions and half reported religious belief. Younger participants, women, and those with religious beliefs were more likely to endorse dualism (Figs. 2 and 3). However, the tendency for women to endorse dualism more often than men was not explained by an association between female sex and religious belief.

Our findings must be considered in the context of the groups we have surveyed and the approach we have taken. A larger survey, including participants from a broader range of educational and cultural backgrounds, would shed more light on such attitudes. Additionally, the closed “agree-disagree” statements used in the survey forced participants to endorse attitudes that they might have wished to qualify had they been given an opportunity to do so. For example, a majority of the Liège survey supported the view that mind is not fundamentally

physical. Yet the group's perspective was not consistently dualistic, as a majority also endorsed the statement that the mind is not separable from the brain. This may reflect the complexities of the concept of mind, or understandable confusion about its nature, which remains controversial among philosophers.

Dualism in Development

Dualism expresses itself in religious beliefs in two prominent ways: in the idea of the soul existing independently of the body, and in the idea of an afterlife.⁹ Research in developmental psychology suggests that although the precise formulation of such beliefs is culturally determined, the idea that consciousness is different from the body is universal. For example, when young (4 years) and older (12 years) children were asked whether psychological functioning (i.e., consciousness) persisted after the death of a mouse, four-year-olds held that both biological functioning and consciousness survived in the dead animal. Older children believed that only consciousness survived death.¹⁰

Besides their tendency to regard consciousness as being separable from the body, children are inclined to "promiscuous teleology": they tend to attribute human-like purpose both to living and nonliving entities. This was shown experimentally in infants who inferred purpose in abstract geometrical figures moving systematically on a monitor.¹¹ Children are "intuitive theists"¹² in the sense that they tend to view nature as an artefact of design by a deity. What is the advantage of such teleological thinking? Daniel Dennett has explained its evolutionary significance in his theory of "intentional stance."¹³ We adopt the intentional stance when we explain events or behavior in terms of the mental lives of agents. This is appropriate and advantageous in our dealings with one another, but our innate tendency to adopt this stance can lead to misattribution of mentality to processes that, arguably, do not involve purpose of this kind.

Dualism in Science

Although one might have expected that dualistic attitudes would grow less common with scientific progress, especially among scientists, this may not be the case. At the beginning of the twentieth century, Leuba's survey of religious beliefs among scientists found that 40 percent believed in a personal God and in afterlife.¹⁴ Eighty years later, Larson and Witham replicated the survey and found little change,³ in accordance with our finding that almost one-third of health-care professionals support dualistic views on mind–brain relationship. In their survey, beliefs in a personal God and in afterlife were found to be considerably lower, at 7% and 7.9% respectively, when the sampled group was "leading scientists" (i.e., members of the National Academy of Science), in contrast to what was found in 1914.¹⁵

Being a Dualist: Clinical and Scientific Implications

The persistence of dualistic attitudes toward mind and brain has direct implications for clinical practice. In neurological practice, around one-third of outpatients have medically unexplained symptoms, which are associated with high levels of psychiatric comorbidity (i.e., somatoform disorders). These patients are especially reluctant to accept psychological explanations for their condition,¹⁶ because psychological symptoms are often considered shameful and associated with the social stigma of "mental" disease. Physical symptoms, on the other hand, are perceived as being free from such stigma or implication of blame. The difficulty patients with somatoform disorders experience in accepting psychological explanations for their symptoms partly flows from, and reinforces, dualistic attitudes toward the relationship between mind and body. Similarly, a recent survey found that mental-health workers utilized the mind–brain dichotomy to reason about the patients' responsibility for their condition: when a problem was

considered of a psychological etiology, the patients were more often thought to be responsible for their condition, whereas when the problem was thought to have a neurobiological cause, the patients were considered less blameworthy.¹⁷

We suggest that dualism is also at work in neuroscientific thinking about consciousness. Thus, talk of consciousness being “generated by” or “conjured from” the brain is reminiscent of the Cartesian view that our mental lives interact with our physical being, but are radically separate from it. Some contemporary philosophers of mind¹⁸ regard dualism of this kind as being theoretically appropriate. Here, we simply draw attention to the fact that the widespread dualism revealed by our survey continues to exert an influence on scientific thought. Whether or not dualistic views are correct, their continuing influence should be acknowledged.

Dualistic preconceptions about mind and brain may also influence the reception of scientific theories of consciousness by the general public. If such views remain alive among scientists who formulate and try to answer questions within the science of consciousness, they are likely to be all the more influential among the wider public.

Conclusions

Efforts in clinical medicine, cognitive neuroscience, and in the wider public arena are gradually reshaping our attitudes toward mind and brain. In clinical practice, the adoption of a bio-psycho-social approach to illness generally provides a helpful antidote to the separation of the care of “diseases of the mind” from those “of the body.”¹⁹ Cognitive neuroscience reflects a sustained attempt by scientists to reinstate mind within nature, from which it was exiled by Descartes at the inception of modern science. Efforts to enhance the public understanding of science are creating lively dialog between scientists and a wider public. Nevertheless, the conceptual clarification of the re-

lationship between mind and brain remains a challenge for scientists and philosophers, as we have inherited concepts and assumptions that may not do justice to their intimate connection.

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Conflicts of Interest

The authors declare no conflicts of interest.

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