CLINICAL CONTRIBUTIONS TO CONSCIOUSNESS STUDIES

George A. Mashour*, Ashley Turner

*University of Michigan Medical School
Ann Arbor, MI, USA*

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Abstract

Consciousness is a multidisciplinary subject of inquiry. The extent of clinical contributions to the field of consciousness studies has yet to be investigated. The goal of this study was to assess the degree of clinically related articles in the literature of consciousness studies through a systematic evaluation. Three journals systematically identified (Consciousness and Cognition, Journal of Consciousness Studies, and Anthropology of Consciousness) were reviewed from the first issue through December 2008. All original articles related to anesthesiology, general clinical medicine, neurology, neurosurgery, and psychiatry were identified. Of the 1,805 articles reviewed for the three journals, a total of 149 clinically relevant articles were identified; this represented an average contribution of 8% to the total articles. Psychiatry was the discipline most consistently represented in the three journals; neurosurgery was the least represented. There is a relative paucity of clinical articles in the literature of consciousness studies. Clinical perspectives may thus be underrepresented in the field.

Key words: Consciousness; Consciousness studies; Meta-analysis

INTRODUCTION

The study of consciousness is a richly interdisciplinary endeavor, involving philosophy, psychology, cognitive science, neuroscience, physics, and numerous other fields. Clinical disciplines such as neurology, psychiatry, neurosurgery, and anesthesiology all deal with the disturbance or disruption of consciousness. As such, studies and reports related to these disciplines may potentially enrich the discourse of consciousness studies. For example, anesthesiologists regularly initiate a deep state of reversible unconsciousness, providing a unique opportunity for understanding the molecular and neurophysiologic mechanisms of consciousness.

Similarly, the hallucinatory experiences of neuropsychiatric patients or cognitive deficits of neurosurgical patients may yield insight into the neural substrates of consciousness through clinicopathologic correlation. Thus, the clinical perspective is vital to the progress of consciousness studies, but the extent of clinical contributions to the field has yet to be investigated. The goal of this study was therefore to assess the degree of clinically related articles in the literature of consciousness studies through a systematic evaluation.

METHODS

Journals devoted primarily to the publication of original articles on consciousness studies were identified systematically. A journal search on PubMed using the term "consciousness" yielded only Consciousness and Cognition. An internet search (Google) using the terms "consciousness journal" and "consciousness journals" further yielded Journal of Consciousness Studies, Psyche, Anthropology of Consciousness, International Journal of Machine Consciousness, and Science and Consciousness Review. Psyche was excluded because it did not have a continuous publication history, with no articles published in Volumes 2, 6, 7 or the year 2008. International Journal of Machine Consciousness was excluded, as the first volume was not scheduled to appear until 2009. Science and Consciousness Review was excluded because it publishes summaries rather than original articles. Thus, the journals Consciousness and Cognition (C&C), Journal of Consciousness Studies (JCS), and Anthropology of Consciousness (AoC) were deemed appropriate for analysis.

All volumes of C&C (1992-), JCS (1994-), and AoC (1990-) were reviewed from the first issue through December, 2008. All titles and abstracts were evaluated

for elements related to anesthesiology, neurology, neurosurgery, psychiatry (and related disciplines such as psychoanalysis) or general clinical medicine. If such elements appeared to be central, the article was deemed to be clinical. The text of the articles themselves was reviewed if ambiguity existed.

Figure 1. Clinical contributions as a percentage of total original articles to Consciousness and Cognition (a), Journal of Consciousness Studies (b), and Anthropology of Consciousness (c). Every journal from the first issue through December, 2008 was reviewed.

Editorial introductions, book reviews, conference announcements or reviews, calls for articles, interviews, obituaries, commentaries and replies were all excluded.

“Commentary” was determined by an explicit statement in the title of the article, or based on the categorization of the journal. The percentage of clinically related articles in the target journals was assessed and compared; the representation of fields comprising the clinical articles was also assessed.

RESULTS

C&C had the most clinical articles in absolute numbers (96 clinical/746 total), as well as the highest percentage of clinical articles (13%) (Figure 1a). JCS had 43 clinical/888 total articles, representing 5% of total articles in that journal (Figure 1b). AoC had only 10 clinical/171 total articles, representing 6% of total articles in that journal (Figure 1c). Please see the Appendix for full listing of clinical articles from the three journals analyzed.

Psychiatry and related disciplines had the best representation in the three journals; neurosurgery had the worst (Figure 2).

Figure 2. Representation of the clinical disciplines analyzed. Values were normalized as percentages for comparison.

DISCUSSION

This is the first study to evaluate the degree of clinically related contributions to the literature of consciousness studies. Consciousness and Cognition had the largest percentage of clinically related articles, as well as the largest absolute number. This may be attributable to the fact that it is the only journal focused on consciousness that is indexed in PubMed. Of the clinical fields, psychiatry and related disciplines were most consistently represented among the three journals analyzed.

It is difficult to make hard conclusions or recommendations based on these findings, as the degree to which clinical disciplines should contribute to the literature of consciousness is unclear. That being said, the pathology observed in the clinical setting may provide significant insight to the study of consciousness—the fact that less than 10% of articles in

C&C, JCS and AoC are clinically relevant suggests that such insights may be underrepresented. There are several possible reasons to account for this. First, clinicians or clinical researchers may not perceive their work under the rubric of “consciousness studies” and may thus submit their research to primary journals in their own field. Second, the paucity of clinically related articles may reflect a lack of interest or knowledge of clinical topics by researchers primarily interested in consciousness. Third, these data may suggest that the lack of academic legitimacy of consciousness studies characteristic of the 20th century still persists in the clinical realm. Although not assessed in the current study, it would be of further interest to investigate how many authors of these clinical studies were actually clinicians.

In terms of the fields represented, it was surprising to see the small contribution of anesthesiology to the total clinical articles. Unlike psychiatrists, neurologists, or neurosurgeons, the primary clinical activity of anesthesiologists is the manipulation of normal human consciousness—it is thus unclear why there has not been better representation in the field of consciousness studies proper. Perhaps the recent high-profile discussion of consciousness and anesthesia in the literature (Alkire, Hudetz, Tononi, 2008) will stimulate further interest and academic activity.

There are several limitations to the current study. First, the determination of clinical relevance can be subjective. Certain subjects are unambiguously clinical (such as blindsight or schizophrenia for example), whereas others require interpretation. Although some choices in the present study could be subject to discussion, it is likely that the primary results would be unchanged. Another limitation relates to the category of commentaries. Some articles or journal classifications clearly denote an article as a commentary, while others do not. In general, if the target article is theoretical, the commentary may be just as “original” in nature and should therefore be included as such. To avoid ambiguity, the decision was made to exclude as commentaries only articles that were explicitly labeled as such. There may thus be instances in which incorrect inclusion or exclusion would alter the outcome. Again, we do not think that such instances would significantly alter the primary results. Finally, this study addresses only the presence, rather than the overall impact, of a clinical contribution.

We are still in the early methodological stages of consciousness studies. The present data indicate that clinical fields directly related to the investigation of consciousness may not yet be fully integrated. Further work on the role of the clinical sciences in the study of consciousness is warranted.

Appendix: Clinical articles identified in AoC (1990 through December, 2008), C&C (1992 through December, 2008), and JCS (1994 through December, 2008), listed alphabetically for each journal.

Anthropology of Consciousness

1. Budden A: Pathologizing Possession: An Essay on Mind, Self, and Experience in Dissociation. *Anthropology of Consciousness* 2003; 14: 27-59
2. Calabrese JD: The Supreme Court versus Peyote: Consciousness Alteration, Cultural Psychiatry and the Dilemma of Contemporary Subcultures. *Anthropology of Consciousness* 2001; 12: 4-18
3. Jervis LL: Finding Order in David's Disorder. *Anthropology of Consciousness* 1997; 8: 97-105
4. Lynch D: Patient Preparation and Perceived Outcomes of Spiritist Healing in Brazil. *Anthropology of Consciousness* 2004; 15: 10-41
5. Lynn CD: Adaptive and Maladaptive Dissociation: An Epidemiological and Anthropological Comparison and Proposition for an Expanded Dissociation Model. *Anthropology of Consciousness* 2005; 16: 16-49
6. Ostlund SK: Doctors, Nurses, & Patients: Who Has Control Over Death And Dying? *Anthropology of Consciousness* 2000; 11: 78-89
7. Peters LG: Rites of Passage and the Borderline Syndrome: Perspectives in Transpersonal Anthropology. *Anthropology of Consciousness* 1994; 5: 1-15
8. Saxton K, Govertsen E: Field Play: The Normalization of an Alternate Cognizance in Seriously Ill Children. *Anthropology of Consciousness* 2000; 11: 14-23
9. Winkelman M: Therapeutic Effects of Hallucinogens. *Anthropology of Consciousness* 1991; 2: 15-19
10. Wright PA: Rhythmic Drumming in Contemporary Shamanism and Its Relationship to Auditory Driving and Risk of Seizure Precipitation in Epileptics. *Anthropology of Consciousness* 1991; 2: 7-14

Consciousness and Cognition

11. Alkire MT: The Power of Observation. *Consciousness and Cognition* 2001; 10: 236-240
12. Alkire MT, Haier RJ, Fallon JH: Toward a Unified Theory of Narcosis: Brain Imaging Evidence for a Thalamocortical Switch as the Neurophysiologic Basis of Anesthetic-Induced Unconsciousness. *Consciousness and Cognition* 2000; 9: 370-386
13. Hobson JA: Sleep and dream suppression following a lateral medullary infarct: A first-person account. *Consciousness and Cognition* 2002; 11: 377-390
14. Alpert JL: Trauma, Dissociation, and Clinical Study as a Responsible Beginning. *Consciousness and Cognition* 1995; 4: 125-129
15. Andrade J: Investigations of Hypesthesia: Using Anesthetics to Explore Relationships between

- Consciousness, Learning, and Memory. *Consciousness and Cognition* 1996; 5: 562-580
16. Andrade J, Munglani R, Jones JG, Baddeley AD: Cognitive Performance during Anesthesia. *Consciousness and Cognition* 1994; 3: 148-165
17. Asai T, Sugimori E, Tanno Y: Schizotypal personality traits and prediction of one's own movements in motor control: What causes an abnormal sense of agency? *Consciousness and Cognition* 2008; 17: 1131-1142
18. Baars BJ: The Brain Basis of a "Consciousness Monitor": Scientific and Medical Significance. *Consciousness and Cognition* 2001; 10: 159-164
19. Baars BJ, Banks WP: Introduction: The evidence for anosognosia. *Consciousness and Cognition* 1992; 1: 148-151
20. Baars BJ, McGovern K: Steps toward Healing: False Memories and Traumagenic Amnesia May Coexist in Vulnerable Populations. *Consciousness and Cognition* 1995; 4: 68-74
21. Bacon E, Danion J-M, Kauffmann-Muller F, Bruant A: Consciousness in Schizophrenia: A Metacognitive Approach to Semantic Memory. *Consciousness and Cognition* 2001; 10: 473-484
22. Ballard CG, Court JA, Piggott M, Johnson M, O'Brien J, McKeith I, Holmes C, Lantos P, Jaros E, Perry R, Perry E: Disturbances of consciousness in dementia with Lewy bodies associated with alteration in nicotinic receptor binding in the temporal cortex. *Consciousness and Cognition* 2002; 11: 461-474
23. Banks WP: Korsakoff and Amnesia. *Consciousness and Cognition* 1996; 5: 22-26
24. Barnett KJ, Kirk IJ, Corballis MC: Bilateral disadvantage: Lack of interhemispheric cooperation in schizophrenia. *Consciousness and Cognition* 2007; 16: 436-444
25. Barnett KJ, Newell FN: Synaesthesia is associated with enhanced, self-rated visual imagery. *Consciousness and Cognition* 2008; 17: 1032-1039
26. Becchio C, Bertone C: The ontology of neglect. *Consciousness and Cognition* 2005; 14: 483-494
27. Behrmann M, Meegan DV: Visuomotor Processing in Unilateral Neglect. *Consciousness and Cognition* 1998; 7: 381-409
28. Bisiach E, Neppi-Mòdona M, Genero R, Pepi R: Anisometry of Space Representation in Unilateral Neglect: Empirical Test of a Former Hypothesis. *Consciousness and Cognition* 1999; 8: 577-584
29. Bisiach E, Ricci R, Mòdona MN: Visual Awareness and Anisometry of Space Representation in Unilateral Neglect: A Panoramic Investigation by Means of a Line Extension Task. *Consciousness and Cognition* 1998; 7: 327-355
30. Blair RJR: Responding to the emotions of others: Dissociating forms of empathy through the study of typical and psychiatric populations. *Consciousness and Cognition* 2005; 14: 698-718
31. Bogen JE: On the Neurophysiology of Consciousness: 1. An Overview. *Consciousness and Cognition* 1995; 4: 52-62
32. Bogen JE: On the Neurophysiology of Consciousness: Part II. Constraining the Semantic Problem. *Consciousness and Cognition* 1995; 4: 137-158
33. Bonebakker AE, Jelicic M, Passchier J, Bonke B: Memory during General Anesthesia: Practical and Methodological Aspects. *Consciousness and Cognition* 1996; 5: 542-561
34. Bowler DM, Gardiner JM, Gaigg SB: Factors affecting conscious awareness in the recollective experience of adults with Asperger's syndrome. *Consciousness and Cognition* 2007; 16: 124-143
35. Brennen T, Dybdahl R, Kapidzic A: Trauma-related and neutral false memories in war-induced Posttraumatic Stress Disorder. *Consciousness and Cognition* 2007; 16: 877-885
36. Cahill C, Al-Eithan M, Frith CD: Conscious and Unconscious Rule-Induction: A Neuropsychological Case Study. *Consciousness and Cognition* 1993; 2: 210-224
37. Cariani P: Anesthesia, Neural Information Processing, and Conscious Awareness. *Consciousness and Cognition* 2000; 9: 387-395
38. Caseley-Rondi G, Merikle PM, Bowers KS: Unconscious Cognition in the Context of General Anesthesia. *Consciousness and Cognition* 1994; 3: 166-195
39. Cermolacce M, Naudin J, Parnas J: The "minimal self" in psychopathology: Re-examining the self-disorders in the schizophrenia spectrum. *Consciousness and Cognition* 2007; 16: 703-714
40. Cheyne JA, Girard TA: Paranoid delusions and threatening hallucinations: A prospective study of sleep paralysis experiences. *Consciousness and Cognition* 2007; 16: 959-974
41. Danion J-M, Cuervo C, Piolino P, Huron C, Riutort M, Peretti CS, Eustache F: Conscious recollection in autobiographical memory: An investigation in schizophrenia. *Consciousness and Cognition* 2005; 14: 535-547
42. Danziger S, Fendrich R, Rafal RD: Inhibitory Tagging of Locations in the Blind Field of Hemianopic Patients. *Consciousness and Cognition* 1997; 6: 291-307
43. de Vignemont F, Zalla T, Posada A, Louvegnez A, Koenig O, Georgieff N, Franck N: Mental rotation in schizophrenia. *Consciousness and Cognition* 2006; 15: 295-309
44. Deeprose C, Andrade J: Is priming during anesthesia unconscious? *Consciousness and Cognition* 2006; 15: 1-23

45. Deouell LY: Pre-requisites for conscious awareness: Clues from electrophysiological and behavioral studies of unilateral neglect patients. *Consciousness and Cognition* 2002; 11: 546-567
46. Dijkerman HC, Milner AD, Carey DP: Grasping Spatial Relationships: Failure to Demonstrate Allocentric Visual Coding in a Patient with Visual Form Agnosia. *Consciousness and Cognition* 1998; 7: 424-437
47. Enriquez P, Bernabeu E: Hemispheric laterality and dissociative tendencies: Differences in emotional processing in a dichotic listening task. *Consciousness and Cognition* 2008; 17: 267-275
48. Feinberg TE, Keenan JP: Where in the brain is the self? *Consciousness and Cognition* 2005; 14: 661-678
49. Forrest KA: Toward an Etiology of Dissociative Identity Disorder: A Neurodevelopmental Approach. *Consciousness and Cognition* 2001; 10: 259-293
50. Fosse R: REM mentation in narcoleptics and normals: an empirical test of two neurocognitive theories. *Consciousness and Cognition* 2000; 9: 488-509
51. Frith C: The self in action: Lessons from delusions of control. *Consciousness and Cognition* 2005; 14: 752-770
52. Frith U, de Vignemont F: Egocentrism, allocentrism, and Asperger syndrome. *Consciousness and Cognition* 2005; 14: 719-738
53. Galin D: Theoretical reflections on awareness, monitoring, and self in relation to anosognosia. *Consciousness and Cognition* 1992; 1: 152-162
54. Gambini O, Barbieri V, Scarone S: Theory of Mind in schizophrenia: First person vs third person perspective. *Consciousness and Cognition* 2004; 13: 39-46
55. Geraerts E, Kozaric-Kovacic D, Merckelbach H, Peraica T, Jelicic M, Candel I: Traumatic memories of war veterans: Not so special after all. *Consciousness and Cognition* 2007; 16: 170-177
56. Geraerts E, Smeets E, Jelicic M, van Heerden J, Merckelbach H: Fantasy proneness, but not self-reported trauma is related to DRM performance of women reporting recovered memories of childhood sexual abuse. *Consciousness and Cognition* 2005; 14: 602-612
57. Glazebrook CM, Elliott D, Lyons J: Temporal judgements of internal and external events in persons with and without autism. *Consciousness and Cognition* 2008; 17: 203-209
58. Guterman Y: A neural plasticity perspective on the schizophrenic condition. *Consciousness and Cognition* 2007; 16: 400-420
59. Halligan PW, Marshall JC: Neglect of Awareness. *Consciousness and Cognition* 1998; 7: 356-380
60. Hameroff S: Anesthesia: The "Other Side" of Consciousness. *Consciousness and Cognition* 2001; 10: 217-229
61. Hembroke H, Ceci SJ: Traumatic Memories: Do We Need to Invoke Special Mechanisms? *Consciousness and Cognition* 1995; 4: 75-82
62. Heywood CA, Kentridge RW, Cowey A: Cortical Color Blindness is Not "Blindsight for Color". *Consciousness and Cognition* 1998; 7: 410-423
63. Huntjens RJC, Postma A, Woertman L, van der Hart O, Peters ML: Procedural memory in dissociative identity disorder: When can inter-identity amnesia be truly established? *Consciousness and Cognition* 2005; 14: 377-389
64. John ER, Prichep LS, Kox W, Valdés-Sosa P, Bosch-Bayard J, Aubert E, Tom M, diMichele F, Gugino LD: Invariant Reversible QEEG Effects of Anesthetics. *Consciousness and Cognition* 2001; 10: 165-183
65. Kentridge RW: Why Do Stationary Visual Transients Apparently Fail to Elicit Phenomenal Vision after Unilateral Destruction of Primary Visual Cortex? *Consciousness and Cognition* 2001; 10: 588-590
66. Kihlstrom JF: The Trauma-Memory Argument. *Consciousness and Cognition* 1995; 4: 63-67
67. Kircher TTJ, Leube DT: Self-consciousness, self-agency, and schizophrenia. *Consciousness and Cognition* 2003; 12: 656-669
68. Korsakoff SS: Medico-Psychological Study of a Memory Disorder. *Consciousness and Cognition* 1996; 5: 2-21
69. Laureys S, Perrin F, Brédart S: Self-consciousness in non-communicative patients. *Consciousness and Cognition* 2007; 16: 722-741
70. Lysaker PH, Tsai J, Maulucci AM, Stanghellini G: Narrative accounts of illness in schizophrenia: Association of different forms of awareness with neurocognition and social function over time. *Consciousness and Cognition* 2008; 17: 1143-1151
71. Mashour GA, LaRock E: Inverse zombies, anesthesia awareness, and the hard problem of unconsciousness. *Consciousness and Cognition* 2008; 17: 1163-1168
72. McKay R, Cipolotti L: Attributional style in a case of Cotard delusion. *Consciousness and Cognition* 2007; 16: 349-359
73. McKay R, Langdon R, Coltheart M: Models of misbelief: Integrating motivational and deficit theories of delusions. *Consciousness and Cognition* 2007; 16: 932-941

74. Merikle PM, Daneman M: Memory for Unconsciously Perceived Events: Evidence from Anesthetized Patients. *Consciousness and Cognition* 1996; 5: 525-541
75. Natsoulas T: A Rediscovery of Sigmund Freud. *Consciousness and Cognition* 1995; 4: 300-322
76. Neumann A, Blairy S, Lecompte D, Philippot P: Specificity deficit in the recollection of emotional memories in schizophrenia. *Consciousness and Cognition* 2007; 16: 469-484
77. Pacherie E, Green M, Bayne T: Phenomenology and delusions: Who put the ['alien' in alien control? *Consciousness and Cognition* 2006; 15: 566-577
78. Persaud N, Cowey A: Blindsight is unlike normal conscious vision: Evidence from an exclusion task. *Consciousness and Cognition* 2008; 17: 1050-1055
79. Persaud N, Lau H: Direct assessment of qualia in a blindsight participant. *Consciousness and Cognition* 2008; 17: 1046-1049
80. Peters ML, Uytterlinde SA, Consemulder J, van der Hart O: Apparent Amnesia on Experimental Memory Tests in Dissociative Identity Disorder: An Exploratory Study. *Consciousness and Cognition* 1998; 7: 27-41
81. Petitmengin C, Navarro V, Le Van Quyen M: Anticipating seizure: Pre-reflective experience at the center of neuro-phenomenology. *Consciousness and Cognition* 2007; 16: 746-764
82. Plourde G: Identifying the Neural Correlates of Consciousness: Strategies with General Anesthetics. *Consciousness and Cognition* 2001; 10: 241-244
83. Pockett S: Anesthesia and the Electrophysiology of Auditory Consciousness. *Consciousness and Cognition* 1999; 8: 45-61
84. Price EH: A critical review of congenital phantom limb cases and a developmental theory for the basis of body image. *Consciousness and Cognition* 2006; 15: 310-322
85. Proust J: Self Model and Schizophrenia. *Consciousness and Cognition* 1999; 8: 378-384
86. Ramachandran VS: Anosognosia in Parietal Lobe Syndrome. *Consciousness and Cognition* 1995; 4: 22-51
87. Rossetti Y: Implicit Short-Lived Motor Representations of Space in Brain Damaged and Healthy Subjects. *Consciousness and Cognition* 1998; 7: 520-558
88. Schwender D, Madler C, Klasing S, Peter K, Pöppel E: Anesthetic Control of 40-Hz Brain Activity and Implicit Memory. *Consciousness and Cognition* 1994; 3: 129-147
89. Shevrin H, Ghannam JH, Libet B: A Neural Correlate of Consciousness Related to Repression. *Consciousness and Cognition* 2002; 11: 334-341
90. Shevrin H, Williams WJ, Marshall RE, Hertel RK, Bond JA, Brakel LA: Event-related potential indicators of the dynamic unconscious. *Consciousness and Cognition* 1992; 1: 340-366
91. Smilek D, Callejas A, Dixon MJ, Merikle PM: Ovals of time: Time-space associations in synaesthesia. *Consciousness and Cognition* 2007; 16: 507-519
92. Solomonova E, Nielsen T, Stenstrom P, Simard V, Frantova E, Donderi D: Sensed presence as a correlate of sleep paralysis distress, social anxiety and waking state social imagery. *Consciousness and Cognition* 2008; 17: 49-63
93. Sonntag P, Gokalsing E, Olivier C, Robert P, Burglen F, Kauffmann-Muller F, Huron C, Salame P, Danion J-M: Impaired strategic regulation of contents of conscious awareness in schizophrenia. *Consciousness and Cognition* 2003; 12: 190-200
94. Stoerig P, Barth E: Low-Level Phenomenal Vision Despite Unilateral Destruction of Primary Visual Cortex. *Consciousness and Cognition* 2001; 10: 574-587
95. Tapp TD: Blindsight in Hindsight. *Consciousness and Cognition* 1997; 6: 67-74
96. Toglia MP: Repressed Memories: The Way We Were? *Consciousness and Cognition* 1995; 4: 111-115
97. Uddin LQ, Rayman J, Zaidel E: Split-brain reveals separate but equal self-recognition in the two cerebral hemispheres. *Consciousness and Cognition* 2005; 14: 633-640
98. Vecera SP, Gills KS: What Is It Like to Be a Patient with Apperceptive Agnosia? *Consciousness and Cognition* 1997; 6: 237-266
99. Veselis RA: Anesthesia--A Descent or a Jump into the Depths? *Consciousness and Cognition* 2001; 10: 230-235
100. Ward J, Li R, Salih S, Sagiv N: Varieties of grapheme-colour synaesthesia: A new theory of phenomenological and behavioural differences. *Consciousness and Cognition* 2007; 16: 913-931
101. Weddell RA: Sequential resolution of fragmented visual percepts: Experimental investigation of a subject's perceptual experience after a right medial temporal stroke. *Consciousness and Cognition* 2007; 16: 551-576
102. Weiskrantz L: Pupillary Responses With and Without Awareness in Blindsight. *Consciousness and Cognition* 1998; 7: 324-326
103. Weiskrantz L: Prime-sight and blindsight. *Consciousness and Cognition* 2002; 11: 568-581
104. Whitfield CL: The Forgotten Difference: Ordinary Memory versus Traumatic Memory. *Consciousness and Cognition* 1995; 4: 88-94
105. Young G: Capgras delusion: An interactionist model. *Consciousness and Cognition* 2008; 17: 863-876
106. Zaragoza MS, Mitchell KJ: Empirical Psychology and the Repressed Memory Debate: Current Status and Future Directions. *Consciousness and Cognition* 1995; 4: 116-119

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107. Alkire MT, Haier RJ, Fallon JH, Barker SJ: PET imaging of conscious and unconscious verbal memory. *Journal of consciousness studies* 1996; 3: 448-462
108. Baron-Cohen S, Bor D, Billington J, Asher J, Wheelwright S, Ashwin C: Savant memory in a man with colour form-number synaesthesia and asperger. *Journal of consciousness studies* 2007; 14: 237-251
109. Barrantes-Vidal N: Creativity & madness revisited from current psychological perspectives. *Journal of consciousness studies* 2004; 11: 58-78
110. Campbell A: Cartesian dualism and the concept of medical placebos. *Journal of consciousness studies* 1994; 1: 230-233
111. Cytowic R: The clinician's paradox: Believing those you must not trust. *Journal of consciousness studies* 2003; 10: 157-166
112. Freeman WJ: Happiness doesn't come in bottles. Neuroscientists learn that joy comes through dancing, not drugs. *Journal of consciousness studies* 1997; 4: 67-70
113. Frith CD, Gallagher S: Models of the pathological mind. *Journal of consciousness studies* 2002; 9: 57-80
114. Grace V: Embodiment and meaning: Understanding chronic pelvic pain. *Journal of consciousness studies* 2003; 10: 41-60
115. Gray J, Chopping S, Nunn J, Parslow D, Gregory L, Williams S, Brammer MJ, Baron-Cohen S: Implications of synaesthesia for functionalism: theory and experiments. *Journal of consciousness studies* 2002; 9: 5-31
116. Gray R: What synaesthesia really tells us about functionalism. *Journal of consciousness studies* 2004; 11: 64-69
117. Hill E, Sally D, Frith U: Does mentalising ability influence cooperative decision-making in a social dilemma? Introspective evidence from a study of adults with autism spectrum disorder. *Journal of consciousness studies* 2004; 11: 144-161
118. Holt J: Blindsight in debates about qualia. *Journal of consciousness studies* 1999; 6: 54-71
119. Hubbard E, Ramachandran VS: The phenomenology of synaesthesia. *Journal of consciousness studies* 2003; 10: 49-57
120. Humphrey N: Cave art, autism, and the evolution of the human mind. *Journal of consciousness studies* 1999; 6: 116-143
121. Hunt H: Synaesthesia, metaphor and consciousness: A cognitive-developmental perspective. *Journal of consciousness studies* 2005; 12: 26-45
122. Ingvar DH: On volition: a neurophysiologically oriented essay. *Journal of consciousness studies* 1999; 6: 1-10
123. Jones RA, Pickles: The person still comes first: The continuing musical self in dementia. *Journal of consciousness studies* 2006; 13: 73-93
124. Kentridge R, Heywood C: The status of blindsight: near-threshold vision, islands of cortex and the Riddoch phenomenon. *Journal of consciousness studies* 1999; 6: 3-11
125. Marzi C: Why is blindsight blind? *Journal of consciousness studies* 1999; 6: 12-18
126. McGeer V: Psycho-practice, psycho-theory and the contrastive case of autism. How practices of mind become second-nature. *Journal of consciousness studies* 2001; 8: 109-132
127. Meijsing M: Self-consciousness and the body. *Journal of consciousness studies* 2000; 7: 34-52
128. Merikle PM, Daneman M: Psychological investigations of unconscious perception. *Journal of consciousness studies* 1998; 5: 5-18
129. Morland A: Conscious and veridical motion perception in a human hemianope. *Journal of consciousness studies* 1999; 6: 43-53
130. Naudin J, Gros-Azorin C, Mishara A, Wiggins O, Schwartz M, Azorin J: The use of the Husserlian reduction as a method of investigation in psychiatry. *Journal of consciousness studies* 1999; 6: 155-171
131. Newman J: Putting the puzzle together. Part I: Towards a general theory of the neural correlates of consciousness. *Journal of consciousness studies* 1997; 4: 47-66
132. Nunez P, Nunez R: Hearts don't love and brains don't pump: Neocortical dynamic correlates of conscious experience. *Journal of consciousness studies* 2007; 14: 20-34
133. Parnas J: Belief and pathology of self-awareness a phenomenological contribution to the classification of delusions. *Journal of consciousness studies* 2004; 11: 148-161
134. Petty PG: Consciousness: a neurosurgical perspective. *Journal of consciousness studies* 1998; 5: 86-96
135. Radden J: Pathologically divided minds, synchronic unity and models of self. *Journal of consciousness studies* 1998; 5: 658-672
136. Ramachandran VS: Phantom penises in transsexuals. *Journal of consciousness studies* 2008; 15: 5-16
137. Ramachandran VS, Hirstein W: Three laws of qualia: what neurology tells us about the biological functions of consciousness. *Journal of consciousness studies* 1997; 4: 429-457
138. Ramachandran VS, Hubbard EM: Synaesthesia -- a window into perception, thought and language. *Journal of consciousness studies* 2001; 8: 3-34
139. Sass LA: Schizophrenia, self-consciousness, and the modern mind. *Journal of consciousness studies* 1998; 5: 543-565

140. Sass LA: Affectivity in schizophrenia a phenomenological view. *Journal of consciousness studies* 2004; 11: 127-147
141. Schwartz JM: A role for volition and attention in the generation of new brain circuitry. toward a neurobiology of mental force. *Journal of consciousness studies* 1999; 6: 115-42
142. Snyder D, Fast K, Bartoshuk: Valid comparisons of suprathreshold sensations. *Journal of consciousness studies* 2004; 11: 96-112
143. Spence SA, Frith CD: Towards a functional anatomy of volition. *Journal of consciousness studies* 1999; 6: 11-29
144. Sullivan M: Does psychiatry need the Husserlian detour. *Journal of consciousness studies* 1999; 6: 296-299
145. Toombs SK: The role of empathy in clinical practice. *Journal of consciousness studies* 2001; 8: 247-258
146. Varela FJ: Intimate distances. Fragments for a phenomenology of organ transplantation. *Journal of consciousness studies* 2001; 8: 259-271
147. Walsh R: Can synaesthesia be cultivated?: Indications from surveys of mediators. *Journal of consciousness studies* 2005; 12: 5-17
148. Watt D: Consciousness, emotional self-regulation and the brain: review article. *Journal of consciousness studies* 2004; 11: 77-82
149. Zahavi D, Parnas J: Conceptual problems in infantile autism research: Why cognitive science needs phenomenology. *Journal of consciousness studies* 2003; 10: 53-71

REFERENCES

- Alkire, M., Hudetz, A., Tononi, G. (2008). Consciousness and anesthesia. *Science*, 322(5903): 876-80