

School of Psychology

**CONSCIOUS AND UNCONSCIOUS
MENTAL PROCESSES**

C8828

Spring Term 2016-17

Module Convenor: This module is organised by Prof Zoltan Dienes, a member of the School of Psychology. You are welcome to direct queries concerning the module to Zoltan during his student feedback sessions in Pev1 2B2 (Tuesday and Thursday 9:30-10:30 am), or by email (z.dienes@sussex.ac.uk).

Type of Module: Conscious and unconscious mental processes is an optional undergraduate final year module that can be taken by students on any of the Psychology degrees or on the Neuroscience degree. It is also available to people taking the COGS IDPE and Visiting and Exchange students from any School.

Syllabus: This module will explore the existence and nature of conscious and unconscious mental processes in the domains of learning, memory, perception, and volition.

Module Objectives: By the end of the module you should be able to:

- 1) Evaluate the relevance of empirical evidence concerning the conscious or unconscious status of mental states.
- 2) Discuss the contribution of different domains or disciplines (e.g. psychology, philosophy, computational modelling, or neuroscience) to understanding the difference between conscious and unconscious processes.

Module Requirements and Assessment:

The assessment is by two assignments, to be submitted to via e-submission, the first assignment is due on Wednesday in Week 10 and the second in the second Assessment Period.

The first assignment contributes 33% to the overall mark. The second assignment, to be submitted as one document, consists of two parts, equally weighted. The first assignment and each part of the second assignment should be between 1000 and 1200 words. (These are absolute minima and maxima. Nothing over 1200 words will help you get marks.)

First assignment, to be submitted 4pm Wednesday of Week 10: *Essay- Discussing a paper.*

Consider the findings in an empirical paper published in 2016 in the journal *Consciousness and Cognition* or *Psychology of Consciousness: Theory, Research, and Practice* or *Frontiers in Consciousness Research* or *Neuroscience of Consciousness* that establishes whether a mental state is conscious or unconscious, and discuss how these findings would be explained by (i) a higher order theory of consciousness, and (ii) a global integration theory of consciousness.

The second assignment is to be submitted in the second assessment period:

2a) *Essay- Research proposal.* For a different 2016 paper from the same set of journals as above write a proposal for a set of experiments that could be performed next to follow on from the research in the paper. Indicate clearly what key question each experiment would address and how it addresses it. State exactly what the independent variables are, how many levels they have, whether they are between-subjects or within-subjects factors, and what your dependent variables are. No need to state fine details like numbers of

participants, items etc., unless they are important conceptually. Explicitly indicate what pattern of results would support one theory rather than another. The direction in which you take the research is up to you. If you can connect different ideas from the module in your proposed research, try to do that. The more you can relate your experiments to particular theories in psychology, the better (i.e. testing a theory is more interesting than saying “I wonder what would happen if I manipulated this variable...”).

2b) *Diary of conceptual change*. Pick one of the concepts or phenomena listed below each topic and write an account of how your understanding of the concept changed as you studied material on the module. In the first lecture I will ask you to write down your thoughts and understanding of the concept. Then keep a diary of how your understanding changed. It might change in several ways: You might simply add to the base you had already. You may change your understanding in more profound ways, completely changing certain views, or seeing the topic from a rather different perspective altogether. When you read on the topic, or suddenly have ideas while reading material from an apparently different topic, make a note of your key insights, recognition of confusions, or revisions of your ideas. A particularly useful feeling to take note of is sensing some problem though maybe you don't know what it is. Somehow things just don't make sense. As a researcher this is a particularly welcome experience because it indicates the possibility of understanding the issue more deeply. Try to capture this conceptual development in your diary. Rather than just take notes on what the author of a paper says, take notes on what were the most important things the author said in developing how you understood that concept. Be careful to note the reasons why your view on a topic changed. Finally, when you feel have made substantial progress in understanding the topic, take your diary and try to spot interesting threads and themes. Rework it into a 1200-word account, taking the most coherent or interesting threads and tell the story of what your starting ideas were and what successive pieces of evidence or arguments motivated specific changes in your views. You can describe how you were confused and resolved the confusion. Remember this is a reflection on how your understanding changed; it is quite OK to use the first person and to talk about what you thought or even guessed etc. It is as much a story about yourself as about the objective reasons for having certain views. Remember also 1200 words is not very much. The idea is not to give a comprehensive account of your understanding of the topic but to present some illustrative threads that show off how your understanding developed. The diary of conceptual change must be written up during the term: Diaries must be written the day events happen or else the details fade. You cannot retrospectively write about what you understood of a concept trying to forget what you have since learned. Your memory will deceive you. “Diaries” constructed the week before the deadline stand out as just that.

Assessment information

Assessments deadlines and methods of submission can be found on your assessment timetable via Sussex Direct.

Information on the following can be found at the link below:

- Submitting your work
- Missing a deadline
- Late penalties
- Exceptional circumstances
- Exams
- Help with managing your studies and competing your work
- Assessment Criteria

<http://www.sussex.ac.uk/psychology/internal/students/examinationsandassessment>

Attendance, Absence and Engagement

You are expected to be 'in attendance' at the University for the full duration of the published term dates for your course of study. That means you should be regularly attending lectures, seminars, labs etc. and committing time to your studies to be in a position to comply with academic and administrative expectations.

Teaching: There will be a two-hour lectures each week for 10 weeks.

The following Table shows the schematic teaching timetable. See Sussex Direct for full details on dates and times.

TEACHING TIMETABLE

| WEEK | Topic |
|------|---------------------------------|
| 1 | Theories of consciousness |
| 2 | Implicit memory |
| 3 | Subliminal Perception |
| 4 | Subliminal Perception |
| 5 | Implicit learning |
| 6 | Implicit learning |
| 7 | Implicit attitudes and emotions |
| 8 | Hypnosis |
| 9 | Hypnosis |
| 10 | Cold Control |
| 11 | |
| 12 | |

Module Monitoring and Student Feedback: Towards the end of the module you will be asked to complete an online questionnaire. In addition, I encourage questions or feedback, either during or after lectures. You can see me during my student feedback sessions for individual discussion of issues relating to the module.

Good general references

The following books contain discussion from a range of points of view on various topics to do with consciousness – you might find useful browsing for your chosen concept:

Zelazo, P. D, Moscovitch, M., & Thompson, E. (Eds) (2007). *The Cambridge Handbook of Consciousness*. Cambridge University Press. Quite thorough chapters.

Velmans, M., & Schneider, S. (Eds) (2007). *The Blackwell Companion to Consciousness*. Blackwell. Shorter chapters on more topics.

Bayne, T., Cleeremans, A., & Wilken, P. (Eds) (2009). *Oxford Companion to Consciousness*. Oxford University Press. This one has the shortest entries (500-1000 words), an A-Z of consciousness.

Readings for Specific Topics.

TOPIC 1: MAJOR THEORIES OF CONSCIOUSNESS

Essential reading.

Dienes, Z., & Seth, A. (2010). The conscious and the unconscious. In G. Koob, R. F. Thompson & M. Le Moal. (Eds), *Encyclopedia of Behavioral Neuroscience*. Elsevier. (Available from my home page:

http://www.lifesci.sussex.ac.uk/home/Zoltan_Dienes/publications.html)

Background reading:

Higher order theory:

Rosenthal, D. M. (2002). Consciousness and higher order thought. *Encyclopedia of Cognitive Science*. Macmillan Publishers Ltd (pp. 717-726). Available at:

<http://dl.dropboxusercontent.com/u/16674062/Rosenthal-Publications.htm>

Which also contains other papers by Rosenthal on higher order thought theory.

Carruthers, P. (2007). Higher order theories of consciousness. In Velmans, M., & Schneider, S. (Eds) (2007). *The Blackwell Companion to Consciousness*. Blackwell (277 – 286).

Online summary of HOT theory:

<http://plato.stanford.edu/entries/consciousness-higher/>

http://www.scholarpedia.org/article/Higher-order_theories_of_consciousness

Integration theories:

Baars, B. J. (2002). The conscious access hypothesis: Origins and recent evidence. *Trends in Cognitive Sciences*, 6, 47-52.

Block, N. (2009). Comparing the Major Theories of Consciousness. In Gazzaniga, M. (Ed.), *The Cognitive Neurosciences IV*. MIT Press.
http://www.nyu.edu/gsas/dept/philo/faculty/block/papers/Theories_of_Consciousness.pdf
other papers by Ned Block:
<http://www.nyu.edu/gsas/dept/philo/faculty/block/>

Edelman, G. M. Gally, J. A., & Baars, B. J. (2011). Biology of consciousness. *Frontiers in Psychology*,
http://www.frontiersin.org/consciousness_research/10.3389/fpsyg.2011.00004/full

See also:

http://www.scholarpedia.org/article/Models_of_consciousness

Concepts for diary of conceptual change:

Unconscious mental state
Conscious mental state
Introspection
Conscious awareness

TOPIC 2: IMPLICIT-EXPLICIT MEMORY

Essential reading

Jacoby, L.L., Toth, J.P., Lindsay, D.S., & Debnar, J.A. (1992). Lectures for a layperson: Methods for revealing unconscious processes. In R.F. Bornstein & T.S. Pittman (Eds) *Perception without awareness: Cognitive, clinical, and social perspectives*. The Guilford Press: New York.

Jacoby, L., Lindsay, S., & Toth, J. (1992) Unconscious influences revealed: Attention, awareness, and control. *American Psychologist*, 47, 802-809.

Background reading:

Yonelinas, A. P., & Jacoby, L. L. (2012). The process-dissociation approach two decades later: Convergence, boundary conditions, and new directions. *Memory & Cognition*, 40, 663-680.

Henkel, L. A., & Mattson, M. E. (2011). Reading is believing: The truth effect and source credibility. *Consciousness and Cognition* 20, 1705–1721.

Perfect, T. J., & Stark, L-J. (2008). Tales from the Crypt...omnesia. In *Handbook of metamemory and memory*. Lawrence Erlbaum.
<http://www.psy.plymouth.ac.uk/research/tperfect/papers/Cryptomnesia%20chapter%202008.pdf>

Reber, R., Schwarz, N. & Winkielman, P. (2004). Processing fluency and aesthetic pleasure: Is beauty in the perceiver's processing experience? *Personality and Social Psychology Review*, 8, 364-382
<http://psy.ucsd.edu/~pwinkiel/reber-schwarz-winkielman-beauty-PSPR-2004.pdf>

Andrade, J., & Deepro, C. (2007). Unconscious memory formation during anaesthesia. *Best Practice & Research Clinical Anaesthesiology*, 21, 385–401.

Wang, M., Deepro, C., Andrade, J., & Russell, I. F. (2013). Psychology in the operating theatre. *The Psychologist*, 26, 498 – 501.
http://www.thepsychologist.org.uk/archive/archive_home.cfm/volumeID_26-editionID_227-ArticleID_2299-getfile_getPDF/thepsychologist%5C0713wang.pdf

Bargh, J. A., Schwader, K. L., Hailey, S. E., Dyer, R. L., & Boothby, E. J. (2012). Automaticity in social-cognitive processes. *Trends in Cognitive Science*, 16(12), 593-605

Rohrer, D., Pashler, H., & Harris, C.R. (2015). Do subtle reminders of money change people's political views? *Journal of Experimental Psychology: General*, 144, e73-e85.

Newell, B. R., & Shanks, D. R. (2014). Prime numbers: Anchoring and its implications for theories of behavior priming. *Social Cognition*, 32, 88-108.

Concepts for diary of conceptual change:

Unconscious memory
Automatic memory

TOPIC 3: SUBLIMINAL PERCEPTION

Essential reading:

Merikle, P. (2007). Preconscious processing. In Velmans, M., & Schneider, S. (Eds) (2007). *The Blackwell Companion to Consciousness*. Blackwell.

Simons et al (2007). Behavioural, neuroimaging and neuropsychological approaches to implicit perception. In Zelazo, P. D, Moscovitch, M., & Thompson, E. (Eds) (2007). *The Cambridge Handbook of Consciousness*. Cambridge University Press

Background reading:

Marcel, A. J. (1983). Conscious and unconscious perception: Experiments on visual masking and word recognition. *Cognitive Psychology*, 15, 197-237.

Lorentz, E., Gould, L., Mickleborough, M., Ekstrand, C., Boyer, M., Cheesman, J., & Borowsky, R. (2015). All in one fell Stroop: Examining consciousness thresholds with a multiple response paradigm. *Psychology of Consciousness: Theory, Research, and Practice*, 2(2), 111-133.

Tsuchiya, N., Wilke, M., Frässle, S., & Lamme, V. A. (2015). No-report paradigms: extracting the true neural correlates of consciousness. *Trends in cognitive sciences*, 19(12), 757-770.

Verwijmeren, T., Karremans, J. C., Stroebe, W., & Wigboldus, D. H. J. (2011). The workings and limits of subliminal advertising: The role of habits. *Journal of Consumer Psychology*, 21, 206–213

Overgaard, M., Rote, J., Mouridsen, K., & Ramsøy, T. Z. (2006). Is conscious perception gradual or dichotomous? A comparison of report methodologies during a visual task. *Consciousness and Cognition*, 15, 700-708.

Lau, H. C., & Passingham, R. E. (2006). Relative blindsight in normal observers and the neural correlate of visual consciousness. *Proceedings of the National Academy of Sciences*, 103(49), 18763-18768.

Dehaene, S., Changeux, J. P., Naccache, L., Sackur, J., & Sergent, C. (2006). Conscious, preconscious, and subliminal processing: a testable taxonomy. *Trends in Cognitive Sciences*, 10, 204-211.

Armstrong, A. M., & Dienes, Z. (2013). Subliminal Understanding of Negation: Unconscious Control by Subliminal Processing of Word Pairs. *Consciousness & Cognition*, 22 (3), 1022-1040.

Sand, A., & Nilsson, M. E. (2016). Subliminal or not? Comparing null-hypothesis and Bayesian methods for testing subliminal priming. *Consciousness and Cognition*, 44, 29-40

Concepts for diary of conceptual change:

Subliminal perception
Conscious perception

TOPIC 4: IMPLICIT VS EXPLICIT LEARNING*Readings***Essential reading:**

Dienes, Z. (2012). Conscious versus unconscious learning of structure. In P. Rebuschat & J. Williams (Eds), *Statistical Learning and Language Acquisition*. Mouton de Gruyter Publishers (pp. 337 - 364).
(On my publications page.)

Shanks, D. R. (2005). Implicit learning. In K. Lamberts and R. Goldstone, *Handbook of Cognition* (pp. 202-220) . London: Sage. Available at:
<http://homepage.psy.utexas.edu/HomePage/Class/Psy394u/Gilden/shanks-il.pdf>

Background reading:

Berry, D. C., & Dienes, Z. (1994) *Implicit Learning: theoretical and empirical issues*. Lawrence Erlbaum. Chapters 1, 5 and 8 give overviews. (Reserve and Short Loan)

Dienes, Z. (2008) Subjective measures of unconscious knowledge. *Progress in Brain Research*, 168, 49 - 64. (On my publications page)

Rünger, D., & Frensch, P. A. (2010) Defining consciousness in the context of incidental sequence learning: theoretical considerations and empirical implications. *Psychological Research*, 74, 121–137.

Jiang, S., Zhu, L., Guo, X., Ma, W., Yang, Z., & Dienes, Z. (2012). Unconscious structural knowledge of tonal symmetry: Tang poetry redefines limits of implicit learning. *Consciousness & Cognition*, 21, 476-486.

Reber, P.J. (2013). The neural basis of implicit learning and memory: A review of neuropsychological and neuroimaging research. *Neuropsychologia*, 51, 2026-2042.

Koizumi, A., Amano, K., Cortese, A., Shibata, K., Yoshida, W., Seymour, B., ... & Lau, H. (2016). Fear reduction without fear through reinforcement of neural activity that bypasses conscious exposure. *Nature Human Behaviour*, 1, 0006.

Lufityanto, G., Donkin, C., & Pearson, J. (2016). Measuring Intuition Nonconscious Emotional Information Boosts Decision Accuracy and Confidence. *Psychological science*, 27(5), 622-634.

Concepts for diary of conceptual change:

Unconscious learning
Implicit learning

TOPIC 6: IMPLICIT ATTITUDES AND EMOTIONS*Readings***Essential reading:**

Hahn, A., Judd, C. M., Hirsh, H. K., & Blair, I. V. (2014). Awareness of implicit attitudes. *Journal of Experimental Psychology: General*, 143, 1369-1392.

Winkielman, P., Berridge, K.C. & Sher, S. (2011). Emotion, consciousness and social behavior. In J. Decety & J. Cacioppo (Eds), *The Oxford Handbook of Social Neuroscience*. Oxford University Press, pp. 195-211.

Available at: http://psy2.ucsd.edu/~pwinkiel/Winkielman-Berridge-Sher_2011-proofs.pdf

Background reading:*Implicit attitudes:*

Adams, H.E., Wright Jr, L. W., & Lohr, B. A. (1996). Is homophobia associated with homosexual arousal? *Journal of Abnormal Psychology*, 105(3), 440–445.

Banaji, M. R., & Greenwald, A. G. (2013). *Blindspot: Hidden biases of good people*. Delacorte Press: New York.

Arkes, H. R., & Tetlock, P. E. (2004). Attributions of Implicit Prejudice, or “Would Jesse Jackson ‘Fail’ the Implicit Association Test?” *Psychological Inquiry*, 15 (4), 257–278

De Houwer, J., Teige-Mocigemba, S., Spruyt, A., & Moors, A. (2009). Implicit Measures: A Normative Analysis and Review. *Psychological Bulletin*, 135 (3), 347–368.

Blanton, H., Jaccard, J., Strauts, E., Mitchell, G., & Tetlock, P. E. (2015). Toward a meaningful metric of implicit prejudice. *Journal of Applied Psychology*, 100(5), 1468-1481.

See also:

<https://implicit.harvard.edu/implicit/> to have a go on various IAT tasks

For a bibliography of many papers (linked to PDFs) discussing the criticisms and replies to those criticisms about the IAT:

http://faculty.washington.edu/agg/iat_validity.htm

PDFs of papers by one of the originators of the IAT:

<http://faculty.washington.edu/agg/bytopic.htm#isc>

Berridge, K.C & Robinson, T.E. (2002). The mind of an addicted brain: Neural sensitization of "wanting" versus "liking". In J. T. Cacioppo, and G. G. Berntson (Eds), *Foundations in social neuroscience*, pp. 493-572. Cambridge, MA: MIT Press.

Available here:

<http://www.lsa.umich.edu/psych/research&labs/berridge/publications/Berridge%20&%20Robinson%20Cur%20Dir%20Psychol%20Sci%201995.pdf>

Unconscious emotions:

Barrett, L. F., Niedenthal, P. M., & Winkielman, P. (Eds) (2005). *Emotion and Consciousness*. Guilford Press: London.

Derakshan, N., Eysenck, M.W., & Myers, L.B. (2007). Emotional information processing in repressors: The vigilance-avoidance theory. *Cognition & Emotion* 21 (8), 1585 - 1614.

Lambie, J.A. & Marcel, A.J. (2002). Consciousness and Emotion Experience: A Theoretical Framework. *Psychological Review*, 109, 219-259.

Lane, R. D. (2008). Neural substrates of implicit and explicit emotional processes: a unifying framework for psychosomatic medicine. *Psychosomatic Medicine*, 70(2), 214-31.

Tong, E. M. W., Tan, D. H., & Tan, Y. L. (2013). Can implicit appraisal concepts produce emotion-specific effects? A focus on unfairness and anger. *Consciousness and Cognition*, 22, 449-460.

Winkielman, P., Berridge, K. C., & Wilbarger, J. (2005). Unconscious affective reactions to masked happy versus angry faces influence consumption behavior and judgments of value. *Personality and Social Psychology Bulletin*, 1, 121-135.

See also:

<http://socrates.berkeley.edu/~kihlstrm/Eich2000.htm>

Concepts for diary of conceptual change:

Unconscious feelings

TOPIC 6: HYPNOSIS AND VOLITION

Readings

Essential reading:

Dienes, Z (2012). Is hypnotic responding the strategic relinquishment of metacognition? In M. Beran, J. L. Brandl, J. Perner, & J. Proust (Eds), *The Foundations of Metacognition*. Oxford University Press (pp 267-278).
(On my publications page)

Oakley, D. A., & Halligan, P. W. (2013). Hypnotic suggestion: opportunities for cognitive neuroscience. *Nature Reviews Neuroscience* 14, 565–576 doi:10.1038/nrn3538

Background reading:

For a summary of recent research on hypnosis see: <http://hypnosis.tools>

Nash, M., & Barnier, A. (Eds.) (2008). *The Oxford Handbook of Hypnosis: Theory, Research, and Practice*. Oxford University Press. Chapters 1, 4, and 5.

Lynn, S. J., & Rhue, J. W. (Eds) (1991). *Theories of hypnosis: Current models and perspectives*. The Guilford Press: New York. See e.g. chapter by Hilgard

Fromm, E., & Nash, M. R. (Eds) (1992). *Contemporary hypnosis research*. The Guilford Press: New York. See e.g. chapter by Spanos & Coe

Dienes, Z. & Perner, P. (2007). Executive control without conscious awareness: The cold control theory of hypnosis. In G. Jamieson (Ed) *Toward a cognitive neuroscience of hypnosis and conscious states*. Oxford University Press. Available at: http://www.lifesci.sussex.ac.uk/home/Zoltan_Dienes/publications.html

Barnier, A. J., Dienes, Z., & Mitchell, C. J. (2008). How hypnosis happens: New cognitive theories of hypnotic responding. In Nash, M., & Barnier, A. (Eds.) *The Oxford Handbook of Hypnosis: Theory, Research, and Practice*. Oxford University Press. Available on my home page.

Dienes, Z., Lush, P., Semmens-Wheeler, R., Parkinson, J., Scott, R. B., & Naish, P. (2016). Hypnosis as self-deception; Meditation as self-insight. In A. Raz and M. Lifshitz (Eds), *Hypnosis and Meditation: Toward an integrative science of conscious planes*. Oxford University Press, pp 107-128.
http://www.lifesci.sussex.ac.uk/home/Zoltan_Dienes/Dienes%20et%20al%20Hypnosis%20and%20meditation%20book.pdf

Terhune, D. B., & Brugger, P. (2011). Doing better by getting worse: Posthypnotic amnesia improves random number generation. *PloS one*, 6(12), e29206.

Hypnosis as an altered state?

Dietrich, A. (2003). Functional neuroanatomy of altered states of consciousness: The transient hypofrontality hypothesis. *Consciousness and Cognition*, 12, 231-256.

Various chapters in

Jamieson, G. (2007) *Toward a cognitive neuroscience of hypnosis and conscious states*. Oxford University Press.

including by Jamieson & Hasegawa, Lynn et al, Pekala & Kumar, & Burgess.

Kirsch, I. (2011): The Altered State Issue: Dead or Alive? *International Journal of Clinical and Experimental Hypnosis*, 59 (3), 350-362.

Terhune, D. B., & Cardeña, E. (2016). Nuances and Uncertainties Regarding Hypnotic Inductions: Toward a Theoretically Informed Praxis. *American Journal of Clinical Hypnosis*, 59(2), 155-174.

Derbyshire, S. W., Whalley, M. G., Seah, S. T., & Oakley, D. A. (2016). Suggestions to Reduce Clinical Fibromyalgia Pain and Experimentally Induced Pain Produce Parallel Effects on Perceived Pain but Divergent Functional MRI-Based Brain Activity. *Psychosomatic Medicine*.

https://www.researchgate.net/profile/Stuart_Derbyshire/publication/305891296_Suggestions_to_Reduce_Clinical_Fibromyalgia_Pain_and_Experimentally_Induced_Pain_Produce_Parallel_Effects_on_Perceived_Pain_but_Divergent_Functional_MRI-Based_Brain_Activity/links/57a7f1b408ae455e8546fb21.pdf

Can hypnosis make a person perform anti-social acts?

Laurence, J-R, & Perry, C. (1988). *Hypnosis, will, and memory: A psycho-legal history*. Guilford Press: NY. Pages 297 – 318.

Concepts for diary of conceptual change:

Altered state of consciousness (not discussed much in the lecture module – you will need to do your own research on this concept by reading the recommended reading above as soon as the module starts)

Volition

Involuntary act

Unconscious control