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Attention

Dynamical Properties of BOLD Activity from the Ventral Posteromedial Cortex Associated with Meditation and Attentional Skills


**To link to this article:** [http://www.jneurosci.org/content/32/15/5242.short](http://www.jneurosci.org/content/32/15/5242.short)

**Tests/Assessments:**

MRI; Rapid visual information processing test (RVIP) from the computerized neuropsychological battery CANTAB (Sahakian and Owen, 1992)

**Abstract:** Neuroimaging data suggest a link between the spontaneous production of thoughts during wakeful rest and slow fluctuations of activity in the default mode network (DMN), a set of brain regions with high basal metabolism and a major neural hub in the ventral posteromedial cortex (vPMC). Meta-awareness and regulation of mind-wandering are core cognitive components of most contemplative practices and to study their impact on DMN activity, we collected functional MRI (fMRI) data from a cohort of experienced Zen meditators and meditation-naive controls engaging in a basic attention-to-breathing protocol. We observed a significant group difference in the skewness of the fMRI BOLD signal from the vPMC, suggesting that the relative incidence of states of elevated vPMC activity was lower in meditators; furthermore, the same parameter was significantly correlated with performance on a rapid visual information processing (RVIP) test for sustained attention conducted outside the scanner. Finally, a functional connectivity analysis with the PMCseed revealed a significant association of RVIP performance with the degree of temporal correlation between vPMC and the right temporoparietal junction (TPJ), a region strongly implicated in stimulus-triggered reorienting of attention. Together, these findings suggest that the vPMC BOLD signal skewness and the temporal relationship of vPMC and TPJ activities reflect the dynamic tension between mind-wandering, meta-awareness, and directed attention, and may represent a useful endophenotype for studying individual differences in attentional abilities and the impairment of the latter in specific clinical conditions.

**Keywords:** None.

**Developmental Constructs:** Sustained Attention
Notes: Individual scores in the RVIP task (A' and RT) were significantly correlated with the vPMC BOLD skewness values during the attention-to-breathing condition across all subjects. In accordance with the experiment’s hypotheses, subjects displaying a more negative (or less positive) vPMC signal skewness were both less accurate (A': Pearson’s r = 0.53, one-tailed p = 0.0039) and slower (RT: r = 0.53, one-tailed p = 0.0039) in their response to the RVIP target stimuli.

Participants: Twelve volunteers with >3 years of daily practice of Zen meditation (MEDT group) were recruited from the local community and meditation centers, along with 12 control subjects (CTRL group) who never practiced meditation before.

Country/Culture: Italy (assumed)

Participant Age: Mean age 37.3 +/- 7.2 years

Support/Funding: This work was supported by the Emory Center for Research on Complementary and Alternative Medicine in Neurodegenerative Diseases (National Institute of Health Grant P30-AT00609).
The Effect of COMT Gene Polymorphism on the Neural Substrate of Attention Control: A Meta-analysis of Imaging Genetics Studies
Cognitive

Developing a dimensional model for successful cognitive and emotional aging
Cognitive Effects of Vitamin D Supplementation in Older Outpatients Visiting a Memory Clinic: A Pre–Post Study


**Tests/Assessments:**

Global cognitive function was assessed at baseline and follow-up visits using the Mini-Mental State Examination (MMSE, total score of 30) and the Cognitive Assessment Battery and executive functions were assessed using the Frontal Assessment Battery.

**Abstract:**

No abstract

**Keywords:** None.

**Developmental Constructs:** Executive Function, Cognitive

**Notes:** After 16 months of follow-up, the vitamin D3 group had higher 25OHD concentrations than at baseline (P = .001) and higher than those of the control group (P < .001). The vitamin D3 group had also higher final scores on the MMSE, CAB, and FAB than the control group and greater score changes on each cognitive test.

**Participants:** Outpatients who visited the University Memory Centre of Angers, France, twice between June 2009 and October 2011

**Country/Culture:** France

**Participant Age:** Of 44 outpatients included (median age 80.6, interquartile range 14.0; 54.5% female; 100% Caucasian)

**Support/Funding:** None noted.
Can Older Adults Promote Their Processing Speed by Training?
Cognitive Control

Unique relations of age and delinquency with cognitive control


To link to this article: http://www.sciencedirect.com/science/article/pii/S0140197111000959

Tests/Assessments:
Stroop task;

Abstract: Context processing has significant empirical support as an explanation of age- and psychopathology-related deficiencies in cognitive control. We examined whether context processing generalizes to younger individuals who are in trouble with the law. We tested whether age and delinquency might have unique relations to context processing skills in four samples of male participants: adolescent offenders (n = 43), control adolescents (n = 33), young adult offenders (n = 40), and control young adults (n = 31). We used a modified Stroop task to measure context processing (i.e., attention, memory, and response inhibition). Task performance was superior for older participants in conditions most demanding of context processing skills. Adolescent offenders and control adolescents showed difficulties engaging selective attention to filter out irrelevant information, even after controlling for the effects of age. Control adolescents made the most errors in the condition most demanding of context processing, whereas the other three samples showed slower processing but fewer errors in context processing.

Keywords: Cognitive control; Adolescence; Antisocial behaviors; Context processing

Developmental Constructs: Cognitive Control; Selective Attention

Notes: Young adult offenders and control young adults performed significantly better in the short delay condition than in the long delay condition of the word reading task. Adolescent offenders and control adolescents, however, performed equivalently in the short and long delay conditions of the word reading task. When presented with conflicting information within a very short period of time (i.e., 1 s), both control young adults and young adult offenders were able to use selective attention to automatically provide the appropriate response. This benefit of selective attention does not appear in the long delay condition, possibly because distracting elements interfere with selective attention during the longer anticipatory period. Control and offender adolescents, on the other hand, were substantially less able to engage this selective attention, and appeared to be equally distracted during both delay conditions. For control adolescents and adolescent offenders, engaging their selective attention to filter out irrelevant information may not be as much of a reflex as it is for young adults.
**Participants:** Incarcerated and non-incarcerated adolescents and young adults

**Country/Culture:** United States

**Participant Age:** Incarcerated young adults mean age 20.86 (1.47), n = 40

**Support/Funding:** This research was funded by grants to the first author from the National Institute of Mental Health (F31MH075239) and the American Psychology-Law Society.
Functional Connectivity in Brain Networks Underlying Cognitive Control in Chronic Cannabis Users
Intelligence

Judgment

The neural basis of intuitive and counterintuitive moral judgment
# Deliberation Versus Intuition: Decomposing the Role of Expertise in Judgment and Decision Making


**To link to this article**: http://onlinelibrary.wiley.com/doi/10.1002/bdm.1759/abstract?userIsAuthenticated=false&deniedAccessCustomisedMessage=

**Tests/Assessments**: Intuitive and Deliberative tasks

**Abstract**: What produces better judgments: deliberating or relying on intuition? Past research is inconclusive. We focus on the role of expertise to increase understanding of the effects of judgment mode. We propose a framework in which expertise depends on a person’s experience with and knowledge about a domain. Individuals who are relatively experienced but have modest knowledge about the subject matter (“intermediates”) are expected to suffer from deliberation and to benefit from a more intuitive approach, because they lack the formal knowledge to understand the reasons underlying their preferences. Individuals who are high (“experts”) or low (“novices”) on both experience and knowledge are expected to do well or poorly, respectively, regardless of decision mode. We tested these predictions in the domain of art. Experiments 1 and 2 showed that intermediates performed better when relying on intuition than after deliberation. Judgments of experts and novices were unaffected. In line with previous research relating processing style to judgment mode, Experiment 3 showed that the effect of processing style (global versus local) on judgment quality is similarly moderated by expertise.

**Keywords**: expertise; knowledge; experience; judgment and decision making; intuition; deliberation

**Developmental Constructs**: Judgment; Decision Making; Intuition; Expertise

**Participants**: University students from the University of Amsterdam, professionals with a background in modern art; students of the Rotterdam Conservatoire; professionals with a background in literature

**Country/Culture**: The Netherlands

**Experiments**: 3

**Participant Age**: Age ranged from 17 to 53 years

**Support/Funding**: None noted.
Learning

Sleep modulates word-pair learning but not motor sequence learning in healthy older adults
Revisiting the Motivated Strategies for Learning Questionnaire: A Theoretical and Statistical Reevaluation of the Metacognitive Self-Regulation and Effort Regulation Subscales

**Citation:** Karee E. Dunn, Wen-Juo Lo, Sean W. Mulvenon and Rachel Sutcliffe. Revisiting the Motivated Strategies for Learning Questionnaire: A Theoretical and Statistical Reevaluation of the Metacognitive Self-Regulation and Effort Regulation Subscales. *Educational and Psychological Measurement* April 2012 vol. 72 no. 2 312-33. doi: 10.1177/0013164411413461

**To link to this article:** [http://epm.sagepub.com/content/72/2/312](http://epm.sagepub.com/content/72/2/312)

**Tests/Assessments:**
Motivated Strategies for Learning Questionnaire (MSLQ)

**Abstract:** The Motivated Strategies for Learning Questionnaire (MSLQ) has dominated self regulated learning research since the early 1990s. In this study, the two MSLQ subscales specifically designed to assess self-regulation—Metacognitive Self-Regulation subscale and Effort Regulation subscale—were examined. Results indicated that the structure of the two scales is not supported by the original data reported by Pintrich, Smith, Garcia, and McKeachie in 1991 or new data. Statistical and theoretical analyses supported two modified scales, the General Strategies for Learning scale and the Clarification Strategies for Learning scale, that assess academic self-regulation from the original MSLQ items. The statistical and theoretical analyses, results, and modified scales are discussed.

**Keywords:** factor analysis, motivation, self-regulation

**Developmental Constructs:** Learning, Self-Regulation

**Participants:** Participants were sampled from four different mid-southern universities

**Country/Culture:** United States

**Participant Age:** All participants volunteered and ranged in age from 24 to 57 years ($M = 33$ years) in the first group and from 18 to 45 years ($M = 24$ years) in the second group.

**Support/Funding:** The author(s) received no financial support for the research, authorship, and/or publication of this article.
How do organizational and task factors influence informal learning in the workplace?
Memory

Cognitive and Neural Effects of Semantic Encoding Strategy Training in Older Adults
Cognit activation: a mechanism enabling temporal integration in working memory
Evaluating short-term and working memory in older adults: French normative data


**To link to this article**: [http://www.tandfonline.com/doi/abs/10.1080/13607863.2012.674487](http://www.tandfonline.com/doi/abs/10.1080/13607863.2012.674487)

**Tests/Assessments**: Word span task; forward version of the Corsi Blocks task (Corsi, 1972) to assess passive spatial–sequential processing in STM; Visual pattern span task adapted from Della Sala, Gray, Baddeley, Allamano, and Wilson (1999) and Wilson, Scott, and Power (1987); operation span tasks adapted from Turner and Engle (1989) to WM capacities; Word/operation span task; location/operation span task assessed the participants’ abilities to simultaneously process and store spatial information in WM.

**Abstract**: Short-term and working memory (WM) capacities are subject to change with ageing, both in normal older adults and in patients with degenerative or non-degenerative neurological disease. Few normative data are available for comparisons of short-term and WM capacities in the verbal, spatial and visual domains. To provide researchers and clinicians with a set of standardised tasks that assess short-term and WM using verbal and visuospatial materials, and to present normative data for that set of tasks. The present study compiled normative French data for three short-term memory tasks (verbal, visual and spatial simple span tasks) and two WM tasks (verbal and spatial complex span tasks) obtained from 445 healthy older adults aged between 55 and 85 years. Our data reveal main effects of age, education level and gender on older adults’ short-term and WM performances. Equation-based normalisation can therefore be used to take these factors into account. The results provide a set of cut-off scores for five standardised tasks that can be used to determine the presence of short-term or WM impairment in older adults.

**Keywords**: short term memory; working memory; ageing; span tasks

**Developmental Constructs**: Short-term Memory; Working Memory

**Participants**: Healthy participants, native French speakers, aged between 55 and 85 years

**Country/Culture**: France

**Participant Age**: The sample (445 participants) was divided into sub-groups based on age (three subgroups: 55–65, 66–75 and 76–85 years).

**Support/Funding**: None noted.
The Persistence of Thought: Evidence for a Role of Working Memory in the Maintenance of Task-Unrelated Thinking
Effects of age on prefrontal subregions and hippocampal volumes in young and middle-aged healthy humans
The Role of Episodic Memories in Current and Future Well-Being
# Metacognition

## A cognitive perspective on mindfulness

**Citation:** Pawel Holas & Tomasz Jankowski (2012): A cognitive perspective on mindfulness, International Journal of Psychology, DOI:10.1080/00207594.2012.658056

**To link to this article:** [http://www.tandfonline.com/doi/abs/10.1080/00207594.2012.658056](http://www.tandfonline.com/doi/abs/10.1080/00207594.2012.658056)

**Tests/Assessments:**

N/A

**Abstract:** Mindfulness, the core teaching of the Buddhist tradition, has been receiving serious attention from the West in recent decades as evidence of the efficacy of mindfulness-based interventions for emotional distress have become available. Although traditional Buddhist texts have described the mechanisms of mindfulness and the way to cultivate it in great detail, much is still not known from the perspective of Western science. In particular, there is no general agreement on the conceptualization and operationalization of mindfulness. Several conceptual models of mindfulness (referred to as “state” or “trait”) have been put forward to elucidate different aspects of this phenomenon, but none has gained sufficient empirical validation. This article proposes a new cognitive model of mindfulness. It has been our goal to describe and interrelate a relatively comprehensive group of determinants of a state of mindfulness, the consequences of its regular practicing, the mechanisms responsible for its beneficial effects, and the feedback mechanisms operating between the various constituents of the model. Within this model, the primary emphasis has been placed on understanding the cognitive processes shaping a state of mindfulness (i.e., the links between consciousness, meta-awareness and the unconscious), and on their determinants (i.e., the executive functions of attention and the components of working memory). A metacognitive system promoting mindfulness, as well as the general capability of the central executive system, is suggested as a factor explaining individual differences in mindfulness, whereas decentering, self-compassion, and reduction of self-focused attention are proposed as mechanisms mediating beneficial changes. We hope that the model presented will encourage further discussion and orient future studies in the area of mindfulness.

**Keywords:** Mindfulness; Attention; Executive functions; Metacognition; Decentering

**Developmental Constructs:** Metacognitive; Attention; Mindfulness; Attention; Working Memory; Consciousness

**Participants:** N/A

**Country/Culture:** N/A

**Participant Age:** N/A

**Support/Funding:** This research was supported in part by grants from the Polish Ministry of Science and Higher Education: N N402 269036 to Pawel Holas and N N106 135137 to Tomasz Jankowski.
Learning from reflective practice and metacognition – an anaesthetist’s perspective
Neurogenesis

MicroRNAs and Glial Cell Development
Cellular imaging and emerging technologies for adult neurogenesis research
Activation of different neural precursor populations in the adult hippocampus: Does this lead to new neurons with discrete functions?
Plasticity

The Reorganized Brain: How Treatment Strategies for Stroke and Amblyopia Can Inform Our Knowledge of Plasticity Throughout the Lifespan
### Plasticity in gray and white: neuroimaging changes in brain structure during learning


**To link to this article**: [http://www.nature.com/neuro/journal/v15/n4/abs/nn.3045.html](http://www.nature.com/neuro/journal/v15/n4/abs/nn.3045.html)

**Tests/Assessments**: N/A

**Abstract**: Human brain imaging has identified structural changes in gray and white matter that occur with learning. However, ascribing imaging measures to underlying cellular and molecular events is challenging. Here we review human neuroimaging findings of structural plasticity and then discuss cellular and molecular level changes that could underlie observed imaging effects. Greater dialog between researchers in these different fields would help to facilitate cross-talk between cellular and systems level explanations of how learning sculpts brain structure.

**Keywords**: None.

**Developmental Constructs**: Plasticity, Neurogenesis

**Participants**: N/A

**Country/Culture**: N/A

**Participant Age**: N/A

**Support/Funding**: R.J.Z. is supported by the Canadian Institutes of Health Research and the Natural Sciences and Engineering Research Council of Canada; R.D.F. is supported by funds for intramural research at the US National Institutes of Health; H.J.-B. is supported by the Wellcome Trust.
Problem Solving

Changes in the Construct Systems of First-Year University Students: Impact on Psychological Symptoms and Problem-Solving Skills
Improving insight and non-insight problem solving with brief interventions
Reasoning

Emotional and cognitive stimuli differentially engage the default network during inductive reasoning

**Citation:** Mark C. Eldaief, Thilo Deckersbach, Lindsay E. Carlson, Jan C. Beucke, and Darin D. Dougherty. *Soc Cogn Affect Neurosci* (2012) 7 (4): 380-392. doi: 10.1093/scan/nsr003

**To link to this article:** [http://scan.oxfordjournals.org/content/7/4/380.abstract](http://scan.oxfordjournals.org/content/7/4/380.abstract)

**Tests/Assessments:**

- fMRI; Experimental Task (Goel and Dolan, 2003)

**Abstract:** The brain’s default network (DN) is comprised of several cortical regions demonstrating robust intrinsic connectivity at rest. The authors sought to examine the differential effects of emotional reasoning and reasoning under certainty upon the DN through the employment of an event-related fMRI design in healthy participants. Participants were presented with syllogistic arguments which were organized into a 2 × 2 factorial design in which the first factor was emotional salience and the second factor was certainty/uncertainty. We demonstrate that regions of the DN were activated both during reasoning that is emotionally salient and during reasoning which is more certain, suggesting that these processes are neurally instantiated on a network level. In addition, we present evidence that emotional reasoning preferentially activates the dorsomedial (dMPFC) subsystem of the DN, whereas reasoning in the context of certainty activates areas specific to the DN’s medial temporal (MTL) subsystem. We postulate that emotional reasoning mobilizes the dMPFC subsystem of the DN because this type of reasoning relies upon the recruitment of introspective and self-relevant data such as personal bias and temperament. In contrast, activation of the MTL subsystem during certainty argues that this form of reasoning involves the recruitment of mnemonic and semantic associations to derive conclusions.

**Keywords:** default network; emotional reasoning; certainty; uncertainty; fMRI

**Developmental Constructs:** Reasoning

**Participants:** Twenty right-handed healthy adults

**Country/Culture:** United States

**Studies:** 1

**Participant Age:** ages 21–32 mean = 24.25, s.d = 3.04

**Support/Funding:** This work was supported by a pilot grant from the Athinoula A. Martinos Center for Biomedical Imaging of the Massachusetts General Hospital via support from the ‘Center for Functional Neuroimaging Technologies’ (P41 RR14075). In addition, M.C.E. was supported by the Mind, Brain and Behavior Interfaculty Initiative at Harvard University.
Thinking

Dialectical thinking and health behaviors: The effects of theory of planned behavior

<table>
<thead>
<tr>
<th>Citation: Feng Jiang, Su Lu, Yubo Hou, and Xiaodong Yue. Dialectical thinking and health behaviors: The effects of theory of planned behavior. Available online: 16 Apr 2012. DOI: 10.1080/00207594.2012.656130</th>
</tr>
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<td>To link to this article: <a href="http://www.tandfonline.com/doi/abs/10.1080/00207594.2012.656130">http://www.tandfonline.com/doi/abs/10.1080/00207594.2012.656130</a></td>
</tr>
<tr>
<td>Tests/Assessments:</td>
</tr>
<tr>
<td>Dialectical Thinking Styles Scale (Hou, 2004); Chinese Health Promoting Lifestyle Profile (HPLP-S, Wei and Lu, 2005).</td>
</tr>
<tr>
<td>Abstract: The primary purpose of this study was to investigate whether the theory of planned behavior (TPB) mediated the relationship between dialectical thinking and health behaviors. A sample of 285 undergraduates was tested with a dialectical thinking styles scale, health promoting lifestyle profiles, and TPB questionnaires. Structural equation modeling was used for data analysis. Results indicated that all the three dimensions of thinking styles (belief in the connection, acceptance of change, and acceptance of contradiction) exerted significant effects on TPB constructs. Specifically, the connection and the change dimensions had positive effects on health behaviors mediated by TPB, whereas the contradiction dimension had a negative effect. Model 2 showed a satisfactory fit, demonstrating the influential pathways between dialectical thinking and health behaviors. Implications in issues of health promotion and future research are discussed.</td>
</tr>
<tr>
<td>Keywords: Dialectical thinking; Theory of planned behavior; Health behaviors</td>
</tr>
<tr>
<td>Developmental Constructs: Thinking; Belief; Acceptance; Attitude; Affect</td>
</tr>
<tr>
<td>Participants: Undergraduate students</td>
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<tr>
<td>Country/Culture: China</td>
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<tr>
<td>Studies: 1</td>
</tr>
<tr>
<td>Participant Age: The mean age of participants was 20.43 years (SD=1.72).</td>
</tr>
<tr>
<td>Support/Funding: This research was supported by Grant 31171001 from National Science Foundation of China to Yubo Hou.</td>
</tr>
</tbody>
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