**Supplementary Material for *The Multifaceted Abstract Brain*, Desai et al., Phil. Trans. Royal Society B, 2018.**

**Supplementary Table 1.**

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| --- | --- | --- | --- | --- | --- | --- |
| **1st Author** | **Year** | **Journal** | **N** | **# Foci** | **Task(s)** | **Contrast Name** |
| Ansari D | 2005 | Neuroreport | 12 | 12 | Comparison size | Distance effect (small > large) |
| Ansari D | 2006 | Neuroimage | 14 | 10 | Comparison size | Main effect of distance (small > large) |
| Ansari D | 2007 | Journal of Cognitive Neuroscience | 13 | 8 | Comparison | Conjunction small and large number |
| Attout L | 2006 | PLOS ONE | 26 | 7 | Order judgment | Distance effect of numerical order judgment |
| Chochon F | 1999 | Journal of Cognitive Neuroscience | 8 | 14 | Number comparison | Number comparison vs. letter naming task |
| Eger E | 2003 | Neuron | 9 | 4 | Target detection | Numbers > Letters & Colors |
| Fias W | 2007 | Journal of Neuroscience | 17 | 3 | Numerical comparison | (number comparison – number dimming) – (letter comp – letter dimming) |
| Franklin M S | 2009 | Journal of Cognitive Neuroscience | 17 | 3 | Numerical comparison | Mag near > mag far (unique regions) |
| He L | 2013 | Cerebral Cortex | 20 | 2 | Numerical comparison | Symbolic > nonsymbolic |
| Holloway I D | 2010 | Neuroimage | 19 | 9 | Magnitude judgment | (Symbolic – control)-(nonsymbolic-control) |
| Holloway I D | 2013 | Journal of Cognitive Neuroscience | 26 | 2 | Passive viewing | Adaptation to Hindu-Arabic numerals |
| Kadosh R C | 2005 | Neuropsychologia | 15 | 15 | Numerical comparison | Numerical vs. size & numerical vs. luminance |
| Kadosh R C | 2007 | Neuron | 17 | 2 | Passive viewing | Notation adaptation |
| Kaufmann L | 2006 | Neuroreport | 17 | 5 | Number-size congruity task | Numerical comparison > Physical comparison |
| Le Clec’H (exp 1) | 2000 | Neuroimage | 5 | 4 | Numerical magnitude | Numerals > Body parts |
| Le Clec’H (exp 2) | 2000 | Neuroimage | 6 | 3 | Numerical magnitude | Numerals > Body parts |
| Liu X | 2006 | Journal of Cognitive Neuroscience | 12 | 6 | Numerical comparison | Distance effect (small>large) |
| Park J | 2012 | Journal of Cognitive Neuroscience | 20 | 1 | Visual matching task | Number > letter |
| Pinel P | 2001 | Neuroimage | 26 | 7 | Numerical magnitude comparison task | Numeric distance effect |
| Pinel P | 2004 | Neuron | 15 | 3 | Numerical comparison | Distance effects during numerical comparison |
| Price GR | 2011 | Neuroimage | 19 | 1 | Passive viewing | Conjunction of Arabic digits > letters and Arabic digits > scrambled digits |
| Tan H Y | 2007 | Journal of Neuroscience | 24 | 3 | Numerical magnitude | Numerical size judgment (size judgment > motoric task) |
| Tang J | 2006 | Journal of Cognitive Neuroscience | 18 | 10 | Numerical magnitude comparison task | Numerical distance > physical distance |

Studies included in the Number Concepts meta-analysis.

**Supplementary Table 2.**

Studies included in the Emotion Concepts meta-analysis.

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| --- | --- | --- | --- | --- | --- | --- |
| **1st Author** | **Year** | **Journal** | **N** | **# Foci** | **Task(s)** | **Contrast Name** |
| Beauregard | 1997 | Journal of Cognitive Neuroscience | 10 | 10 | Passive reading | Emotion > concrete words |
| Briesemeister | 2015 | Cogn Affect and Behav Neurosci | 20 | 3 | Lexical decision | Positive < Neutral words |
| Briesemeister | 2015 | Cogn Affect and Behav Neurosci | 20 | 3 | Lexical decision | Positive > neutral words |
| Castellucio | 2015 | Journal of Psycholinguistic Research | 12 | 2 | Living / nonliving judgment | Angry > Neutral sentences |
| Chow | 2013 | Journal of Cognitive Neuroscience | 24 | 14 | Comprehension question | Emotion > perception + action stories |
| Citron | 2014 | Neuropsychologia | 19 | 1 | Lexical decision | Interaction between arousal and valence |
| Citron | 2014 | Neuropsychologia | 19 | 1 | Lexical decision | Negative > neutral words |
| Citron | 2014 | Neuropsychologia | 19 | 2 | Lexical decision | High > low arousal w/in positive words |
| Compton | 2003 | Cogn Affect and Behav Neurosci | 12 | 11 | Color Stroop | High > low arousal w/in negative words |
| Compton | 2003 | Cogn Affect and Behav Neurosci | 12 | 1 | Color Stroop | High > low arousal w/in positive words |
| Compton | 2003 | Cogn Affect and Behav Neurosci | 12 | 12 | Color Stroop | Negative > Neutral words |
| Crosson | 1999 | Neuroreport | 16 | 2 | Covert generation | Emotion > Neutral words |
| Cunningham | 2003 | J of Person & Soci Psychology | 15 | 5 | Valence / presence judgment | Emotion task > Semantic task |
| Cunningham | 2004 | Journal of Cognitive Neuroscience | 20 | 14 | Valence / concreteness judgment | Emotion task > Semantic task |
| Denkova | 2013 | Front in Behavioral Neuroscience | 18 | 6 | Emotion / context ratings | Emotion task > Semantic task |
| Ferstl | 2007 | Neuroscience Letters | 20 | 1 | Detect inconsistency | Emotion > Time + Space sentences |
| Ferstl | 2005 | Journal of Cognitive Neuroscience | 20 | 3 | Detect inconsistency | Emotion > Time sentences |
| Goel | 2003 | NeuroImage | 19 | 3 | Syllogism validation | Positive > Neutral |
| Hamann | 2002 | Neuroreport | 10 | 1 | Recognition memory test | Negative > Neutral words |
| Hamann | 2002 | Neuroreport | 10 | 5 | Recognition memory test | Positive > Neutral words |
| Isenberg | 1999 | PNAS | 6 | 4 | Name font color | Positive > Neutral words |
| Kensinger | 2004 | PNAS | 28 | 5 | Concreteness judgment | Negative > Neutral words |
| Kross | 2009 | Biological Psychiatry | 24 | 2 | Memory/Perception task | Memory task > Baseline task |
| Kuchinke | 2005 | NeuroImage | 22 | 4 | Lexical decision | Positive > Neutral |
| Lai | 2015 | Journal of Cognitive Neuroscience | 24 | 10 | Perceptual oddball | Negative > Neutral sentences |
| Lai | 2015 | Journal of Cognitive Neuroscience | 24 | 1 | Perceptual oddball | Negative > Neutral words |
| Lai | 2015 | Journal of Cognitive Neuroscience | 24 | 1 | Perceptual oddball | Negative < Neutral sentences |
| Lewis | 2007 | Cerebral Cortex | 19 | 4 | does it apply to me | Emotional valence |
| Maddock | 2003 | Human Brain Mapping | 8 | 4 | Covert valence judgment | Valenced > Neutral words |
| Maratos | 2001 | Neuropsychologia | 13 | 6 | Word recognition task | Negative > Neutral words |
| Nacik | 2006 | NeuroImage | 13 | 5 | Lexical decision | Emotion > Neutral words |
| Rodriguez-Ferreiro | 2011 | Journal of Cognitive Neuroscience | 14 | 5 | Comprehension question | Emotion > Neutral words |
| Sakaki | 2012 | Cogn Affect and Behav Neurosci | 22 | 8 | Valence ratings | Social pictures + words > neutral |
| Sass | 2012 | Human Brain Mapping | 16 | 3 | Lexical decision | Positive + Negative related > Unrelated Neutral |
| Schloctermeier | 2013 | PLOS ONE | 21 | 11 | Valence rating | Positive > Neutral words |
| Skipper | 2015 | Brain and Language | 19 | 1 | Semantic judgment | Emotional > Neutral words |
| Strange | 2000 | NeuroImage | 12 | 2 | Emotion/Semantic feature judgment | Emotion task > Semantic task |
| Zaitchik | 2010 | Neuropsychologia | 15 | 5 | Comprehension question | Emotional > Neutral sentences |
| Zysset | 2003 | Neuroscience Letters | 18 | 10 | Validity judgment | Emotional > Neutral sentences |

**Supplementary Table 3.**

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| --- | --- | --- | --- | --- | --- | --- |
| **1st Author** | **Year** | **Journal** | **N** | **# Foci** | **Task(s)** | **Contrast Name** |
| Avram | 2013 | Neuroscience Letters | 16 | 8 | Moral Judgment | Moral > Esthetic |
| Avram | 2014 | BMC Neuroscience | 16 | 10 | Moral Judgment | Moral (1st and 3rd person) > Non-moral |
| Borg | 2006 | Journal of Cognitive Neuroscience | 24 | 7 | Moral Evaluation Task | Moral > Non-moral |
| Chiong | 2015 | Brain | 16 | 3 | Moral Evaluation Task | Moral-personal > Non-moral |
| De Achával | 2013 | Journal of Psychiatric Research | 13 | 6 | Moral Judgment | Moral > Non-moral |
| FeldmanHall | 2014 | Soc Cogn and Affect Neuroscience | 38 | 10 | Moral Evaluation Task | Moral (difficult/easy) > Non-moral (difficult/easy) |
| Han | 2014 | Behavioral Brain Research | 16 | 28 | Moral Evaluation Task | Moral (personal and impersonal) > neutral |
| Harada | 2009 | Neuroscience Research | 18 | 9 | Moral Decision Task | Moral > Gender judgment |
| Heekeren | 2005 | Neuroimage | 12 | 8 | Moral Decision Task | Moral > Semantic |
| Moll | 2001 | Arquivos de Neuro-Psiquiatria | 10 | 10 | Moral Judgment | Moral > Factual |
| Moll | 2002 | Journal of Neuroscience | 12 | 12 | Moral Judgment | Moral > Non-moral neutral |
| Parkinson | 2011 | Journal of Cognitive Neuroscience | 30 | 28 | Moral Evaluation Task | Moral (harmful, dishonest, disgust) > Neutral |
| Prehn | 2008 | Soc Cogn and Affect Neuroscience | 23 | 6 | Social Norm Task | Socio-normative > Grammatical |
| Reniers | 2012 | Biological Psychology | 24 | 6 | Moral Evaluation Task | Moral > Non-moral |
| Robertson | 2007 | Neuropsychologia | 16 | 5 | Moral Judgment Task | Moral (Care/Justice) > Neutral non-moral |
| Schleim | 2011 | Soc Cogn and Affect Neuroscience | 40 | 6 | Moral Judgment Task | Moral > Personal |
| Schneider | 2012 | Soc Cogn and Affect Neuroscience | 28 | 4 | Moral Dilemma Task | Moral > Baseline |
| Sommer | 2010 | Neuropsychologia | 12 | 6 | Moral Decision Task | Moral > Neutral |
| Sommer | 2014 | Social Neuroscience | 16 | 6 | Moral Decision Task | Moral > Neutral |
| Takashi | 2008 | Cerebral Cortex | 15 | 4 | Moral Judgment Task | Moral (beauty and depravity) > Neutral |

Studies included in the Morality meta-analysis.

**Supplementary Table 4.**

Studies included in the Theory of Mind meta-analysis.

|  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- |
| **1st Author** | **Year** | **Journal** | **N** | **# Foci** | **Task(s)** | **Contrast Name** |
| Abraham | 2008 | Consciousness and Cognition | 17 | 22 | Comprehension question | Mental state stories > Personal attribute stories |
| Abraham | 2010 | Social Neuroscience | 22 | 5 | Rate others’ belief/desire | Belief > Desire (outcome and response) |
| Abraham | 2010 | Social Neuroscience | 22 | 3 | Rate others’ belief/desire | Belief > Desire (story description) |
| Abraham | 2006 | NeuroImage | 18 | 3 | Sentence verification | Other > Self |
| Abraham | 2009 | Journal of Cognitive Neuroscience | 21 | 7 | Comprehension question | False belief > False photograph |
| Bodden | 2013 | Advances in Cognitive Psychology | 35 | 5 | Picture / statement match | Affective verbs > Cognitive verbs |
| Bodden | 2013 | Advances in Cognitive Psychology | 35 | 11 | Picture / statement match | Affective verbs > Physical verbs |
| Bodden | 2013 | Advances in Cognitive Psychology | 35 | 4 | Picture / statement match | Cognitive verbs > Physical verbs |
| Calarge | 2003 | American Journal of Psychiatry | 13 | 13 | Story generation | Generate story about others > Read story aloud |
| Chan | 2015 | Frontiers in Psychology | 27 | 2 | Funniness rating | ToM > non-ToM jokes |
| Chan | 2015 | Frontiers in Psychology | 27 | 3 | Funniness rating | ToM > non-ToM jokes |
| Chan | 2015 | Frontiers in Psychology | 27 | 5 | Funniness rating | ToM joke > Non-joke |
| Dodell-Feder | 2011 | NeuroImage | 62 | 16 | Comprehension question | False belief > False photograph |
| Dufour | 2013 | PLOS ONE | 27 | 17 | Comprehension question | False belief > False photograph |
| Feng | 2014 | Neuroscience Letters | 20 | 8 | Funniness rating | Second-order (X thinks that Y thinks) > First-order ToM |
| Fletcher | 1995 | Cognition | 6 | 4 | Comprehension question | ToM > Physical stories |
| Fletcher | 1995 | Cognition | 6 | 5 | Comprehension question | ToM > Unlinked sentences |
| Gallagher | 2000 | Neuropsychologia | 6 | 5 | Comprehension question | ToM > Non-ToM stories |
| Gobbini | 2007 | Journal of Cognitive Neuroscience | 12 | 19 | Comprehension question | False belief stories > Action stories |
| Jenkins | 2011 | Social Neuroscience | 15 | 2 | Mental state judgment | Other > Self |
| Kliemann | 2008 | Neuropsychologia | 26 | 5 | Comprehension question | False belief > False photograph |
| Kobayashi | 2007 | Neuropsychologia | 16 | 2 | Comprehension question | Interaction: Story > Cartoon, ToM > nToM |
| Kobayashi | 2007 | Neuropsychologia | 16 | 5 | Comprehension question | Second-order ToM (X thinks that Y thinks) > non-ToM stories |
| Mitchell | 2008 | Cerebral Cortex | 20 | 4 | Comprehension question | False belief stories > False photograph descriptions |
| Otsuka | 2009 | Neuroscience Letters | 24 | 6 | Sentence congruity judgment | Belief judgment > Tense congruity judgment |
| Ozdem | 2016 | Social Neuroscience | 20 | 5 | Comprehension question | False belief > False photograph |
| Perner | 2006 | Social Neuroscience | 19 | 6 | Comprehension question | False belief > False photograph |
| Perner | 2006 | Social Neuroscience | 19 | 7 | Comprehension question | False belief stories > Temporal change stories |
| Saxe | 2003 | NeuroImage | 25 | 5 | Passive reading | False belief stories > Mechanical inference stories |
| Saxe | 2006 | Psychological Science | 12 | 2 | Passive reading | Others’ thoughts > Others’ circumstances |
| Scholz | 2009 | PLOS ONE | 24 | 1 | Comprehension question | False belief > False photograph |
| Vogeley | 2001 | NeuroImage | 8 | 1 | Comprehension question | Interaction: ToM > Non-ToM \* Other > Self |
| Vogeley | 2001 | NeuroImage | 8 | 7 | Comprehension question | ToM > physical (collapsed across self conditions) |
| Young | 2008 | NeuroImage | 17 | 6 | Comprehension question | False belief > False photograph |
| Young | 2007 | PNAS | 10 | 12 | Comprehension question | False belief > False photograph |
| Young | 2007 | PNAS | 10 | 6 | Moral judgment | Neutral > Negative intentions |
| Young | 2010 | Neuropsychologia | 17 | 3 | Likeliness rating | Belief > Physical stories |
| Zaitchik | 2010 | Neuropsychologia | 15 | 8 | Comprehension question | Beliefs > non-ToM stories |