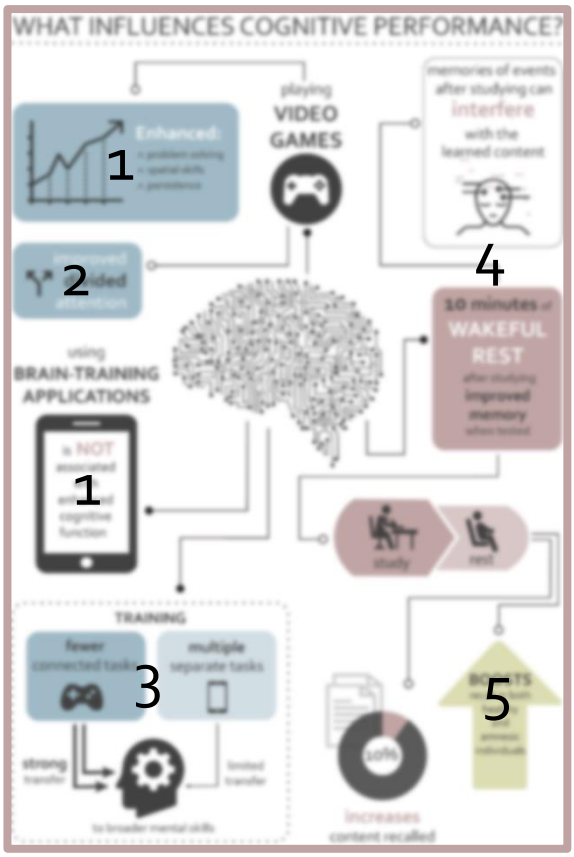
This is the reference list for page 12 of the 2016 Insights for Impact report.



[1]Shute, V. J., Ventura, M., & Ke, F. (2015). The power of play: The effects of Portal 2 and Lumosity on cognitive and noncognitive skills. *Computers & Education, 80*, 58–67. doi:10.1016/j.compedu.2014.08.013

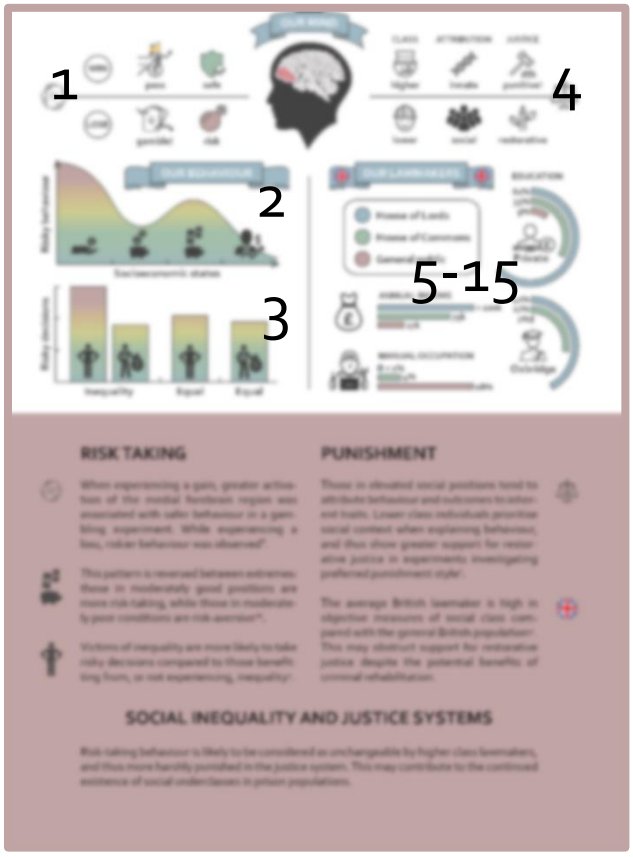
[2]Baniqued, P. L., Kranz, M. B., Voss, M. W., Lee, H., Cosman, J. D., Severson, J., & Kramer, A. F. (2014). Cognitive training with casual video games: points to consider. *Frontiers in Psychology, 4*, 1010. doi:10.3389/fpsyg.2013.01010

[3]Anguera, J. A., & Gazzaley, A. (2015). Video games, cognitive exercises, and the enhancement of cognitive abilities. *Current Opinion in Behavioral Sciences, 4*, 160–165. doi:10.1016/j.cobeha.2015.06.002

[4]Dewar, M., Alber, J., Butler, C., Cowan, N., & Della Sala, S. (2012). Brief wakeful resting boosts new memories over the long term. *Psychological Science, 23*, 955–960. doi:10.1177/0956797612441220

[5]Alber, J., Della Sala, S., & Dewar, M. (2014). Minimizing interference with early consolidation boosts 7-day retention in amnesic patients. *Neuropsychology, 28*, 667–675. doi:dx.doi.org/10.1037/neu0000091

This is the reference list for page 14 of the 2016 Insights for Impact report.



[1]Vermeer, A. B. L., Boksem, M. A., & Sanfey, A. G. (2014). Neural mechanisms underlying context-dependent shifts in risk preferences. *Neuroimage*, *103*, 355–363. doi:10.1016/j.neuroimage.2014.09.054

[2]Mallpress, D. E., Fawcett, T. W., Houston, A. I., & McNamara, J. M. (2015). Risk attitudes in a changing environment: An evolutionary model of the fourfold pattern of risk preferences. *Psychological review, 122*, 364–375. doi:10.1037/a0038970

[3]Mishra, S., Hing, L. S. S., & Lalumière, M. L. (2015). Inequality and risk-taking. *Evolutionary Psychology, 13*, 1–11. doi:10.1177/1474704915596295

[4]Kraus, M. W., & Keltner, D. (2013). Social class rank, essentialism, and punitive judgment. *Journal of Personality and Social Psychology, 105*, 247–261. doi:10.1037/a0032895

[5]The Sutton Trust. (2005, December 9). *The Educational Backgrounds of Members of the House of Commons and House of Lords.* Retrieved from http://www.suttontrust.com/wp-content/uploads/2005/12/PoliticiansBackgrounds_09-Dec-05.pdf

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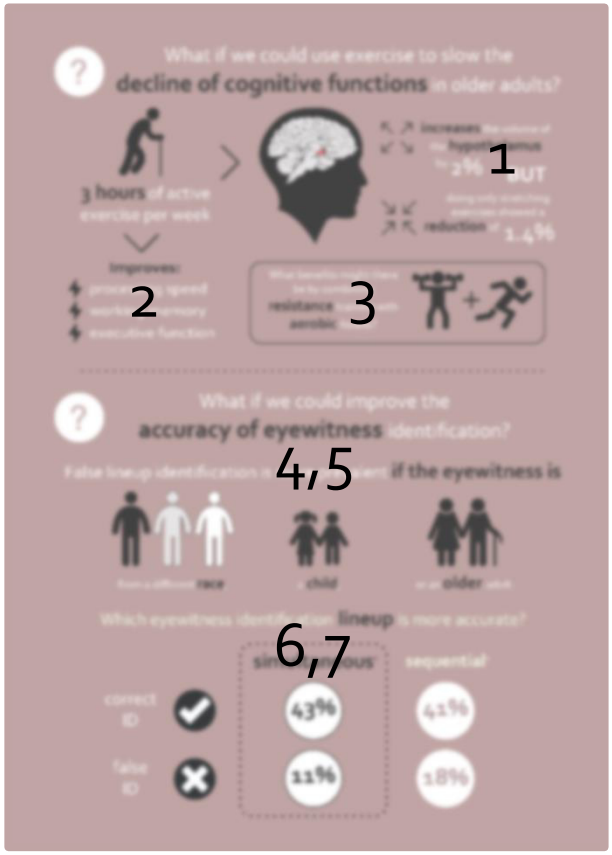
[14]McGuinness, F. (2010, December 14). *Social background of MPs.* House of Commons Library Standard Note SN/SG/1528, 14.

[15]NOMIS Official Labour Market Statistics. (2016, March). *Labour Market Profile Great Britain, Employment by Occupation.* Retrieved from https://www.nomisweb.co.uk/reports/lmp/gor/2092957698/report.aspx

This is the reference list for page 15 of the 2016 Insights for Impact report.



[1]Erickson, K. I., Voss, M. W., Prakash, R. S., Basak, C., Szabo, A., Chaddock, L., Kim, J.S., Heo, S., Alves, H., White S.M., Wojcicki, T. R., Mailey, E., Vieira, V.J., Martin S.A., Pence P.D., Woods, J.A., McAuley, E.

& Kramer A.F. (2011). Exercise training increases size of hippocampus and improves memory. *Proceedings of the National Academy of Sciences*, *108*, 3017–3022. doi:10.1073/pnas.1015950108

[2]Langlois, F., Vu, T. T. M., Chassé, K., Dupuis, G., Kergoat, M. J., & Bherer, L. (2013). Benefits of physical exercise training on cognition and quality of life in frail older adults. *The Journals of Gerontology Series B: Psychological Sciences and Social Sciences, 68*, 400–404. doi:10.1093/geronb/gbs069

[3]Kelly, M. E., Loughrey, D., Lawlor, B. A., Robertson, I. H., Walsh, C., & Brennan, S. (2014). The impact of exercise on the cognitive functioning of healthy older adults: a systematic review and meta-analysis. *Ageing research reviews*, *16*, 12–31. doi: 10.1016/j.arr.2014.02.004

[4]Fitzgerald, R. J., & Price, H. L. (2015). Eyewitness identification across the life span: A meta-analysis of age differences. *Psychological Bulletin, 141*, 1228–1265. doi:10.1037/bul0000013

[5]Brewer, N., & Wells, G. L. (2011). Eyewitness identification. *Current Directions in Psychological Science, 20*, 24–27. doi:10.1177/0963721410389169

[6]Wixted, J. T., & Mickes, L. (2014). A signal-detection-based diagnostic-feature-detection model of eyewitness identification. *Psychological Review, 121*, 262–276. doi:10.1037/a0035940

[7]Amendola, K. L., & Wixted, J. T. (2015). Comparing the diagnostic accuracy of suspect identifications made by actual eyewitnesses from simultaneous and sequential lineups in a randomized field trial. *Journal of Experimental Criminology, 11*, 263–284. doi:10.1007/s11292-014-9219-2

Insight headline	Neurocognitive effects of physical exercise in older adults
Theme	Cognition & neuroscience
Domain	Learning and Memory
Proposed by	Zea Szebeni

Primary citations (max 2 – 1 original study; 1 review)

[1]Erickson, K. I., Voss, M. W., Prakash, R. S., Basak, C., Szabo, A., Chaddock, L., Kim, J.S., Heo, S., Alves, H., White S.M., Wojcicki, T. R., Mailey, E., Vieira, V.J., Martin S.A., Pence P.D., Woods, J.A., McAuley, E., & Kramer A.F. (2011). Exercise training increases size of hippocampus and improves memory. *Proceedings of the National Academy of Sciences*, *108*(7), 3017-3022. doi:10.1073/pnas.1015950108

[2]Langlois, F., Vu, T. T. M., Chassé, K., Dupuis, G., Kergoat, M. J., & Bherer, L. (2013). Benefits of physical exercise training on cognition and quality of life in frail older adults. *The Journals of Gerontology Series B: Psychological Sciences and Social Sciences*, *68*(3), 400-404. doi:10.1093/geronb/gbs069

Most recent significant citation (2011-2015)

[3]Kelly, M. E., Loughrey, D., Lawlor, B. A., Robertson, I. H., Walsh, C., & Brennan, S. (2014). The impact of exercise on the cognitive functioning of healthy older adults: a systematic review and meta-analysis. *Ageing research reviews*, *16*, 12-31. doi:10.1016/j.arr.2014.02.004

Highest dissemination

[1]Erickson, K. I., Voss, M. W., Prakash, R. S., Basak, C., Szabo, A., Chaddock, L., Kim, J.S., Heo, S., Alves, H., White S.M., Wojcicki, T. R., Mailey, E., Vieira, V.J., Martin S.A., Pence P.D., Woods, J.A., McAuley, E., & Kramer A.F. (2011). Exercise training increases size of hippocampus and improves memory. *Proceedings of the National Academy of Sciences*, *108*(7), 3017-3022. doi:10.1073/pnas.1015950108

50-word summary of insight (non-technical)

With increasing life expectancy, it is important to mitigate the decline in cognitive functioning associated with aging. Physical exercise is associated with improved brain and cognitive functions, even for those with limited physical capacity. Effective interventions with these insights are possible to deliver at a very low cost.

Headline findings & critical numbers (simplify if overly technical)

Deterioration of the hippocampus leads to memory impairment in late adulthood. Adults, who participated in moderate-intensity aerobic exercise 3 days/week demonstrated an increase in volume of the left and right hippocampus by 2.12 % and 1.97 %, respectively, over 1 year period. Adults who only did light stretching exercises on the there hand displayed 1.40 % reduction in the left and 1.43 % reduction in the right hippocampus[1].

Older frail and non-frail adults who participated in an exercise programme for 12 weeks (1h 3 days a week) had enhanced cognitive performance in processing speed, working memory and executive functioning compared to the control group who did not start such exercise routine[2].

Interventions which combine aerobic fitness with resistance training may be the most beneficial for promoting healthy cognitive functions for older adults[3].

Cautions & limitations

Positive findings have not been assessed for long-term benefits across elderly population nor if improved cognitive functions translate to everyday situations.

Insight headline	Brain-training apps and cognitive functioning
Theme	Cognition & neuroscience
Domain	Learning and Memory
Proposed by	Zea Szebeni

Primary citations (max 2 – 1 original study; 1 review)

[1]Baniqued, P. L., Kranz, M. B., Voss, M. W., Lee, H., Cosman, J. D., Severson, J., & Kramer, A. F. (2014). Cognitive training with casual video games: points to consider. *Frontiers in Psychology*, *4*, 1010. doi:10.3389/fpsyg.2013.01010

[2]Shute, V. J., Ventura, M., & Ke, F. (2015). The power of play: The effects of Portal 2 and Lumosity on cognitive and noncognitive skills. *Computers & Education*, *80*, 58-67. doi:10.1016/j.compedu.2014.08.013

Most recent significant citation (2011-2015)

[3]Anguera, J. A., & Gazzaley, A. (2015). Video games, cognitive exercises, and the enhancement of cognitive abilities. *Current Opinion in Behavioral Sciences*, *4*, 160-165. doi:10.1016/j.cobeha.2015.06.002

Highest dissemination

[2]Shute, V. J., Ventura, M., & Ke, F. (2015). The power of play: The effects of Portal 2 and Lumosity on cognitive and noncognitive skills. *Computers & Education*, *80*, 58-67. doi:10.1016/j.compedu.2014.08.013

50-word summary of insight (non-technical)

In recent years many brain-training applications emerged claiming that they can enhance cognitive functions. Even though users might improve in these games, it doesn't mean that they get better in other tasks. 'Simple' video games usually achieve better results and users also find them more engaging and enjoyable.

Headline findings & critical numbers (simplify if overly technical)

Participants who played a video game (Portal 2) showed enhanced problem solving, spatial skills and persistence over participants who played a popular brain training application (Lumosity)[2].

Playing casual video games with elements associated with working memory and reasoning improved divided attention[1].

When playing casual video games participants improved on the trained games, but transfer to untrained tasks was limited[1].

Training on fewer tasks, such as video games - may be more beneficial in terms of transfer effects than training on a multitude of tasks, such as is brain-training applications[3].

Participants enjoyed playing the video game Portal 2 more than the training app Lumosity[2].

Casual action video games increase the ability to extract patterns in the environment, but this is only true in real-world settings which resembe elements from such games[4].

Cautions & limitations

Using brain-training applications to improve cognitive functions should not be disregarded, but a different approach might be needed for their design. Also, the marketing of such games can overshadow other ways of cognitive training (e.g. exercise). Long-term effects of the use of 'brain-training' applications are unknown, because of lack of the follow-up after training. Further, it has not been measured whether the improved skills are useful in real life settings.

[4]Bavelier, D., Green, C. S., Pouget, A., & Schrater, P. (2012). Brain plasticity through the life span: learning to learn and action video games. *Annual review of neuroscience*, *35*, 391-416.

Insight headline	Measuring the accuracy of eyewitness identification
Theme	Cognition & neuroscience
Domain	Learning and Memory
Proposed by	Nika Čermak

Primary citations (max 2 – 1 original study; 1 review)

[1]Wixted, J. T., & Mickes, L. (2014). A signal-detection-based diagnostic-feature-detection model of eyewitness identification. *Psychological Review, 121*(2), 262–276. doi:10.1037/a0035940

[2]Brewer, N., & Wells, G. L. (2011). Eyewitness identification. *Current Directions in Psychological Science, 20*(1), 24–27. doi:10.1177/0963721410389169

Most recent significant citation (2011-2015)

[3]Amendola, K. L., & Wixted, J. T. (2015). Comparing the diagnostic accuracy of suspect identifications made by actual eyewitnesses from simultaneous and sequential lineups in a randomized field trial. *Journal of Experimental Criminology, 11*, 263–284. doi:10.1007/s11292-014-9219-2

Highest dissemination

[4]Fitzgerald, R. J., & Price, H. L. (2015). Eyewitness identification across the life span: A meta-analysis of age differences. *Psychological Bulletin, 141*(6), 1228–1265. doi:10.1037/bul0000013

50-word summary of insight (non-technical)

Eyewitness identification evidence is less reliable than the general public seems to believe. Mistaken eyewitness identifications can be attributed to several variables, including cognitive, social, and contextual characteristics. Awareness of these indicators can improve the chances of correctly identifying the suspect.

Headline findings & critical numbers (simplify if overly technical)

Children and older people are more likely to make a false identification (ID) in culprit-absent line-ups, relative to young adults[4].

Simultaneous line-ups show lower false ID rates (11%) and slightly higher (43%) correct ID than rates sequential line-ups (18% and 41%, respectively)[1, 3].

Witnesses are worse at correctly identifying suspects of a different race than themselves[2].

People with low memory capacity, short attention spans, and who misattribute familiarity to the suspects perform worse at suspect discrimination[2].

Short exposure duration, long viewing distance, and confirming feedback to witness can also decrease accurate identification[2].

Discriminability is also influenced by social factors, such as susceptibility to social demands, an excessive willingness to help (mostly in older people) and suggestibility to biased instructions (mostly present in children)[4].

Cautions & limitations

By applying these findings in practice we could lower the rate of false suspect identifications. However, even though simultaneous line-up yields more accurate suspect identifications, the witness might feel pressured to pick the line-up member who looks most like the perpetrator. Therefore, introducing this procedure and conclusions in practice would require adequate training and education of the professionals working in this field in order for them to understand and use them correctly.

Insight headline	Brief wakeful resting after a study session improves memory
Theme	Cognition & neuroscience
Domain	Learning and Memory
Proposed by	Silvana Mareva

Primary citations (max 2 – 1 original study; 1 review)

[1]Dewar, M., Alber, J., Butler, C., Cowan, N., & Della Sala, S. (2012). Brief wakeful resting boosts new memories over the long term. *Psychological Science*, *23*(9), 955-960. doi:10.1177/0956797612441220

[2]Alber, J., Della Sala, S., & Dewar, M. (2014). Minimizing interference with early consolidation boosts 7-day retention in amnesic patients. *Neuropsychology*, *28*(5), 667. doi:dx.doi.org/10.1037/neu0000091

Most recent significant citation (2011-2015)

[3]Craig, M., Dewar, M., Della Sala, S., & Wolbers, T. (2015). Rest boosts the long-term retention of spatial associative and temporal order information. *Hippocampus*, *25*(9), 1017-1027. doi:10.1002/hipo.22424

Highest dissemination

[1]Dewar, M., Alber, J., Butler, C., Cowan, N., & Della Sala, S. (2012). Brief wakeful resting boosts new memories over the long term. *Psychological Science*, *23*(9), 955-960. doi:10.1177/0956797612441220

50-word summary of insight (non-technical)

Ten minutes of wakeful rest after a study session improves memory for the studied material. Memories from events occurring after the study session can interfere with the learned content. Wakeful rests postpone the interference and reduce the chance of information being lost from memory. Post-study rests boost recall in both healthy and amnesic individuals.

Headline findings & critical numbers (simplify if overly technical)

Post-study rests improve memory for stories and spatial positions[1,2]. Wakeful rests enhance both short- and long-term recall[1]. Seven days after the study session learners who took a rest remembered approximately 10% more of the studied content compared to learners who did not rest[1]. The benefits of post-study rest seem more pronounced in amnesic individuals[2].

Cautions & limitations

The potential benefits of wakeful resting for learning complex materials and curriculum content remain to be explored. The benefits observed for amnesic patients are promising, but there is still need for a comprehensive evaluation of the clinical utility of this learning strategy.

Policy Assessment Index 4

Insight headline	Inequalities lead to risk-taking behaviour
Theme	Cognition & neuroscience
Domain	Behavioural Economics
Proposed by	Guillermo V. Carbajal

Primary citations (max 2 – 1 original study; 1 review)

[1]Vermeer, A. B. L., Boksem, M. A., & Sanfey, A. G. (2014). Neural mechanisms underlying context-dependent shifts in risk preferences. *Neuroimage*, *103*, 355-363. doi:10.1016/j.neuroimage.2014.09.054

[2]Mishra, S., Hing, L. S. S., & Lalumière, M. L. (2015). Inequality and risk-taking. *Evolutionary Psychology*, *13*(3). doi:10.1177/1474704915596295

Most recent significant citation (2011-2015)

[3]Mallpress, D. E., Fawcett, T. W., Houston, A. I., & McNamara, J. M. (2015). Risk attitudes in a changing environment: An evolutionary model of the fourfold pattern of risk preferences. *Psychological review*, *122*(2), 364-375. doi:10.1037/a0038970

Highest dissemination

[4]Mishra, S. (2014). Decision-Making Under Risk Integrating Perspectives: From Biology, Economics, and Psychology. *Personality and Social Psychology Review* *13*(3). doi:10.1177/1474704915596295

50-word summary of insight (non-technical)

Societal increases in inequality, such as those following economic crises, as well as a personal loss of socioeconomic status may lead to riskier decision-making. One forebrain region has been identified as critical in these behaviours. Addressing context for these individuals may reduce risk-taking by those affected by reduced status.

Headline findings & critical numbers (simplify if overly technical)

When experiencing a gain, greater activation of the ventromedial prefrontal cortex (vmPFC) induced safer behaviour in a gambling experiment, as an attempt to preserve the current state[1].

When experiencing a loss, greater activation of vmPFC stimulated risky behaviour, potentially as an attempt to recover from the loss and go back to the previous state[1].

Victims of inequality engaged in greater risk-taking behaviours compared to beneficiaries of inequality and those not experiencing inequality[2].

Among victims, reduction of inequality contributed to decreased risk-taking[2].

Cautions & limitations

Current data was obtained from samples of university students and animal models in controlled environments.

Insight headline	Cognitive habits reduce support for restorative justice
Theme	Cognition & neuroscience
Domain	Social Cognition
Proposed by	David Thomson

Primary citations (max 2 – 1 original study; 1 review)

[1]Kraus, M. W., & Keltner, D. (2013). Social class rank, essentialism, and punitive judgment. *Journal of Personality and Social Psychology*, *105*(2), 247. doi:10.1037/a0032895

Most recent significant citation (2011-2015)

[1]Kraus, M. W., & Keltner, D. (2013). Social class rank, essentialism, and punitive judgment. *Journal of Personality and Social Psychology*, *105*(2), 247. doi:10.1037/a0032895

Highest dissemination

[1]Kraus, M. W., & Keltner, D. (2013). Social class rank, essentialism, and punitive judgment. *Journal of Personality and Social Psychology*, *105*(2), 247. doi:10.1037/a0032895

50-word summary of insight (non-technical)

People higher in social standing attribute criminal behaviour to offenders' biological traits. Societies with lawmakers predominantly from elevated social classes prefer sentences intended to punish perpetrators rather than rehabilitate them. Reducing lawmaker class disparity may facilitate criminal reform through consideration of restorative punishment.

Headline findings & critical numbers (simplify if overly technical)

People from elevated social classes are 8% more likely to believe that individual traits and dispositions are determined by biological factors[1].

People's beliefs about social class were manipulated using mock journal articles describing it as being either biologically inherent or socially constructed. Those manipulated with the former type of article were significantly less likely to support restorative punishment for academic cheaters[1].

14% of those in elevated social positions score lower on support for restorative punishment than the minimum scores of those in lower social standing[1].

Cautions & limitations

These insights seem to be more exaggerated in societies with significant disparities between socioeconomic classes. However, the direction of this pattern is unclear, so immediate adaption for application may not produce meaningful effects if idiosyncratic inequalities are not understood in the place of application.