Insights *for* Impact

The annual report
of the Policy Research Group
in the Department of Psychology

2016

UNIVERSITY OF CAMBRIDGE

This report should be cited as:

Policy Research Group. (2016). *Insights for Impact*, 1. K. Ruggeri (Ed.). Cambridge, UK

When citing a specific theme section, authors for the respective sections should be cited instead of Policy Research Group.

Published by the Department of Psychology, University of Cambridge, August 2016

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For the full report, go to: www.psychol.cam.ac.uk/pol-res-group/insights-for-impact

Insights for impact (Print) ISSN 2398-8932

Insights for impact (Online) ISSN 2398-8940

Disclaimer

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Insights *for* Impact

Edited by Kai Ruggeri

Volume 1

Acknowledgments

The Editor would like to dedicate this report to Mrs Maryellen Maclin, who passed away shortly before the completion of the project.

The work presented on the following pages represents a major undertaking involving a large number of contributors and advisors. Without their support, it is inconceivable to think it could have been compiled to the degree to which it has, nor within the timeframe. Beyond the efforts made by those with direct responsibility for work included herein, support has been provided by several organisations. As such, the Policy Research Group would like to formally extend a warm thanks to:

Erasmus+
Universidad Francisco de Vitoria (Spain)
Leids Universiteits Fonds (the Netherlands)
Slovene Human Resources Development and Scholarship Fund

We would particularly like to acknowledge help and assistance of Ms Josephine Ruggeri for her support in coordinating the large number of contributors prior to and during the work being carried out in Cambridge.

The report acknowledges use of images from flaticon.com generated by Becris, Bogdan Rosu, Chanut is Industries, Clipartix, Daniel Bruce, Freepik, Grafichera, Gregor Cresnar, Hadrien, Hanan, Iconnice, Lucy G, Madebyoliver, OCHA, Sarfraz Shoukat, Scott de Jonge, Sergiu Bagrin, SimpleIcon, Vaadin and Vector Market. We also acknowledge use of icons from Vecteezy, created by pauldizonr.

Foreword
Prof Trevor Robbins

It is my pleasure to present the first annual *Insights for Impact* report. The Department of Psychology has long recognised the value of translating evidence for application in clinical settings, industry, and public policy. As such, we proudly endorse Dr Ruggeri and his team for producing this first volume.

What follows is an illumination of recent findings whose potential have not yet been realised to their full extent. It is not simply a collection of dated studies with results familiar to the entire population, as is often the case with similar reports.

In future years, we can expect additional approaches to further highlight these, including both those making an impact and those anticipated to do so. For 2016, emphasis has been placed on the latter, and we are pleased at the variety presented, as it demonstrates well the diversity of our field.

On behalf of the Department of Psychology, we commend the Policy Research Group and the Junior Researcher Programme for their contribution. We hope you will enjoy the first in what will hopefully become a tradition of identifying and translating evidence from our work—as well as our peers—as theories are developed, as evidence accumulates, and as applications are evaluated.

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Introduction

Policies are population-based interventions. They are established—intentionally or otherwise—to produce an outcome that is determined best by the leadership in place. The desired outcomes may take the form of measured improvements in a specific domain, avoidance of unwanted problems, or simply maintaining ideological values. To ensure these are met, leaders use policies; to ensure they are effective, we argue that these should be built as much as possible from evidence.

The role of psychology in policy has been evident for decades. This has included many domains from clinical guidelines for therapies in mental health services, to dealing with safeguarding against poor financial choices in vulnerable populations. Recent initiatives to establish behavioural science teams within governments and international organisations have furthered this position. This has also been furthered via recognition of psychological insights in fields such as economics, public health, and politics.

In spite of this history, many existing approaches to integrating evidence from psychological research give only passive reference to findings. For real and sustainable impact, systematic approaches toward identification and translation of evidence must be established. To optimise the process and reduce bias that may marginalise impact, these approaches should be built by experts from psychology, as well as policy makers, economists, industrial leaders, clinicians, and third sector stakeholders. Additionally, translation should not replace basic, fundamental, theoretical work, nor hinder research with no immediate application.

For this *Insights* report, we have taken an open but structured approach, as described in the following sections. The aim has been to present the potential of systematically and categorically collating studies followed by extracting primary results. In the first volume, we emphasise *potential*, as it has not been fully attempted here. In future volumes, we will aim to narrow the scope on an annual basis and elicit views from experts near and far, as well as to highlight relevant research from within Cambridge.

The five themes

The five themes to follow were chosen as an indication of current trends in the field as well as in evidence-driven policy. Further reasons for including each is provided on the opening page of each theme. The order has been chosen deliberately, beginning with **Decisions**, as policies are at their core a mechanism to guide choices and behaviours, understanding the evidence behind them is crucial. Following this is **Cognition & neuroscience**, which is both topical for policy as well as core to the psychological science tradition. **Illness & disorder** has been the most common theme for psychological research in policy, hence placing it central in the report. **Big Data** is possibly the closest to ubiquity in terms of covering all areas of research, not just psychology, and has an overarching theme covering the fields in this volume and beyond. It has been framed as such and placed as the penultimate theme as a means to illuminate this overarching capacity directly.

Finally, **Health & well-being** has intentionally been placed last, as we make no reservations about this being the ultimate outcome of interest for all policy. Though economic indicators will continue to dominate the headlines and political debates, of what good is greater GDP if well-being is left untested? We would never accept a single, passive indicator for our economic stability, so we must not accept anything less than the best insights as to how life is going for a population and how healthy we are.

If you read only one part of this section, let it be this: the purpose of this report is to highlight insights from psychological research between 2011 and 2015. We define insights as evidence that can be useful for a policy relevant to population behaviour or decision-making, and impact as measurable change in primary indicators of those behaviours, decisions, and their related outcomes, namely economic stability and population well-being.

While we aim to simplify complex concepts for a diverse audience of all backgrounds, we do not intend to undermine results of studies whose ultimate strengths have been their meticulous provision of results. We acknowledge this challenge to present a very fine line. The same may be said regarding optimism about a study versus exaggeration of potential for findings to result in impact. For this reason, we have included a working version of the tool the Policy Research Group uses for assessing appropriateness for policy applications.

For this first report, we hope you will find yourself immersed in the wealth and breadth of insights generated from psychological research from 2011 to 2015. We look forward to further engagement with peers in future volumes, and invite colleagues near and far to contact us should they be interested in contribute to future editions.

Approach

To build this first report, we took a broad look at evidence from psychological research between 2011 and 2015. This range was selected to establish an annual tradition of reviewing recent work, as well as to allow time from publication to proliferation in the field for the most recent studies. Other criteria may emerge in future volumes.

For the first year, we selected insights by identifying mainstream indications of uptake rather than a systematic review of studies on a given topic. Our approach was to find annual statements, articles, reviews, and editorials with policy relevance from major journals and organisations within five chosen domains of psychology. For 2016, a committee determined that the themes would be decision-making, cognition and neuroscience, illness and disorder, Big Data, and health and well-being. As psychologists publish in a variety of journals and are based in many different academic departments, we kept an open mind for what qualified as evidence from psychology. As such, some insights may also be attributed to fields such as economics, finance, public health, medicine, or social sciences more broadly.

From literature deemed relevant and critical to each theme, we generated a list of insight suggestions for exploration and translation. We utilised templates for all insights identified to remain consistent in the information presented. These are now archived for review (see below), and emphasise general messages, primary citations related to the insight, and Policy Assessment Index ratings. To be included, insights must have been scored between 1 and 8 on this exercise; above this means they are already widely used (as highlighted on page 41) and a score of zero means they are likely to be reviewed in future years. Each archived version contains citations for the primary studies linked to each insight, with the requirement that all work has been published between 2011 and 2015.

We presented the final list of insights to researchers in the respective themes to validate utility and prevent significant omissions. Once confirmed, visualisations of the insights were generated for each theme for the purpose of engaging a wide audience. Information included in these is intended to represent potential approaches and impacts as questions, and we aimed to safeguard against exaggerating real-world implications. This year we emphasise the potential of direct findings rather than generalising a field of study or direct translation for specific policies. In future years, these may become more tangible in how they are presented.

To close each section, we outline potential scaling and key questions. These have been provided to frame the thinking of those in leadership positions in policymaking, research, clinical settings, and industry, who may consider using these insights to make practical improvements in their respective domains. Following this, references have been included for studies mentioned directly within the text. Further details about the studies used in the visuals can be accessed through a link to the online archive. These archives also present additional information about the selection process and the appraisal of policy appropriateness.

Decisions

Lives are shaped by the choices we make. Policies are ultimately about helping populations with those decisions. From individuals making purchases to population behaviours, recent evidence in decision-making research offers tremendous insights that can be used to support a large range of activities and choices. Utilising these may improve outcomes for individuals, leaders, and the groups they serve.

the role of DECISION MAKING

within leaders

6 out of 10 **POWERFUL** people lied for their own benefit

3 out of 10 **POWERLESS** people lied for their own benefit

Managers accountable for **processes** make **more** accurate decisions...

... and **lower** risk-taking investments

Managers accountable for **outcomes** make **less** accurate decisions...

... and **greater** risk-taking investments

When executives think their **PREDICTIONS** have a success rate of **80%**

... they **ONLY** have an actual rate of **36%**

Individuals with high levels of **narcissism** have **LOWER** job performance when in positions of **authority**

Individuals with high levels of **psychopathy** may end up **LESS** likely to exhibit counter-productive work behaviour if given more **authority** over tasks

within teams

Percentages of **high-talented** team members

50% — **Higher** team performance

80% — **Lower** team performance

Performance

within society

Anti-smoking ads are counter effective after too many views

Positive smoking attitudes

5 views

Smokers

Non-smokers

Insights

Power

Powerful individuals tend to behave more unethically, compared to those with less power. However, this is only the case when the unethical behaviour is self-beneficial. In contrast, powerless individuals are more likely to engage in unethical behaviour that benefits others[1].

Confidence

Executives tend to be overconfident, which means they overestimate the precision of their predictions. Such overconfidence, or miscalibration, is linked to higher levels of corporate debt[2]. Female executives tend to be less overconfident in predictions and their firms have less debt on average than those of male executives[3].

Accountability

Managers that have to account for the ways in which judgements and decisions were made, tend to make more accurate and less biased decisions. Conversely, when the results of managerial decisions are the criteria by which the decisions are assessed, decisions may be less appropriate[4].

Personality

The Dark Triad of personality traits may explain damaging work behaviours. Such behaviours tend to decrease for employees with high levels of psychopathy when in positions of authority. Narcissists, on the other hand, had reduced job performance when in positions of authority[5].

Conflict

Status conflicts in teams may severely harm group performance by decreasing information sharing. Popular beliefs advocate that more talented individuals form more efficient teams. However, having too many highly talented team members does not always enhance team performance but may even hinder it by increasing status conflicts[6].

Advertisement

Anti-smoking advertisements may actually encourage smoking. Advertisements initially succeed to reduce smoking attractiveness. However, after an excessive number of repetitions, the effect reversed. The advertisement becomes unreliable and positivity towards smoking may increase to an even higher level than before[7].

Cooperative behaviour

Cooperation is understood in psychology as participating in desired behaviours that contribute to the good of a group. Cooperative behaviours such as charitable donations, voting, conservation, and taxpaying have major benefits for society as a whole. Interventions that aim to increase cooperative behaviours are most successful if they take into account two aspects: reputation and reciprocity[8].

Making individual contributions visible is one effective strategy as it helps individuals to create a **reputation** to cooperate. In a field study promoting an energy-saving program, public sign-up was more effective than anonymous sign-up or material reward[9].

Another strategy is informing people about contributions of other people, which creates an expectation of **reciprocity**. In a field study, informing people about the water consumption of their neighbours compared to their own decreased water consumption[10].

Successful interventions in field studies

Making contributions of individuals visible

Energy saving

3x higher participation

7x more effective than a $25 incentive

Informing individuals about contributions of others

Water consumption

7000L of water saved per household

36% of the effects persist after 1 year

Could focussing on outcomes instead of fair processes explain the persistence in workplace inequalities?

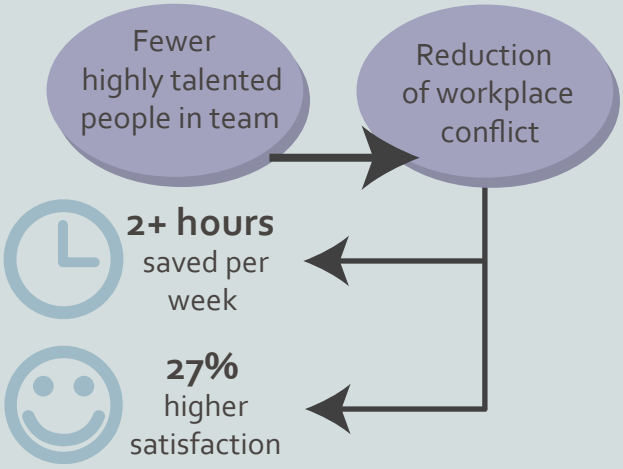
Gender pay gap in the UK

- Female **employees** earn **19%** less
- Female **executives** earn **23%** less
- Male **executives** earn **£1.3 million** more over a 5-year period

Could tax evasion be reduced by tailoring messages based on income levels?

Target group	Potential interventions
High-income	Highlighting **individual risk and costs** of tax evasion
Low-income	Highlighting the costs of tax evasion **for society**

Could controlling the balance of talent within a team improve productivity and satisfaction?



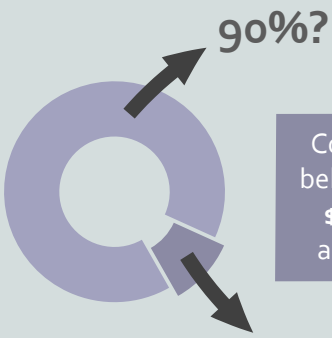
So what might help us make better decisions?

The typical half-life of a publicly traded company is a decade...

...is that because of **overconfidence?**

Female executives are less confident.

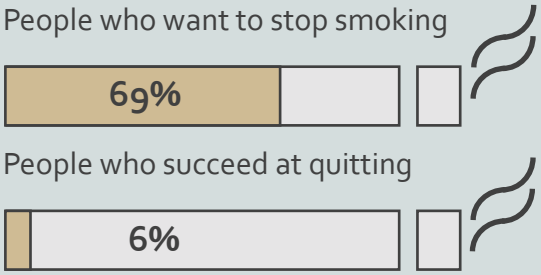
Would fewer businesses file for bankruptcy if more women served as executives?



Counterproductive work behaviour costs more than **$14,000** per employee and **$50 billion** annually

But only **10%** of this issue is understood by traditional personality questionnaires

Could measuring the Dark Triad help predict counterproductive work behaviour and inform interventions?



Could excessive antismoking ads make it harder to quit?

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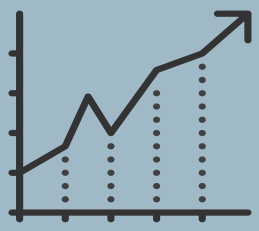
Further details are available at http://bit.ly/2bORXVW

Cognition & neuroscience

Significant developments in cognitive psychology and neuro-imaging have facilitated novel insight into brain functioning. This evidence, which illuminates how we manage information that influences our choices and behaviours, may benefit populations if integrated effectively into policy.

WHAT INFLUENCES COGNITIVE PERFORMANCE?

playing
VIDEO GAMES

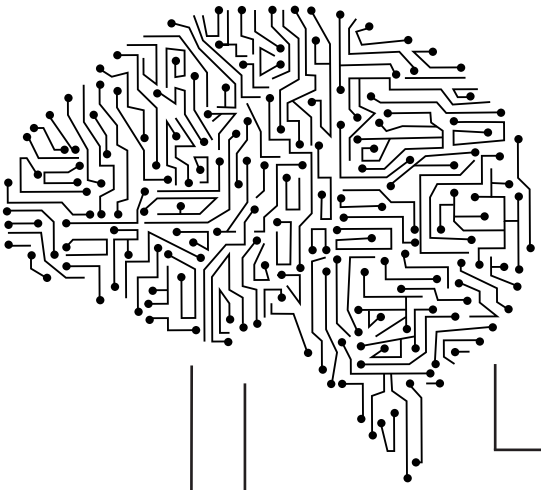


Enhanced:
- ^ problem solving
- ^ spatial skills
- ^ persistence

memories of events after studying can **interfere** with the learned content

improved **divided** attention

using
BRAIN-TRAINING APPLICATIONS



10 minutes of **WAKEFUL REST** after studying **improved memory** when tested

is **NOT** associated with enhanced cognitive function

TRAINING

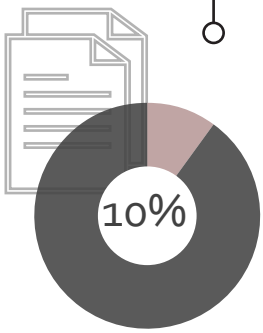
fewer connected tasks

multiple separate tasks

strong transfer

limited transfer

to broader mental skills



increases content recalled

BOOSTS recall in both healthy and amnesic individuals

Insights

Video games

In recent years, many brain-training applications have emerged claiming that they can enhance cognitive functions. Even though training improves performance in these games, this improvement does not transfer to other tasks[1]. 'Simple', casual video games usually achieve more substantial cognitive improvements[2].

Learning

Ten minutes of wakeful rest after a study session may improve memory of the studied material[3, 4]. Memories from events occurring after the study session can interfere with the learned content. Wakeful rests are believed to postpone the interference and reduce the chance of information being lost.

Risk taking

Increases in social inequality, such as those following economic crises, or personal losses of socioeconomic status, may lead to riskier decision-making[5]. One forebrain region has been identified as critical in these behaviours[6]. It may be possible to reduce risk-taking behaviours in individuals of lower social status by addressing the context as such.

Punishment

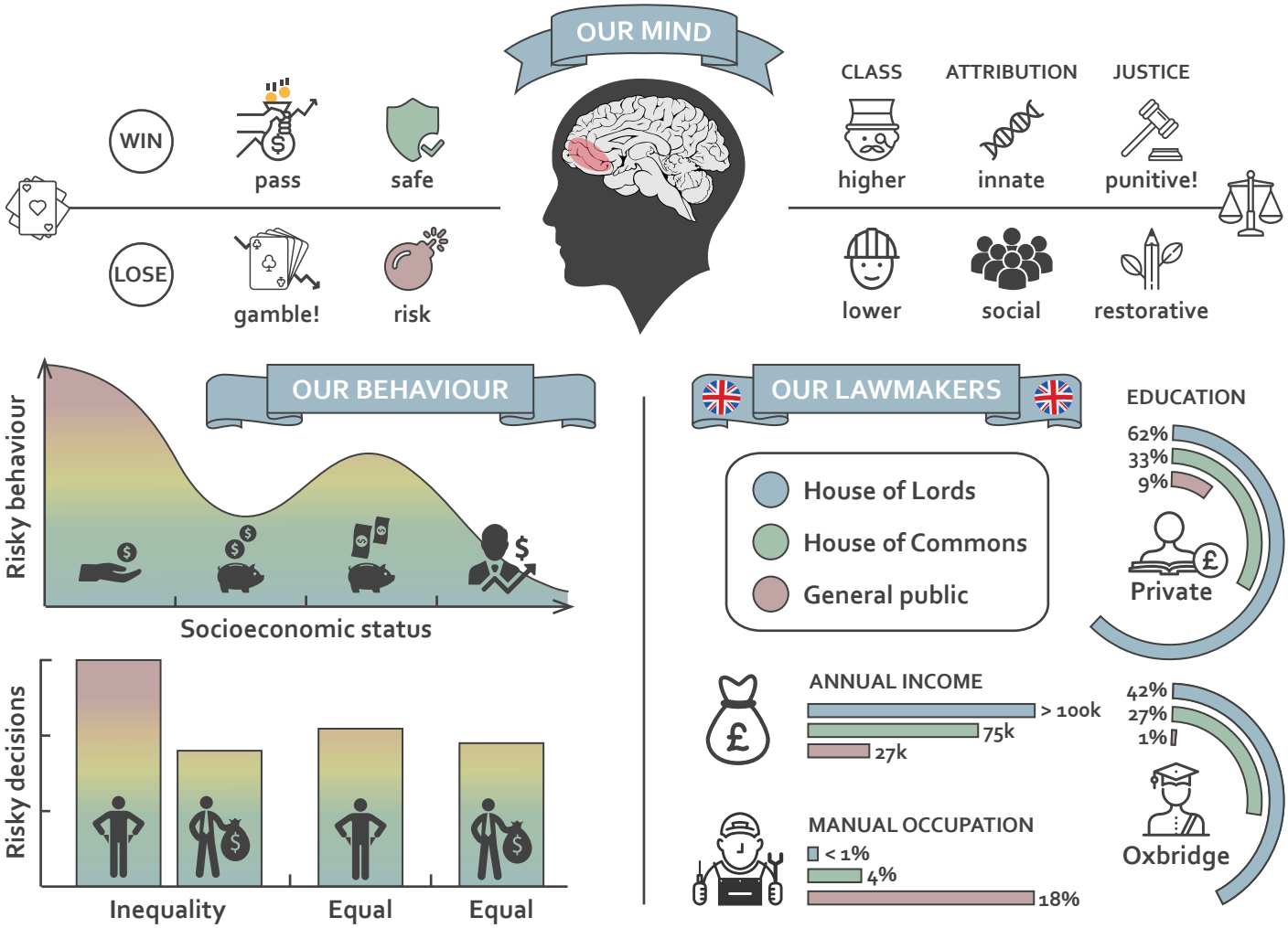
People higher in social standing tend to attribute criminal behaviour to biological traits of offenders. Individuals from elevated social classes often prefer sentences intended to punish perpetrators rather than to rehabilitate[7]. Addressing the disparity in lawmaker class may facilitate criminal reform by emphasising restorative justice.

Exercise

Cognitive decline associated with aging is a growing problem as general life expectancy increases. Physical exercise may mitigate this decline by improving brain and cognitive functions, even for those with limited physical capacity[8]. Effective interventions based on these insights could be delivered at a very low cost.

Eyewitnesses

Eyewitness identification evidence is less reliable than the general public seems to believe[9]. False identifications can be attributed to several factors, including cognitive, social, and contextual characteristics. Awareness of these indicators can improve the chances of correctly identifying suspects.



RISK TAKING

When experiencing a gain, greater activation of the medial forebrain region was associated with safer behaviour in a gambling experiment. While experiencing a loss, riskier behaviour was observed[6].

This pattern is reversed between extremes: those in moderately good positions are more risk-taking, while those in moderately poor conditions are risk-aversive[10].

Victims of inequality are more likely to take risky decisions compared to those benefitting from, or not experiencing, inequality[5].

PUNISHMENT

Those in elevated social positions tend to attribute behaviour and outcomes to inherent traits. Lower class individuals prioritise social context when explaining behaviour, and thus show greater support for restorative justice in experiments investigating preferred punishment style[7].

The average British lawmaker is high in objective measures of social class compared with the general British population*. This may obstruct support for restorative justice despite the potential benefits of criminal rehabilitation.

SOCIAL INEQUALITY AND JUSTICE SYSTEMS

Risk-taking behaviour is likely to be considered as unchangeable by higher class lawmakers, and thus more harshly punished in the justice system. This may contribute to the continued existence of social underclasses in prison populations.

What if we could use exercise to slow the **decline of cognitive functions** in older adults?

3 hours of active exercise per week

increases the volume of the **hypothalamus** by **2%**

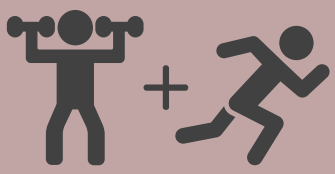
BUT

doing only stretching exercises showed a **reduction** of **1.4%**

Improves:

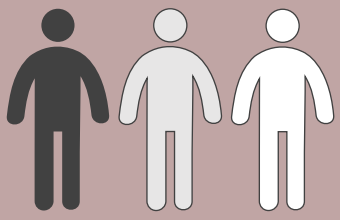
- processing speed
- working memory
- executive function

What benefits might there be by combining **resistance** training with **aerobic** fitness?



What if we could improve the **accuracy of eyewitness** identification?

False lineup identification is more prevalent **if the eyewitness is**



from a different **race**,

a **child**,

or an **older** adult.

Which eyewitness identification **lineup** is more accurate?

	simultaneous*	**sequential***
correct ID	43%	41%
false ID	11%	18%

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Note

The information provided about British lawmakers and public was compiled from multiple official UK parliamentary and national statistic web sources and publications. These can be retrieved from our online archive.

"In the simultaneous procedure, the members of the lineup are presented together, whereas in the sequential procedure, the members of the lineup are presented one at a time for individual recognition decisions"[11].

Further details are available at http://bit.ly/2bCxTkw

Evidence-based policy process

There are many existing models that attempt to describe how policies are developed. To effectively support evidence being integrated within, the Policy Research Group utilises two pragmatic yet theoretically-backed tools. This approach considers such models as well as wider considerations throughout the process and after implementation. The first provides a general order for the process to remain consistency. The second establishes a rating scale to support stable assessment of evidence in terms of appropriateness for application.

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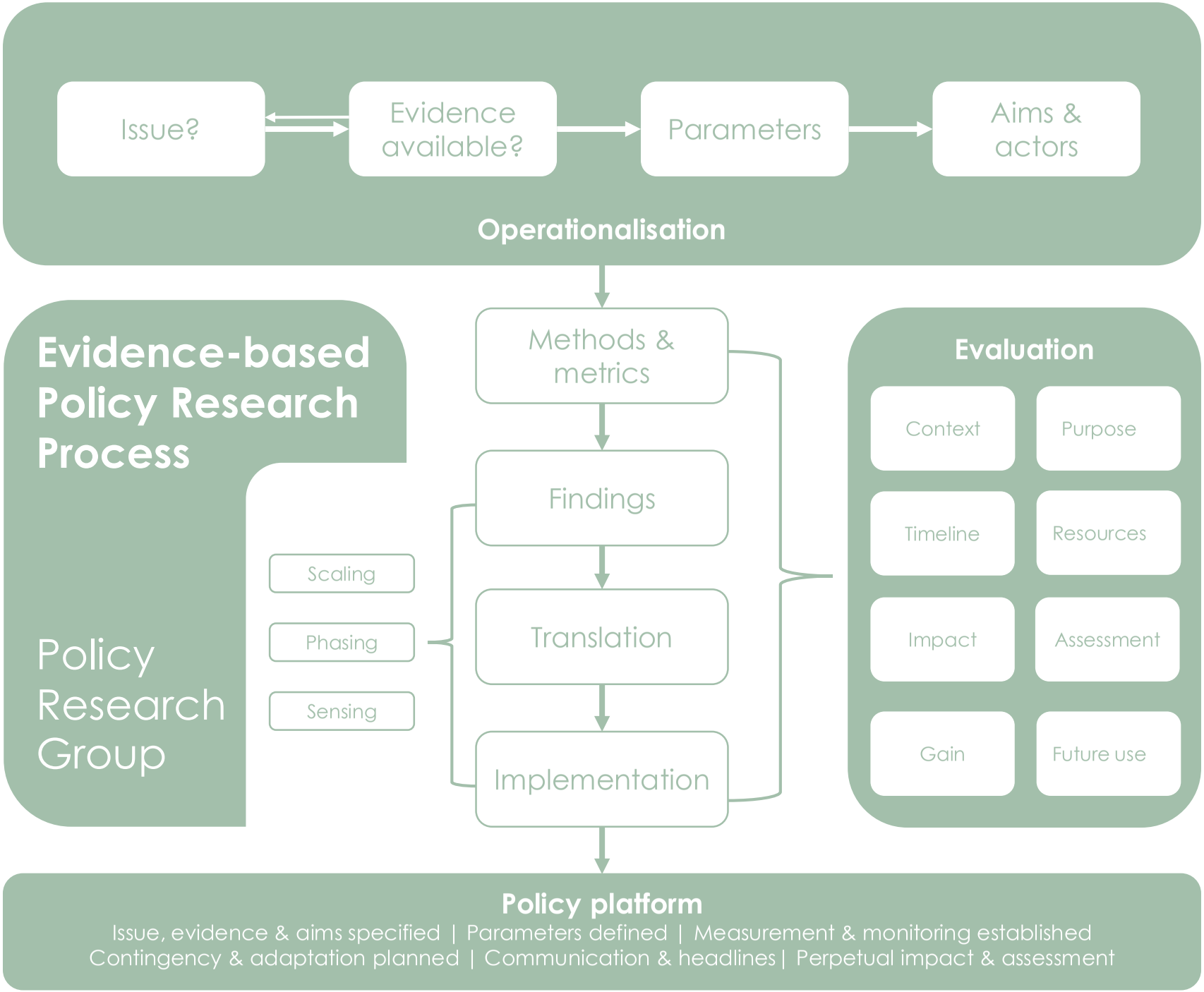

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Psychology and policy

The role of psychology in policy has been evident for decades. This has ranged from clinical guidelines for therapies in mental health services to dealing with safeguarding against poor financial choices in vulnerable populations. Recent initiatives to establish behavioural science teams within governments and international organisations have furthered this position. This has also been furthered via recognition of psychological insights in fields such as economics, public health, and politics. However, with increasing attention given to improving the process of translating evidence, the Policy Research Group has begun development of multiple tools to support such initiatives.

Evidence-based policy research process

A large number of theoretical and applied models exist that attempt to explain the processes involved in the development of policies. However, they are often overly simplified, focus only on the period after a problem is recognised or after the policy has been implemented. They sometimes may simply lack any element for direct application that would catalyse integration of evidence in a systematic fashion. As such, the PRG utilises a pragmatic tool for outlining a policy process driven by evidence.

Policy Assessment Index

The purpose is to present structure and consistency rather than suggest being a comprehensive or sufficiently nuanced to be universally accurate. It is broken into five primary stages. The first involves operationalising key aspects such as defining the issue and key objectives. This is followed by the development of methods, measurements, translation of findings, and expanding implementation at scale. The aim of this approach is to produce a policy *platform* that is suitable for long-term use as a tool to monitor and adapt as key indicators change. By using this tool, we aim to be consistent and diligent even when faced with highly complex issues. An overarching theme of the process is evaluation, which is set as distinct but critical for effective delivery and improvement of any such exercise.

The rating scale provided on the previous page is a working version of a tool under perpetual development within the PRG. The purpose of this tool is to provide guidance for scientists and the wider public in being able to classify not only what qualifies as evidence, but also appropriateness for application in policy or other practice. This report primarily focuses on findings rated between 1 and 8. It is important to note that ratings are not meant for direct comparison (e.g. better or worse), but rather for types of validation and scale of insights.

Policy Assessment Index

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This rating scale is a working version of the tool used within the Policy Research Group to assess the appropriateness of published evidence for use in policies. Further details are provided on page 19 of the report.

0	**Theory proposed** Concept proposed through scientific channel but only as theory without empirical validation.
1	**Possible issue suggested** Some research has been done that may explain an issue, whether positive or negative.
2	**Issue identified** Sufficient evidence available that converges on specifying a precise issue, problem, opportunity.
3	**Issue understood** Consistent and robust body of work comprehensively describes issue on near-standardised level across the discipline.
4	**Consensus on approach** Across the discipline, there is general agreement on appropriates methods for assessing, measuring, and analysing the issue.
5	**Consensus on evidence** Using standardised approaches, there is consistent agreement on the interpretations and applications of the issue.
6	**Intervention tested** Issue is understood sufficiently to attempt improvement, reduce negative, or otherwise influence outcomes.
7	**Intervention validated (contained)** In a controlled or niche environment, the intervention has resulted in good fidelity and efficacy.
8	**Intervention validated widely** An intervention has been successfully evaluated in a real-world setting beyond a single group or location.
9	**Intervention applied & translated** Results of the intervention have been used in multiple contexts at scale for applications beyond initial purpose or target group.
10	**Impact validated** Application, scaling, evaluation widely established across diverse groups and settings with converging interpretations of outcomes.

Illness & disorder

Mental disorders and obesity currently affect a quarter of the global population directly. Early preventive measures and novel evidence-based psychological treatments present critical opportunities to improve quality of life, particularly amongst those affected by such conditions.

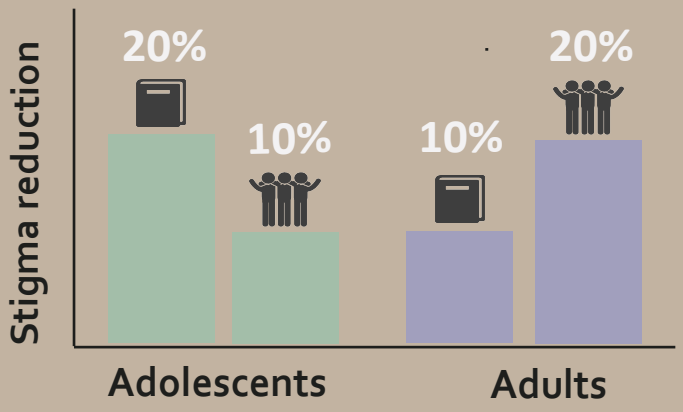
Improving **mental health services** through...

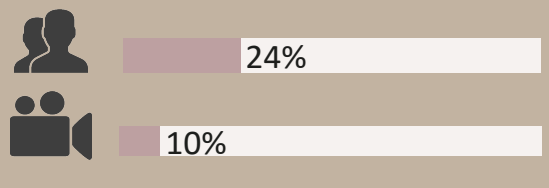
DIMINISHING STIGMA

Stigma interventions need to be highly tailored to the age of the population...

Education
Replacing stereotypes with facts

Contact
Interacting with members of stigmatised groups

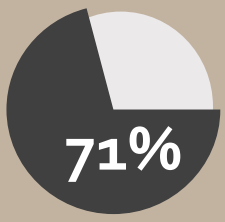




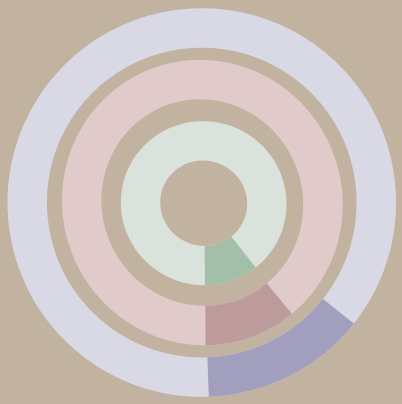
Face-to-face contact has larger impact than contact by video.

CLIENT PREFERENCES

Clients who choose their preferred treatment have...



of patients reported preference for having an active role in treatment decisions



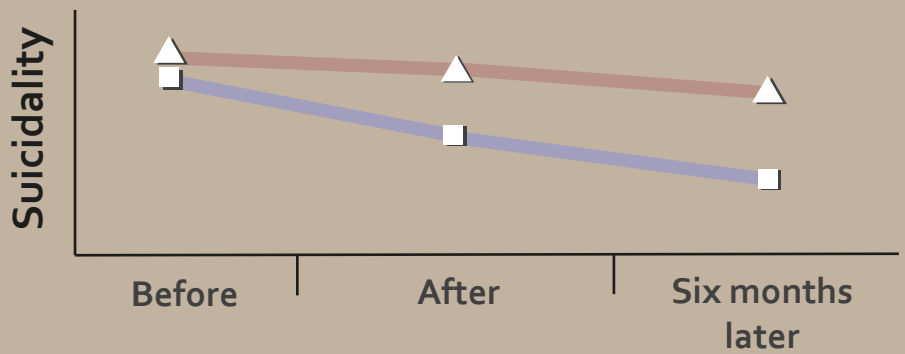
17% higher levels of satisfaction,

10% greater completion rates,

8% symptom reduction.

FAMILY INTERVENTION

Family inclusive suicide interventions for adolescents are more effective compared to usual treatment...



10% lower dropout rates

Improves family functioning

Cost-effective

Insights

Preferences

There are several benefits of assessing client preferences and providing treatment choices when two or more effective options are available. These gains include greater satisfaction with treatment, lower dropout rates, and better clinical outcomes[1].

Family intervention

Interventions to reduce suicide that include family members may reduce adolescent suicidal and self-harming behaviour. This intervention may help to increase the quality of family functioning, decrease suicidal and self-harming behaviour, and lower the treatment dropout rates[2, 3].

Stigma

The stigma of mental illness has a negative impact on help-seeking attitudes and predicts poorer therapeutic outcomes. Interventions based on interacting with members of stigmatised groups (for adults) and replacing stereotypes with facts (for adolescents) significantly improve attitudes towards people with mental illness[4].

Portion size

Excessive consumption of food and sugary drinks is a leading determinant of obesity. Individuals typically consume more when they are offered large portions, particularly adults. Unhealthy food and larger packaging exacerbate this. Reducing the size and availability of calorie-dense food may help decrease the obesity epidemic at population level[5, 6].

Nutrition

Dietary choices of pregnant women may affect the development and progress of mental disorders in children as much as a child's individual diet[7]. Possible ways of addressing this issue include lowering healthy food prices, promoting healthy food choices, and educating expecting mothers about the benefits of a wholesome diet.

Food intake impact on illnesses & disorders

NUTRITION

Low-quality maternal diet has an effect on childhood mental disorder prevalence.

Toddler diet influences probability of later mental disorder development.

High-quality diet*

Reduction in depression risk by **30-50%**

40-50% lower incidence of cognitive impairment.

38-68% delay in Alzheimer's dementia onset.

Dietary coaching resulted in a **40-50%** improvement in depressive symptoms.

DOWNSIZING

Daily energy consumption can be reduced by **11%** if people receive smaller portions.

Larger portion size leads to...

...children eating **10%** more.

...adults eating **22%** more.

People are more affected by food portion size when they choose unhealthy food.

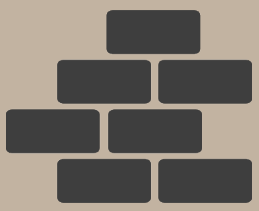
Food package shows the largest influence on consumption, increasing it by **26%**.

Mental disorders account for roughly a quarter of health-related disability worldwide, and the proportion of aging individuals in the world population is increasing[8]. This demands critical examination of possible ways of protecting the population from neurological disorders and age-related diseases, which pose a major burden for affected individuals and their loved ones.

Potential ways of tackling this issue include lowering healthy food prices and educating about the benefits of a wholesome diet, as well as including the principle of downsizing: an approach which utilises the idea of reducing portion size[9]. Furthermore, reducing the size of tableware and packaging, as well as packing food in individual units, leads to long-term obesity prevention and in turn protects physical and mental health[6].

*High quality diet includes: high intake of vegetables, fruit, whole grains, nuts and seeds; moderate consumption of dairy products, fish (high in omega-3), olive oil; low intake of red meat, red wine, and saturated fats.

What if ?



Social stigma is one of the **main barriers** to treatment and social inclusion.

What would happen if **attitudes** towards people with **mental disorders** improved?

HELP SEEKING

EMPLOYMENT OPPORTUNITIES

When clients decide to **stop** psychotherapeutic treatment, **chances of improvement** drop.

The **psychotherapy dropout** rate is **47%**

Is there any way to change this?

The **clinical, economic,** and **moral** burden of dropout may be reduced...

...if clients were allowed to choose their preferred treatment.

According to a 2014 report by **WHO,** more than **1.9 billion adults** and **41 million children** were overweight or obese.

Could downsizing portions help to tackle this **global issue**?

One study showed that reducing the quantity and size of portions...

DOWNSIZING → **-184 kcal per day** → **-9 kg annually**

References

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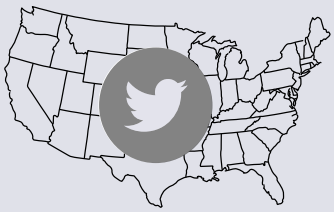
Further details are available at http://bit.ly/2byR41K

Big Data

Big Data refers to large, rapidly accumulating, and often unstructured data sets and their analysis. It holds enormous potential for revealing patterns, trends, and associations in human behaviour, which may serve as a platform for introducing interventions tailored to specific individuals or populations.

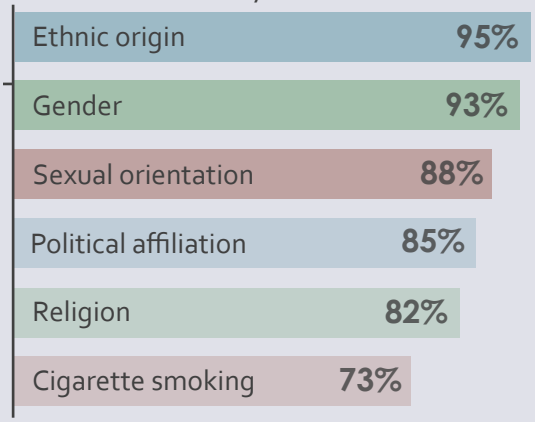
BIG DATA can be used to:

INFER
- risk factors
- mental states
- personal attributes
- population characteristics

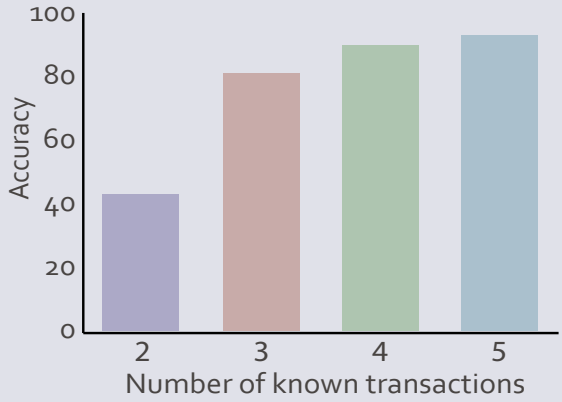


Regional levels of heart disease mortality can be predicted based on Twitter language.

Prediction accuracy from Facebook likes*



DEANONYMISE information

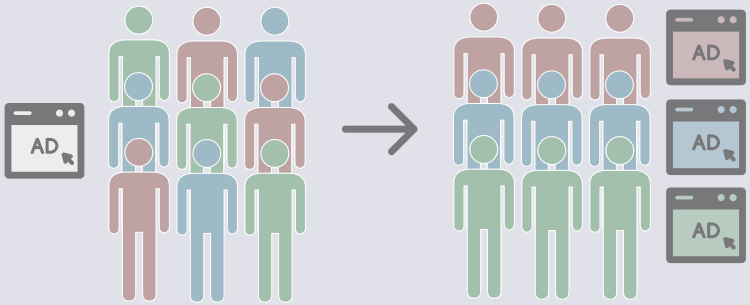


ONLY 4 TRANSACTIONS

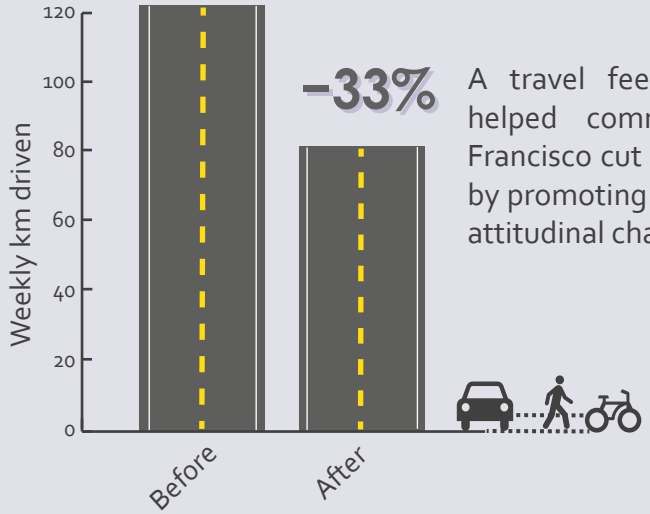
were necessary to identify bank account owners with 90% accuracy, in a dataset of 1.1 million bank accounts.

PERSONALISE services

Insights into individuals' characteristics, habits, and preferences gained from Big Data are being used to personalise advertisements.



INFLUENCE behaviour



-33%

A travel feedback program helped commuters in San Francisco cut down on driving by promoting behavioural and attitudinal changes.

Showing Facebook users who among their close online friends had voted in an ongoing election made them more likely to vote, resulting in an additional amount of

280,000 votes.

*Based on a binary distinction involving two major ethnic origins, genders, sexual orientations for males, US parties, religions, and cigarette smokers and non-smokers.

Insights

Assessment

Risk factors, personal characteristics, mental states, individual patterns, and population trends have been inferred from online behaviour[1]. This approach may help identify individuals and groups of interest to policymakers and beyond, and is more time- and cost-efficient than administering surveys.

Intimate traits

Intimate personal information has been predicted from basic digital footprints[2]. While this information might be used to offer more personalised products and services, it raises questions regarding privacy and putting vulnerable individuals at risk.

Privacy

Privacy can have a measurable impact on behaviour and well-being. Attitudes toward sharing sensitive information have been shown to be vulnerable to manipulation[3]. As it is possible to infer information beyond what people may intend to share[4], the omnipresent observation implied by Big Data is likely to have real-world psychological effects on a large scale.

Empowerment

People may feel empowered by collecting and sharing their data. This could be facilitated by receiving understandable, personalised feedback and advice based on their own individual data[5]. This may then lead to a greater impact of personal Big Data on individuals' behaviour and well-being[6].

Social influence

Analysing social media networks could improve our understanding of how and under which circumstances people influence each other online. This may be used to design interventions to alter behaviour across many domains, such as voting in elections[7] or consumer behaviour[8].

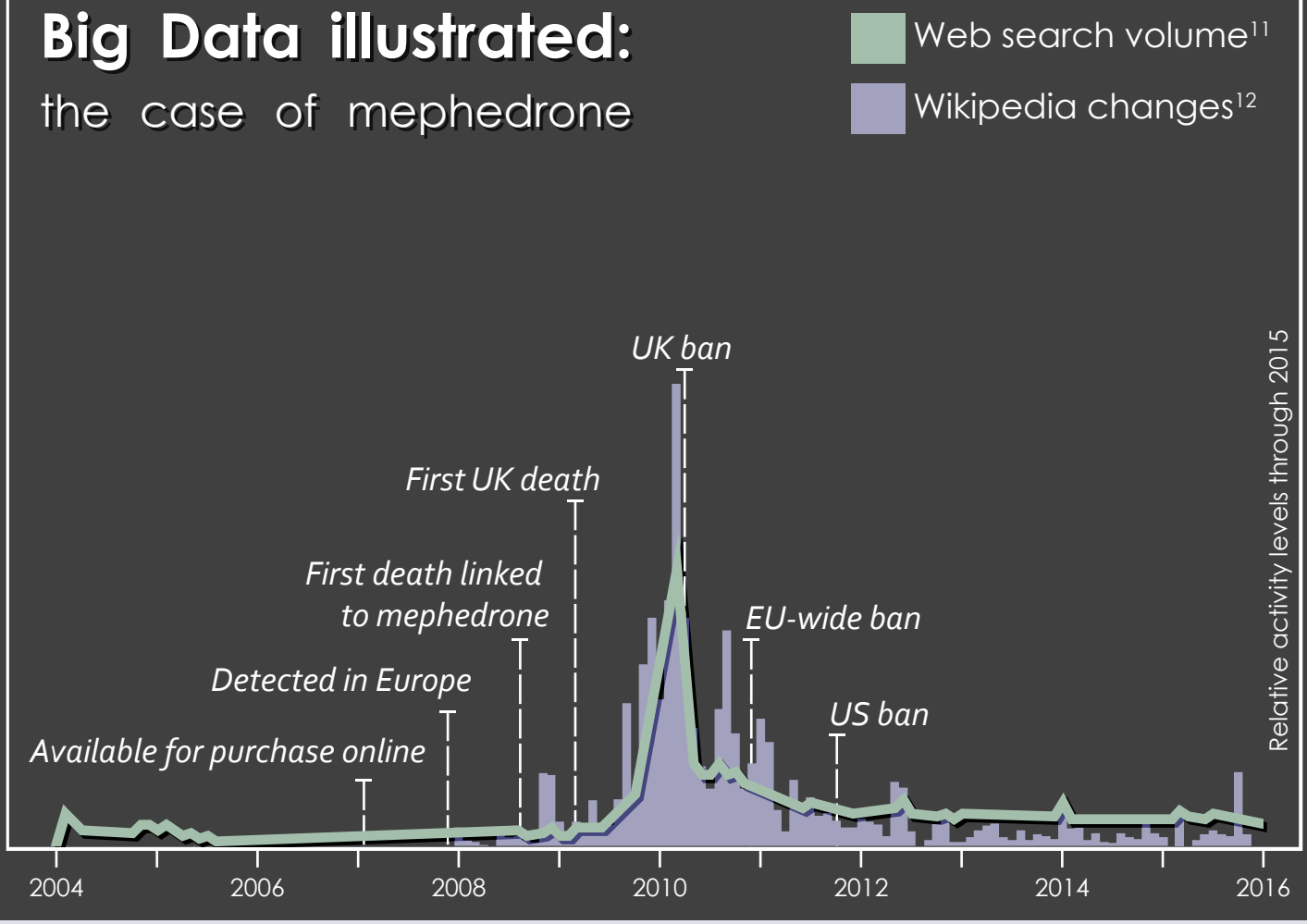
Urban development

Sensor networks deployed in smart cities, which integrate data from social networks and smartphones, can give a real-time view on mobility in the urban landscape[9]. This could help inform planning decisions and drive persuasive sustainability programs that could change the way people think about travelling.

Substance abuse

Substance abuse trends have been monitored and anticipated via social media analytics[10]. Doing this further could support clinicians and administrators in assessing attitudes, enhancing preparedness, and responding to threats much earlier than is possible using traditional indicators.

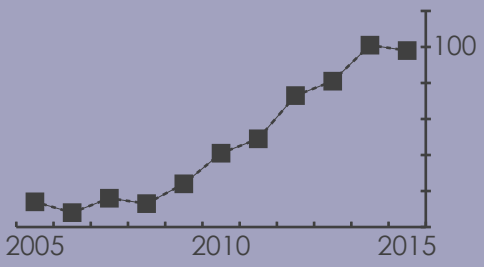
Big Data illustrated:
the case of mephedrone



Mephedrone, a now-banned stimulant that was marketed as a "legal high" for party-goers, appeared in Europe circa 2007 and was linked to multiple deaths and increased addiction treatment demand in the years that followed[13]. This graph shows how changes in the volume of people searching for *mephedrone* on Google Search, and in the number of modifications to the substance's English-language Wikipedia page, corresponded with key events related to the substance's popularity, which peaked in 2010. These data are among the diverse indicators used by next-generation monitoring programmes to anticipate potential threats to public health, gauge attitudes regarding substance use in different groups of society, and assess the effectiveness of interventions[10].

In 2005, the European Monitoring Centre for Drugs and Drug Addiction started tracking new psychoactive substances that may pose a public health risk. Since then the number of substances reported annually has been rising. As the internet is a major venue for the sale of these substances, Big Data offers a natural opportunity to track developments in this area.

Number of new psychoactive substances reported to EMCDDA, 2005–2015[13]



The BIGGER picture of BIG DATA

How to make BIG DATA work?*

PRIVACY & EMPOWERMENT

COLLECT Big Data
select, combine, and store data from various sources

How can we balance individuals' control over their Big Data and organisations' demand for this data?

EXPLORE Big Data
uncover possibly relevant relationships

Can we control how much is inferred from Big Data by different parties?

VALIDATE findings
examine whether relationships are meaningful and hold in different settings

How relevant are the findings to populations not covered by Big Data?

DETECT, classify, and infer
recognise situations, behaviour, and characteristics of interest

Can we turn more data into more accurate predictions?

TEST proposed strategies
assess the effectiveness and potential impact of prevention and intervention programmes

How can we make use of real-time data to target individuals more effectively?

IMPLEMENT tested strategies
translate scientific findings into real-world practical interventions

Can we increase the impact of interventions by involving individuals actively?

* Research using Big Data follows a similar process as other forms of scientific enquiry. Depending on the purpose, not all steps in the process have to be carried out to the same depth.

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Note

Similar arguments to those made on the previous page have also been made in the following publications:

Khoury, M. J., & Ioannidis, J. P. (2014). Medicine: big data meets public health. *Science*, *346*, 1054–1055. doi:10.1126/science.aaa2709

Krumholz, H. M. (2014). Big data and new knowledge in medicine: The thinking, training, and tools needed for a learning health system. *Health Affairs*, *33*, 1163–1170. doi:10.1377/hlthaff.2014.0053

Further details are available at http://bit.ly/2bXtm0a

Health & well-being

There is increasing evidence demonstrating the importance of focussing on health beyond the absence of illness, and on understanding well-being beyond happiness. Policies that consider how behaviour, work, and economic factors may improve these critical population outcomes could be generated by using these insights. Relevant findings are now beginning to converge in support of this.

HEALTH & WELL-BEING

DIMENSIONS OF WELL-BEING

- Vitality
- Competence
- Engagement
- Growth
- Positive relationships
- Positive mood

Mobile health

Mobile support	No support	
11%	4.9%	Smoking cessation rates double with text-based support
80%	47%	Higher completion rate of cardiac rehab with app support
3.6%	2.6%	More weight loss in obese people with app support

Servant leadership

Organisations with servant leaders improve employee

- 40% → Performance
- 30% → Well-being
- 13% → Engagement

Social interactions

Company

With high-quality interactions:

- Self-efficacy
- Alcohol and other drugs
- PTSD recovery

Solitude

People who are

Living alone | Isolated | Feeling lonely

have a

32% | 29% | 26%

increased risk of **premature death** compared to baseline

Insights

Mobile health

Mobile phone health applications and text-based interventions, collectively known as mHealth, enable individuals to observe and evaluate their health, thereby improving related behaviours through individualised feedback[2, 3]. Evidence indicates that mHealth tools may increase treatment adherence[4] and improve self-efficacy, self-management[5], and ultimately, health and well-being.

Mindfulness

Mindfulness-based interventions appear to be effective in reducing anxiety, depression, and stress, working mainly through reducing repetitive negative thinking and promoting focus, and emotional stability[6, 8]. In addition, mindfulness-based interventions also seem to have an impact on well-being, emotion regulation, and self-realisation[7].

Servant leadership

Servant leadership is a specific type of leadership focused on employee well-being and development. It is built through leaders' empowerment, stewardship, authenticity and citizenship. Through these features it increases positive psychological capital, and subsequently, employee engagement, and performance[9].

Social interactions

The presence and quality of social interactions are essential for overall health. For several disorders, social bonding helps patients recover faster, with a lack of social support considered a health risk factor[10]. As such, social relationships have a significant role in preventing disorders.

Assessment

As well-being is increasingly considered a useful measure of social progress and recently, improvements in comprehensive measurements have been made. Existing well-being measurements now converge on several important dimensions of well-being: positive emotions, resilience, and vitality, among many[11]. These advancements in the scientific field of well-being can be utilised to improve population-level policies.

Mindfulness

The number of scientific publications on mindfulness has increased steadily in recent years.

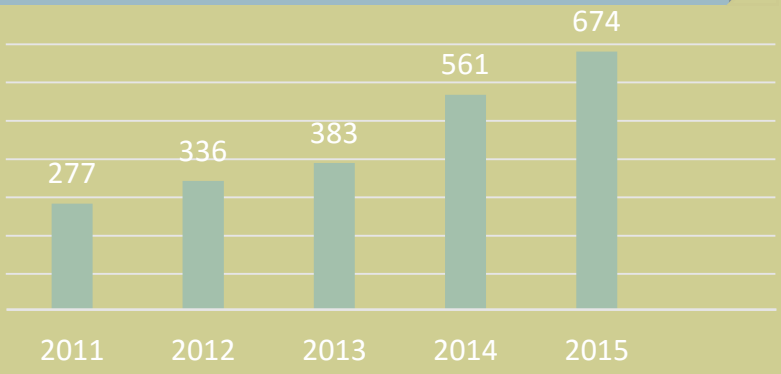
Although there is considerable scepticism about mindfulness-based interventions in the media, results show they may be effective in reducing stress, anxiety, and depression significantly. There is also an indication that such interventions may be as effective as Cognitive Behavioural Therapy or pharmacological treatment.

Research on mindfulness-based stress reduction and mindfulness-based cognitive therapy found that they are more effective than regular meditation, by 13% and 16%, respectively.

One UK government report demonstrates the success of MBIs in important areas such as health, work, education, and criminal justice[12].

However, the question remains whether mindfulness can be applied globally, delivering similar positive effects across different cultures.

Growing in popularity...



Scientific publications on mindfulness

...but people are sceptical...

Mindfulness: does it really live up to the hype?

The Telegraph, 2014

...however some results indicate it may be effective for...

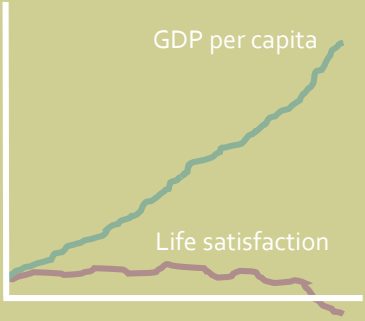
emotion regulation	5%
self-realisation	6%
well-being	10%
stress, anxiety, depression	20%

...overall, mindfulness may reduce unwanted mental processes...

...but does it benefit everyone equally?

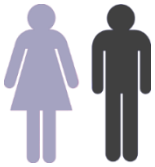
Well-being is more than economic growth.

The OECD found that GDP per capita has increased by 16% between 2007 and 2014, but life satisfaction has decreased by 1.8%.



Improvement in measurements for well-being will support better understanding of the link between health and economy.

Women have a **marginally higher** life satisfaction.



Are there more **critical comparisons** than gender differences?

Higher education is associated with higher level of well-being.

What can be done to preserve the well-being of people with **lower education**?

Children from **poorer households** have 10% lower life satisfaction.

How can we improve well-being of **vulnerable children?**

Life satisfaction and subjective well-being are lowest amongst those aged **50+** in the UK.

What can we do to better the lives of the **aging population**?

Economic growth or economic stability: **Which matters most to well-being?**

What will we gain if well-being becomes a **global goal** for public policy?

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Note

Ad 5) Those apps were specifically designed to enhance self-management. Although most apps in general help to self-monitor, not all of them necessarily improve self-efficacy and self-management.

Further details are available at http://bit.ly/2coBMzx

Conclusion

The preceding pages have illuminated evidence from psychological research between 2011 and 2015. Studies and findings presented here have potential for application in policy and beyond. The following section summarises these insights and presents a breakdown of ratings based on suitability for application. Recognition is then provided for major findings already applied in policy and practice.

Conclusion

This report presents a variety of insights across many domains in psychology. We are delighted that researchers in our field are illuminating such meaningful topics. Their findings will eventually drive the development of useful frameworks for understanding policy-relevant outcomes, leading to better approaches for integrating evidence.

In the first section, the Decisions team identified insights related to organisations, leadership, and biases in decision-making. It was concluded that leaders are in a unique psychological state, that puts them at risk to behave over-optimistically and self-focused. However, new measures of personality, combined with better understanding of social influences, could help to prevent such unwanted outcomes.

The Cognition and neuroscience team presented insights focused on cognitive abilities and the ways in which contextual factors may influence them. Evidence currently suggests that brain training provides limited benefits across tasks and that social context very likely influences the way we think. Systematic translational work and consideration of social context will allow these insights to fully realise their impact.

As outlined in the Illness and disorder section, poor mental and physical health affects much of the global population. We highlight new insights into intervention and prevention. Many of these approaches have been developed for those directly affected by illness, disorders, and unwanted outcomes. As such, our focus was on how new evidence will contribute to improving psychotherapy and mental health services for greater impact on critical health concerns.

The section on Big Data outlines tremendous opportunities to improve understanding of policy-relevant outcomes and to serve individuals as well as societies. At the same time, we note how it also poses a major challenge regarding regulation of access and individual right to privacy. Data literacy and empowerment will be crucial levers with which researchers and policy makers can facilitate the acceptance and integration of new technologies into science.

Understanding and measuring well-being has led to a major rethinking about whether economic growth should be the main indicator of social progress and thus the primary target of policy-based interventions. Mindfulness, empowering employees, social support networks, as well as individualised technology-supported health care, have demonstrated great potential for improving well-being, though much is left to be done to approach population-level impact.

As the first attempt at producing such a report, the Policy Research Group is pleased at the diversity and breadth represented on the preceding pages. We look forward to future adaptations of this approach as well as the opportunity to highlight advancements in psychology in coming years. While no single statement will appropriately conclude a report of such a spectrum of topics as well as the outlook for the field, we will simply reiterate our mindset. In short, we hope these pages engage individuals of all backgrounds with recent insights from research in psychology, and that by doing so, we have illuminated their potential for meaningful impact, in policy and beyond.

Insights *with* impact

This report primarily focuses on evidence that is considered as having the potential for impact. However, psychology has a long and expanding tradition of application in policy, including during the same period of 2011 to 2015. Below are examples of studies identified for this report which were assessed as 9 or 10 in the Policy Application Index, as they are widely in use already across a number of settings. As such, they have been presented here to highlight impact rather than potential, which is the focus in other sections.

Retrieval practice, or the use of practice tests to improve learning, has been successfully applied in authentic classrooms in the United States to enhance the final performance of middle-school students.	1
Financial incentives are effective in encouraging health-benefitting behaviour such as attendance for vaccination or screening smoking cessation in various countries.	2
Strategies in preventing and treating obesity, such as promoting physical activity or front-of-package traffic light nutrition labelling, have been linked with decreased levels of obesity in Australia.	3
Online CBT is being used as an effective and viable alternative to face-to-face treatment for individuals who are unable or unwilling to seek traditional forms of mental healthcare worldwide.	4
Mindfulness-based interventions have already had a successful impact in the United Kingdom through health-related, educational, organisational, and prison settings.	5

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Summary of insights

As described, insights were only selected if they received a Policy Assessment Index rating between 1 and 8. Beyond this, there was no predetermined plan for selection distributions by rating.

The actual distribution of PAI ratings in the report is therefore a random result of the work with the suggested insights rather than an attempt to apply a strategic approach or generate a systematic breakdown. This distribution is shown proportionately in the graphic below.

Apart from **1 (possible issue suggested)**, insights of all other ratings have been included here. This was not intentional but likely represents its own insight into the approaches psychologists utilised in evidence-building.

In total, we present 30 insights in the report. The most frequent rating in these is **6 (intervention tested)**, which is applied to eight insights. The median number of time a specific rating was assigned was three.

These numbers are purely descriptive and do not express any specific message. They are presented solely to overview the level of evidence presented by the selected insights.

About the project

Junior Researcher Programme

The Junior Researcher Programme is an independent research initiative for psychology students and early-career researchers. Its primary function is to support six projects developed annually at the jSchool, which is an intensive, week-long event involving over 40 individuals at undergraduate, postgraduate, doctoral and postdoctoral levels. Each year, they develop and carry out original research supervised by a PhD student or postdoc, with members representing over 30 countries each year. A team of volunteers supports each project for the duration of the 13-month programme. Highlights of the programme include publication of research protocols with a partner journal, *Frontiers in Psychology,* as well as the annual JRP conference, held each August in Corpus Christi College, Cambridge.

JRP Internship

The JRP internship provides students with the opportunity to engage in research translation. It is through this activity that JRP members are able to contribute to the *Insights for Impact* report each August. Interns are briefed throughout the year prior to arriving in Cambridge, where they are assigned themes with supervision from a Cambridge PhD student or postdoc. All interns must generate their own funds and contribute a variety of scientific and administrative skills.


2016 contributors

Policy Research Group

The Policy Research Group is a recently established unit in the Department of Psychology at the University of Cambridge. It is led by Dr Kai Ruggeri and a revolving team of early-career researchers in psychology, public health, and economics. The PRG functions on the core principle that more actionable evidence in policies leads to better population outcomes. To demonstrate this, the team works on a series of projects across many domains of interest to psychologists, policymakers, and industry. The ultimate goal within PRG is to generate relevant evidence for decision-making, whether informing leaders about complex challenges or simply engaging individuals with research outcomes in a way that speaks to the widest possible audience. In reaching for this goal, we hope to offer improved outcomes for populations, particularly regarding their well-being and economic stability.

Junior Researcher Programme

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