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An independent academic psychologist, based in England, who has written extensively on different areas of psychology with an emphasis on the critical stance towards traditional ideas.

A complete listing of his writings at <http://psychologywritings.synthasite.com/>.

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1. EXTRAORDINARY AND UNUSUAL EXPERIENCES

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1.1. OVERVIEW EFFECT

Astronauts have a unique experience, among many, of viewing the Earth from the outside, and this can produce a profound reaction called the "overview effect" (White 1987). "A number of astronauts have attributed deep feelings of awe and even self-transcendence to this experience" (Yaden et al 2016 p2) (appendix 1A). Phrases like an "explosion of awareness", and "overwhelming sense of oneness and connectedness" have been used by astronauts (quoted in Yaden et al 2016).

Yaden et al (2016) distinguished three characteristics of the "overview effect" from public comments by astronauts:

a) "Appreciation and perception of beauty" - eg: "the astonishing beauty and diversity of the planet itself" (in Robinson et al 2013 quoted in Yaden et al 2016).

b) "Unexpected (and overwhelming) emotion" - eg: "...when I first looked back at the earth, standing on the moon, I cried" (in Nardo 2014 quoted in Yaden et al 2016).

c) "An increased sense of connection to other people and the Earth as a whole" - "The feeling of unity is not simply an observation. With it comes a strong sense of compassion and concern for the state of our planet and the effect humans are having on it. It isn't important in which sea or lake you observe a slick of pollution or in the forests of which country a fire breaks out, or on which continent a hurricane arises. You are standing guard over the whole of our Earth" (in Jaffe 2011 quoted in Yaden et al 2016).

"It might be tempting to attempt to explain the awe of the overview effect strictly as a response to perceptual vastness, and to equate the experience to that of viewing a natural feature on Earth. But where

natural features on Earth suggest enormity, a distant view of Earth also suggests totality" (Yaden et al 2016 p4). Two aspects of the experience seem important - the Earth against the black vacuum of space, and the familiar landmarks from a different visual orientation (Yaden et al 2016).

"The overview effect might best be understood as a state of awe with self-transcendent qualities, precipitated by a particularly striking visual stimulus" (Yaden et al 2016 p5).

1.2. NEGATIVE SIDE OF EXTRAORDINARY EXPERIENCE

Having an "extraordinary experience" (EE) (ie: "different from and better than the experiences that most other people have"; Cooney et al 2014) can have negative social consequences.

Cooney et al (2014) summed up: "People seek extraordinary experiences – from drinking rare wines and taking exotic vacations to jumping from airplanes and shaking hands with celebrities. But are such experiences worth having? We found that participants thoroughly enjoyed having experiences that were superior to those had by their peers, but that having had such experiences spoiled their subsequent social interactions and ultimately left them feeling worse than they would have felt if they had had an ordinary experience instead" (p2259). These researchers based these conclusions on three studies.

Study 1 - Sixty-eight participants at Harvard University were divided into groups of four for the experiment. They watched a short video alone before discussing it. One of the four watched a highly rated video ("EE") and the others watched a low-rated one. Afterwards, participants rated how they felt after the video and after the social interaction (on a 100-point scale).

Extraordinary experiencers felt good after watching the video, but felt worse (mean 53.26) after the social interactions than the ordinary experiencers (mean 64.37), and also more excluded (mean 80.47 vs 51.00). This study established the negative social costs of EEs.

Study 2 - This study investigated how participants predicted their feelings after the EE. One hundred and five individuals recruited online were told about Study 1, and asked to imagine how they would feel as the extraordinary experiencer and an ordinary experiencer. The participants "correctly predicted that the extraordinary experience would leave them feeling better than the ordinary experience would before the interaction, but failed to realise that it would leave

them feeling worse after the interaction" (Cooney et al 2014 p2262), which suggested that individuals "cannot always predict the social costs of extraordinary experiences" (Cooney et al 2014 p2263).

Study 3 - This was a replication of Study 2 with 100 more online participants, but the task was to imagine how the participants in Study 1 felt. "In short, participants did not expect the extraordinary experiencer to be excluded from the interaction, and they expected the extraordinary experiencer to feel better – not worse – than the ordinary experiencers" (Cooney et al 2014 p2263).

Overall, Cooney et al (2014) felt that individuals are faced with incompatible desires - "to do what other people have not yet done and to be just like everyone else... Satisfying the first of these desires can frustrate the second. When extraordinary experiences separate a person from others, these experiences may ultimately reclaim more joy than they provide" (pp2263-2264).

1.3. FAMILY SECRETS

Barnwell (2019) explored the experience of uncovering family secrets by individuals researching their family history. Four hundred Australian non-professional family historians completed an online survey in late 2016.

Barnwell (2019) explained: "In the survey, I asked respondents about the cause and effect of secrets within families, including why the secret was kept, who it was kept from, how the family has reacted to the revelation of the secret and whether the secret will now become part of the official family history. For ethical reasons, it was important to me that people be able to draw their own assumptions about what constitutes a secret, and decide how much detail to disclose. To facilitate this, I did not require respondents to explicitly state the nature of the secret itself, and some withheld this information" (p1118).

Thirty-nine responses were focused upon as they offered "concrete accounts of structural damage across generations as a 'consequence' of family secrets, such as conflict, ostracism and family separation. These responses offered varying levels of detail about specific consequences, but they all focused on the slow-burning ramifications of one or more family secrets" (Barnwell 2019 p1118).

Barnwell (2019) linked her analysis to Nixon's (2011) idea of "slow violence" - "a violence of delayed

destruction that is dispersed across time and space, an attritional violence that is typically not viewed as violence at all" (quoted in Barnwell 2019). Also to Goffman's (1963) concept of "tribal stigma" - "the stigma that comes with belonging to a group, and is thought to 'be transmitted through lineages and [can] equally contaminate all members of a family'" (Barnwell 2019 p1116).

So, families keep secrets across generations to manage the slow violence of stigma. For example, "Melissa" talked about bigamy and illegitimacy in her family: "I guess that the reason these types of things were kept secret is that people think it was shameful, that others will think less of them and such information could stop them from having a career, or family or getting ahead in life. Or... what will people think if they knew the truth about us?" (p1119).

While the "fear of emotional contagion" of "tribal stigma" was evident for "Ellen" in the family secret of her uncle's institutionalisation as a young man for schizophrenia.

"Myrtle" reported the pressure from childhood to keep her mother's affair with her brother-in-law secret both within the family and outside. One consequence was no Christmas family events. "Myrtle explains that for many years she 'invented stories at work about 'what I did at Christmas'' having 'learnt that it was easier to embellish the truth than to say after I left home at 16 years old I never went back'" (Barnwell 2019 pp1122-1123).

Respondents also reported being the focus of the secret, as with "Julie" who had a child out of marriage many years ago: "When I told my father over the telephone, 'He said don't come home. What would the neighbours (everyone) think, bringing disgrace upon the family'. [...] when there was a family discussion about my situation, it was taboo to mention I ever had given birth to a child. It was never to be discussed within the family, let alone to friends or neighbours" (p1121).

Barnwell (2019) concluded that "families often attempt to revise their narrative and control information and relationships to prevent the transmission of what Goffman calls 'tribal stigma'. In a complex response to both potential and actual discrimination, secrets can be the means by which families both defend against and perpetuate social stigmas. This stigma, as the family historians' responses show, takes the form of emotions such as shame, which are presumed to be contagious and to foreclose certain social opportunities. As a reaction, families may keep secrets to shield the family. Nixon's theory of slow violence can help us to recognise the workings and long-term ramifications of unseen, yet injurious social acts" (pp1123-1124).

1.4. APPENDIX 1A - AWE

1.4.1. Pro-Sociality

Encouraging pro-social behaviour is usually good for society, and researchers are reporting different ways of doing this.

One such way is through awe. This is defined as "an emotional response to perceptually vast stimuli that defy one's accustomed frame of reference in some domain... People typically experience awe in response to asocial stimuli like natural wonders, panoramic views, and beautiful art" (Piff et al 2015 p883). It is suggested that awe is a collective emotion that "produces specific cognitive and behavioural tendencies that enable individuals to fold into collaborative social groups, and engage in collective action" (Piff et al 2015 p883) (ie: enhanced pro-social tendencies).

One aspect of this is the "small self" (Piff et al 2015). Shiota et al (2007), for example, found that participants asked to recall a personal experience of feeling awe rated themselves as feeling smaller and less significant than controls.

Piff et al (2015) test the general hypothesis that "awe can result in a diminishment of the individual self and its concerns, and increase pro-social behaviour" (p883) with five studies.

Study 1 - This was an Internet study involving 1519 participants from a Knowledge Networks nationally representative panel in the USA ¹. They were asked to rate themselves for different emotions on the Dispositional Positive Emotions Scale (DPEC-r) (Shiota et al 2006) ². Items like "I often feel awe" were scored on a seven-point scale ³. The participants then played the "dictator game", where they were given ten raffle tickets and asked how many they would share with an unseen stranger. This was the measure of pro-social behaviour. Half of the participants were the "decider" and half the "receiver" (controls).

Participants who rated themselves higher on awe gave away more raffle tickets. This was a significant positive correlation.

Study 2 - Seventy-five US adults were recruited to this online experiment via Amazon Mechanical Turk. They

¹ 752 were male, and overall ages ranged from 24 to 93 years old. Most were European-American.

² This measures seven positive emotions - amusement, awe, compassion, contentment, enthusiasm, love, and pride.

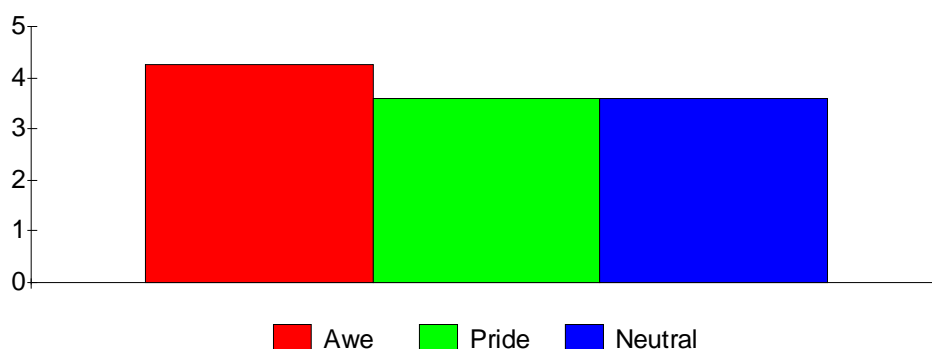
³ This is a Likert scale, where 1 = "strongly disagree", to 7 = "strongly agree".

were randomly assigned to one of three conditions ⁴ to recall a past experience - awe, pride, or neutral ⁵. For example, the instructions in the awe condition read: "Please take a few minutes to think about a particular time, fairly recently, when you encountered a natural scene that caused you to feel awe. This might have been a sunset, a view from a high place, or any other time you were in a natural setting that you felt was beautiful" (p887). The pride instructions focused on personal achievement, and the neutral (control) condition was simply the recall of a recent event.

The "small self" was rated after this with an item about feeling "the presence of something greater than myself".

The outcome measure ⁶ involved eight scenarios, like being given too much change in a shop and not reporting it ⁷, that assessed the "participants' willingness to prioritise self-interest over collective norms and others' interests" (p888). Participants rated themselves in each case on a seven-point scale (where a higher score was a more pro-social or ethical decision).

Participants in the awe condition were more likely to endorse ethical decisions than the other two conditions (figure 1.1). The awe condition also "triggered a sense of something greater than oneself, which indicates a relative diminishment of the concepts and concerns attached to the individual self... Moreover, the sense of a small self accounted for the effects of awe on ethicality" (Piff et al 2015 p889).



(A higher score is a more ethical decision)

Figure 1.1 - Mean scores of ethical scenarios (out of 7) in three conditions of Study 2.

⁴ Independent participants design or between-participants design.

⁵ The type of recall was the independent variable.

⁶ The dependent variable was the pro-social or ethical decision.

⁷ "You've waited in line for 10 min to buy a coffee and muffin at Starbucks. When you're a couple of blocks away, you realise that the clerk gave you change for \$20 rather than for the \$10 you gave him. You savour your coffee, muffin, and free \$10" (p888).

But "participants wrote about a time when they had experienced a target emotion such as awe, and it is possible that participants' memories of the events, and not the experience of awe itself, influenced their ethical tendencies" (Piff et al 2015 p889). Also the "small self" was measured by a single item.

Study 3 - This experiment with 264 US students ⁸ attempted to rectify the two limitations mentioned above of the previous study. Rather than recall an event, participants watched a five-minute video to create the emotion - awe, amusement, or neutral ⁹. Afterwards, participants rated themselves on four items to measure the "small self" (eg: "I feel small or insignificant"). Participants then played the "dictator game" (with points) as the "decider" ¹⁰.

Participants were significantly more generous after watching the awe video (figure 1.2), and the level of generosity positively correlated with feelings of the "small self".

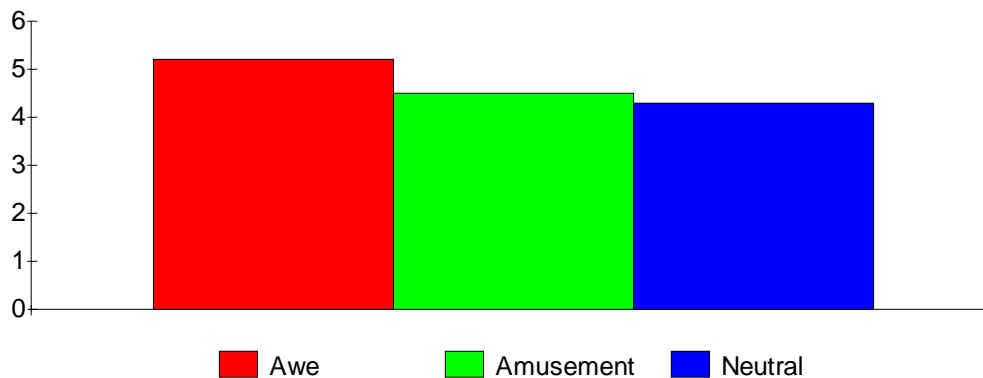


Figure 1.2 - Mean points (out of 10) donated to an unseen stranger based on type of video watched beforehand.

The focus of the research so far has been nature-related awe. The subsequent experiments investigated awe created in other situations/ways.

Study 4 - This online experiment with 100 US participants ¹¹ presented them with one of three three-minute long videos ¹² ¹³:

⁸ 180 were female, and overall the main ethnic group was Asian American.

⁹ The independent variable was the type of video watched in this independent participants designed experiment.

¹⁰ The dependent variable was the number of points donated to an unseen stranger.

¹¹ Mostly European-American, and an overall age range of 18-67 years old.

¹² The type of video watched was the independent variable.

¹³ An independent participants design.

- Carpentry (neutral)
- Natural phenomena like tornados (threatening awe condition)
- Droplets of water in super-slow motion (non-nature awe).

After the video, participants completed a measure of the "small self" before nine hypothetical sharing scenarios to test pro-social tendencies^{14 15}.

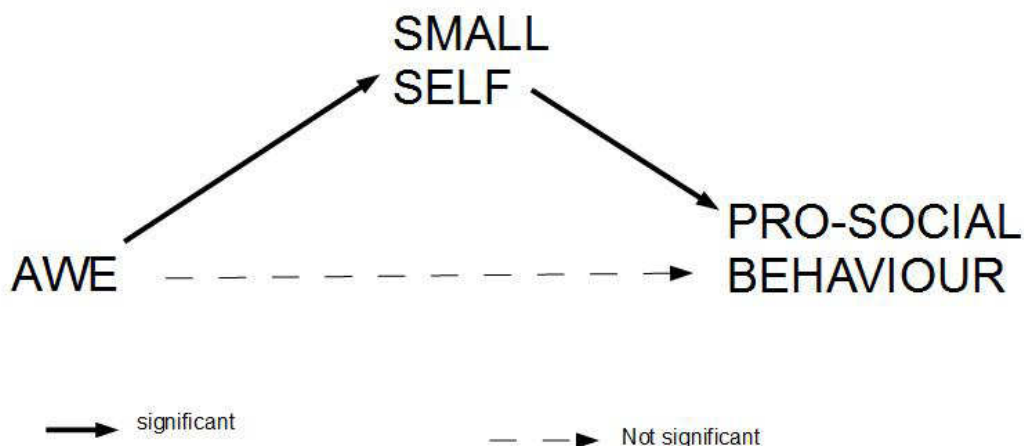
Pro-sociality was higher in the two awe conditions than the neutral one, and the "small self" rating was positively correlated with pro-sociality. This study showed that awe and the "small self" can be created by vastness (as in natural phenomena) and by small things (but "vast in complexity"; Piff et al 2015 p893).

This experiment was based on watching videos rather than a real-life experience of awe as in Study 5.

Study 5 - Ninety US students were involved in this field experiment, and they were taken to look at tall trees (awe condition) or buildings (neutral condition) on campus before completing a version of the ethical scenarios from Study 2.

The awe condition produced more ethical or pro-social decisions than in the neutral condition.

Overall, the studies showed a relationship between awe and pro-social behaviour that was mediated by feelings of the "small self" (figure 1.3).



(Based on figure 1 p889 Piff et al 2015)

Figure 1.3 - Relationship found by Piff et al (2015).

¹⁴ Individuals chose between 3 options - (A) 480 points for self and 80 points for unseen stranger, (B) 540 for self and 280 for other, and (C) 480 points each. Choosing option C is the pro-social choice.

¹⁵ The dependent variable was the scores on these measures of pro-sociality.

The five studies used a variety of participants, ways of creating awe, and of measuring pro-social behaviour. But only one study involved a real-life situation of awe, whereas the others depended on short videos or recall. The Internet studies had less control on how the participants performed the experiment (eg: watching the video attentively or while doing something else).

1.4.2. Prade and Saroglou (2016)

Prade and Saroglou (2016) tested the influence of awe on "pro-social inclinations" in two online experiments.

Experiment 1 - 127 young adults were recruited from French-speaking Facebook university groups. They were randomly allocated to one of three conditions - awe (instructed to think of a stunning landscape), amusement (a time when laughed with friends), or neutral (last grocery shopping experience). The outcome measure (or dependent variable) was to imagine a lottery win and write down how they would allocate their winnings (eg: give away to others or charity).

Participants in the awe condition reported that they would give more of their winnings to others (mean 41%) compared to the amusement condition (mean 37%) and the neutral condition (mean 28%).

Experiment 2 - 170 more students were recruited in the same way as above. The three independent conditions of awe, amusement, and neutral were based on watching a three-minute video clip (beautiful landscape, comic sketch, or beer brewing techniques). Pro-sociality was then measured with nine hypothetical scenarios (eg: help with homework).

Participants in the awe condition were more willing to help (mean 3.18 out of 5) than the other two conditions (amusement 2.93 and neutral 2.69).

The participants had previously taken a personality test for the "Big Five" traits, and only Agreeableness (A)¹⁶ was significant. It was found that individuals low on A were most impacted by awe in terms of pro-social behaviour, whereas for high A individuals it was less so. In other words, low A individuals in the awe condition were significantly more pro-social than low A individuals in the other conditions, but there was no significant difference for high A individuals.

¹⁶ This dimension includes traits like co-operativeness, kindness, altruism, and trusting.

These two experiments confirmed the relationship between awe and pro-social behaviour found in US studies.

1.4.3. Threat-Based Awe

"Awe is a complex emotion, one that can be intensely pleasurable or imbued with dread depending on the context and how it is appraised... Paradoxically, awe exists in the 'upper reaches of pleasure and on the boundary of fear' (Keltner and Haidt 2003)" (Gordon et al 2017 p310)¹⁷.

Gordon et al (2017) focused on "a more negative variant of awe that arises in response to vast, complex stimuli that are threatening (eg: tornadoes, terrorist attack, wrathful god)" (p310). The consequence is feelings of less control and certainty, fear, and powerlessness.

Gordon et al (2017) reported six studies into "negative awe".

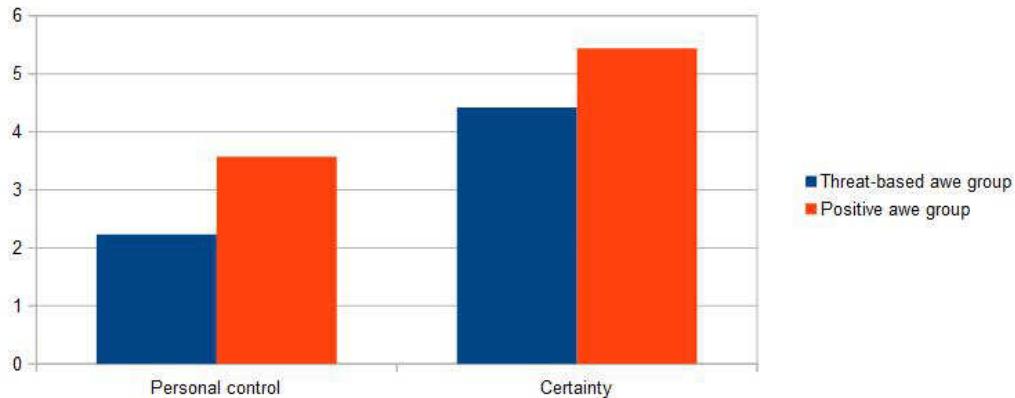
Study 1 - This study investigated the prevalence of "threat-based awe" with 165 participants (US undergraduates, and adults recruited online via Amazon Mechanical Turk; MTurk). They were asked to remember "an experience in which they felt intense awe", and their responses were analysed for threats or danger. Around one in five responses described "an experience of awe that involved threat appraisals" (p314). For example, one participant recalled the terrorist attack on the World Trade Centre (11th September 2001), and described being "completely awestruck" by "the horrified, shocked, dumbfounded sort of awe" (p314).

Study 2 (a and b) - These two studies compared negative and positive awe. In the first part, the participants (n = 299) were sampled as above from undergraduates and MTurk. After thinking about an experience of awe, they were asked to score it on seven-point scales, including for feelings of personal responsibility and control, and certainty.

Forty-one participants were categorised as recalling a threat-based awe event, and the others a positive-awe experience. Comparing the two groups on the self-reported scales, the "negative awe" group had significantly lower personal control and certainty scores, for example (figure 1.4). The two groups were clearly not equal in

¹⁷ Keltner and Haidt (2003) described two core aspects to awe - "(a) perceived vastness, which refers to the sense that the stimulus is beyond the scale of ordinary human perception, and (b) the need for accommodation, which refers to the sense that the stimulus cannot be assimilated into current mental structures, thus necessitating changes to basic beliefs, categories, and schemas" (Gordon et al 2017 p311).

terms of number of participants.



(Data from Gordon et al 2017 table 1 p316)

Figure 1.4 - Selected mean ratings (out of seven) in Study 2a.

In the second part of this study, 384 adults recruited online were instructed to think about a positive or negative awe event rather than choosing for themselves (table 1.1).

Threat-based awe:

- "Often we feel awe in response to natural disasters such as earthquakes, hurricanes, or volcanic eruptions. We can also feel awe in response to people who cause large-scale devastation, such as Hitler and the vast horrors of the Second World War. Other times, we might feel awe towards an idea that is amazing and scary at the same time – such as the mysteries of space".

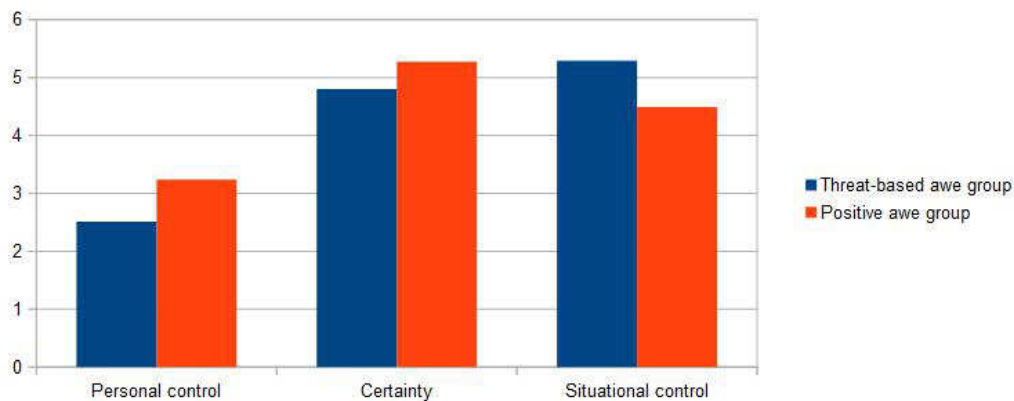
Positive awe:

- "Often we feel awe in response to vast, beautiful landscapes and natural wonders such as tall mountains, expansive vistas, or large waterfalls. We can also feel awe in response to people who cause large-scale change such as Nelson Mandela and his role in ending apartheid in South Africa. Other times, we might feel awe towards an idea that is amazing and wondrous – such as the mysteries of space".

(Source: Gordon et al 2017 p316)

Table 1.1 - Instructions in Study 2b.

The threat-based awe group reported significantly lower personal control and certainty scores, and significantly higher feelings of situational control (ie: feeling that the situation is beyond anyone's control) (figure 1.5).



(Data from Gordon et al 2017 table 1 p316)

Figure 1.5 - Selected mean ratings (out of seven) in Study 2b.

These two parts of Study 2 established that "[T]hreat-based awe experiences were characterised by power appraisals of personal responsibility and control over the situation and greater situational control and uncertainty" (Gordon et al 2017 p317).

Study 3 - This study investigated the physiological reactions (eg: heartbeat) to watching ambiguous awe-inducing video clips with 107 first-year US undergraduates.

Participants who perceived the videos as threat-based awe had a higher heart rate than participants who perceived positive awe.

Study 4 - This study involved 105 undergraduates keeping a diary for fourteen days describing their experiences of awe, powerlessness, and well-being. "Each night participants were asked to describe that day's most awe-inducing experience. In doing so, participants described whom they were with, where they were, what they saw, and how they felt. Participants were forced to report on the experience that gave them the most awe, regardless of whether they actually felt awe that day, to maximise compliance" (Gordon et al 2017 p319-320).

The diary entries were then coded and analysed by the researchers.

On the days that threat-based awe experiences were reported, ratings of well-being were lower than on positive-awe days (mean 5.87 vs 6.34 out of 10, and 5.95 on no-awe days).

Threat-based awe experiences were also more likely to include feelings of powerlessness (53% vs 8% in

positive-awe descriptions).

Overall, the data analysed were small - 410 awe experiences in total and fifty-one rated as threatening.

Study 5 - This study also investigated awe and well-being, but with 525 adults recruited online, who watched one of four short videos. The threat-based video showed tornadoes with ominous music, while the positive-awe video involved wide sweeping camera shots of nature with uplifting music. The fear condition involved an extract from a horror film, and the neutral video was of a man building a fence. Afterwards, participants completed different rating scales including well-being.

Participants in the positive-awe condition reported well-being score improvements between pre- and post-video measures, while the threat-based awe group had a fall in well-being. This relationship was partially mediated by powerlessness. "That is, participants in the threat-based awe condition did not experience the same boosts in well-being after the awe experience relative to participants who were in the positive awe condition, and this lack of enhanced well-being was due in part to the fact that participants felt more powerless (beyond feelings of self-size) during threat-based awe experiences" (Gordon et al 2017 p324).

Gordon et al (2017) summed up: "Across six studies using cross-sectional, daily experience, physiological, and experimental methods, threat-based awe consistently differed from more positive forms of awe in its appraisals, affective experience, physiological correlates, and consequences for well-being" (p324).

The researchers had began with five hypotheses that were supported by their findings (table 1.2).

Table 1.3 summarises the different methods used by the researchers.

The key methodological limitations of Gordon et al's (2017) studies included:

a) Where the researchers created awe, the focus was nature, which ignored awe elicited by interpersonal experiences (Gordon et al 2017).

b) The measures of well-being were immediate and momentary, and were the main outcome measure in some studies. "Threat-based awe likely has differential effects on a variety of outcomes and it will be important to uncover those outcomes which are uniquely influenced by threat-based awe. For example, this variant of awe might reduce curiosity, cause individuals to behave more submissively, or question awe-inducing authority figures less" (Gordon et al 2017 p325). Long-term measures of well-being are also needed.

HYPOTHESIS	STUDY
1 - "Threat-based awe will be characterised by reduced appraisals of control and certainty more so than positive awe".	2a & 2b
2 - "Threat-based awe will generate significantly more fear and anxiety and less positive affect than positive awe".	2a & 2b
3 - "Threat-based awe will be associated with indicators of greater sympathetic autonomic nervous system activation, whereas positive awe will be associated with indicators of greater parasympathetic nervous system activation".	3
4 - "Threat-based awe will not produce the same benefits for well-being as more positive awe".	4
5 - "Differences in well-being between threat-based and positive variants of awe will be explained in part by feelings of powerlessness" (p313).	5

Table 1.2 - The five hypotheses stated by Gordon et al (2017) and the study numbers that supported them.

c) The samples were self-selecting on MTurk (ie: volunteers who use that platform paid a small amount to participate) or undergraduates.

STUDY	METHOD	SAMPLE
1	Survey	2 sets of US undergraduates (UGs); US adults from MTurk
2a	Survey	US UGs; US adults MTurk
2b	Online experiment	US adults MTurk
3	Laboratory experiment	US UGs
4	Diary study	US UGs
5	Online experiment	US adults MTurk

Table 1.3 - Methods and samples in six studies by Gordon et al (2017).

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2. SURVEILLANCE CAPITALISM

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2.1. OVERVIEW

Zuboff (2015) used the concept of "surveillance capitalism" (SC) to describe the "deeply intentional and highly consequential" accumulation of "Big data", which "aims to predict and modify human behaviour as a means to produce revenue and market control" (p75).

Varian (2014) noted a trade-off where people agree where people agree to the "invasion of privacy" to "get something they want in return... a mortgage, medical advice, legal advice - or advice from your personal digital assistant" (quoted in Zuboff 2015) (appendix 2A). Zuboff (2015) argued that SC goes further than that. She talked of "Big Other" ("a new universal architecture existing somewhere between nature and God"): "It is a ubiquitous networked institutional regime that records, modifies, and commodifies everyday experience from toasters to bodies, communication to thought, all with a view to establishing new pathways to monetisation and profit. Big Other is the sovereign power of a near future that annihilates the freedom achieved by the rule of law. It is a new regime of independent and independently controlled facts that supplants the need for contracts, governance, and the dynamism of a market democracy" (pp81-82).

Put very simply, the trade-off is very one-sided. Relationships are usually based on trust, but SC is the "precise opposite": "Doctors, attorneys, and other trusted professionals are held to account by mutual dependencies and reciprocities overlain by the force of professional sanction and public law. Google... does not bear such burdens. Its formal indifference and distance from 'users', combined with its current freedom from meaningful regulation, sanction, or law, buffer it and other surveillance capitalists from the consequences of mistrust" (Zuboff 2015 p83). Asymmetries of power and asymmetries of knowledge (Zuboff 2015).

Zuboff (2015) asserted: "Surveillance capitalism challenges democratic norms and departs in key ways from the centuries-long evolution of market capitalism" (p75).

Because of these concerns, Olah (2019) challenged the claims of large technology companies to "save" us from social problems by letting them have access to more personal data (eg: Google and NHS patient data). She stated: "To ensure that we retain the control over these systems and to avoid an unprecedented level of power being concentrated in the hands of an unaccountable elite, our infrastructure needs to be brought under state control" (Olah 2019).

2.2. MONITORING AND THE GIG ECONOMY

One consequence of the development of the Internet in the 21st century is the "gig economy". This consists "both of work that is transacted via platforms but delivered in a specific locality and of platforms that enable remote working... Examples of platform work in the local gig economy are transport and food delivery, while remote gig work consists of the non-proximate provision of a wide variety of digital labour, ranging from data entry to software programming" (Wood et al 2019 p932).

What is the experience of individuals involved in this type of work? Wood et al (2019) reported interviews with workers in the remote gig economy in South-East Asia and sub-Saharan Africa, who worked via online platforms (like "virtual labour exchanges").

"Nicote", a virtual personal assistant from the Philippines summed up the experience: "[My] online job is not that secure, because unlike with actually working physically in an office, [where] you get to sign a contract, you get to see your bosses, they get to see what kind of work you actually do... [Online] work varies from one thing to another. And the fact that you don't have an actual binding agreement with your employer other than you rely on [the platform] to treat you and somewhat like negotiate whatever disagreement you may have with your employer. Yes, you kind of feel that it's not secure" (p939).

The "employers" or "clients" were in high-income countries. The physical distance created issues around the development of trust, and Wood et al (2019) noted the "importance of trying to develop long-term higher-trust personal relationships with clients was widely recognised by our informants. There were some examples of higher-trust relationships, including long-term relationships, personal communication via other mediums, the granting of advances and the giving of gifts" (p938).

From the "employer's" side, online platforms, which

link the two parties for a fee ¹⁸, provided various monitoring and disciplinary mechanisms (eg: ratings from previous contracts). "These monitoring and disciplining mechanisms suggest that outsourcing platforms do not provide an architecture for generating trust on the basis of thick, strong, stable and durable ties. Indeed, they are disincentivised from doing so, as they would soon be bypassed by clients and workers communicating directly" (Wood et al 2019 p939).

Workers with high reputational ratings on the platforms accessed more work, and "these workers were in such demand that they often could not satisfy it on their own. One solution was to use the platforms to re-outsource the work. In total 33% of our survey respondents reported that they had re-outsourced work in the seven previous days either through hiring other online workers, or by hiring workers in their local area or friends and family. It was in this manner that labour became embedded within interpersonal networks of trust generated through micro-level interactions" (Wood et al 2019 p940).

But the lead worker has the responsibility for ensuring the quality of the work. There was also "the fear that secondary workers, who despite the more durable ties, could never be completely trusted as they might try to cut out the lead worker by contacting the client directly. Therefore, the additional costs and risk could be reduced and trust increased through utilising local interpersonal networks made up of family, friends and local colleagues" (Wood et al 2019 p940). For example, "David" in Kenya said he "looked for a few friends I knew that were looking for work. Asked them if they have a computer. They did, so I call them to my house because I have Internet connection. I call them, so I delegate each person a certain task" (p941).

The insecurity and commodification of labour on the gig economy platforms is seen in "the construction of workers as online 'freelancers' and 'contractors' left them without legal labour rights and protections" (Wood et al 2019 p943). Few interviewees had health insurance, for instance. The workers also experienced "significant unpaid 'work-for-labour' (Standing 2016) as time spent on work-related activities such as breaks, training, job searching and applying and waiting for work went unpaid..." (Wood et al 2019 p943).

Overall, though these workers were remote from their

¹⁸ The CEO of one of the platforms talked of creating "an eBay of jobs". Another CEO said: "We don't get involved in telling people where to work or how to work or whatever, it's literally, 'It's up to you, you can pick and choose whatever'... sort of like frictionless little marketplace, it really is up to you" (p942).

"employers" and faced insecurities of the gig economy (disembeddedness), they remained embedded in interpersonal relationships, both locally and sometimes with "employers", particularly as a means to overcome lack of trust inherent in the gig economy (Wood et al 2019) (appendices 2B and 2C).

2.3. PREDICTING PUBLIC HEALTH

Internet search data "may provide valuable insights into patterns of disease and population health" (Nutti et al 2014 p1) ¹⁹.

"Google Trends" is a free, publicly available online portal which analyses "Google Search" searches to provide "data on geospatial and temporal patterns in search volumes for user-specified terms" (Nutti et al 2014 p1). This produces a relative search volume (RSV) (ie: the relative importance of a particular search term for a given location and time period) (Nutti et al 2014) ²⁰.

Nutti et al (2014) investigated how health researchers were using Google Trends with a systematic review of studies (up to the end of 2013) (n = 70 articles).

Four main topic domains were distinguished for the use of Google Trends - infectious diseases, mental health and substance use, other non-communicable diseases, and general population behaviour (excluding mental health- and substance use-related behaviours).

Three categories of study aim were found:

i) Causal inference - The relationship between a variable and search trends, like a public figure's health problem and general searches about that health problem (eg: Jade Goody's cervical cancer diagnosis and searches about cervical cancer; Metcalfe et al 2011).

ii) Descriptive - Geographical and temporal trends for searches about a health issue (eg: searches about in-vitro fertilisation (IVF) between 2004 and 2009; Connolly et al 2009).

iii) Surveillance - The use of Google Trends to predict future disease cases (eg: searches for suicide information and suicide deaths in Taiwan 2004-9; Yang et al 2011).

For example, heroin-related emergency department

¹⁹ This is "big data" (appendix 2D).

²⁰ Also search volume indexes (SVIs) are used. These are "normalised values based on total searches during a specified period per selected region" (Bloom et al 2015 p903).

hospital admissions. Young et al (2018) collected US data on these for ten metropolitan areas for 2005 to 2011, and Internet search data on twelve prescription and non-prescription-related opioids from Google Trends for 2004-11.

Across the datasets, the number of Internet searches for general information using certain terms like "China White", "Codeine" and "Methadone" in the preceding year significantly predicted heroin-related overdose admissions. The assumption was that an increase in searches about the drugs was a sign that more people were thinking of consuming them, and this increase will manifest in the future as more (accidental) overdoses. This idea works at a population-level rather than at an individual one.

The study used only Internet search data using Google, and so searches using other search engines were not included as well as cases where opioid-related information was not investigated. In terms of the data, "Google Trends does not provide raw data on the number of searches but rather normalised search volume" (Young et al 2018 p168).

Bloom et al (2015) collected Google Trends data for 2010 to 2014 on the search terms "skin cancer" and "melanoma" to see if these were associated with the future cases of the condition. US data on melanoma incidence and mortality did not correlate with searches, "suggesting that increased search volumes may not be associated with early detection" (Bloom et al 2015 p904). Searches for the terms did increase during the summer months, however.

Bloom et al (2015) emphasised the limitation that Google Trends is "restricted to only the segment of the population with access to the Internet" (p904).

Concerning their systematic review, Nuti et al (2014) observed that "the majority of studies lack thorough documentation of search methodologies, which precludes the reproducibility of results; less than 10% of articles are reproducible. In addition, search rationale is often not provided. Thus, while the data within Google Trends holds promise, significant variability and limitations remain around study quality and reliability" (pp45-46).

Different selections of search terms for a common question can produce different results, and this is why it is important to detail methodology. For example, the rationale for choice of terms or specific syntax, the query categories, and search dates. Also whether to include potential misspellings of the search words, like Desai et al (2012) and searches about the norovirus. While Cho et al (2013) asked individuals beforehand what search terms they would use in a study of influenza-

related searches in South Korea, 2007-12.

2.4. APPENDIX 2A - RE-IDENTIFICATION

The collection of large-scale digital data is assumed to not be connected to specific individuals, so consent is less of an issue. De-identification (ie: anonymised datasets) has been the justification for the sharing of information on the Internet.

"Right now, the decision on whether the benefits of digital-data studies outweigh the risks largely falls to the researchers who collect and analyse the data - and not to the people who are unwillingly taking part" (Editors 2019).

However, (re-)identification of individuals in anonymised datasets is still possible. For example, journalists in Germany in 2016 re-identified politicians from an anonymised browsing history dataset of three million citizens, while medical records have been re-identified in Australia (Rocher et al 2019).

Rocher et al (2019) developed an algorithm to identify individuals from large anonymised datasets. Using real data from Massachusetts, for example, zip code, date of birth, and gender gave a 58% likelihood of being identified, but by adding number of children, the figure increased to 80%. Fifteen demographic attributes "would render 99.98% of people in Massachusetts unique" (Rocher et al 2019 p5). Datasets may contain ten times that many attributes.

The researchers also challenged the "claims that a low population uniqueness is sufficient to protect people's privacy" (Rocher et al 2019 p6) with their algorithm.

Facebook (FB) uses personal information to link certain online advertising to individuals. These "ad preferences" include political opinions, sexual orientation, personal health, and other potentially sensitive information (Cuevas et al 2019) ²¹.

Cuevas et al (2019) analysed FB data for 197 countries in February 2019, and used five categories of sensitive personal data - racial or ethnic origin; political opinions; religious or philosophical beliefs; health; sexual orientation. Overall, two-thirds of users were labelled with "some potentially sensitive ad preference". FB users in Western Europe were exposed to ads based on sensitive information more than users in Africa and Asia.

²¹ FB attributes "ad preferences" based on "likes", say. FB told the "New Scientist" magazine: "The interest targeting options we allow in ads reflect people's interest in topics, not personal attributes" (Stokel-Walker 2019).

Focusing on specific sensitive issues, "homosexuality" was a label applied to 4.5% of users worldwide, and even "in countries where being gay may be punished with the death penalty" (eg: 2% of users in Saudi Arabia given this label).

"Pregnancy" was an "ad preference" for 15% of all users. "Recently, a journalist of the Washington Post wrote an article to denounce her own experience after she became pregnant. It seems FB algorithms inferred that situation out of some actions she performed while browsing in Facebook. Probably FB labelled her with the ad preference 'pregnancy' or some other similar and she started to receive pregnancy-related ads. Unfortunately, the journalist had a stillbirth but she kept receiving ads related to pregnancy, which exposed here to a very uncomfortable experience" (Cuevas et al 2019).

2.5. APPENDIX 2B - INSECURITIES AND WORK

"Solo self-employed" is a term used to cover freelancers, contractors, gig workers, and one-person business owners, who experience "atypical" work arrangements, like "zero hours contracts" (Datta 2019).

Datta (2019) offered two reasons for the growth in this type of work:

a) Demand-side - the demand for traditional employees is weak among companies.

b) Supply-side - workers are choosing this type of work.

Datta (2019) reported a survey of 2000 individuals in the UK and 2000 in the USA about fictional job choices with varied flexibility and security. The majority preferred job characteristics associated with traditional employer-employee relations. For example, respondents would accept less pay per hour for a permanent contract. This research suggested that it was not the supply-side explanation driving the rise in "solo self-employed".

"Occupational decline" is when workers for a particular occupation are in less demand, for example, because of technological developments. Michaels (2019) reported an analysis of Swedish workers' careers in such situations, and found that low-earning occupations (ie: low- and middle-skilled) were the biggest losers. But the losses from occupational decline are smaller than occupations with mass lay-offs/plant closures (Michaels 2019).

Analysing data from the British Household Panel

Survey (BHSP), and the Avon Longitudinal Study of Parents and Children, Clark (2019) reported a "striking finding" that "the number of financial problems is a far better predictor of behaviour and emotional health than average family income during childhood. (Indeed, the latter is mostly unimportant). It is also as good as a predictor of exam scores as income" (p23). Put simply, living in a household with financial problems when aged 6-11 years old is associated with poorer cognitive and non-cognitive outcomes in adolescence.

Individuals born in London earn more as adults than those born elsewhere in Britain, according to analysis of the BHSP (Bosquet and Overman 2019).

Bosquet and Overman (2019) considered three possibilities for this finding:

- i) Individuals vary based on birthplace.
- ii) Quality of schools, for example, are better in one place than another.
- iii) Individuals tend to stay to work in the place where they were born.

The authors' analysis favoured the first explanation in terms of "parental sorting". Individuals with higher paid jobs (eg: professionals) are more likely to live in cities (than non-cities), and in London. Add to that, the third explanation: "Low lifetime mobility reinforces the link between the location decision of generations" (Bosquet and Overman 2019 p28).

2.6. APPENDIX 2C - EMBEDDEDNESS AND RELATIONSHIPS

Talking about individualism generally, Tornqvist (2019) pointed out that "we are not necessarily automatised and detached but also embedded and connected in late-modern societies, and the relation between hedonism and care, as well as autonomy and love, is often a lot messier than dichotomous charts allow us to see" (p902). She wanted to talk about "individualised collectivism" ("an everyday response to a widespread tension between individualised societies and people's search for community"; Tornqvist 2019 p900).

This idea is contrary to those who see "pure individualism" as threatening relationships. Bawin-Legros (2004), for example, stated that "we are tourists of our own private land and [that] we have entered the world of pure individualism...[F]usion in love... harmonises badly with aspirations to autonomy and self-development which are characteristic of our contemporary world" (quoted in Tornqvist 2019).

2.7. APPENDIX 2D - BIG DATA

Young (2014) summed up the attitudes of many health professionals to "big data": "Social media 'big data' can provide valuable insights about people's behaviours, such as their likelihood of engaging in risk behaviours or contracting a disease. Although in its infancy, advancing this research provides the promise of predicting health-related behaviours to promptly prepare for and respond to public health emergencies and epidemics" (p601).

Via social media like Twitter, Facebook and others, individuals are "becoming increasingly comfortable publicly sharing many types of information, including personal stories and health information, providing data that can be extracted, categorized as psychological and behavioural data, and used for analysis in health research" (Young 2014 p601).

For example, Young and Jaganath (2013) analysed postings by a sample of African American and Latino men in the USA who had sex with other men, and found a predictive relationship with requesting an HIV test.

Young et al (2014) emphasised the benefits of social media with HIV prevention by analysing tweets for sexual- and drug-related risk behaviours and mapping them to official data on HIV cases. "Results from this study found a significant positive relationship between US county-level HIV cases and counties with tweets suggesting the occurrence of sexual risk behaviours, controlling for socio-economic status measurements. These results suggest that behavioural health characteristics might be able to be extracted from social media and used for predicting behaviour and diseases" (Young 2014 p602).

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3. VARIED PAIN: TWO EXAMPLES

- 3.1. Smoking
- 3.2. Altruism
- 3.3. References

3.1. SMOKING

Former and current cigarette smokers report increased levels of bodily pain as compared to never smokers (Perski et al 2020).

For example, Bendayan et al (2018) compared occasional and regular lifetime smokers and non-smokers in the 1946 British birth cohort study for self-reported chronic pain at age 68 years old.

Even a short period of smoking has an effect. In Finland, for instance, smoking at sixteen years old was associated with reporting lower back pain at 18 years old (Mikkonen et al 2008).

Many studies do not control for other variables (eg: length of smoking and major smoking-related diseases; low mood).

Perski et al (2020) reported the British Broadcasting Corporation (BBC) Lab UK Study, which collected data on the BBC website. Bodily pain was self-reported for the last four weeks, and amount of smoking for the last thirty days. Nearly 600 000 individuals completed the survey between 2009 and 2013 (of which 78% were eligible - UK residents aged 16 years and above). Full data were available for 223 537 respondents.

Overall, 80% were never daily smokers, 11% current daily smokers, and the remainder ex-daily smokers. Combining the latter two groups, these individuals reported significantly more bodily pain than never smokers at all age groups. Many variables were controlled in the analysis, including gender, income, self-reported health status, neuroticism, anxiety and depression, and alcohol consumption.

But, Perski et al (2020) admitted, "we were unable to adjust for specific smoking-related disease, length of smoking or time since quitting smoking in former daily and daily smokers..." (p4). Note also that the "never daily smoker" group included occasional current or former smokers.

The study involved volunteers who came to the BBC website from advertisements on BBC television, radio or the website (ie: self-selection bias). The proportion of current smokers was less than the official figures (eg: 19% of the general population) (Perski et al 2020). Also: "As is commonly the case in smoking research, this study was likely subject to the 'healthy survivor effect', a

selection process whereby healthy smokers are likely to be over-represented in the older age strata, as those who experience smoking-related problems may stop or die prematurely" (Perski et al 2020 p5).

In terms of explaining the relationship between pain and smoking, nicotine has acute analgesic effects, and produces physiological changes in the brain. Perski et al (2020) explained that "smoking may lead to chronic down-regulation of the hypothalamic-pituitary-adrenal (HPA) axis. Hence, the analgesic effect of HPA axis activation which typically occurs during exposure to social or physiological stressors may be attenuated in smokers" (p2).

Alternatively, smoking may damage bones, say, which causes the increased pain, or "people who take up smoking may differ systematically from those who do not with regards to personality traits (eg: neuroticism) or illness representations (eg: the tendency to experience psychological distress as somatic symptoms) which are also associated with the development of pain" (Perski et al 2020 p2). The BBC study was not able to explain causation.

3.2. ALTRUISM

Altruistic behaviour is known to improve psychological well-being and health, but Wang et al (2020) showed that it also reduces physical pain perception. These researchers reported two pilot studies and three experiments to support this view.

Pilot Study 1 - Shortly after an earthquake in China in 2013, the researchers recruited thirty-three blood donors and thirty-three blood test takers at a nearby hospital. The participants were asked to rate retrospectively the pain of the needle entering the arm for the blood test/donation. The blood donors reported significantly less pain than the blood test takers (mean 1.52 vs 2.36 out of 10). "The act of having blood drawn to benefit others versus the self was found to alleviate the painful experience. This provides preliminary support for a pain-relieving effect of altruistic behaviour" (Wang et al 2020 p951).

Pilot Study 2 - Eighty-six students at a Chinese university were asked to perform a small altruistic act (agreed or refused) or not asked before a pain perception test (eg: placing hand in cold water). The agreed-altruistic participants reported less pain, and kept their hand in the cold water for longer than the other two groups.

Experiment 1 - Forty Chinese students underwent pain perception tests after being given the opportunity to donate their fee for the experiment to the earthquake emergency fund or not. This experiment took a baseline measure of pain before the altruistic act (or not) and then after. At baseline, there was no difference between the groups in pain perception, but in the second test the altruistic group perceived less pain. "These results indicated analgesia induced by altruistic manipulations" (Wang et al 2020 p951).

Experiment 2 - Thirty-two students received electrical stimulation while undergoing a brain scan after the opportunity to donate their fee to an orphanage or not. The brain scans showed differences in pain-related areas of the brain between the groups. This suggested that altruism leads to an "objective" change in pain perception. The greater the perceived meaningfulness of the altruistic act, the lower the pain perceived.

Experiment 3 - Sixty-four cancer in-patients in China had their pain perception measured over seven days while they were encouraged to help each other or focus upon themselves. Pain perception decreased over the study period in the altruism group.

Wang et al (2020) ended: "Our research has revealed that in adverse situations, such as those that are physically threatening, acting altruistically can relieve unpleasant feelings, such as physical pain, in human performers of altruistic acts from both the behavioural and neural perspectives. Whereas most of the previous theories and research have emphasised the long-term and indirect benefits for altruistic individuals, the present research demonstrated that participants under conditions of pain benefited from altruistic acts instantly..." (p955) ²².

How to explain "altruistic analgesia"? Wang et al (2020) proposed some potential psychological processes:

- Meaningfulness of helping others. "The experience of meaning is often viewed as a cornerstone of eudaimonic well-being. It is generally agreed that meaningfulness is the essence of life, distinguishes human beings, and helps an individual navigate the world" (Wang et al 2020 p954).
- Choosing altruistic behaviour increases perceived

²² Altruism has also been found to change sensory experience - an environment was perceived as warmer (Hu et al 2016) or a heavy package as lighter (Li and Xie 2017), for example.

control of a situation, and stress is known to be lessened in controllable situations.

- Switching attention to others and away from the pain (ie: distraction).

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