PSYCHOLOGY MISCELLANY

No.96 - June 2017

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ISSN: 1754-2200

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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/ and http://kmbpsychology.jottit.com.

CONTENTS

1. A BRIEF SURVEY OF AGEING IN THE "ARAB WORLD"

1.1. OVERVIEW

"Population ageing is a relatively recent phenomenon, though its global manifestations – in particular the changes being experienced by developing countries – have been recognised since the first World Assembly on Ageing was convened by the United Nations in 1982. The older segment of population throughout the world is increasing both in absolute numbers and as a proportion of the total population, with 75% of older people living in developing countries" (Sibai et al 2004 p219).

A number of different countries make up the "Arab world" [1] or the Middle East and North Africa (MENA). They share "similar historical and cultural backgrounds, particularly founded around Islamic culture [2], yet they are not a homogeneous group" (Hussein and Ismail 2016) [3]. The "Arab world" includes some of the richest countries in the world (eg: Kuwait) as well as some of the poorest (eg: Somalia).

Currently, these countries have a "youth bulge" (eg: half the population below thirty years old), but this will mean a large number of older adults in the future (Hussein and Ismail 2016) [4].

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[1] Twenty-two members of the League of Arab states (Hussein and Ismail 2016). Yount and Sibai (2009) included the Western Sahara to make 23 countries.

[2] This means that there are some key differences compared to the West (appendix 1A).

[3] For example, Somalia has a fertility rate of 6.6 children and an average life expectancy of 55 years, at one end, compared to 1.8 and 80 years respectively in Lebanon, at the other end (Hussein and Ismail 2016).

[4] The "demography dividend" describes the situation where a country has a failing birth rate and few older adults (because of short life expectancy), so for a period the majority of the adult population is

The speed of the population ageing process will vary between countries at "fast", "medium" or "slow" tempo (Saxena 2008) [5]. The "fast" tempo countries include Tunisia, Bahrain, Kuwait, and Lebanon (table 1.1) (Hussein and Ismail 2016) [6]. All the countries will experience population ageing in the context of specific social, economic and political changes (eg: "Arab spring"; changes in traditional family structures; decline in oil supplies) as well as the general changes of modernisation, urbanisation, and youth migration [7].

FAST	MEDIUM	SLOW
Bahrain	Oman	Yemen
Kuwait	Saudi Arabia	
Qatar		Iraq
United Arab Emirates	Jordan	Palestine
	Syria	
Lebanon		Comoros
	Egypt	Djibouti
Algeria		Mauritania
Libya		Somalia
Morocco		Sudan
Tunisia		

Table 1.1 - "Tempo" of population ageing of 22 Arab countries (according to Saxena 2008).

Care for older adults is traditionally provided by the family, either through living with or near offspring. With the internal and international migration of young men, in particular, wives are left with the responsibility of caring for older relatives as well as the children (ie: multiple responsibilities).

Use of long-term formal care, where available, is often linked to social stigma because of the "deeply-rooted religious and cultural norms" of informal care (Hussein and Ismail 2016).

The "modernisation" hypothesis argues that

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working age. The benefits of few dependents can be challenged by large numbers of unhappy, under- or unemployed young adults if an economy is not providing work (Heistendahl 2016).

[5] The United Nations in 2008 reported that MENA countries saw population ageing as a "minor" concern (Hussein and Ismail 2016).

[6] One consequence of the "fast" tempo is the challenge of the health requirements of an ageing population that will arrive soon, though this challenge will eventually face all countries whatever their "tempo" (Saxena 2008). It has also been noted that functional ageing occurs earlier and is more pronounced in the developing world (Sibai et al 2004).

[7] Yount and Sibai (2009) highlighted increased schooling as a major social change. For example, around 1990 between 0-15% (depending on the country) of the oldest-old men (ie: over 80 years old) had ever attended school and 0-3% of women, but by the early 2000s, the figures were 4-30% and 1-13% respectively. Among younger adults the figures are much higher (eg: over 90% of men in their 20s in Egypt in 2005). But there is still a large gender gap in some countries (eg: 80% of women in their 20s in Egypt in 2005).

intergenerational co-residence will decline as a society becomes modernised, urbanised, and industrialised, while the "kin-keeping" hypothesis proposes that "mothers still may receive more co-residential support from children because greater maternal investments in family services in early and middle adulthood may foster stronger emotional attachments and greater loyalty from children... In addition, women's continued greater domestic contributions than men's in later life... may make older women more valued as household members" (Yount and Khadr 2008 p204) [8].

These contributions by women have been seen as part of the "patriarchal bargain" (Kandiyoti 1988), where women receive "protection" from kin in exchange (Yount and Khadr 2008).

Longevity is increasing [9], and the longer life can be associated with ill health as well as good health. The individuals with ill health will obviously need the extra care.

There is also "an evident gender-gap" (Hussein and Ismail 2016) with women being more likely to live longer [10], partly due to higher life expectancy, and also large age gaps in marriage (ie: older men with much younger wives). Older women may also end up alone because of polygyny or lack of marriage after divorce or widowhood. Thus, 85% of men over 60 in North Africa in 2009 were married compared to half of that for women (Hussein and Ismail 2016), while 31% of men in their 80s were widows compared to 88% of women in Egypt in 2005 (Yount and Sibai 2009).

Hussein and Ismail (2016) observed: "While... traditional values remain at the heart of Arab society, the practicalities of women delivering elderly care, along with their traditional roles of wives and mothers and meeting other competing and increasingly expected duties of labour participation can be challenging to say the least. With increasing life expectancy and societal changes there are considerable forces that calls for new policy and governmental support that addresses care needs of older people outside the family sphere".

In terms of the retirement situation for the majority of the world, Saxena (2008) summed up: "Those who work in formal sector of the economy having a fixed retirement age loose income upon retirement and those engaged in informal sector, their earnings reduce with

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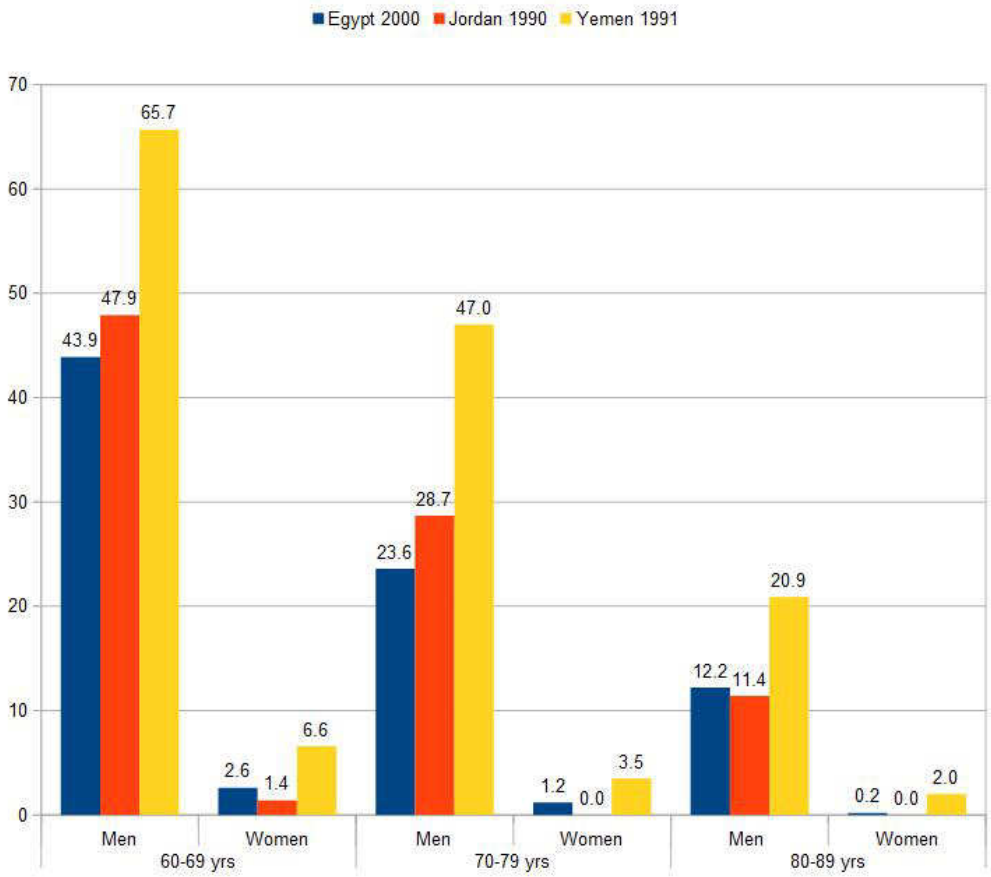
[8] Often differences are seen as between generations (appendix 1B).

[9] In the 1950s, over half of Arab countries had a life expectancy in the 40s, and by the beginning of the 21st century, it was 70-79 years old for over half the countries (Yount and Sibai 2009).

[10] Generally, this has been called the "feminisation of old age".

increase in age. Thus, with the growing age, people generally lose their economic independence in countries having little or no retirement benefits and/or social security schemes for their elderly populations and fall into a perpetual poverty" (p60).

Non-existent or limited retirement benefits mean that older adults have to continue to work (eg: one-third of men in Lebanon working after retirement age of 64 years old; Saxena 2008) (figure 1.1).



(Data from Yount and Sibai 2009 table 13.4 p288)

Figure 1.1 - Percentage of older adults still working in selected countries and years.

1.2. HEALTH SITUATION

Yount and Sibai (2009) noted that there was "an epidemiological transition" taking place in the Arab countries "with non-communicable and degenerative diseases replacing communicable diseases as the leading causes of death and morbidity" (p297). These authors summarised the main health trends, thus:

i) Circulatory diseases (eg: stroke, heart disease) - The leading cause of death in the region, and a prevalence of cardiovascular diseases (CVD), for example, among older adults comparable to the USA. Evidence of the key risk factors - hypertension, obesity, and smoking as seen in this selection of figures:

- Hypertension among 60% of over 65s in Egypt in the mid-1990s;
- Nearly half of over 60s classed as obese in Bahrain in 2001;
- Rates of smoking among adults over 50 years old varying from 4% (UAE) to 38% (Lebanon) (Yount and Sibai 2009).

ii) Cognitive impairment and mental health - Research on these conditions is "sorely lacking, notably among older populations" (Yount and Sibai 2009), but a selection of the figures include:

- 1 in 5 older adults with depression in the UAE;
- Cognitive impairment among 6% of older men and 26% of older women in Saudi Arabia versus 39 and 42% respectively in Egypt versus 80& of the institutionalised population in the UAE (Yount and Sibai 2009).

iii) Musculoskeletal disorders (eg: arthritis) - eg: 24% of older adults in Saudi Arabia and 36% in Jordan (Yount and Sibai 2009).

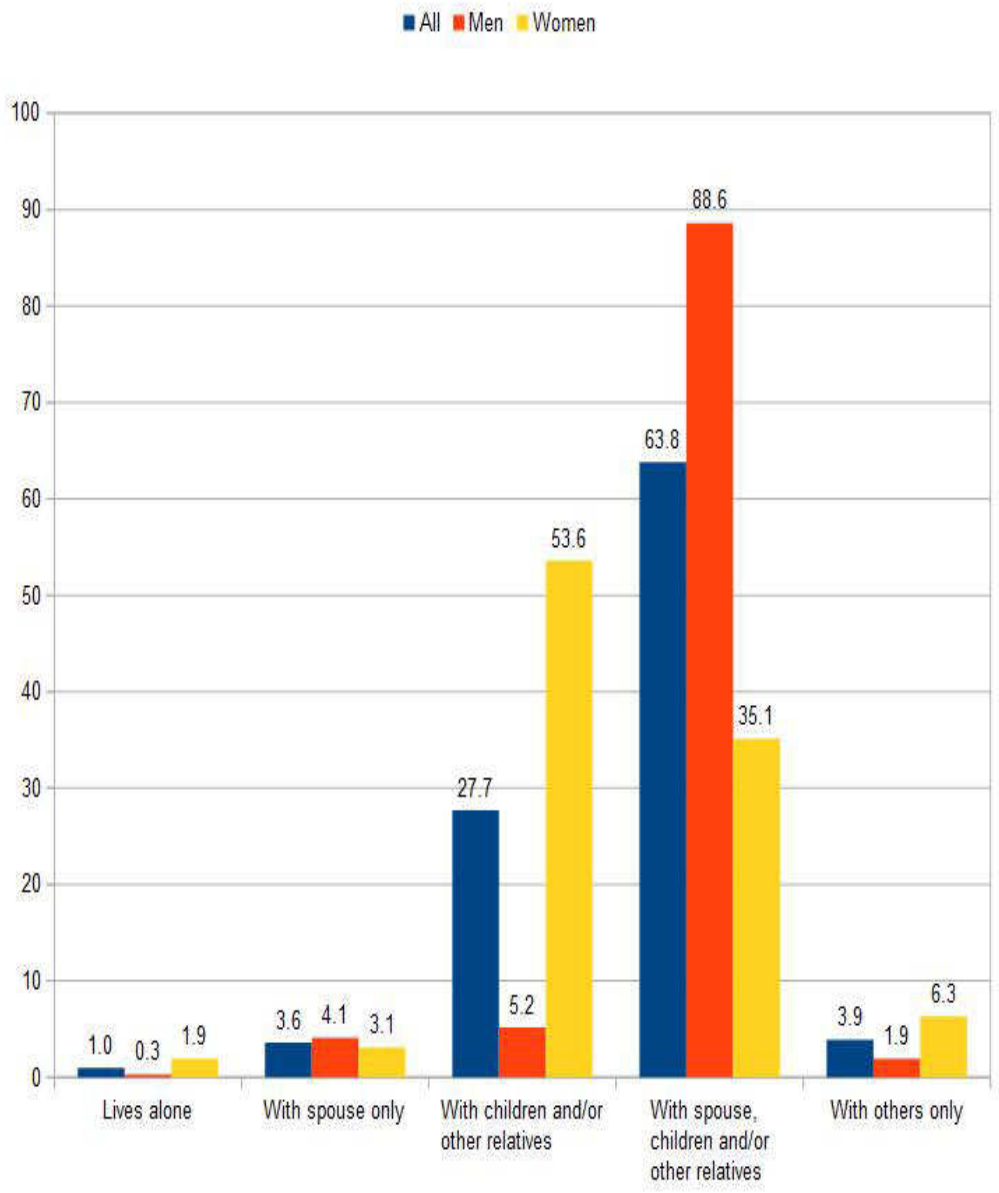
Yount and Sibai (2009) summed up the picture: "substantial differences in the health profiles of women and men, with rates of CVD and smoking higher in men, rates of diabetes, obesity, hypertension, depression and ADL [activities of daily living] disability higher in women and inconsistent gender gaps in cerebrovascular diseases across Arab countries" (p307).

1.3. DIFFERENT COUNTRIES

Looking at specific country examples, Kuwait is a small Gulf country with oil-based wealth, increased education levels generally, and growing participation in the formal labour force by women (Shah et al 2002).

Daughters leave the parental home at marriage, and are expected to be the primary care providers for the co-resident husband's parents. Using nationally

representative data on 687 households, Shah et al (2002) found that only 0.3% of men and 1.9% of women over 60 years old lived alone (figure 1.2). Women, who were more likely to be widowed, were, thus, also more likely to be living alone.



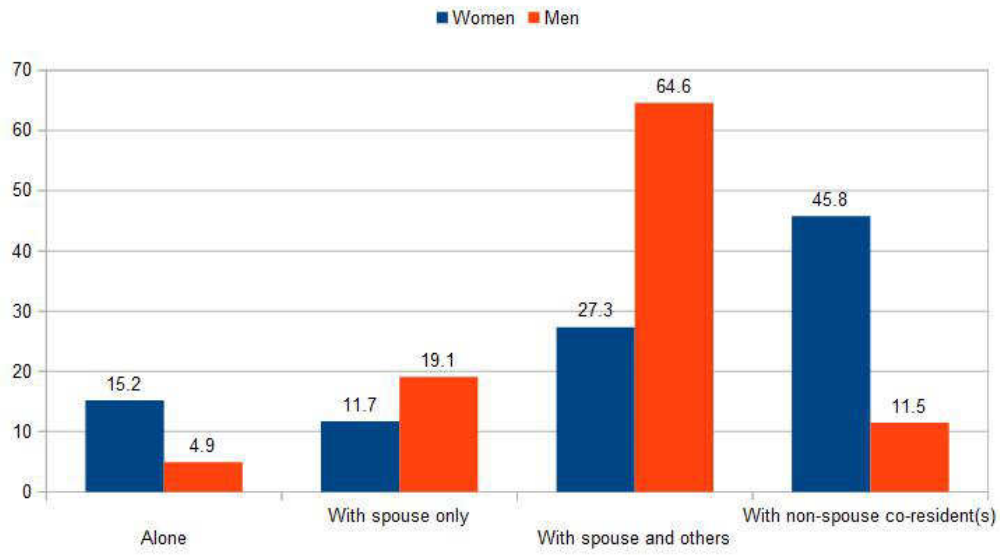
(Data from Shah et al 2002 table 2 p346)

Figure 1.2 - Living arrangements of over 60s in Kuwait (%).

Focusing on Lebanon, Sibai et al (2004) reported that the proportion of over 65s had increased from 4.9%

of the population in 1970 to 7.1% in 1995, with the prediction of the continued trend [11]. The 1970 figure is based on a Ministry of Planning survey of 30 000 households throughout the country, while the 1995 figure comes from Ministry of Social Affairs data based on 60 000 households.

The 1995 data showed that older women outnumbered men, and were more likely to be widowed or divorced (54 vs 13%), and living alone (15 vs 5%) (figure 1.3).



(Data from Sibai et al 2004 table 2 p222)

Figure 1.3 - Living arrangements of over 65s in Lebanon in 1995 (%).

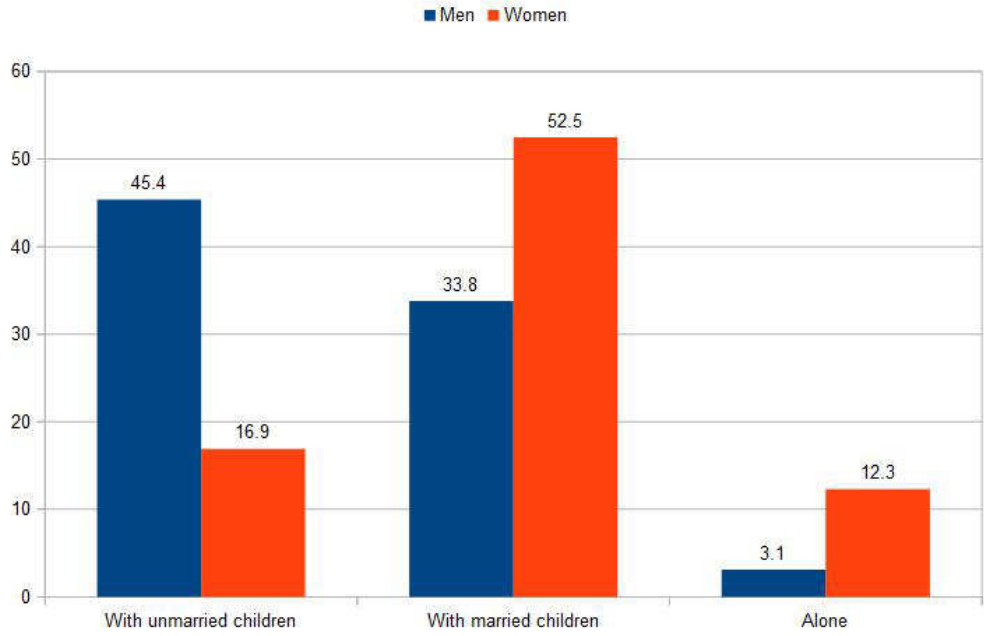
Yount and Khadr (2008) examined the living arrangements of over 60s in Egypt for the period 1988 to 2000 using demographic and health surveys. In total over 50 000 households were covered by four national surveys.

Yount and Khadr (2008) summed up the period under study as "characterised by consistently more frequent marriage among men and widowhood among women, large percentages of men and women without any schooling, shifts toward secondary or more schooling among men and at least some primary schooling among women over the period, and persistently lower rates of paid work among women than men. Despite increases in standards of living (according to the number of household assets or

[11] Lebanon has faced the specific problem of political instability between 1975 and 1991 (Sibai et al 2004). It also shows high levels of non-communicable diseases, similar to developed countries (eg: 60% of deaths in older adults linked to cardiovascular diseases) (Sibai et al 2004).

amenities) between 1988 and 2000, men more often occupied the highest standard-of-living stratum, and women more often occupied the lowest by 2000" (p212).

In terms of living arrangements, only 2-3% of older men lived alone compared to 12% of older women. Men were more likely to live with unmarried children and women with married children (figure 1.4).



(Data from Yount and Khadr 2008 table 3 p213)

Figure 1.4 - Three living arrangements for older adults in Egypt in 2000 (%).

Despite the norms of family caregiving in Egypt, some frail older adults are in long-term care centres. Sinunu et al (2009) explored the decision-making of eighteen families in Cairo who decided to do they ("cases") as compared to seventeen families who did not ("controls"). Semi-structured interviews were performed.

Three key differences were found between the two groups - the decision-maker for the cases was more likely to be not "immediate family" (child or spouse); cases had relatively fewer surviving sisters and/or immediate family geographical nearby; and the health of the cases was perceived as poorer by relatives (table 1.2).

In terms of qualitative data from the interviews, for example, one son said: "The daughters should be the main source of care for the old. Unfortunately, I have no sisters and that's why I put her in a hospital" (p70).

DIFFERENCE	CASES	CONTROLS
Decision-maker (%): Child/spouse Other	 67 33	 94 6
Average number of living sisters	1.0	1.6
Location of living siblings (%): Same neighbourhood in Cairo Outside Cairo/Egypt	 21 23	 55 19
Perceived physical health as poor/very poor (%) Perceived mental health as poor/very poor (%)	61 55	41 41

(Data from Sinunu et al 2009 table 1 p68)

Table 1.2 - Selected differences between cases and controls in Cairo.

A wife in her 70s admitted about her husband: "Suppose there was no one with me, I cannot carry him from the bed to the toilet. It was difficult for me and he may fall too... I cannot manage it alone so there was no way out except long-term care" (p70).

A daughter gave this reason for hospitalisation of her father: "His life was endangered in some of the activities or behaviours he did, for example, he would use the oven in an irrational way... Also, he started going away to the street and losing his way back" (p70).

Sinunu et al (2009) categorised the justifications given by caregivers of the cases for their decisions, including:

- Competing demands on time
- Changes in family economics
- Increasing rates of women's work.

Some caregivers of cases "redefined 'care'" - ie: they presented "institutionalisation of older relatives as a new way of meeting customary obligations of care" (Sinunu et al 2009 p74). For example, one daughter said: "[I]n Eastern countries, people... regard this act as a kind of neglect and lack of respect for old people... [but] We are educated and not ignorant people. This hospital has specialised people to care for old people and whatever I do for my mother, this place would be better... I care about... my mother's interest" (p72).

1.4. APPENDIX 1A - AGEING IN THE WEST

1.4.1. Religion

Western countries like Britain are described as

secular, post-religious or post-Christian as indicators of religiosity show a long-term decline (eg: regular church attendance). Wilkins-Laflamme (2016) described "a new phase in the religious landscape characterised most notably by religious–secular divide where smaller and more defensive religious groups stand opposite a non-religious majority" (p633) [12]. This situation has been described as "polarisation" (eg: Kaufman et al 2012).

Gill et al (1998) talked of the British as "increasingly divided in assent (or dissent) to traditional religious beliefs", while Brierley (2000) saw that the "the divide between Christian and non-Christian is becoming sharper" [13].

Wilkins-Laflamme (2016) explored the idea of polarisation in Britain using data from the British Social Attitudes surveys (BSA) from 1983 to 2012 [14]. Individuals' responses to questions about religious affiliation and frequency of religious service attendance were grouped as "unaffiliated" ("no religion"), "nominally affiliated" (infrequent religious service attendance), and "religiously affiliated" (attendance at least once a month).

The overall pattern for the years studied was an increase in unaffiliated, while a decrease in the other two categories. The data showed that "the British population does appear to be cleaving more and more into two distinct groups when it comes to religion: an unaffiliated majority characterised by very low levels of beliefs and an actively religious minority generally more fervent in its beliefs and views" (Wilkins-Laflamme 2016 p649).

1.4.2. Risk-Taking

"Individual differences in the tolerance of, and appetite for, risk can lead to substantially different choices given the same set of options..." (Mamerow et al 2016 p711). But it is unclear about the individual's risk-taking over their life span - studies report

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[12] Wilkins-Laflamme (2014) talked of "populations splitting into two distinctive groups: one more secular whose members mainly profess having no religion in surveys and generally score low on religiosity scales, and one more committed whose members attend religious services regularly and generally score high on religiosity scales" (quoted in Wilkins-Laflamme 2016)..

[13] Other explanations of Western societies include "believing without belonging" (Davie 1990), where individuals "seek their own unique and authentic belief systems separate from those professed by religious groups" (Wilkins-Laflamme 2016 p634). The growing individualisation of religious practices has also been referred to as "being spiritual but not religious, or an unchurched believer/seeker" (Wilkins-Laflamme 2016).

[14] A randomised stratified sample of adults in England, Scotland and Wales of between 1-5000 in each case.

declines, increases or no change with age (Mamerow et al 2016).

One problem is the use of self-report measures, which can record general propensity or specific domains. An overall age-related decline in financial, recreational, ethical, social, and health-related risk-taking have been found with such measures (Mamerow et al 2016). Other methods found different results.

Mamerow et al (2016) found a small reduction in risk-taking with age using three different methods to measure risk-taking.

1. Self-report - Participants rated themselves from 0 ("absolutely not risk-taking") to 10 ("very risk taking").

2. Description-based behavioural measure (gambles task) - Participants were offered gambling choices with specific probabilities and equal or unequal outcome values (table 1.3).

(a) 8 points vs 0 pts (50/50 chance) OR (b) 4 pts (100% chance) After a number of gambles, equal outcome value Eg: 4 gambles - (a) = 16; (b) = 16
(c) 15 pts v 0 pts (20/80 chance) OR (d) 4 pts (100% chance) After a number of gambles, unequal outcome value; safe option always better Eg: 10 gambles - (c) = 30; (d) = 40

Table 1.3 - Examples of gambles task.

3. Experience-based behavioural measure (Balloon Analogue Risk Task; BART) - On a computer screen, participants "pump up" a balloon and gain money for each pump, but lose it all if the balloon "pops". They can stop pumping at any time. Two coloured balloons were used, one allowing 32 pumps and the other sixteen before popping. Each participant completed twenty trials, so they had the opportunity to learn.

The participants were an opportunity sample of 902 adults between 18 and 90 years old in Basel, Switzerland, approached in the city centre.

Self-reported risk-taking was lower with age. Older adults chose the risky gamble less often when the two options had an equal outcome value, but chose the risky option on unequal value outcome trials (ie: when safe option produced better outcome). The researchers explained the findings as a product of the task demands

(ie: unable to calculate the outcome value of each option) rather than risk-taking behaviour. In the BART, there was less pumping on the high capacity balloon with age (ie: low risk situation).

"In sum, the patterns of age differences in behavioural tasks seem to suggest a decline in propensity for risk across the life span, albeit with strong dependence on specific task characteristics" (Mamerow et al 2016 p721).

Limitations of study:

- No control over cognitive variables - ie: differences in cognitive ability needed for different tasks, like calculating outcome value on gambles task.

- Possibility of priming effect - The three measures were presented in the same order with the self report first, which could have "established a 'risk' anchor", though Mamerow et al (2016) argued against it.

- Cross-sectional study - ie: comparing age groups at one point in time, whereas a longitudinal study could follow the trajectory of risk-taking over time.

Risk also plays a role in the desistance from crime in older individuals (Sparkes and Day 2016). Desistance is "the long-term desistance from criminal behaviour among those for whom offending has become a pattern of behaviour" (McNeil et al 2012 quoted in Sparkes and Day 2016).

Sparkes and Day (2016) interviewed sixteen individuals with prison experience in south-west England, of which six were "ex-offenders" (no crime for over a year since release), two "stuck" (still involved in crime - ie; in prison), and eight "trying" (just released from prison).

A form of "risk assessment" of their lives was reported by interviewees as they got older. This can be seen in "Simon's" comment: "I think it's just knowing how much that there is to lose and just having that focus. Just knowing that as long as I keep on this path [avoiding criminal activity] and I do not stray from this, things should be okay. And it's just not worth the risk. I think there's also an age factor in there as well. You get to an age where you just think, 'It's just not worth it'. I couldn't do another one of those prison sentences again. So there's also that factor as well in the back of the mind. Not something you consciously think about but I'm sure that's a factor as well" (p55). Shover (1985) referred to a "changed criminal calculus" where the costs of crime are seen as more important with age.

Three other themes related to the ageing body emerged from analysis of the interviews:

i) Crime as a "young person's game" - eg: "Sam": "The last one (prison sentence) was probably about a year and a half ago I suppose. I just thought to myself... you're too old. Too old for this, being in prison again and seeing all the younger people... So last prison sentence I just thought, 'I've got to stop. Enough is enough'. Felt too old for it and I had enough of just going to prison basically … Too old for this. I don't want to be doing this still" (p53).

ii) Tiredness - eg: "Tom": "I feel, lately I've been feeling like these knocks and, my body feels... done in... Sometimes I feel like I'm a bloody old man just moaning, and moaning, and moaning" (p53).

iii) Slowing down - eg: "Mark": "When you get older I think you calm down a lot, you seem to want to kick back a lot. You start realising you're wasting your life and stuff. There's more to life when you get older I think. I think that's how to explain it. You chill out more don't you?" (p54).

Sparkes and Day (2016) argued that the phenomenological lived body should be viewed as important in desistance - ie: "how the corporeal body both looks and subjectively feels as it ages within criminal justice settings can provide important turning point moments..., and hooks for change..., that have the potential to instigate a movement away from criminal activity and towards desistance" (p56).

1.4.3. Oil Dependence Syndrome

Spencer (2009) began: "To the extra-terrestrial observer, it would appear that the human species is programmed to bring about its own destruction. This is not surprising as today three significant and interlinked challenges face mankind: global warming, population density and the increasing dependency on crude oil to supply escalating energy demands. There is a behaviour parallel to this uncontrolled consumption in the concept of addiction and substance dependence" (p446).

He pointed out the parallel in terms of tolerance, compulsion, and withdrawal:

- Tolerance - Increasing the dosage to achieve the desired effect. "Humanity's demand for energy-consuming equipment and technology continue to increase with the passage of time. Household equipments are now almost

entirely power-driven and personal transport demands increasing consumption of petrol. Speed, acceleration and air-conditioning are no longer luxuries but necessities. In developing countries, the populations now measured in billions are currently copying our lifestyle and increasing their levels of consumption" (Spencer 2009 p447).

- Compulsion - Indulging in the behaviour despite the negative consequences. More and more electronic devices consuming energy.

- Withdrawal - Unpleasant effects of stopping. For example, the behaviours after a power cut.

Together, this is "oil dependence syndrome", argued Spencer (2009). He concluded pessimistically: "Over 2000 years ago, Buddha claimed that the origin of man's suffering is uncontrolled craving – the essence of addictive and dependency behaviour. If the increasing use of drugs, alcohol, gambling, computer games and now oil in the form of energy consumption and all its associated gadgetry is even partly due to modern man's response to meaningless and emptiness, then the task of persuading the policy-makers of the world to control the excessive consumptive behaviours associated with energy and oil is a major challenge, a challenge which is presently threatening our very survival as a species" (Spencer 2009 p448).

1.5. APPENDIX 1B - GENERATIONS

"Today's social problems are the problems of generations. This seems to be the view of a range of politicians, journalists and public intellectuals in present-day Britain. Terms such as the 'baby boomers' and the 'jilted generation' are common in public debate, while problems of debt, access to higher education, housing, pensions, and the health of the environment are all routinely denominated in age-aware terms..." (White 2013 p216) [15]. This is "generationalism" - "the systematic appeal to the concept of generation in narrating the social and political" (White 2013). But what is a generation?

A generation is part of the process of social categorisation - ie: how "reality can be descriptively arranged" (White 2013). This fits with the ideas of

[15] "There have always been those who have celebrated youth as opposed to old age. Yet it has been only in the relatively recent past,... that the social emphasis (it has been called an obsession) has come to be placed so starkly on the advantages of youngness and the disadvantages of age" (Price 1997 quoted in Thijssen 2016).

Bourdieu (1991). A social category can be distinguished "strictly for analytical purposes by those who, as disinterested observers, seek to understand and explain the world", or by "those seeking to change the world, guiding perception of it in a certain direction, or – less concertedly – those seeking to navigate the world as they find it. In these everyday settings, social categories can become central to symbolic struggles to impose and legitimise a vision of reality, and to make and unmake social groupings" (White 2013 p218). It is the latter use of generation that was interesting to White (2013), and, in particular, the use of generation in explaining society today. Texts like "The Pinch: How the Baby Boomers Stole Their Children's Future - and How They can Give It Back" by David Willetts MP in 2010, refer to groups like "baby boomers" and the "jilted generation".

However, such terms are used fluidly. For example, "baby boomers" can include those born within 10 years or twenty years after 1945, for instance. So, "'baby-boomers' are cast as all those of a certain age, and the 'jilted generation' as all those reaching maturity" (White 2013 p223) [16].

White (2013) outlined how generations are presented in contemporary generationalism:

i) As a historical causal explanation;

ii) As "a way of ordering history, putting a face on an otherwise faceless past or present, and casting the momentary as momentous" (White 2013 p224);

iii) As a sense of community (ie: "connections across periods"; White 2013);

iv) As "a means of identifying injustice";

v) As "an axis of conflict and impending crisis".

Thijssen (2016) noted that "the willingness to show intergenerational solidarity and to redistribute between generations seems to depend largely on the fact that younger and older generations recognise each other as cooperative members of a democratised and prefigurative civil society" (p609).

The "reciprocity imbalance" (Gouldner 1960) is where some generations are "longer old or more numerous", and this undermines "the essence of intergenerational

[16] Phillipson et al (2008) noted that "boomers are being constructed as a 'problem generation'", and are "depicted, variously, as bringing new lifestyles and attitudes to ageing and retirement; or heralding economic disaster; or placing fresh burdens on health and social care services" (quoted in Bristow 2016).

solidarity, namely that the fact that generations support each other" (Thijssen 2016 p593).

In terms of intergenerational solidarity, Thijssen (2016) outlined four types:

- Group-based ("you are a member of a group I identify with. I need to support my kind");
- Compassionate ("you are like me, but you don't have what I have (and you need it). That makes me feel shameful");
- Exchange-based ("you are an interesting exchange partner. I invest in you because this may help in the future");
- Empathetic ("you are not like me but nevertheless I understand and respect you").

Bristow (2016) analysed 268 articles about "baby boomers" in the British press between 1986 and 2011. The number of articles had increased with time, and so had the construction of this group as a "problem" (eg: "boomergeddon"; Harkin 2006). Bristow (2015) commented on "the metaphor of the Baby Boomers having thrown a 'party' and expecting their children to clear up the 'mess' recurs in the cultural script of the Baby Boomer problem, as a shorthand way of expressing a variety of related ideas" (Bristow 2016 pp581-582).

The articles, both negative and positive, tended to see "baby boomers" as homogeneous, but "research within the UK consistently highlights the diversity of fortune and experience within the Baby Boomer generation, and the extent to which people's experience within later life is shaped by factors of social class, income inequality, employment, (ill) health, gender, ethnicity, and family support networks as much as, if not more than, by their generational location" (Bristow 2016 p587).

White (2013) noted that "a focus on generations tends to come at the expense of the consideration of alternative differences. Arguably, moreover, this is no accident: its purpose for some seems exactly to distract from other, more familiar categories of the social – class in particular – so as to set up relatively innocuous targets for public dissatisfaction in a time of socio-economic upheaval" (White 2013 p233).

Intersectionality (McCall 2005) highlights the diversity within social groups. White (2013) continued: "Often that reality is a middle-class one: in evocations of the tragedy of today's youth, the focus is on those who aspire to middle-class rewards but are denied them. Likewise denunciations of the 'boomers' are often denunciations of a select few – those who enjoyed

university education without the need to pay fees (when circa 10 per cent went to university); those who could get a mortgage to buy a home (when a minority owned property); those who had the economic and political power to make the decisions castigated today (eg: on public spending). Despite the many references to 'our' and 'your parents', the parents of many of today's young would not have had access to any of these. The face of the boomers tends to be a middle-class face" (p237).

White (2013) concluded: "The rise of generationalism suggests the ongoing appeal of large, organising frameworks by which to comprehend society – ideologies in the non-pejorative sense. In a time of insecurity, the generational scheme offers a means of coping with uncertainty, perhaps even of making the future knowable. In many ways it is meagre comfort, for the future is cast in threatening terms, its generations characterised by suffering and conflict. Yet the suggestion of continuity provides some ontological security, locating today's world in a larger frame" (p242).

1.5.1. Longitudinal Study

Generations can be studied using the longitudinal method. Three key longitudinal studies were started in the USA in the 1920s - the Oakland Growth Study (individuals born in 1920-1), the Berkeley Guidance Study (born 1928-9), and the Berkeley Growth Study (born 1928-9). These studies have provided much data about the lifespan, but also the basis to new theoretical ideas, like lifecourse theory (Elder 1998). "Historical forces shape the social trajectories of family, education, and work, and they in turn influence behavior and particular lines of development. Some individuals are able to select the paths they follow, a phenomenon known as human agency, but these choices are not made in a social vacuum. All life choices are contingent on the opportunities and constraints of social structure and culture" (Elder 1998 p2).

Elder (1998) summed up the principles of the lifecourse approach:

i) Historical time and place - "the life course of individuals is embedded in and shaped by the historical times and places they experience over their lifetime" (p3);

ii) Timing in lives - "the development impact of a succession of life transitions or events is contingent on when they occur in a person's life" (p3);

iii) Linked lives - "lives are lived

interdependently, and social and historical influences are expressed through this network of shared relationships" (p4);

iv) Human agency - "individuals construct their own life course through the choices and actions they take within the opportunities and constraints of history and social circumstances" (p4).

1.5.2. The Future

McDaniel (1987) coined the term "emerging population paradigm" to cover the "eagerness to explain and to address a variety of social and economic problems... by reference to population ageing" (quoted in Lundgren and Ljuslinder 2011). Other value-laden terms, including "apocalyptic demography", "voodoo demography", "demographic alarmism" and "demographic demagoguery" (Lundgren and Ljuslinder 2011), have been used in the focus on the economic costs of the growing proportion of older people in the population. Gee (2002) described how such terms "reconstruct and redefine social problems in ways that fit a political agenda" (quoted in Lundgren and Ljuslinder 2011). Northcott (1994) emphasised the role of the media to "fuel perceptions of an age-related economic crisis".

Lundgren and Ljuslinder (2011) analysed three Swedish newspapers between 1988 and 2009 to see how population ageing was presented. Five hundred and ninety-four relevant articles were found.

Three main points emerged - population ageing is a threat, it is presented as an "unproblematised cause of different problems", and experts as the source saying such things. In terms of the "threat" language, terms like "crisis", "shock", "ticking bomb", and "boom" (eg: "grandma-boom") were common. There was also language that presented older people as "Other".

Three inter-related discursive patterns were distinguished:

i) Creation of seriousness - ie: the severity of the problem, which was reinforced by graphs and tables giving a "scientific legitimisation".

ii) Dichotomisation - eg: young/old, taxpayer/dependent.

iii) Use of emotion - "The explicit metaphorical references to future catastrophes in the material worked to address feelings of anxiety or even fear" (Lundgren and Ljuslinder 2011 p58).

Lundgren and Ljuslinder (2011) concluded that the three newspapers "unambiguously displayed population ageing as a threat, they appointed politicians and academics as experts rather than 'ordinary people', 'wage-earners' or 'older people', and they seldom defined the concept of population ageing explicitly" (p62).

1.5.3. Perceived Age Discrimination

Perceived age discrimination (PAD) includes "beliefs about how others generally perceive old age (referred to as meta-perceptions) and whether there is a normative climate that inhibits expressions of age prejudice" (Vauclair et al 2016 p699). Individual-level meta-perceptions are older individuals' beliefs about how other individuals view older people as a group, while societal-level meta-perceptions are the beliefs about how society views that age group. The meta-perceptions will be influenced by the perceived social status of older people, age stereotypes, prejudice, and society's tolerance of age prejudice. In terms of prejudice, the distinction can be made between paternalistic prejudice (eg: pitying older people), envious prejudice (eg: older people are seen as having too many of scarce resources), and contemptuous prejudice (eg: older people seen as "free riders" in society) (Vauclair et al 2016).

Vauclair et al (2016) showed the importance of meta-perceptions in PAD using data from the European Social Survey (ESS) 2008. This is a survey of adults in 29 European countries (including Israel), of which this research concentrated on over 8000 respondents 70 years old and above. PAD was measured by questions like, "How often, in the last year, has anyone shown prejudice against you or treated you unfairly because of your age?". Meta-perceptions were covered by items like, "Where would most people place the status of people over 70?" (from "extremely low status" (0) to "extremely high status" (10)).

It was found that PAD was higher in countries with perceived lower status of older people, but lower where older people were stereotyped as warm or competent. Perceived pity, envy or contempt for older people positively correlated with PAD. Vauclair et al (2015) summed up the findings thus: "if older people personally believe that their age group is seen as of lower social status and that others feel pity, contempt and envy toward them and stereotype them negatively, they also report experiencing more age discrimination" (p707).

It should be noted that all the measures were the subjective perceptions of the older adults who participated, and there were no objective measures of prejudice, for instance (ie: no verification of

perceptions).

There were also limitations related to the ESS. The researchers noted: "The ESS data were collected at the height of the global financial crisis during 2008 to 2010 raising the question of whether the findings are specific to this particular time period. Cross-national longitudinal data on this topic would be insightful into how these changes affect meta-perceptions, norms and perceived discrimination" (p708).

Also the decision was made to concentrate on over 70s. Sub-analyses using 50-59 and 60-69 year-olds found no difference in the results.

In terms of causality, the researchers admitted: "We are aware that cross-sectional evidence constrains interpretation of cause and effect. Thus we relied on theoretically specified hypotheses that meta-perceptions of old age should predict older people's PAD. We think it is seems reasonable to assume that societal meta-perceptions of individuals under the age of 70 are not primarily caused by older people's PAD. Hence, the greater ambiguity concerns the association between older peoples' personal meta-perceptions and PAD. Here the opposite direction of effects is indeed conceivable: older people who perceive age discriminatory acts may develop certain meta-beliefs about their age group" (Vauclair et al 2016 p708).

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2. FULL MOON AND CRIME: SIX DIFFERENT STUDIES

2.1. INTRODUCTION

The lunar cycle (or synodic month) lasting 29.53 days produces "periodic variation in the illuminated surface of the moon that is visible from the earth" (Biermann et al 2009). The full moon is when the sun, the earth, and the moon are aligned.

"Philosophers, historians, and researchers have presumed that the influence of the moon might change or may have a negative impact on disorders of human physiology and behaviour" (Biermann et al 2009 p573). The "lunar hypothesis" or "lunar-lunacy hypothesis" was described as early as the Roman writer Plini the Elder (Nunez et al 2002).

Hoctor (2009) recalled: "When I joined the police, the old blokes used to say, 'Full moons and brass bands bring out the crazies'. I don't know about the brass bands, but experience has shown the full moon aspect is true. It's just something every copper knows" (quoted in Sheldon and Prunckun 2017).

In terms of research, Jorgenson (1981) found that individuals with an external locus of control were more likely to attribute their own and other's behaviour to the lunar effects than individuals with an internal locus of control.

The possible mechanisms for the influence of the moon on behaviour generally include:

i) Geophysical aspects (eg: gravitational pull of the moon upon the earth and "human tidal waves"; Thakur and Sharma 1984) and neurobiology.

Rotton and Kelly (1985) asserted that the gravitational effect of the full moon on an individual is the equivalent of the effect of a drop of sweat on the skin, and is over 5000 times less than the gravitational pull exerted by the earth.

Kruszelnicki (2012 quoted in Sheldon and Prunckun 2017) pointed out that "tides happen only over large expanses, not within the small dimensions of a human body... [and] the ocean tides still happen if the moon is full, new or half-full".

ii) Variations in lunar light and melatonin levels.

Rotton and Kelly (1985) noted that the standard light bulb is up to seventy times greater in luminance than the full moon. Furthermore: "Given the fact that individuals spend between 75% and 90% of their time inside settings..., which are usually lighted, it is hard to believe that they behaviour would be affected by a source whose luminance is one fourth that of a candle" (Rotton and Kelly 1985 p288).

iii) The level of moonlight and people outdoors/active.

Stolzenberg et al (2017) observed: "Similar to predators in the animal world, criminals must have light to ply their trade because it would be virtually impossible for them to operate effectively in a completely dark environment. Yet, while light is certainly necessary for visual acuity, the excessive amount of artificial illumination generated from a flashlight might leave a criminal vulnerable to detection. It is thus possible that a full moon furnishes just enough natural light to enable an offender to perpetrate a crime, but not too much light to expose the offender to discovery and possible capture" (p189).

2.2. STUDIES

I took six freely accessible pdfs of studies from a search on Google Scholar using the terms "full moon" and "crime" on 16th January 2017.

BIERMANN ET AL (2009)

Data - Crimes of aggravated assault filed at the Police Department of Middle Franconia, Bavaria, Germany, between the beginning of 1999 and the end of 2005. Information about each crime was extracted, particularly the exact time of the offence, removing identifying details. There were 23 127 crimes included.

Analysis - The four stages of the lunar cycle for each month were detailed - absent, crescent, full, and decrescent moon. The focus was upon the 48 hours centred on the full moon and 48 hours centred on the absent moon, and a comparison with 129 hours around the crescent moon and 129 hours around the decrescent moon.

The number of observed crimes was calculated in relation to the number expected crimes for a certain period. For example, in a 30-day month, one-thirtieth of

crimes would be expected on one day. Significantly more crimes than expected (chance) on one day would suggest an effect.

Findings - Overall, 13.7% of crimes took place during the absent moon, 13.7% during the full moon, and the remainder equally during the crescent and decrescent moons. There were not significantly more crimes than expected in any phase of the moon.

The researchers also controlled for the location of the crime (indoors or outdoors), and the sex of the offender. Significantly more crimes were committed outdoors during the full moon and the waning moon, especially by male offenders. These significant differences were found with chi square test, but another statistical test did not confirm them.

Strengths:

- Large sample over a number of years.
- Multiple statistical tests to avoid spurious associations.

Limitations:

- Only one type of reported serious crime (table 2.1), and one area of Germany.
- Additional information about the offence not available (eg: alcohol intoxication; repeat offenders).

Overall - Strong methodology with most details of the study reported.

- Perceived seriousness of event.
- Faith in police to deal with it.
- Fear of reprisal.
- Availability of means to communicate with police; eg: telephone.
- Requirement of police investigation for insurance purposes.
- Embarrassment of victim.
- Preferences of victim for informal sanctions (ie: dealing with it themselves).
- Victim is partly to blame or likely to be in trouble when police investigate.

Table 2.1 - Some factors influencing whether crimes are reported to the authorities.

KARAN ET AL (2010)

Data - Number of crimes reported on each day of 2009 based on patients at the New Civil Hospital, Surat,

Gujarat, India. A total of 564 crimes on the medico-legal case register.

Analysis - The number of crimes for each day of the week when it was a full moon or not was compared.

Findings - There were no significant differences in the number of crimes for each day of the week whether that day was a full moon or not. In total 287 crimes on full moon days and 277 on non-full moon days.

Strengths:

- Use of medico-legal register in a hospital.
- Comparison for each day of the week.

Limitations:

- No details given of which crimes included. Also other methodological details not reported, like how non-full moon comparison days chosen (eg: same month).
- Only covered crimes that involved treatment at a hospital or that individual sort medical help for.
- Data distorted by public holiday, when crime increases, on one full moon Wednesday.

Overall - Weak study with many details of methodology missing.

NUNEZ ET AL (2002)

Data - All injuries caused by human aggression who presented in 1997 at the Hospital de la Candelaria in the Canary Islands, Spain.

Findings - There were 1100 patients treated for injuries by human aggression, but there was no pattern of victims and lunar luminosity ("a pattern resembling white noise ie: a random sequence..."; p128).

Strengths:

- Clear dataset.
- Focused on violence.

Limitations:

- Only injuries that treated at hospital.

- Depends on the classification of injuries by hospital staff.

- Not all human aggression is the same as a crime (eg: on a sports field).

Overall - Clear study using a specific dataset.

SHELDON AND PRUNCKUN (2017)

Data - All calls for assistance to the Brisbane Police Communications Centre, Australia for 2004 to 2011.

Analysis - Comparisons were made for 3 days - the day before, the day of, and the day after the full moon - and non-full moon days, as well as the full moon day to non-full moon days.

Findings - The means and medians were similar, but in terms of the maximum number of calls made, significantly more calls were made on non-full moon days in both comparisons. Further analysis of calls by eight categories (eg: homicide, domestic violence) found no difference between full and non-full moon days.

Strengths:

- A decent period of time.

- Two types of comparison - day of full moon, and three days around full moon.

Limitations:

- Only calls to police in one area of Australia.

- Limited controlling for other variables.

- Basic statistical analysis (ie: chi-square test).

Overall - Straightforward study with clear dataset.

STOLZENBERG ET AL (2017)

Data - All reports in the National Archive of Criminal Justice Data for 2014 for thirteen US states and Washington DC. The focus was upon crimes committed between 10 pm and 2 am.

Moon illumination was defined as "the ratio of the apparent illuminated area of the disk to the total area of the disk as seen from the Earth at 12 am

(midnight) by the Naval Observatory [Washington DC]" (p192). By this definition, a new moon = 0.00, a first quarter moon = 0.05, last quarter 0.50, and full moon 1.00.

Analysis - A statistical technique called time-series analysis was used. This establishes the pattern of the data over time, and whether any periods (eg: days) are significantly different to the overall trend.

Findings - The intensity of moon illusion was not related to total crime, but there was an escalation in outdoor crimes as moon illumination increased.

Stolzenberg et al (2017) offered this explanation: "It is plausible that the enhanced visibility engendered by the natural light of a full moon intensifies criminal activity by affording offenders a better opportunity to ascertain the vulnerability of a potential victim, gauge the value of a victim's property, and by assisting them in determining the proximity of capable guardians. It is also possible that the natural illumination generated by a full moon motivates people to venture away from their homes by diminishing the fear of crime, which in turn enhances their vulnerability to criminal victimisation" (p195).

Strengths:

- Relatively large dataset.
- Distinguished between indoor (residences, bars, stores, restaurants) and outdoor (roads, alleys, fields and woods, beaches and on water) crimes, and removed ambiguous locations (eg: an ATM in the foyer of a closed shop). Indoor crimes were used as a control because they should not change with moon illumination.
- Focused on specific time when moon usually visible if the sky clear.
- Sophisticated statistical analysis of data.

Limitations:

- Only crimes recorded in the National Archive of Criminal Justice Data.
- Only fourteen jurisdictions covered.
- No controlling for potentially relevant variables, like precipitation, because this information only available for 24-hour period.

- Short time window for crimes and precision of recording of time of crime. Why not a longer period at night?

Overall - Strong methodology and statistical analysis.

THAKUR AND SHARMA (1984)

Data - The number of crimes reported on each day during 1978 to 1982 at three police stations in towns (one rural, one urban, and one industrial) in Bihar State, India.

Findings - During the study period, there were 183 full moon days, on which 256 crimes were committed. The mean was significantly more than on non-full moon days (1.40 vs 0.54).

Strengths:

- Reasonably large sample (5478 study days - ie 5 years x 3 police stations).

- All types of crimes covered.

Limitations:

- Only reported crimes in three randomly chosen police stations in one area. The study may actually show that individuals are more likely to report crimes on full moon days.

- No controlling for full moon and day of the week.

- No details of crimes covered.

- No details of how police recorded crimes (eg: every report or just those investigated).

- The use of mean number of crimes on each type of moon day. Nunez et al (2002) noted that comparing means was not an appropriate statistical technique because of the unrandom nature of the variables (moon phases and crime).

Overall - Weak methodology, and the study has been criticised subsequently (eg: "did not sufficiently demonstrate a correlation"; Coates et al 1989).

2.3. OVERALL COMMENTS

Table 2.2 summarises the studies included.

STUDY	DATA	SIGNIFICANT
Biermann et al (2009)	Aggravated assault; 1999-2005; one police department in Germany	No
Karan et al (2010)	Patient-reported crime; 2009; one hospital in India	No
Nunez et al (2002)	Injuries from human aggression; 1997; hospital in Canary Islands	No
Sheldon and Prunckun (2017)	Calls to Brisbane Police Communications Centre; 2004-2011	No overall, but significantly more maximum number of calls on non-full moon days
Stolzenberg et al (2017)	All crimes in National Archive of Criminal Justice Data for 14 US jurisdictions; 2014	No overall, but some increase in outdoor crimes on full moon days
Thakur and Sharma (1984)	All crimes reported at 3 police stations in India; 1978-82	Yes

Table 2.2 - Main details of studies.

Barr (2000) admitted that "researchers do not agree on exactly what effect they are looking for or whether it is only likely to occur in certain individuals. These problems stem from the absence of a widely accepted theoretical base which could account for any supposed lunar effect..." (quoted in Sheldon and Prunckun 2017).

Overall key issues of studies of the full moon and behaviour include:

1. Which cycle?

Studies generally use the synodic cycle of the moon rather than the sidereal cycle. The former is the time between full moon (29.5 days) as the earth orbits the sun, while the sidereal cycle is the time it takes the moon to circle the earth (27.3 days). Occasionally studies use the anomalistic (apogee-perigee) cycle [17] of 27.5 days as the moon approaches the earth (Rotton and

[17] Apogee = further away; perigee = near.

Kelly 1985).

2. What to compare?

Dividing the lunar cycle into four quarters (ie: 7 days) is common, or into 30 lunar days ("phase window analysis"; Lieber and Sherin 1972) (Rotton and Kelly 1985).

3. Which statistical test to use?

Chi-square tests of significance are common, but there is a debate over whether parametric tests are appropriate (Rotton and Kelly 1985). Forbes (1978) admitted that "there is truly no satisfactory way to analyse data of this type" (quoted in Rotton and Kelly 1985).

The number of statistical analyses made of the data is also relevant. For example, Rotton and Kelly (1985) pointed out that one study (Lieber and Sherin 1972) that found three significant relationships between homicides and the full moon had performed 96 tests of significance in total, but just by chance around four of the tests would be significant.

4. Use of lagging.

When comparing periods of time, a phase of the moon is set to begin on the first day of each quarter. "This is equivalent to lagging or shifting observations backward in time" (Rotton and Kelly 1985 p292).

Rotton and Kelly (1985) commented: "What is at issue here is whether an investigator is engaged in exploratory or confirmatory data analysis... If one's goal is to discover and describe relations, nobody can object to lagging. However, if one's goal is to test the lunar hypothesis, there can be no doubt that lagging, especially as it is done in lunar research, increases the probability of obtaining spuriously significant results" (p292).

Talking about their meta-analysis of studies about the full moon and behaviour generally, Rotton and Kelly (1985) stated: "Although this meta-analysis uncovered a few statistically significant relations between phases of the moon and behaviour, it cannot be concluded that people behave any more (or less) strangely during one phase of the moon than another. This is not the same as saying that there is no relation between phases of the moon and behaviour. Just as we cannot prove that werewolves, unicorns, and other interesting creatures do

not exist, we cannot prove that the moon does not influence behaviour. However, the burden of proof lies with those who favour the lunar hypothesis. They will have to collect a great deal more - and better - data before they can reject the null hypothesis of no relation between phases of the moon and behaviour" (p300).

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3. THE SWIFTLY EVOLVING DEBATE ON HUMAN EVOLUTION

3.1. INTRODUCTION

Foley (2016) distinguished "normal evolution", which is "the incremental, persistent change, from ancestor to descendant, from parent to offspring, which gives the continuity to life", and "transitional evolution" - ie: the origin of a new species, or "the evolution of major new adaptations, and the evolution of entirely new biological systems, such as multi-cellularity" (Foley 2016).

Evolutionary change has four fundamental types (Foley 2016):

i) Baseline evolution - Acquisition of new traits through genetic mutation.

ii) Novel taxa - The appearance of a new species.

iii) New adaptive zones - Large-scale evolutionary change (eg: bat echolocation).

iv) Major evolutionary transitions (METs) - This covers when "there is a change in the level of organisation, the consequences for which are capable of changing the rules of life. In major transitions, entities that previously reproduced independently subsequently reproduced as part of a larger unit, which can result in a change in the units and levels of selection" (Foley 2016 p3) [18].

Foley (2016) asked whether the evolution of humans is an example of the latter. Szathmary (2015) argued in favour because culture has replaced biology as "the principal domain of change and selection" (Foley 2016) [19].

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[18] The human influence on the world could have major changes (appendix 3A).

[19] The discovery of the genetic basis of development in the late 1970s is covered by a new field called evolutionary developmental biology (evo-devo), and two classes of developmentally important genes are key - genes that encode proteins involved in cell-cell interactions, and genes that encode proteins

Thus, there is a massive separation between humans and the nearest relatives (chimpanzees), and humans are the globally dominant species.

On the other hand, the difference between humans and chimpanzees is relatively small. "There is nothing like the major biological reorganisation that characterises, for example, sexually reproducing organisms from asexual ones" (Foley 2016 p4).

Foley (2016) applied the four types of evolutionary change to humans:

i) Baseline evolution - Many examples including changes in brain size, and body size.

ii) Novel taxa - eg: different Homo.

iii) New adaptive zone - Foley (2016) stated that "human evolution comprises to a large extent the third level of evolutionary change, comparable with the first land creatures. However, the wealth of archaeological and fossil evidence indicates strongly that the change occurs across the whole of the seven or less million years since the divergence from the last common ancestor with chimpanzees, and actually consists of three separate phases of substantial adaptive change. The first of these is related to locomotion, foraging and habitat adaptations; the second to a suite of behavioural changes that are linked to a change in diet, means of acquisition of resources (technology) and life-history strategy; and the final one is strongly based on cognitive and behavioural changes. The adaptive zone occupied by humans is one that was the product of cumulative, mosaic-based, transitions rather than a single shift" (p11).

iv) MET - The candidates for this change include language, cumulative culture, and technology [20]. Foley (2016) argued that the MET was in the impact of humans on the planet. He said: "It has also been argued that human impact in the Holocene [current era] has resulted in the first major restructuring of trophic systems since the establishment of terrestrial herbivory in the late

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that control the expression of genes (Tickle and Urrutia 2016). In evo-devo, "for each organism, the aim is to uncover the genetic basis of morphology and how this translated during development, while the aim of the comparative studies of the different organisms is to illuminate steps in phylogeny" (Tickle and Urrutia 2016 p6).

[20] Maynard-Smith and Szathmary (1995) outlined the concept of METs to include common characteristics like "a reduced replicative potential associated with the agents composing the new entity(such as multicellular versus single cell), the emergence of division of labour and the presence of new forms of dealing with information at different scales in the hierarchy" (Sole 2016 p2). Subsequently, different authors have varied the list of characteristics (Sole 2016).

Permian [21]. In that context, the evolution of humans is a major and irreversible transition" (Foley 2016 p12).

To sum up, human evolution is gradual and cumulative with a mosaic pattern of changes in different hominins, but "no breakthrough moment" (Foley 2016).

3.2. HOMO SAPIENS

Foley et al (2016) began: "The word probably most associated with our evolutionary past is 'origins'. The history of science is awash with books and papers in search of human origins, or the origins of the things that made us human—upright walking or language or culture. Seeking origins is looking for the beginnings of something, finding out why and when something that did not exist before did so afterwards" (p1). They continued: "Pragmatically, the search for origins is a recipe for frustration. There may be a hypothetical point of origin for Homo sapiens, but to find one fossil closer to that elusive point than another is only to engender the search for another that is closer still, until the path leads inexorably to the origins of something else" (Foley et al 2016 p1).

However, the evolution of humans can be divided into two parts (Foley et al 2016):

i) Early hominins whose taxa [22] are closer to humans than living apes, but are not Homo - Sahelanthropus, Ardipithecus, Ororrin, Kenyanthropus, Australopithecus [23], and Paranthropus [24]. This is the "bipedal apes" phase from 7 to 2.8 million years ago (MYA).

ii) The evolution of the genus Homo (since 2.8 MYA) [25].

But the two parts overlap as the first Homo appears in fossils 2.8 MYA, but the last "bipedal ape" disappears 1.5 MYA (Foley et al 2016). Not only does the time overlap, there are other similarities which make a point of origin of Homo difficult to establish (eg: body size; tool use) (Foley et al 2016). For example, stone tools have been found at sites of fossils 3.3 MYA (Lewis and

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[21] Around 50 million years ago.

[22] Taxon (taxa, plural) is usually a group of populations seen as sharing common characteristics that form a unit (eg: hominin). Genus (genera, plural) is a group of species (eg: Homo).

[23] Australopithecus was first "discovered" in southern Africa in the 1920s (Wood 2014).

[24] From 2.3 to 1.4 MYA two different hominins lived in the same region of East Africa - Paranthropus boisei and Homo habilis (Wood 2016).

[25] Including Homo rudolfensis (Wood 1992).

Harmand 2016) (appendix 3B). This shows that "clear watershed points do not occur" (for example, between Australopithecus and Homo) (Foley et al 2016) [26] [27].

Kimbel and Villmoare (2016) stated: "Large brains, stone-tool technology, derived life-history traits and complex social behaviours have at one time or another all been seen as 'defining' of the genus Homo [28]. It is not uncommon to see the transition to the genus Homo imaginatively reconstructed from a comparison of the relatively derived morphology and behaviour of Pleistocene H. erectus to the much more generalised morphology and behaviour of early Australopithecus – even though no such radical transition ever actually occurred" (p2).

Table 3.1 gives an overview of differences between Homo and Australopithecus based on fossil evidence and inferences from that.

Foley et al (2016) summed up: "Looking at the totality of hominin evolution, there is no broad division between the earlier and later phases, nor between archaic and modern humans. These transitions are significant, but the richer fossil record now in existence, and the multiple techniques available for studying it, show that the major transitions of human evolution are comprised of multiple smaller ones" (p2) [29].

Nor is the evolution of humans a linear process from genus to genus, or taxon to taxon. For example, Kenyanthropus platyops was present in East Africa at the same time as two Australopithecus genera (Foley et al 2016).

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[26] In the 1950s, the view was of Australopithecus africanus as the link to Homo erectus, but this was challenged by the discovery of Homo habilis in 1964 (Kimbel and Villmoare 2016). Leakey et al (1964) announced a new species within the genus Homo - Homo habilis ("handy man") - from fossils in the Great Rift Valley in Tanzania. But "even with all the fossil evidence and analytical techniques from the past fifty years, a convincing hypothesis for the origin of Homo remains elusive" (Wood 2014 p31).

Wood (2014) argued that Homo habilis should be its own genus - ie: not Homo nor Australopith - because it is "an incoherent mishmash of features". While, based on analysis of fossils in southern Georgia, Lordkipanidze et al (2013) proposed that Homo habilis-like fossils be reassigned as Homo erectus. Anton et al (2014) argued for three distinct taxa of early Homo, including Homo erectus, based on East African fossils.

[27] Anton et al (2014) commented: "When integrated with our understanding of the biology of living humans and other mammals, the fossil and archaeological record of early Homo suggests that key factors to the success and expansion of the genus rested on dietary flexibility in unpredictable environments, which, along with co-operative breeding and flexibility in development, allowed range expansion and reduced mortality risks" (p45).

[28] Other traditional criteria for defining Homo include an upright posture, a bipedal gait, and dexterity to allow fashioning of stone tools (Wood 2014).

[29] "The fossil record bearing on the ancestry of Pleistocene Homo is poor. However, the more we learn about early Homo, the less compelling is the case that an adaptive shift can be read from currently documented skull and skeletal anatomy as a 'major transition' from generalized Australopithecus precursors" (Kimbel and Villmoare 2016 p7).

	A. afarensis vs early Homo (non-erectus)	A. afarensis vs Homo erectus (He)	Homo erectus vs other early Homo
Average brain size	Homo larger	He larger	He larger
Average body mass	Homo larger	He larger	He larger
Limb proportions	Same	Same	Same
Energetic requirements	Homo more	He more	He more
Nutrition	Homo meat, bit better quality food	He meat, better quality and wider diet	He more meat and better quality; similar range of foods
Co-operative behaviours	Homo possibly greater	He more	He more
Tool technology	None prior to 2.6 MYA	He after 1.76 MYA	Both after 1.76 MYA

(Source: Anton et al 2014 tables 2 and 3)

Table 3.1 - Comparison of Homo and Australopithecus.

Stringer (2016) raised the issue of how to define Homo sapiens in the fossil record [30]. He used the term for "material that appears morphologically more closely related to extant humans than to the clade of Homo neanderthalensis, one of two potentially closest fossil relatives of extant H. sapiens (the other being Denisovans, which are so far virtually unknown from fossil material)" (Stringer 2016 p1). The common traits of Homo sapiens include "a high neurocranium [31], rounded in lateral profile, a small face retracted under the frontal bone, a true chin even in infants, small discontinuous supraorbital tori [32], a lengthened post-natal growth period and life history, and a narrow trunk and pelvis with short superior pubic rami [33]" (Stringer 2016 p1).

The recent discovery of fossils that represent a new species of human - Homo naledi (Berger et al 2015) - with a combination of primitive and modern features [34] has been

[30] The fossil record used to understand the evolution of Homo sapiens is limited, with key sites in African including in Morocco (eg: Jebel Irhoud cave), South Africa (eg: Border Cave), and Tanzania (eg: Nyaloba beds) (Stringer 2016).
[31] Braincase.
[32] Eyebrow ridge.
[33] Part of hip area.
[34] Australopithecus characteristics (eg: skull size), Homo characteristics (eg: teeth), and unique traits

among the challenges to the understanding of human evolution. It could be two million years old and be an early Homo (Wong 2016) [35].

Critics have argued that it is a primitive Homo erectus, as well as questioning the amount of information from the fossils to state that it is a new species (Wong 2016).

Stringer (2016) raised a number of other issues about Homo sapiens [36]:

a) Was the mode of evolution of Homo sapiens gradual or punctuational (ie: sudden bursts of evolutionary change)?

b) Who is the last common ancestor of Homo sapiens and Homo neanderthalensis? Options include Homo heidelbergensis (preferred by Stringer 2016), Homo antecessor, or the Denisovans.

c) As Homo evolved, what happened to older "versions"?

3.3. HUMAN SOCIETY

The fact that humans today live in large groups of genetically unrelated individuals has been called "ultra-sociality" (eg: Richerson and Boyd 1998). The basis of ultra-sociality are social norms and institutions, which Turchin et al (2013) explained by cultural multi-level selection (CMLS) (Gavrilets et al 2010). "Costly ultra-social institutions can evolve and be maintained as a result of competition between societies: societies with traits that enable greater control and coordination of larger numbers will out-compete those that lack such traits" (Turchin et al 2013 p16385). Warfare is one way of competing.

Turchin et al (2013) found support for the prediction that "selection for ultra-social institutions and social complexity is greater where warfare between societies is more intense" (p16385) in a comparison of Afro-eurasia societies between 1500 BCE (before common era or BC) and 1500 CE (common era or AD) [37].

(eg: finger bones) (Wong 2016).

[35] Homo naledi dated as 200 000 - 300 000 YA by John Hawks, who was involved in the team making the original discovery, talking on the BBC (Rincon 2017).

[36] There are many related issues, like the use of fire and cooking (appendix 3C).

[37] The "Seshat" database has been set up to allow statistical testing of different theories about the development of complexity in societies. It covers societies before, during and after complexity developed (attributed as initially 10 000 years ago) around the world, and certain markers (eg: presence or absence of writing) (Spinney 2016).

Turchin et al (2013) concluded: "More generally, the present study highlights the role that evolutionary theory in combination with suitable data can play in addressing questions about human history and cultural evolution [38]. Undoubtedly, the rise and fall of individual states and empires will be complex, involving idiosyncratic and contingent events. Our analyses, however, also provide support for the idea that the story of the past is not just a case of 'one damned thing after another' (Toynbee 1957), but that there are general mechanisms at play in shaping the broad patterns of history" (p16387).

3.4. APPENDIX 3A - HUMAN INFLUENCES ON EVOLUTION

Modern human behaviours, like pollution, commercial fishing, species introductions, and urbanisation, have been described as the "world's greatest evolutionary driving force" (Palumbi 2001), and leading to "rapid evolution", "contemporary evolution" or "evolution on ecological time scales" (Hendry et al 2017) [39].

The phenotypic adaptive landscape (Simpson 1953) represents high adaptive fitness of a species as a peak and low fitness as as a valley. Selection favours populations "phenotypically 'climbing' the slopes towards fitness peaks" (Hendry et al 2017). Human behaviours, however, can change the number, position, elevation and gradient of the peaks (Hendry et al 2017).

Hendry et al (2017) drew a distinction between how humans interact with their "enemies" (or "adversaries") (eg: weeds, pests, pathogens) by reducing them, which selects for resistance or tolerance, and "friends" (eg: crops) which are encouraged. There are also "frenemies" (eg: pathogen bacteria evolving to influence other pathogens), and "neighbours" that are "just there" (Hendry et al 2017).

Hendry et al (2017) outlined some mechanisms of human influences on evolution:

i) Directional selection - consistent pressure in one direction (eg: hunting the largest body size).

ii) Evolutionary potential - increasing or decreasing variation (eg: "emerging and disappearing infectious diseases"; Rogalski et al 2017).

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[38] Jensen et al (2014) applied evolutionary theory to understand financial markets today.

[39] There is a debate as to whether today is thus part of the Anthropocene epoch (starting in 1950, possibly) as opposed to the Holocene epoch (which began 11 700 years ago) (Zalasiewicz 2016).

iii) Genetic change (ie: whole population) vs phenotype change (plasticity in individual behaviour) - "In general, genetic change is expected to be more important when populations are larger (because standing genetic variation and mutational inputs are greater), when generation times are shorter (because even small per generation changes can achieve larger per year changes), when the altered environmental conditions are novel (because existing adaptive plasticity would be less likely) and when the environmental change is greater (because the scope for plasticity is limited)" (Hendry et al 2017 p6).

iv) Evolutionary diversification - Humans changing the environment influences the evolution of biodiversity.

Hendry et al (2017) summed up: "For instance, environmental change should render many populations maladapted, leading to decreased individual fitness, which should decrease population size — potentially causing extirpation or extinction. Yet this maladaptation should also generate selection, which should promote adaptation that increases individual fitness, which should increase population size — potentially allowing 'evolutionary rescue'" (p7).

3.4.1. Biodiversity Loss

One argument put forward for biodiversity conservation is that it decreases infectious disease transmission (ie: improves human health indirectly). The links between habitat destruction, conservation, and disease risk are complex (Young et al 2017). "Consider, for example, the assumption that habitat disturbance reduces species richness. Recent studies suggest that disturbance often correlates with increases — or no change—in species richness. This occurs because disturbance adds new habitats (eg: forest edges) and because gains in invasive or generalist species add to or compensate for lost native or specialist species" (Young et al 2017 p2).

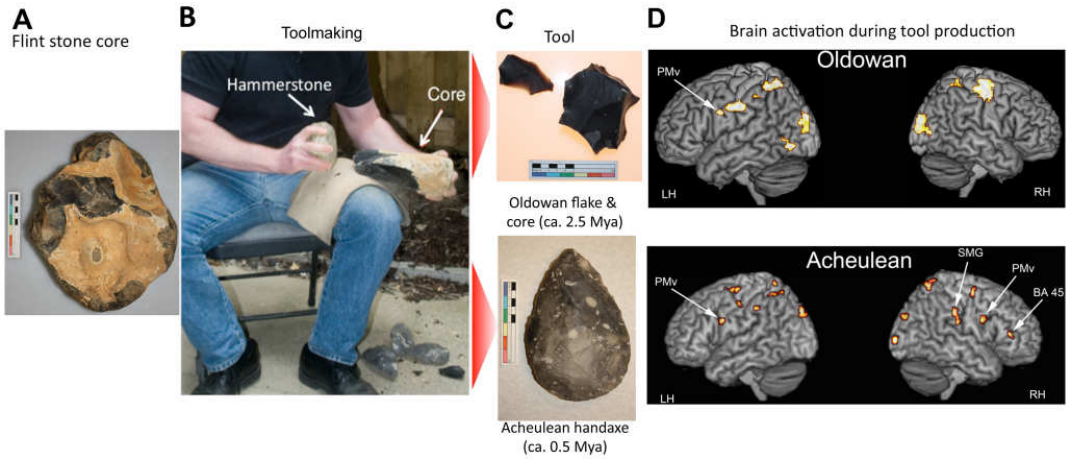
Faust et al (2017) showed that habitat loss that reduces biodiversity can either increase or decrease disease transmission depending on the pathogen. For example, the risk of Lyme disease in the UK could be increased by conservation actions (eg: increasing woodlands), but reduced by lowering deer populations (Millins et al 2017).

3.5. APPENDIX 3B - TOOL-MAKING AND COGNITION

The emergence of modern human cognition is not only

related to brain size, but to brain areas and functions, like the enhancement of the prefrontal cortex and executive control of actions, which can be seen in sophisticated tool-making (Stout et al 2015).

But "links among brain size, cognitive complexity, and the technological skill" (Shea 2011) are difficult to establish with evidence. This led Stout et al (2015) to use an experimental neuroscience approach, where living individuals were trained in the stone tool-making methods of the past and their brains were neuroimaged (figure 3.1).



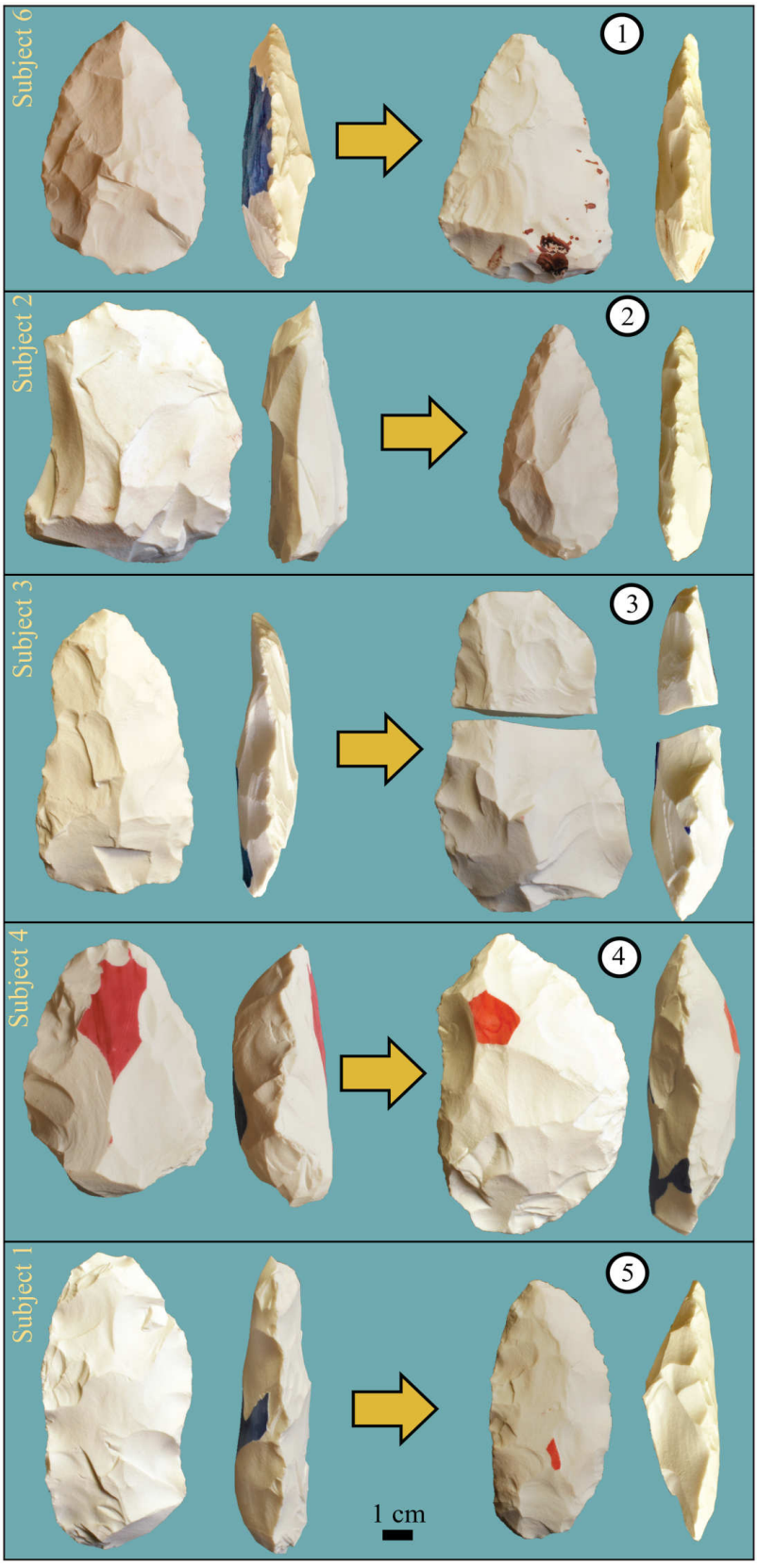
(A stone 'core' (A) is struck with a hammerstone (B) in order to detach sharp stone 'flakes'. In Oldowan tool-making (C, top) the detached flakes (left in photo) are used as simple cutting tools and the core (right in photo) is waste. In Acheulean tool-making (C, bottom), strategic flake detachments are used to shape the core into a desired form, such as a handaxe. Both forms of tool-making are associated with activation of left ventral premotor cortex (PMv), Acheulean tool-making activates additional regions in the right hemisphere, including the supramarginal gyrus (SMG) of the inferior parietal lobule, right PMv, and the right hemisphere homolog of anterior Broca's area: Brodmann area 45)

(Source: Faisal et al 2010 figure 1)

Figure 3.1 - Tool-making in Lower Paleolithic period [40].

Six students of archaeology at a UK university were trained in Paleolithic tool-making. Basic Oldowan [41] tools (eg: removing flakes of stone to make a sharp point) were used by Homo habilus 2.6 - 1.5 MYA, while more sophisticated Acheulean [42] tools (eg: "handaxe") were evident 1.7 - 0.25 MYA among Homo erectus and Homo heidelbergensis. The average amount of practice by the participants was 167 hours over twenty-two months (figure 3.2).

[40] Around 3.3 - 0.3 MYA.
[41] Sub-period of Lower Paleolithic: 2.6 - 1.7 MYA.
[42] Sub-period of Lower Paleolithic: 1.8 - 0.1 MYA.



(Source: Stout et al 2015 figure 1)

Figure 3.2 - Examples of first attempts (left hand images) and final attempts (right hand images) of stone tools by five participants.

In the functional magnetic resonance imaging (fMRI) scanner, at the start, mid-point and end of training, the participants saw pictures of stone tools and answered questions about them. There were differences observed in the dorsal prefrontal cortex that correlated with success with more sophisticated tool-making (Acheulean). The researchers stated: "This corroborates hypothesised cognitive control demands of Acheulean tool-making, specifically including information monitoring and manipulation functions attributed to the 'central executive' of working memory" (Stout et al 2015).

This is an interesting attempt to fill in the gaps in evidence, but a relatively few hours training and practice is not the same as the years involved in real life, and the study does not "resolve the directionality of causation between technological, cognitive and neuroanatomical changes over human evolution" (Stout et al 2015).

Proffitt et al (2016) reported capuchin monkeys in Brazil smashing rocks in a way that produced sharp-edged stones (akin to those of early Stone Age humans). But the intention was not clear as the sharp edges were not used to cut anything, and this should be a warning that "the intention of the makers of the earliest artefacts can be hard to discern" (Editorial 2016 p290).

Furthermore: "The capuchin study should also dampen ideas that the human hand, with its precision grip. together with advanced hand-eye co-ordination, must necessarily have been evolutionary products or pre-requisites of technology. Capuchins break rocks together without the benefit of either" (Editorial 2016 p290).

3.6. APPENDIX 3C - FIRE USE AND COOKING

Gowlett (2016) noted that researchers "have often treated fire as a technological 'add on' or invention, but fire awareness must inevitably go back to very early times because of the high visibility of natural fires" (p1). Exposure to natural fire, started by lightning, would probably have been 3 MYA as this was the period of open grasslands where natural fire is "more prevalent and obvious" than in tropical forests (Gowlett 2016).

Based on traces of ash in caves, and burnt bone fragments, hominids (Homo erectus) were using fire at least 1 MYA (million years ago), while obvious hearths date from 400 000 YA (Lawton 2016). But it is not clear if food was habitually cooked at this time.

Three forms of fire use/interaction have been distinguished (Gowlett 2016):

i) "Fire foraging" - The attraction towards natural fires in the search for resources (eg: birds eggs; rodents). "Although fire does not create such resources, it renders them far more visible, and chance cooking might well improve their digestibility" (Gowlett 2016 p2).

This is not unique to hominins as bird "fire followers" are known (Gowlett 2016).

ii) The social/domestic hearth fire for protection and cooking - The "cooking hypothesis" (eg: Wrangham 2009) proposes that the ability to cook foods, meat in particular, increases digestibility and aids in the evolution of the large brain of humans. It is suggested that Homo erectus at 1.7 MYA was doing this, despite the lack of actual evidence (Gowlett 2016).

iii) Fire as a tool - eg: for firing pottery.

The cooking of food produces a reaction between sugars and amino acids called the "Maillard reaction" (ie: the browning of the food). Humans (and great apes) prefer cooked to raw food, but the cooking process can make meat, for example, less digestible, destroy nutrients, and produce carcinogenic chemicals (Lawton 2016).

So there must be key benefits to eating cooked food. Human teeth/jaws and intestines are too small to extract enough nutrients from low-quality raw food to fuel the large demands of the brain. Cooking makes food softer, and releases more calories [43] [44], as well as killing pathogens and making certain inedible foods edible (eg: tubers) (Lawton 2016).

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[43] Eg: About one-third of the calories of raw potatoes are digestible compared to almost all cooked (Lawton 2016).

[44] Digesting raw meat uses calories - eg: mice fed a 100% meat diet lose weight (Lawton 2016).

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4. PSYCHOLOGY OF CLOTHES

4.1. INTRODUCTION

The influence of the clothes worn on others has been well documented. Table 4.1 summarises some examples of the research on clothes and the perception and reaction of others (Adam and Galinsky 2012).

FINDING	STUDY
Graduate university teaching assistants wearing formal clothes perceived as more competent, but less interesting than in less formal clothes (eg: faded jeans).	Morris et al (1996)
Women in job interviews dressed in a masculine fashion more likely to be hired in a study with marketing and banking employees.	Forsythe (1990)
Women in high-status jobs dressed "sexily" perceived as less competent than in neutral-clothing by undergraduates, but no effect for low-status jobs.	Glick et al (2005)
Students rated formally dressed therapists as having more expertise and being more trustworthy than casually dressed ones.	Dacy and Brodsky (1992)
Appropriately dressed sales staff elicit stronger purchase intentions for banking services than inappropriately dressed ones.	Shao et al (2004)

Table 4.1 - Examples of studies into the perception and reaction of others to clothes.

1.2. ENCLOTHED COGNITION

Adam and Galinsky (2012) coined the term "enclothed cognition" [45] to "designate the systematic influence of

[45] This is based on the idea of "embodied cognition" (appendix 4A).

clothes on the wearer's psychological processes and behavioural tendencies" (p919). Put another way, "the experience of wearing clothes triggers associated abstract concepts and their symbolic meanings. In particular, we posit that wearing clothes causes people to 'embody' the clothing and its symbolic meaning. Consequently, when a piece of clothing is worn, it exerts an influence on the wearer's psychological processes by activating associated abstract concepts through its symbolic meaning — similar to the way in which a physical experience, which is, by definition, already embodied, exerts its influence" (Adam and Galinsky 2012 p919).

Adam and Galinsky (2012) used the lab (or doctor's) coat in their experiments. Firstly, they asked thirty-eight respondents to an online survey to rate the association of the lab coat with attentiveness, carefulness, responsibility, and a scientific focus on a five-point scale. The perception of these characteristics was high for lab coat wearers.

Based on these findings, Adam and Galinsky (2012) designed three experiments to see if the wearing of a lab coat influenced selective and sustained attention.

Experiment 1

This focused on wearing a lab coat and selective attention. Fifty-eight US undergraduates were randomly assigned to wear a disposable white lab coat or not over their normal clothes while completing a Stroop task on a computer. Participants were required to name the colour a word was written with in this task. Half the words were colour names written in a different colour (eg: the word "red" in blue ink), and half the colour name in the same ink (eg: the word "red" in red ink). Participants usually make more errors in the former case.

Adam and Galinsky (2012) found that participants wearing a lab coat made significantly less errors (ie: they showed increases selective attention).

Experiment 2

This experiment investigated sustained attention with seventy-four more undergraduates, who had to find differences between four very similar pictures. This task was done either wearing a lab coat, a painter's coat, or with a lab coat on the table nearby. The participants found more differences, which was taken as a measure of increased sustained attention, when wearing a lab coat than the other two conditions (which were similar).

Experiment 3

This experiment was very similar to the previous one, but the condition involving the lab coat on the table nearby was changed to identifying with a lab coat. This was done by asking the participants to write a short essay about a lab coat in front of them. In total, there were 99 participants.

More differences between the pictures was found when wearing a lab coat again, but the identifying condition was slightly better than the painter's coat condition. This finding showed that "the effects of wearing a piece of clothing on the wearer's psychological processes cannot be reduced to a simple material priming process [ie: identifying with item]" (Adam and Galinsky 2012 p922).

4.3. FORMAL CLOTHES

Formal clothing is worn in situations like job interviews, and, as well as following norms, it signifies professionalism, the requirement of respect, and social distance, for instance. As opposed to casual clothing which signals intimacy and familiarity (Slepian et al 2015).

What is the impact of formal clothing on the wearer? For example, in studies, wearers describe themselves as competent and rational compared to friendly and laid-back when wearing casual clothes (Slepian et al 2015).

Slepian et al (2015) performed five studies on the psychological impact of wearing formal clothes.

Study 1

Based on previous research, it was hypothesised that wearing formal clothes is associated with abstract rather than concrete thinking [46]. Sixty students at a US university participated via the Internet. They were asked to rate the formality of their clothing relative to peers before completing a cognitive test (known as an action identification test). This involved choosing how to describe a behaviour - eg: "voting": "influencing the election" (abstract thinking) or "marking a ballot" (concrete thinking).

[46] "Abstract processing consists of superordinate, holistic, and broad mental representations, whereas concrete processing includes more subordinate and narrow mental representations" (Slepian et al 2015 p661). These influence decision-making processes - eg: abstract processing focuses on long-term over short-term goals (Slepian et al 2015).

Self-reported wearing of formal clothes was associated with the abstract thinking choice.

Study 2

This study was similar to the previous one, but involved approaching sixty undergraduates on campus. After rating the formality of their clothing compared to peers from 1 ("very much less formal") to 7 ("very much more formal"), they were asked to think of exemplars for categories (eg: furniture, vehicles) (which were later scored as abstract or concrete by the researchers). This is an category inclusion task.

The researchers summed up the findings: "Wearing relatively formal clothing was again associated with increased abstract processing, using a new measure of processing. This association held even when controlling for a measure of SES [socio-economic status]. Worn clothing was not associated with affect, and all effects remained when controlling for positive affect, suggesting that the current findings are not contingent on an association between formal clothing and positive affect" (Slepian et al 2015 p663).

Both studies so far are correlational only.

Study 3

This study attempted to establish the causality of the relationship between formal clothing and abstract processing with an experiment. Thirty-four undergraduates were asked to bring two sets of clothing with them - "clothing you would wear to a job interview" or "clothing you would wear to class". The participants were randomly assigned to dress in one of the sets before completing the category inclusion test.

Participants dressed in formal clothing showed increased abstract processing.

Study 4

This study replicated the previous one with 54 more undergraduates, but used a different cognitive task. The task was the speed of recognition of a global letter made up of smaller letters - global "L" made up of small "L" or global "L" made up of small "H" (figure 4.1). Participants in formal clothing were significantly faster at recognition of global than smaller letters (figure 4.2). This is known as global processing and is linked to abstract thinking.

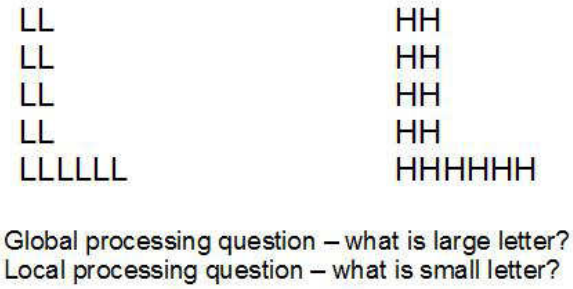
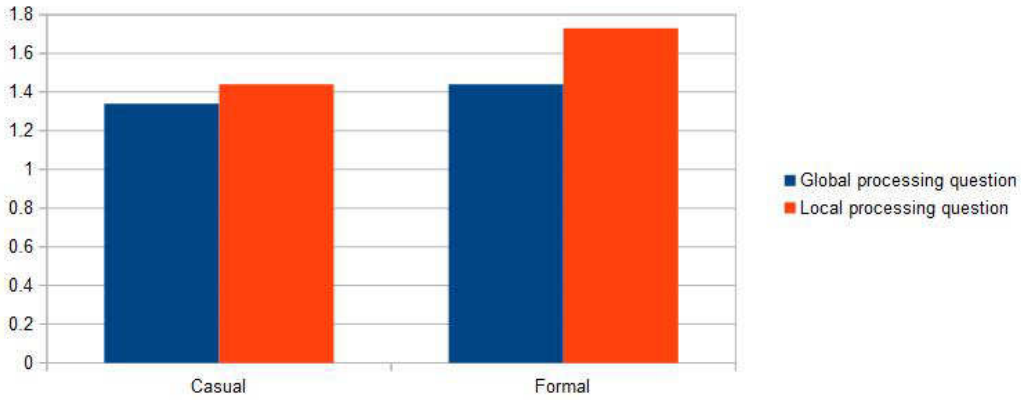


Figure 4.1 - Example of stimulus material used by Slepian et al (2015) in Study 4.



(Data from Slepian et al 2015 table 1 p664)

Figure 4.2 - Mean reaction time (in milliseconds) to answer question based on clothing worn.

Study 5

This study attempted to establish the reason why wearing formal clothing was linked to abstract thinking. The mediating factor was predicted to be "social distance", which formal clothing induces, and which leads to abstract processing.

One hundred and fifty undergraduates participated in this study via the Internet. They rated their clothing first, then completed measures of social distance (eg: likelihood of hugging a classmate goodbye at the end of a party) and other emotions like feelings of power, before the action identification test.

Statistical analysis showed that social distance, and feelings of power mediated the relationship between formal clothing and abstract processing.

Overall, the studies showed that "the clothing worn,

influences cognition broadly, impacting the processing style that changes how objects, people, and events are construed" (Slepian et al 2015 p661).

Key methodological issues:

i) Participants rated their clothing as formal relative to peers, and the Internet studies had no verification of the accuracy of the rating (ie: reliability and validity).

ii) All the participants were undergraduates (table 4.2), who are not typical of the general population, and so the generalisability of the findings is limited.

Study	Number of participants	Females	Form university subject pool
1 - Internet, correlational	60	47	Yes
2 - Campus, correlational	60	27	No - opportunity sample
3 - Laboratory experiment	34 *	No details	No details
4 - Laboratory experiment	54 **	43	No details
5 - Internet	150	No details	Yes

(* N = 50, but 16 participants did not bring correct clothes; ** N = 60, but 6 not correct clothes)

Table 4.2 - Undergraduates involved in the studies.

4.4. SOCIAL RANK AND NON-CONFORMITY

Kraus and Mendes (2014) concentrated on clothing as signalling social rank. They predicted that wearing high-status symbols will elicit behavioural (eg: valuing the self) and physiological responses (eg: increased testosterone) associated with dominance, and "will increase the likelihood that perceivers will scan their external environments for potential social- and survival-related threats. This will occur, we reason, because having subordinate status relative to an interaction partner elevates expectations that one may have lower standing in society and reduced resources to cope with demands of the social context" (p2331).

Kraus and Mendes (2014) recruited 134 18-34 year-old males from the San Francisco Bay Area of California for

mock negotiations. Participants were randomly assigned to wear high-status (business suit) or low-status (T-shirt and sweat pants) or neutral clothing. Heart rate and testosterone measures were taken before, during and after the negotiation, which involved role-playing a chief executive purchasing a factory.

Dominance in the negotiation, as measured by less concessions, for example, was evident when wearing the suit as well as increased testosterone. Those in the high-status clothes also showed changes in heart rate that signalled threat vigilance.

The experiment had the following key limitations:

- An artificial task (ie: six-minute paired mock negotiation);
- Participants varied in their experience of such negotiations;
- It was clear to the participants that clothing was being manipulated, and this could have produced demand characteristics;
- Only male participants;
- Volunteers via a particular website.

But Bellezza et al (2014) showed that in certain circumstances, "non-conforming behaviours can be more beneficial than efforts to conform and can signal higher status and competence to others. We argue that while unintentional violations of normative codes and etiquette can indeed result in negative inferences and attributions, when the deviant behaviour appears to be deliberate, it can lead to higher rather than lower status and competence inferences" (p35). Bellezza et al (2014) continued: "We propose that non-conforming behaviour can act as a particular form of conspicuous consumption and lead to perceptions of enhanced status and competence in the eyes of others. Observers may infer that a non-conforming individual is in a more powerful position that allows her to follow her volition in autonomy and bear the cost of deviating from the norm. Research suggests that high-status individuals tend to avoid blatant and conspicuous displays of wealth, status, or personal accomplishments, and instead seek alternative ways to differentiate themselves from lower-status individuals" (p37). This is called the "red sneakers effect".

In their first study, Bellezza et al (2014) presented an opportunity sample of women in Milan a story

about a woman going into a luxury boutique in that city. She was described as wearing gym clothes (non-conformity) or a dress and fur coat (conformity), and an expensive or cheap wristwatch. Participants were asked to rate if she was likely to be a VIP or a celebrity (on a seven-point scale).

Participants familiar with luxury boutiques rated the non-conforming woman as having greater status, but the opposite for individuals not familiar with that environment. One participant who was a shop assistant in a luxury boutique said: "wealthy people sometimes dress very badly to demonstrate superiority" and "if you dare enter these boutiques so underdressed, you are definitely going to buy something".

Study 2 concentrated on conformity and non-conformity in a professional setting. One hundred and fifty-nine students from Harvard University were presented with a vignette about a lecturer who wore a suit and tie or a T-shirt, and worked at a prestigious or non-prestigious university. Participants rated the lecturer from a prestigious university wearing the T-shirt as more competent.

These two studies showed that non-conformity through "dressing down" can signal high status, while Study 3 showed non-conformity through an original product choice. One hundred and forty-one participants recruited online read about "Charles" who attended a formal black-tie party at a golf club wearing a red or black bow-tie, and the choice was presented as deliberate or accidental. The non-conforming clothing (red bow-tie) was associated with higher status only when "Charles" had chosen to wear it. Figure 4.3 shows the main differences for Studies 1-3.

Study 4 moved away from clothing and looked at non-conformity in the layout of a Powerpoint presentation. Non-conformists were perceived as higher status and more competent in an online study.

The final study took place at a business conference. The female speaker wore red sneakers, and she was rated as having a higher professional status by observers who owned a pair of unique shoes. Thus, "owners of products that deviate from the norm (individuals with high levels of need for uniqueness) are more sensitive to non-conforming behaviours and grant more status and competence to signals of nonconformity than individuals with low levels of need for uniqueness" (Bellezza et al 2014 p49).

Table 4.3 summarises the hypotheses and studies which supported them.

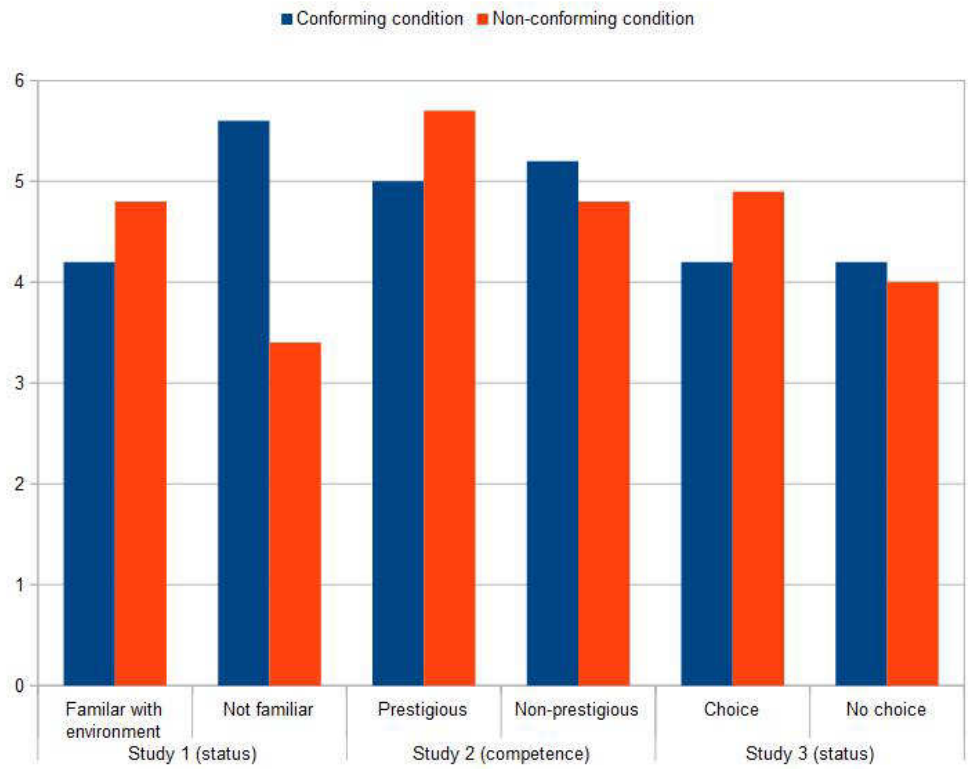


Figure 4.3 - Mean ratings (out of 7) in Studies 1-3.

HYPOTHESIS	STUDY NUMBER
Non-conforming dress/behaviour is associated with higher status and competence than conforming dress/behaviour.	1-5
Choosing to wear non-conforming clothes is seen as higher status than accidentally wearing them.	3
Observers with a high need for uniqueness will perceive higher status from non-conforming rather than conforming behaviour.	5
Non-conforming behaviour will be seen as a sign of higher status only for individuals familiar with the environment where the non-conforming takes place.	1
Non-conformity is associated with higher status for more rather less prestigious individuals.	2

Table 4.3 - Hypotheses proposed by Bellezza et al (2014).

4.5. WEARING RED

Wearing the colour red has been linked to success in sport. For example, Attrill et al (2008) found that wearing red at home games was associated with winning in

professional association football in England over 55 years of data. But Garcia-Rubio et al (2011) found no benefits in the Spanish association football premier league after controlling for other factors.

In the case of combat sports, Hill and Barton (2005) found that red uniforms/strips beat blue uniforms significantly more often, but only for closely matched bouts. The data used were from the 2004 Olympic Games in the sports of wrestling, boxing, and tae known do [47]. The allocation of uniform was random (ie: not based on ability).

The researchers explained the findings based on the evolutionary and cultural association of red with aggression and dominance. But Hill and Barton (2005) "failed to clarify whether it is the athlete or the referee who is responsible for this phenomenon. In other words, one research question is whether it is actors and their performance that are influenced by the colour of the jersey they wear, or whether it is the people who observe this colour and evaluate performance who are influenced" (Dreiskaemper et al 2013 p44).

Hagemann et al (2008) tried to resolve this issue experimentally. Referees watched videos of tae kwon do fights with red versus blue outfits. One condition used the actual colours worn, and the other condition artificially swapped the colours. The referees awarded more points to fighters in red in both conditions.

Dreiskaemper et al (2013) concentrated on the effect on the wearer of the red strip. Fourteen pairs of non-fighters fought each other with "smash sticks" [48] twice - once in red and once in blue uniforms.

Both heart rate and physical strength were measured as significantly higher during the artificial fight situation when wearing the red strip. But, the researchers admitted, "it is not clear whether greater strength and a higher heart rate lead to better fighting performance and more hits" (Dreiskaemper et al 2013 p48).

4.6. COUNTERFEIT SELF

Having counterfeit products (usually of designer labels and brands) can be seen as a signal of the desire for wealth (ie: aspirational). But Gino and North (2010) argued that buying such products causes individuals to be "not admirable, but unethical, generating in them a feeling of a 'counterfeit self'" that leads them to

[47] Rowe et al (2005) found an advantage for blue uniforms over white ones in judo matches at the 2004 Olympics. Though this relationship has been questioned (Dreiskaemper et al 2013).

[48] 1.8 m long fibreglass sticks.

behave unethically" (p211).

Gino and Norton (2010) hypothetised "a link between wearing counterfeits, feeling 'fake' or inauthentic, and behaving unethically: We suggest that a product's lack of authenticity may cause their owners to feel less authentic themselves – despite their belief that the product will actually have positive benefits – and that these feelings then cause them to behave dishonestly and to view others' behaviour as more dishonest as well. In short, we suspect that feeling like a fraud makes people more likely to commit fraud" (p211).

This idea was tested in experiments where individuals wore counterfeit designer sunglasses and had the opportunity to cheat on a test.

Gino et al (2010) described the three experiments.

Experiment 1

In Experiment 1a 85 US female students were given a pair of designer brand sunglasses to wear, but half were told that the sunglasses were fake. Then they performed a problem-solving task with the opportunity to cheat. It was found that 71% of the participants in the counterfeit sunglasses condition cheated in comparison 30% in the other condition. The participants were led to believe that they had chosen the sunglasses worn.

In Experiment 1b, a replication with 91 more female students, but the allocation of sunglasses was clearly randomised. The findings were the same with levels of cheating of 69% (counterfeit) and 26% (authentic sunglasses).

Experiment 2

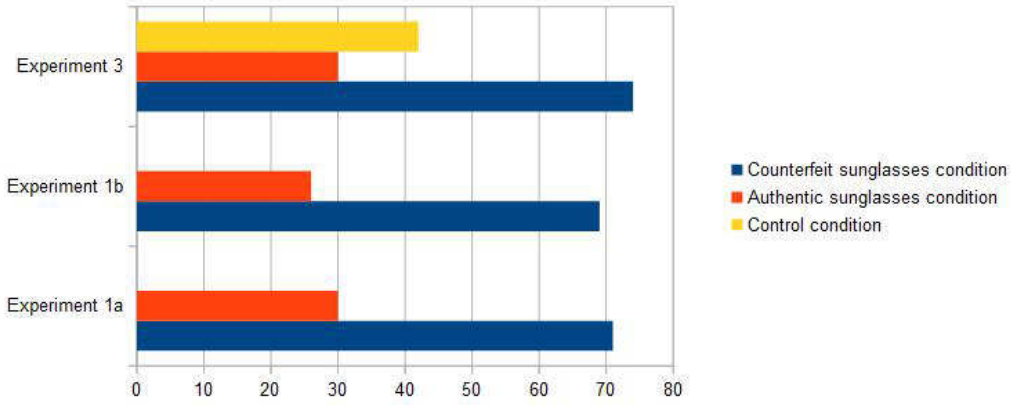
This tested whether "wearing counterfeits also affects how people interpret the behaviour of others: If wearing counterfeits makes people feel less authentic and behave less ethically, they may interpret others' behaviour as less authentic and ethical as well" (Gino et al 2010 p716).

Seventy-nine female students were randomly allocated to wear counterfeit or authentic sunglasses while completing a survey about the likelihood of cheating by other people (eg: inflating business expenses). Dishonesty was perceived in others more in the counterfeit sunglasses condition (mean 5.32 vs 4.32 out of 9).

Experiment 3

This was a replication of Experiment 1b with 100

more female students, and a control group of no sunglasses added. Cheating on the problem-solving task was 74% in the counterfeit condition, 42% in the control condition, and 30% in the authentic sunglasses condition (figure 4.4).



(* No control group in Experiment 1)

Figure 4.4 - Percentage of participants cheating in problem-solving task in Experiments 1 and 3.

4.7. LINGERIE

Wood (2016) explored the "everyday significance" of lingerie [49] to women. Lingerie is one part of "sexual consumer culture" which links to "post-feminism". "Post-feminist representations of female sexuality situate femininity primarily within the feminine 'sexy body', which is portrayed as both a site of empowerment and as requiring constant surveillance and improvement" (Wood 2016 p13). There are contradictions here, but also the opportunity for agency, which Wood (2016) noted in her research. She saw "a discourse of (dis)comfort opens up ways in which women can explore the embodied experience and feelings of wearing lingerie. This discourse has the potential to circumvent the dominant visual code of the female body as an object as pleasure, replacing it with a more ambivalent embodied narrative" (Wood 2016 p11).

Budgeon (2003) described bodies "not as objects, upon which culture writes meanings, but as events that are continually in the process of becoming - as multiplicities that are never just found but are made and remade" (quoted in Wood 2016). Wood (2016) continued: "Female bodies 'become' through the continual negotiation

[49] Wood (2016) defined "lingerie" as "items of underwear purchased and worn for use in a sexual context" (p11).

of the relationship between the body and femininity: a negotiation that can be experienced as constrained, anxious or alienating at the same time as it can be playful, pleasurable or empowering... Buying and wearing lingerie represents one aspect of everyday life through which women make and remake processural and embodied feminine identities" (p14).

Wood (2016) performed sixteen indepth interviews in 2012-13 with heterosexual women in their 20s and 30s in the south of England recruited via snowball sampling. The overall goal of the interviews was the experiences of shopping in sex shops. "Florence's" comment represented the general response of the interviewees: "I think the first time I actually bought something was, awfully, from an Ann Summers party... So there were kind of things in the catalogue, it starts off with the lingerie, and then as you go through it gets sort of dirtier or sluttier, or whatever, um, and sort of the hardcore stuff is nearer the back and so you, everyone's kind of ordering furtively from the front pages" (p10) [50].

Wood (2016) highlighted a number of themes from the interviews, including:

i) "Nice" lingerie - The word "nice" was used often to distinguish it from "dull, everyday, practical underwear", and to make clear what it is not (eg: "bright colours and 'cheap' designs"). "Overall 'nice' appears to connote a pretty, soft version of femininity, which is special and different from the everyday, but at the same time carries no risk of appearing to be distasteful" (Wood 2016 p16).

ii) "Looking good, feeling good" - eg: "Shelley" said: "You want to look nice when you start to take your clothes off. I think it's partly about wanting to feel good about yourself as well" (p16).

iii) "Making the effort" - As well as the women wearing the lingerie for themselves, they also thought

[50] Wood (2016) noted how the layout of Ann Summers' shops mirrored heterosexual sexual expression: "The desire to display the female body is constructed as an appropriate public act, whilst toys and products that speak to genital or other bodily pleasures need to be private, concealed and discreet. This reproduces normative constructions in which the sexual display of the lingerie-clad female body is, particularly in heterosexual relationships, an often expected component of both female and male sexuality" (p11). The response of the women to Ann Summers shops was interesting. Despite buying lingerie there, "the idea of the store as an overall brand was used as a way of Othering and distancing themselves from an inferior form of classed femininity. .. the sexuality attached to Ann Summers is seen as inauthentic, 'porny', 'stereotypy' or, as Clara described, a 'man's idea of what's sexy'. The performance of femininity that rejects this inauthentic display is therefore positioned as morefeminine, more tasteful and above all more authentic; as tasteful lingerie is constructed asa more genuine reflection of the woman who wears it" (Wood 2016 pp15-16).

about what the male partner would like, as "Claire" said: "If I buy stockings and suspenders I'm not really concerned about what I like... but I'm buying it for him and with something I think he'll like in mind" (p17). But "Clara's" comment showed the ambivalent feelings involved: "My partner at the time liked the fact that I had made a bit of an effort for him. But I did sort of start questioning who was I doing it for as well - was it for him or for me?" (p17).

The wearing of lingerie was a form of "body work", which Coffey (2012) defined as "the embodied everyday work that individuals undertake to modify or 'improve' their bodies" (quoted in Wood 2016). But it was also part of other aspects of "body work". For example, "Shelley" monitored her weight as "nice lingerie is uncomfortable when you're fat, it really is" (p18).

Wood (2016) concluded: "Lingerie advertising emphasises creating a perfect desirable visual spectacle through the lingerie-clad female body... Women do accommodate this expectation, gaining pleasure from visually performing femininity as a form of love and care for a partner, to feel sexually 'wanted', to enhance feelings of confidence or to do something 'nice' for themselves. But women also have diverse ways of critiquing and negotiating this discourse. Through speaking about the tensions and anxieties caused by lingerie, the multiple forms of body work and 'effort' involved in creating a sexual spectacle, and the embodied feelings of discomfort caused, the ambivalences and contradictions involved in the everyday performance of femininity and female sexuality are exposed" (p22).

4.8. APPENDIX 4A - EMBODIED COGNITION

The "conceptual metaphor theory" (Lakoff and Johnson 1999) proposes the idea of "embodied cognition" - ie: "abstract thoughts about morality my be grounded in concrete experiences of physical cleanliness" (Schaefer et al 2015).

For example, Zhong and Liljenquist (2006) asked participants to copy out an ethical or unethical story before rating the desirability of certain cleaning products, which the latter group scored higher. The idea is that the unethical story made the participants feel "dirty" (abstract thought), and the cleaning products were attractive to wash that away (physical action). This is called the "Macbeth effect" ("linking moral purity with physical cleansing"; Schaefer et al 2015).

More widely, "embodied cognition" can be described as "the mind influences the body, the body influences the

mind" (Locklear 2016). For example, participants who held a hot cup of coffee rated a stranger as being a "warm" person more than when holding an iced coffee (Williams and Bargh 2008).

Ackerman et al (2010) concentrated on physical touch experiences in six experiments. They stated that the "experience of weight, exemplified by heaviness and lightness, is metaphorically associated with concepts of seriousness and importance. This is exemplified in the idioms 'thinking about weighty matters' and 'gravity of the situation'".

In experiment 1, 54 passersby in a US city were asked to read a document about a job candidate. They were given the document attached to a heavy (>2000 g) or light <350 g) clipboard. The former group rated the candidate as better overall, and more serious about the job (mean 5.80 out of 7 vs 5.38), but no differently on the irrelevant trait of social likeability (ie: getting on with workmates).

Experiment 2 involved the two clipboards again and forty-seven more passersby. They were asked about allocating government funding for socially important and serious schemes. Only male participants, not the female ones, recommended more money in the heavy clipboard condition.

The next experiment investigated roughness and smoothness and links to concepts of difficulty or ease. Sixty-four more passersby completed a wooden jigsaw puzzle that was rough or smooth to the touch before reading about an ambiguous interaction. Those participants given the rough puzzle rated the interaction as more adversarial (ie: "rough").

In experiment 4, the same puzzles were used, but 42 participants played the Ultimatum Game afterwards. In a pair, one individual is given a small amount of money and can choose how to share it with the other person. If the offer is rejected both individuals get nothing. The game is used as a measure of co-operation. Co-operation was more common after the rough puzzle, which was unexpected.

Experiment 5 tested softness and harshness, and the concepts of strictness and rigidity. Forty-nine passersby felt a soft or hard object before rating the behaviour of a boss towards an employee. After feeling the hard object, the boss was rated as more rigid/strict than after feeling the soft object (mean 5.15 out of 7 vs 4.44).

Experiment 6 manipulated the hardness by asking 86 participants to sit on a wooden chair with or without a

cushion as an imaginary car auction took place. Sitting on a hard chair produced less change in offers (ie: rigidity).

The somatosensory cortex seems to be activated by embodied metaphors (eg: "dirty hands" for guilt), and this explains "embodied cognition" [51]. Schaefer et al (2015) showed this in a functional magnetic resonance imaging (fMRI) experiment. Thirty-five German volunteers were placed in a fMRI scanner, and asked to read different ethical scenarios. For example, you find an important dropped document of a promotion competitor of yours at work, would you tell the boss? Participants were told to inform the competitor by voicemail or written note (independent variable 1 - modality), and to leave a true or lying message (independent variable 2 - ethical/unethical behaviour). Then the participants were told to rate the desirability of toothpaste/mouthwash products or hand soaps. It was predicted that the unethical message group would feel guilt and rate the washing products more desirable than the ethical message group, and the difference would be related to modality - leaving a message (oral) and toothpaste/mouthwash products, and writing a note and hand soaps.

The cleaning products were rated significantly more positively after lying than being honest. Toothpaste/mouthwash products received a significantly higher desirability rating after the lying voicemail (mean 2.5 out of 4) than the honest voicemail (mean 2.48), but the opposite for hand soaps (lying note 2.54 vs honest note 2.51). So, the experimental predictions were supported.

Different areas of the somatosensory cortex were activated depending on whether the lying was by voice message or written note.

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[51] Williams et al (2009) proposed that the development of knowledge by babies is first based on bodily sensations, while Wilson (2002) stated that humans "evolved from creatures whose neural resources were devoted primarily to perceptual and motor processing" (quoted in Schaefer et al 2015). Alternatively, the neural reuse theory (Anderson 2014) argued that brain areas are involved in various tasks - "our novel and abstract higher-order cognitive processes may be just recombinations of more simple and basic brain processes" (Schafer et al 2015 p10).

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