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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://kmbpsychology.jottit.com.

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1. DELUSIONAL INFESTATION, UNEXPLAINED DERMOPATHY, AND MORGELLONS DISEASE

1.1. DELUSIONAL INFESTATION

Delusional parasitosis [1] is "the fixed false belief of being infested by small creatures or inanimate particles" [2] (Freudenmann et al 2010 p517) [3]. "Patients experience abnormal sensations, which they ascribe to the presence of parasites under the skin or in their immediate environment. As a result of their belief, patients often try to treat the parasites with disinfectant, pesticides or self-mutilation, leading to skin lesions and further itching, which in turn serves to confirm the patient's belief that there is something wrong with their skin" (Lepping et al 2010 p841).

There is some cultural difference in the type of "imaginary pathogens" (Freudenmann et al 2010). Freudenmann & Lepping (2009) preferred the term "delusional infestation" (DI) as parasites are less frequently reported as the "pathogen" today [4].

DI can be a disorder by itself (primary DI [5]) (known

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[1] Coined by Wilson and Miller (1946), who also used the term "acarophobia". But Freudenmann and Lepping (2009) stated: "All names ending with '-phobia' that have been proposed over the years are also misleading, because there is no evidence of an anxiety disorder (such as entomo-, acaro-, or parasitophobia). Similarly, names highlighting the abnormal sensations and hallucinations, such as 'organic hallucinosis', used in ICD-10, are imprecise (cognitive symptoms are more important...)" (p692).

Also called Eckbom syndrome (Savely et al 2006). But Eckbom syndrome (named in 1938) is ambiguous as it is also used in reference to restless legs syndrome (Freudenmann and Lepping 2009).

[2] Pathogens include parasites (eg: ticks, worms), infections (eg: bacteria, viruses), organic particles (eg: splinters, pollution-related particles), and inorganic substances (eg: metal pigments, salts) (Harth et al 2010).

[3] Delusions in dermatology can be divided into delusional parasitosis, body odour delusion, hypochondriac delusions, and body dysmorphic disorder (Harth et al 2010). Karl Jaspers in 1913 described the characteristics of delusions as involved "an extraordinary conviction" and "subjective certainty" which cannot be influenced by experience, others, logic, or evidence ("imperviousness"), as well as "their content is impossible" (quoted in Freudenmann and Lepping 2009).

[4] "An interesting and indicative feature is the presumed size of the pathogens. They are often described as 'almost too small to see' or tiny..., such that it is difficult for the patient to catch one" (Freudenmann and Lepping 2009 p693).

[5] Primary DI was coined by Skott (1978). It is categorised as "delusional disorder, somatic type" in DSM-IV-TR (Freudenmann and Lepping 2009).

as a monodelusional disorder) [6] or associated with another physical disease or mental disorder (eg: dementia), or transitory symptoms after drug over-use (prescribed or illicit) (Lepping et al 2010) [7].

The core symptoms are (i) the rigid belief that the individual is infested contrary to medical evidence [8] [9], and (ii) abnormal (tactile) sensations from "pathogens" (eg: "crawling", "biting") (Freudenmann and Lepping 2009). But not all patients report tactile symptoms (eg: 82% of 33 cases did; Zomer et al 1998).

Common features include (Freudenmann and Lepping 2009) [10]:

- "Pathogens" are black, grey or white.
- Transmitted from humans mostly, then plants/gardens, and animals least.
- Skin of hands, arms, feet, lower legs, and scalp most infected areas, but whole body rare.
- Patients examine skin in great detail and keep reports of this process.
- Extensive and ritualised self-cleaning, and sometimes extreme behaviours (eg: burning "infested" clothes).
- "Doctor hopping" - approaching different people for help.

The typical sufferer of primary DI is a woman aged 50-80 years old with few social contacts, no psychiatric history, and normal cognitive functioning (Freudenmann and Lepping 2009). Thus there is a large gender difference with more female sufferers in a ratio of 1.33 to 25:1 (depending on the study) (Freudenmann and Lepping 2009).

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[6] The "pure form" (Trabert 1995). The "psychopathology is limited to the delusions and abnormal tactile sensations related to the delusional theme. It is stunning to see that patients are otherwise entirely mentally healthy and argue rationally if they discuss issues other than infestation" (Freudenmann and Lepping 2009 p692).

[7] DI has been explained by a vulnerable-stress model. A particular stressor triggers the tendency towards delusional behaviour. The trigger may be an actual parasite infection, media reports, or personal observations (eg: illness in family members) (Harth et al 2010). The predisposition might be a dysfunction in the dopamine synapse (Huber et al 2006).

[8] There is a question of whether the rigid beliefs are "overvalued ideas" (ie: shakeable) or delusions (unshakeable), or illusions or delusions (Freudenmann and Lepping 2009).

[9] Bell et al (2006) proposed the "two-factor cognitive model" of delusions - (i) abnormal sensory perceptions, and (ii) dysfunctional "belief evaluation system" in prefrontal cortex, which "prevents the person from rejecting the belief in the light of strong evidence against it".

[10] Freudenmann and Lepping (2009) reviewed 508 publications up to December 2008.

Historically, Georges Thibierge in 1894 and Perrin in 1896 in Paris are quoted as the first medically recorded cases, though older descriptions exist (Freudenmann and Lepping 2009).

The key behaviour was the sufferer bringing specimens of pathogens to show the doctor, and "to prove that their skin, other parts of their body, or immediate environment are infested" (Freudenmann et al 2010). This has subsequently been called the "matchbox sign" (Anonymous 1983) as the pathogens are often brought in matchboxes [11].

The advent of the Internet has offered an opportunity for sufferers to "compare notes". Since 2002, Internet self-diagnosed individuals have presented fibres or filaments as their infestation. This has been a key characteristic of "Morgellons disease" (Freudenmann et al 2010) [12].

Researchers have looked for a genetic basis to DI. For example, Skott (1978) found that patients with DI had significantly more relatives with a psychiatric disorder (45 of 200 relatives) than controls (23 of 200). But only one case of DI among the relatives of sufferers. This study suggested a higher level of general psychiatric disorders not DI as inherited. Freudenmann and Lepping (2009) stated that the "numbers of cases are too small and the diagnosis of the affected relatives were too heterogeneous for any further conclusions" (p706) [13].

1.1.1. Prevalence of DI

Dermatologists are usually visited most often by sufferers.

Lepping et al (2010) investigated the prevalence of DI in the UK with a postal questionnaire sent in 2008 to 231 dermatologists in the UK Dermatology Clinical Trials Network (UK DCTN). One hundred and three questionnaires (44.6%) were returned completed.

In the previous three years, an average of 1.8 individuals with DI were seen by the respondents (total of 182 cases), but a quarter of them had not seen a case. The prevalence of DI converts to 4.99 per million dermatology outpatients or 1.48 per million population in the UK. This compares to 5.58 per million population in a

[11] Freudenmann et al (2010) preferred the term "specimen sign".

[12] Because of the importance of the Internet in the spread of Morgellons, terms like "socially transmitted disease over the Internet", "cyberchondria", and "folie à Internet" have been used (Harth et al 2010).

[13] DI has been reported as affecting a whole family, but as a "joint delusion" ("folie à famille") (Daniel and Srinivasan 2004).

German study (Trabert 1993 quoted in Lepping et al 2010).

While Morris and Jolley (1987) calculated an annual incidence in the UK of 83.33 cases per million population in over 65s.

How accurate are the figures of Lepping et al (2010)? The authors admitted themselves that "any conclusions as to the real prevalence of DI need to be drawn with caution, but it would be reasonable to assume that our data represent the likely minimum prevalence in the UK, and are at present the best available" (p843).

The following points can be made about the sample studied by Lepping et al (2010):

- The respondents covered a catchment area of half the UK population.
- Only individuals with DI who seek help will be covered.
- The UK DCTN does not include every dermatologist in the UK.
- The response rate was less than half [14].
- It was self-selected sample (ie: those who chose to respond).

Freudenmann et al (2010) surveyed seventy-two attendees ("psycho-dermatologists") from nineteen countries at the 13th Congress of the European Society of Dermatology and Psychiatry (ESDaP) in September 2009. The survey had three sets of questions only.

1. Since 1995 (a convenient date for memory), how many patients have been personally seen with delusional parasitosis, and how many brought evidence of the infestation with them?

The median number of individuals seen was eight (total of 1078 cases in fifteen years), and half of them brought "proof" with them.

2. What "pathogens" did the patients bring, and what did these prove to be on analysis? Did the patients use the label "Morgellons"?

"Insects" and "animals" were the most frequent organic pathogens (36% and 28% of total respectively),

[14] Whether this is a good or bad response rate determines upon different factors (eg: official survey; incentive to return questionnaire; population approached) (appendix 1A).

while "fibres", "threads" and "filaments" were the most common non-organic ones (around 20% of total). On analysis, most "pathogens" were found to be skin debris or cloth/cotton threads.

Individuals from English- and German-speaking countries only used the label "Morgellons".

3. Did the patient present their pathogen/proof in a container?

All but one respondent answered "yes". Matchboxes and plastic bags were most popular (39% and 38% of containers respectively).

This survey covered more cases than past studies (eg: 282; Lyell 1983), but less than a meta-analysis of historical cases (1223 cases; Trabert 1995).

Entomologists Schrut and Waldron (1963) reported over 100 cases they met in five years. While, among psychiatrists, a study in Germany calculated a rate for DI of 2.5 per 1000 (Mester 1977 quoted in Freudenmann and Lepping 2009).

1.2. MORGELLONS DISEASE

Morgellons disease [15] was a term coined in 2002 by American biologist, Mary Leitao [16], to cover the apparent infestation of her two year-old son's skin with "bundles of fibres" (Harth et al 2010) [17]. Morgellons disease is named after a disease described by Sir Thomas Browne in 1674 where hair grew on the backs of children called the Morgellons in France (Kellett 1935 quoted in Savely et al 2006) [18].

Virginia Savely reported patients in 2002 appearing with chronic illness and non-healing skin lesions at her

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[15] Freudenmann and Lepping (2009) preferred the term "unexplained dermopathy". However, some clinicians have argued that "while Morgellons should not be validated as an organic disease, the name Morgellons itself may be used to establish a positive rapport with patients, as it helps bypass the stigma associated with the psychiatric diagnostic category DP" (Fair 2010 p605).

[16] The main advocates of Morgellons are Mary Leitao, Virginia (Ginger) Savely (nurse), and William Harvey (physician). Freudenmann and Lepping (2009) noted about the latter - "Apart from his recent papers on Morgellons, it is interesting to see that all of his earlier publications — before the name Morgellons was coined in 2002 — deal with neuropsychiatric symptoms in himself which he considered to be 'emerging illnesses' or 'an unrecognised borreliosis pandemic' in connection with Lyme disease and *Candida tropica*.. Previously, Harvey had also founded an organization called the International Lyme and Associated Diseases Society... and described his self-treatment with ultrahigh doses of antibiotics to free himself from bacteria" (p708).

[17] The first doctor Leitao visited diagnosed eczema. However, she was accused of Munchausen by proxy by a later doctor who she took her son to see (Fair 2010).

[18] Kellett (1935) also referred to other isolated cases between 1544 and 1884 (Harvey et al 2009).

clinical practice in Texas, USA [19]. Microscopic analysis found blue and white fibres protruding from the lesions, but the filaments could not be removed (Savely et al 2006) [20].

Advocates of Morgellons disease define it as "infestation of the body with unknown fibres, threads, or filaments associated with multiple symptoms affecting the entire body, including arthralgia, fatigue, and concentration disorders" (Harth et al 2010 pp237-238) [21]. Though the skin symptoms are important, individuals report many of these other symptoms as well [22]. Pearson et al (2012) felt that, in fact, Morgellons disease has subsequently come to mean "an unexplained collection of symptoms, with the primary manifestation involving the skin" [23].

There is a variety of views on the Internet [24], and, in some cases, links are made to conspiracy theories [25].

Harth et al (2010) described a case study from Germany of a 55 year-old woman with severe ulcers on the face. She believed that the ulcers were caused by fibres or barbs emerging from the skin, and she provided samples of them. But "the patient believed that there was infestation with inanimate fibres and splinters, which could however move like live organisms and cause various moving tactile sensations" (p238).

Skin damage, which is used by the patient as evidence, is self-inflicted as they attempt to remove the "pathogens". The skin is also damaged by frequent cleaning and/or the use of chemicals to eliminate the "pathogens" (Harth et al 2010).

Savely et al (2006) argued that Morgellons disease is a condition that has much in common with Lyme disease (caused by a tick) (ie: that it is a "real" disease rather than delusional). They said: "It is possible that the medical community is overlooking an important and

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[19] The highest rates of Morgellons cases are in the US states of California, Texas, and Florida (Savely et al 2006).

[20] Over 14 000 families had symptoms based on Internet contact (Savely and Stricker 2010).

[21] The quality of life of sufferers is substantially reduced, and at the extreme, there is total disability (Pearson et al 2012).

[22] Nine symptoms (Savely and Stricker 2010).

[23] Certain conditions like chronic fatigue syndrome and fibromyalgia have been reported as co-morbid with Morgellons disease (Pearson et al 2012). It is possible that there is some "confusion" over the non-skin symptoms and these co-morbid conditions.

[24] The infestation can include "a fungus (new to science), genetically modified food, 'nanotechnology gone awry, an immune disorder, an infectious agent, mass psychogenic hysteria, the effects of airline contrails..., illegal immigrants, Lyme disease, and others' (Molyneux 2008)" (Freudenmann and Lepping 2009 p707).

[25] Even linked to extra-terrestrial visitors ("Ancient Aliens: Aliens, Plagues and Epidemics"; History Channel; 2011).

previously unrecognised skin infection, dooming patients to endless frustration and suffering by not validating or attempting to treat this chronic infection. The few medical professionals who have become involved with the diagnosis and treatment of Morgellons disease are becoming increasingly convinced that many patients have a puzzling infectious disease that may cause horrific symptoms and psychiatric sequelae" (p4).

The problem for the medical establishment is physiological evidence as a new type of disease. Freudenmann and Lepping's (2009) response is thus: "The origin of Morgellons, in the particular mother-child constellation, has similarities with DI by proxy. The desperate search for an explanation and a name for the symptoms that led to the name 'Morgellons' resembles phenomena such as delusional elaboration... Therefore, the practical conclusion for the medical community must be to treat Morgellons as DI as long as there is no better explanation... From a psychiatric point of view, we expect further variations and manifestations of DI, including new names and pathogens. It is important for dermatologists, microbiologists, and generalists to know the phenomenon of name shifts and variations within a delusional theme. Morgellons will not be the last variation to emerge." (p709).

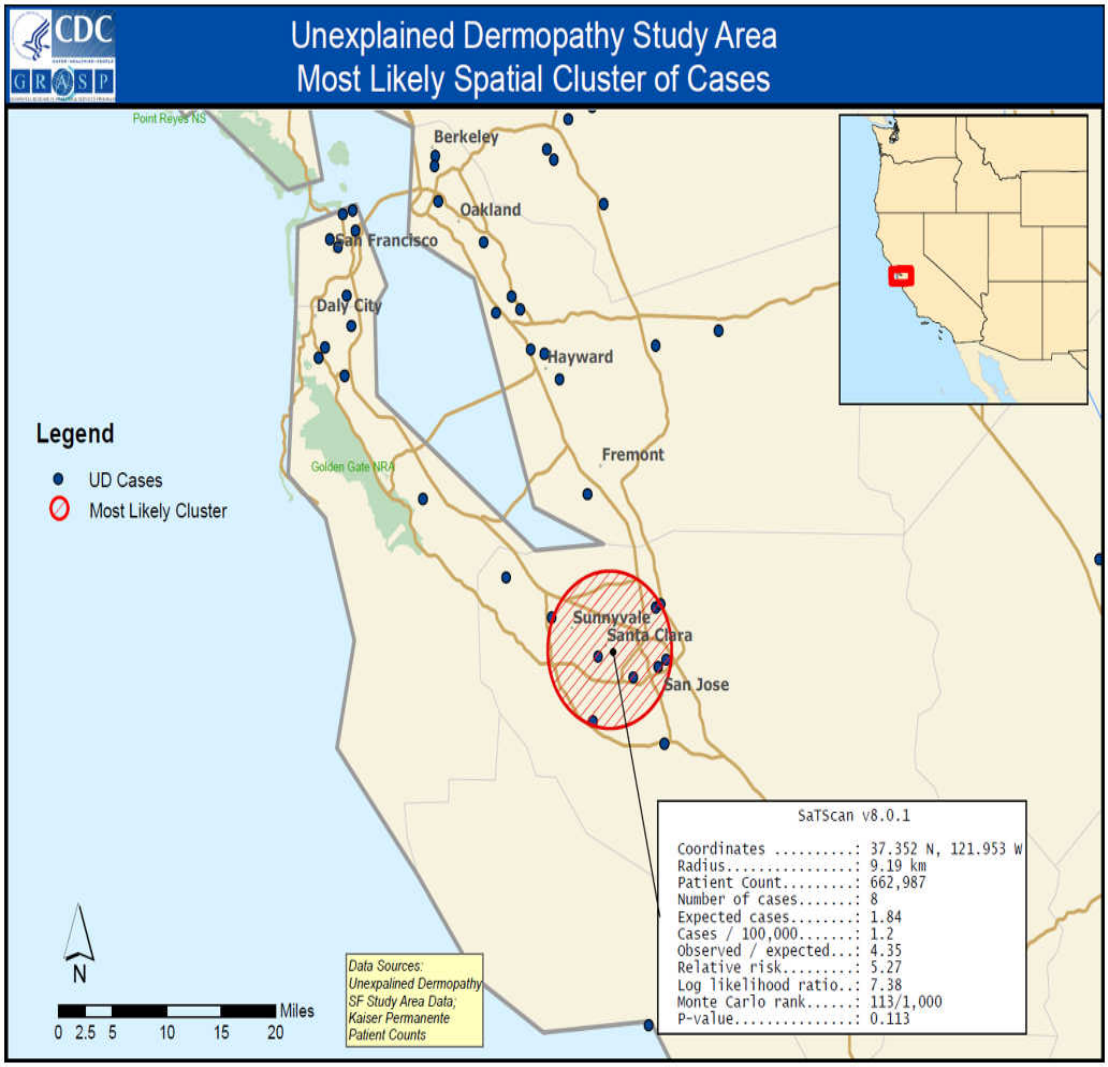
1.2.1. CDC Study

Pearson et al (2012) reported a study supported by the Centers for Disease Control and Prevention (CDC) in northern California covering July 2006 to June 2008. A "case-patient" was a person, who received help from the health provider, Kaiser Permanente of Northern California (KPNC), and reported "fibres, threads, specks, dots, fuzzballs, granules, or other forms of solid material coming out of his/her skin". There were 115 case-patients (figure 1.1), of which seventy completed a detailed web survey (covering physical and mental health), and forty-one participated in clinical tests (eg: blood and skin samples) (figure 1.2).

The prevalence rate of the unexplained dermopathy (as the researchers preferred to use) was 3.65 per 100 000 KPNC patients (table 1.1) [26]. The median age was 52 years old, and three-quarters of the individuals were female, and White [27].

[26] Total number of KPNC patients was 2.85 million.

[27] Compared to Savely and Stricker's (2010) sample, which was 85% female with a median age of 48.5 years, and 90% White.

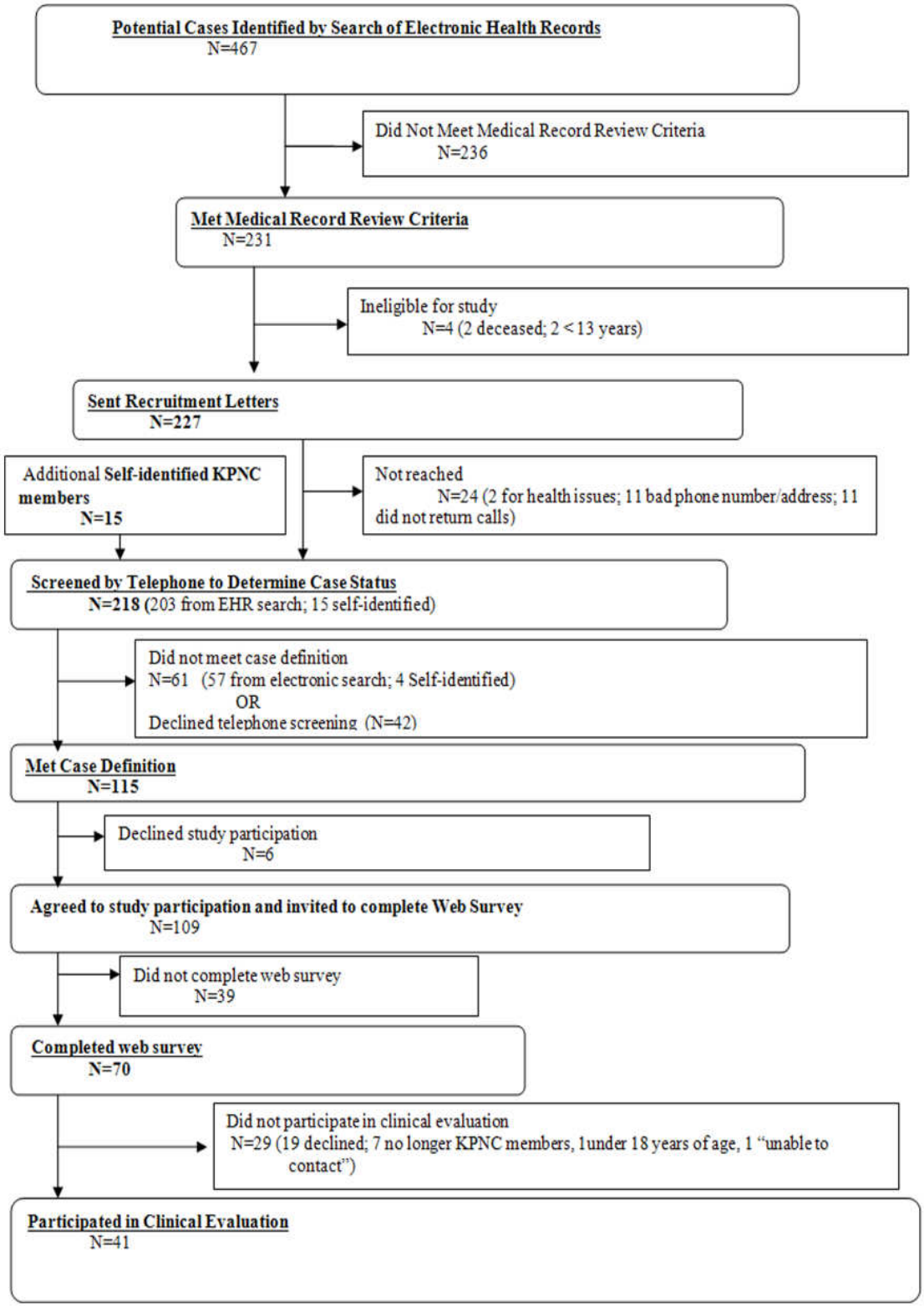


(There was no significant geographical clustering found [28])

(Pearson et al 2012 figure 2)

Figure 1.1 - Map showing distribution of cases.

[28] Over two-thirds of Savely and Stricker's (2010) sample were from California and Texas, which led the authors to wonder: "A common feature shared by these states is that they have the most mileage of coastline, prompting speculation that the putative infectious agent of Morgellons disease could be water-borne. California and Texas are also two of the states with the highest number of Hispanic immigrants. It is not known whether this may have a bearing on the high prevalence of the disease in these states, but recent third-world travel was found in this study to be a risk factor for the development of Morgellons disease. Furthermore, California and Texas are among the states with the highest average yearly temperatures according to the National Weather Service... and rarely, if ever, endure hard freezes in the winter. The resultant warm weather may sustain the ability of certain types of pathogens to survive. The definitive reason for the high prevalence of Morgellons disease in Texas and California remains to be determined" (Savely and Stricker 2010 pp73-74).



(Pearson et al 2012 figure 1)

Figure 1.2 - Recruitment details of sample.

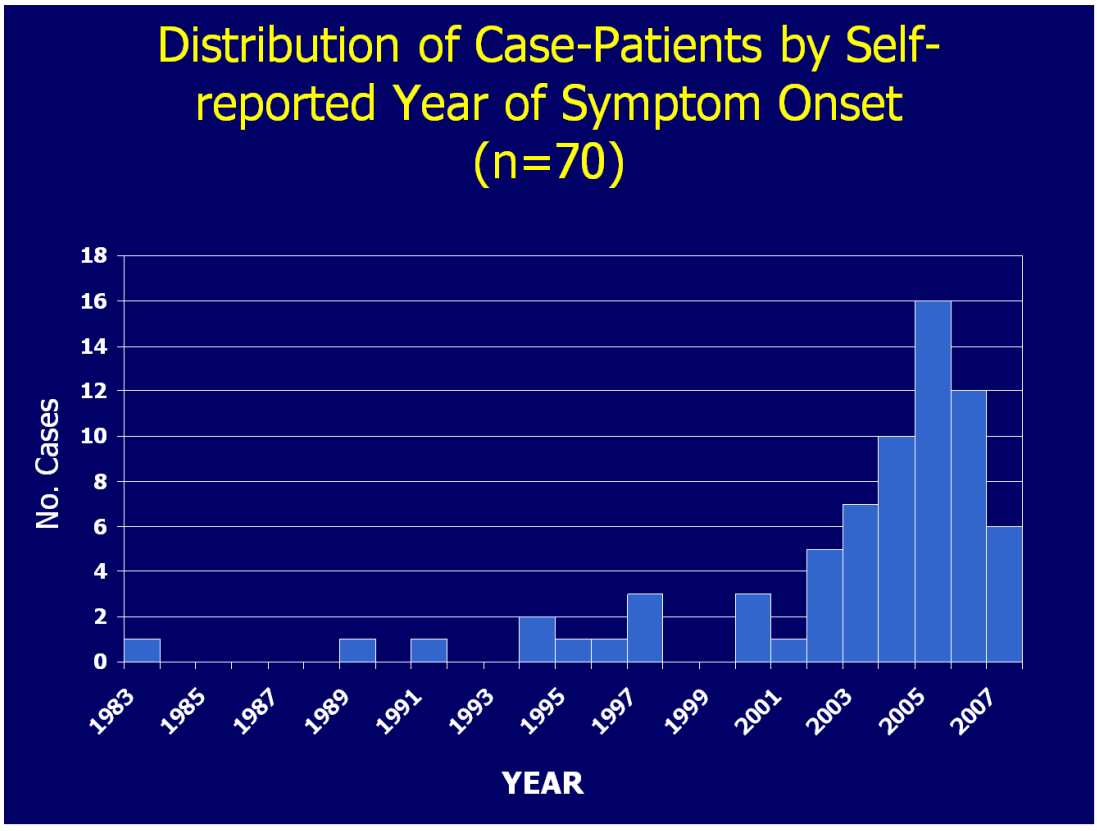
Group	Rate per 100 000 KPNC patients
Total	3.65
Gender • Female • Male	 5.38 1.81
Age • <18 yrs • 18-44 • 45-64 • ≥65 yrs	 0.15 2.08 8.11 4.78

(Based on Pearson et al 2012 table 1)

Table 1.1 - Prevalence rates of unexplained dermopathy.

The length of symptoms varied from one to nearly thirty years (figure 1.3).

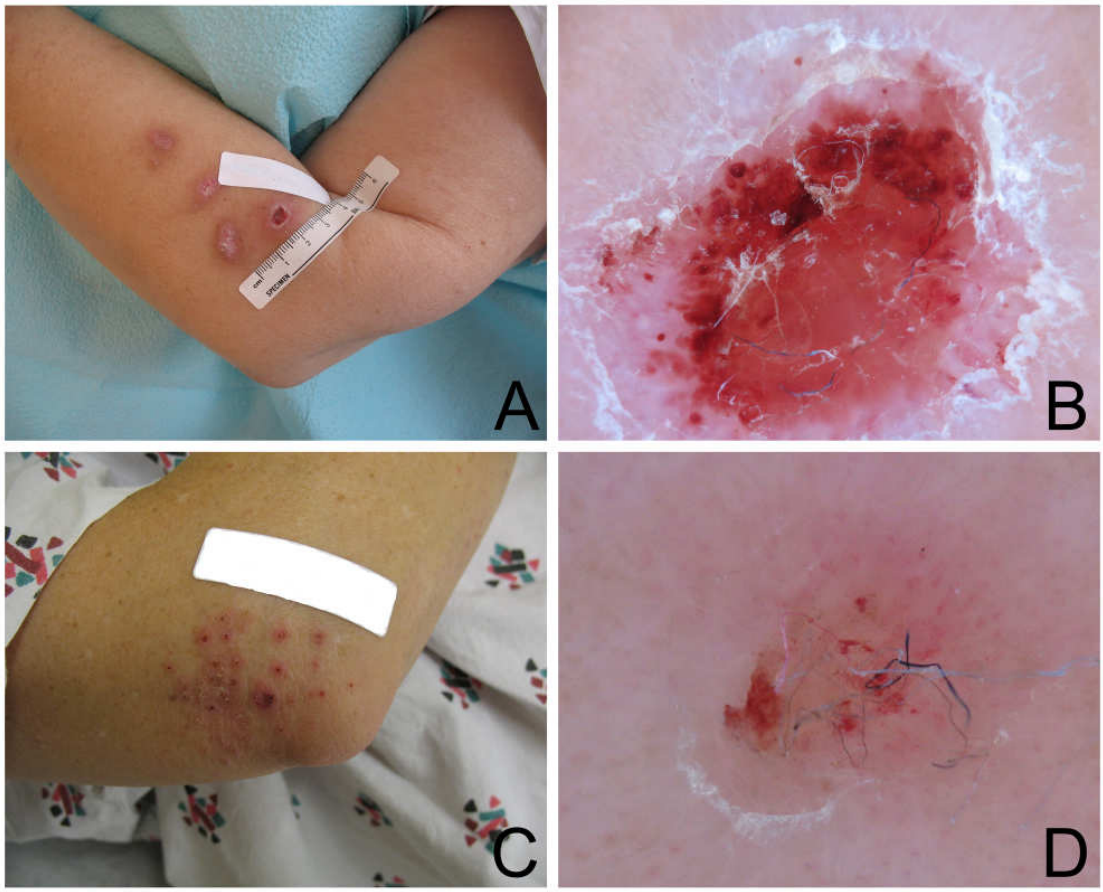
Over half of the participants (53.6% reported their general health as fair or poor, which is significantly higher than the general population in California (17.5%) and the USA (16.3%).



(Pearson et al 2012 figure 3)

Figure 1.3 - Self-reported onset of symptoms.

Pearson et al (2012) summarised the findings thus: "Case-patients had a wide range of skin lesions, suggesting that the condition cannot be explained by a single, well-described inflammatory, infectious, or neoplastic [tumour] disorder. A substantial proportion (40%) of biopsied lesions had histopathologic [29] features compatible with the sequelae of chronic rubbing or excoriation [30], without evidence of an underlying aetiology. The most common histopathologic abnormality was solar elastosis, a degeneration of dermal connective tissue and increased amounts of elastic tissue due to prolonged sun exposure" (figure 1.4).



(A. Three erythematous [redness of skin] scaly plaques with a fourth more proximal eroded and crusted plaque. B. Close-up of the eroded plaque in image A showing blue fibres. C. Excoriated erythematous papules suggestive of arthropod bites, dermatitis or possible excoriated folliculitis. D. Close-up of excoriated lesion in image C)

(Pearson et al 2012 figure 4)

Figure 1.4 - Photographs of skin lesions detected during clinical examination.

[29] Histopathology is the microscopic study of tissue for disease.
[30] To tear off skin.

Analysis of the "fibres" "were largely consistent with skin fragments or materials such as cotton and were either entrapped in purulent crust or scabs, suggesting the materials were from environmental sources (eg: clothing) or possibly artifacts introduced at the time of specimen collection and processing" (Pearson et al 2012).

There was no common pattern of infection that could be an underlying cause. The researchers also reported: "We found evidence of drug use in 50% of participants. Formication [31] can be a side affect drug use (prescription and illicit) and drug withdrawal, but the extent to which case-patients' drug use contributed to, or was being used as a treatment for, the condition was not determined. The high prevalence of drug use also may represent some case-patients' attempts to alleviate frustration or symptoms associated with the illness. Also, we found that over 75% of case-patients reported some exposure to solvents during hobbies" (Pearson et al 2012).

In conclusion, they said: "We were not able to conclude based on this study whether this unexplained dermopathy represents a new condition, as has been proposed by those who use the term Morgellons, or wider recognition of an existing condition such as delusional infestation, with which it shares a number of clinical and epidemiologic features... We found little on biopsy that was treatable, suggesting that the diagnostic yield of skin biopsy, without other supporting clinical evidence, may be low. However, we did find among our study population co-existing conditions for which there are currently available therapies (drug use, somatisation)" (Pearson et al 2012).

Though the sample was limited to KPNC patients, it is the most extensive study of sufferers of Morgellons disease/unexplained dermopathy to date, and involved many different aspects (eg: psychology, histopathology). For example, Harvey et al (2009) studied twenty-five self-referrals [32], and Savely and Stricker (2010) had a convenience sample in the USA [33]. Neither study included biopsies of the skin (Pearson et al 2012).

There was no comparison group in the Pearson et al (2012) study. Also Pearson et al (2012) said: "As there is no established definition or diagnostic test for this condition, our case definition was based on self-reported

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[31] The feeling of an insect crawling under the skin.

[32] Self-diagnosed individuals who went to a clinic between September 2006 and July 2007. The researchers had nine screening criteria, which included "patient convinced of chronic parasite infestation", chronic itching present for at least six months, illness has life-altering, and experiencing symptoms for more than six months (Harvey et al 2009).

[33] 122 patients seen at San Francisco medical office by Virginia Savely. It was a retrospective study with one data collection episode. Because no medical insurance available for condition, the sample may have been bias towards individuals who could pay for their own treatment (Savely and Stricker 2010).

symptoms and hence subject to reporting biases and potential misclassification of cases".

The Pearson et al (2012) study cost over half a million US dollars to the CDC (Fair 2010), and the value of the study has been questioned. Fair (2010) pointed out that Morgellons "shows the ways in which a small contested illness community can utilise the Internet to push its political agenda, attracting the attention of the CDC" (p599). Referring to the "electronic support group" of another condition, fibromyalgia, Barker (2008) noted how it reified self-diagnosis. Another condition is "multiple chemical sensitivity" (MCS) (Kroll-Smith and Floyd 1997), where sufferers "reconfigure biomedical logic in order to make sense of their bodies' intolerance of putatively benign chemicals emitting from everyday objects like perfume or dry-cleaned clothing; that is, because MCS's aetiology lacks a scientific explanation, patients do their best to rationally theorise the conditions of their contested illness, appropriating biomedical rhetoric in their pragmatic attempt to figure out what it is that makes them feel sick" (Fair 2010 p607).

There are a number of other factors that come together with Morgellons (or "Health Social Movements" (HSM) Brown et al (2004), or "Medically Unexplained Physical Symptoms" (MUPS) Zavestocki et al (2004)) - namely, growing patient empowerment (eg: demand for health resources devoted to their condition), public distrust of the medical professions, and concerns about the environment's impact on health (Fair 2010).

1.3. APPENDIX 1A - IMPROVING RESPONSE RATES ON POSTAL SURVEYS

A good response rate is important for either a one-off survey or repeated mailings in a longitudinal study. In the latter case, a low response rate to later questionnaires can mean that none of the individual's data are usable. Thus the importance of findings ways to improve response rates. One technique tried is pre-notification (ie: telling participants that they will soon receive a questionnaire).

Edwards et al's (2009) review of 47 studies found that pre-notification by post or telephone significantly increased the response rate to the questionnaire (by about one and half times compared to no pre-notification).

MacLennon et al (2014) found that a pre-notification telephone call was more effective than a post-questionnaire non-response phone call. The researchers used participants from the RECORD (Randomised Evaluation

of Calcium and/OR vitamin D) (eg: Grant et al 2005) in the UK, which involved questionnaires every four months. Participants who had not responded previously to a questionnaire were allocated to one of two groups. The intervention group (n = 390) received a pre-notification telephone call fourteen days before the questionnaire, while the control group (n = 363) received the questionnaire and a follow-up letter if they did not respond within three weeks.

There was a small non-significant increase in the response rate in the intervention group (68%) as compared to the control group (62.5%). But in the following questionnaire (four months later), there was a significant increase (51.8% response rate in the intervention group vs 42.7%) (ie: "a residual carry over" from the pre-notification call) (figure 1.5). MacLennon et al (2014) concluded: "This study suggests that pre-notification telephone calls may only be worthwhile if further questionnaires are to be sent out soon after reminder questionnaires".

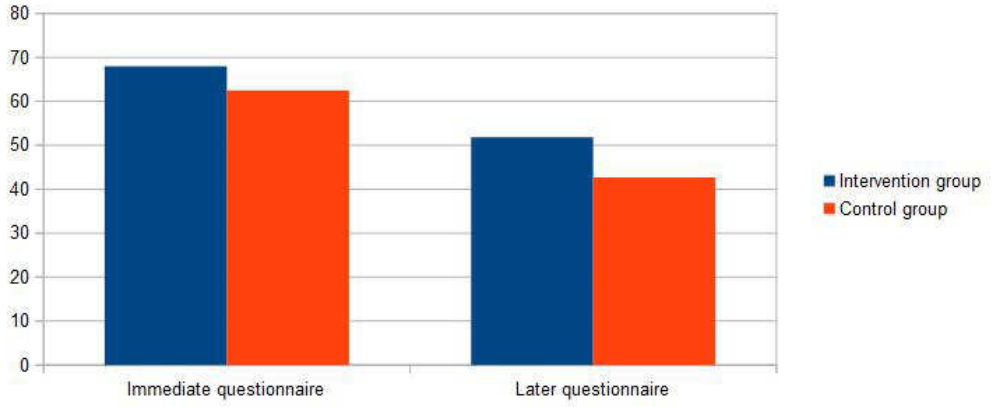

Figure 1.5 - Response rate (%) to two questionnaires.

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2. A SELECTION OF STUDIES OF FOOD AND WEIGHT

2.1. PERCEPTION OF TASTE AND FOOD

The perception of taste is not an objective sense, and food is affected by the consumption environment (eg: shape of the glass; ambient lighting). For example, a beverage in a glass of a "cold" colour is perceived as more thirst-quenching than in a glass of a "hot" colour (eg: Piqueras-Fiszman and Spence 2012a), while the colour of the serving plate can influence perceived saltiness or sweetness of the food (eg: Piqueras-Fiszman et al 2012). Food in a heavier porcelain bowl was perceived as thicker and denser than served in a lighter bowl (eg: Piqueras-Fiszman and Spence 2012b). This is called "sensation transference" (Harrar and Spence 2013).

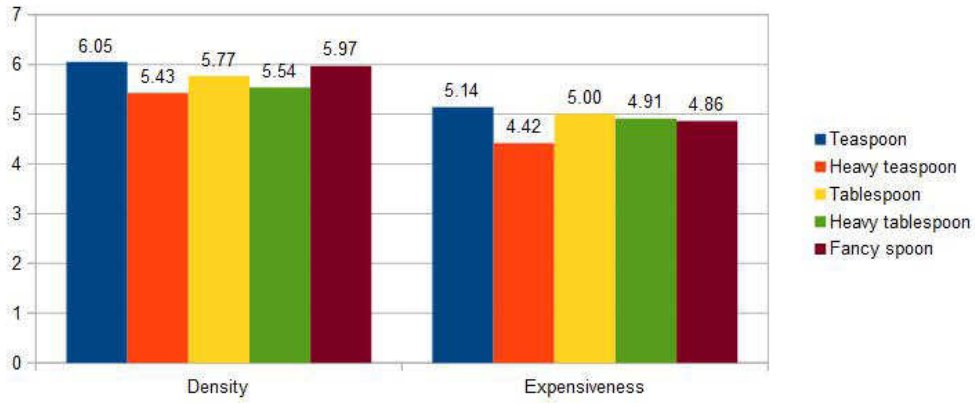
Harrar and Spence (2013) investigated through three experiments whether the cutlery used to eat the food will change the perception of the food itself.

In Experiment 1, with 35 participants, five plastic spoons were compared to eat yoghurt. These were two teaspoons (one with added weight - 6.57 g vs 2.35 g), two tablespoons (one with extra weight attached - 10.84 g vs 3.73 g), and a "fancy" spoon that appeared expensive with an ornamental handle (weighing 7.30 g). Participants rated the yoghurt for perceived density, expensiveness, sweetness, and overall liking [34].

The yoghurt was rated as tasting denser and as more expensive when sampled with lighter spoons as compared to heavier spoons for the identical food (figure 2.1). This is opposite to the results with plateware. Harrar and Spence (2013) stated: "we suggest that the effects of tableware weight on taste are mediated by the consumer's expectation of the tableware's weight. That is, when the cutlery or bowl is expected to be light (as here with plastic cutlery) the yoghurt tastes better (more dense and more expensive) when these expectation are met (that is, when the cutlery is light)".

[34] Eg: Density - 1 (very thin) to 9 (very thick); Expensiveness - 1 (very inexpensive) to 9 (very expensive).

The yoghurt sampled with a small spoon was rated as significantly sweeter. Again, Harrar and Spence (2013) emphasised the role of expectations: "Small spoons are often used for desserts, or to stir sugar into coffee or tea. There might be an expectation that food tasted from a small spoon would normally be sweeter than food tasted from a larger tablespoon (more often used for savoury dishes such as soups)".



(Higher score = more dense; more expensive; out of 9)

(Data from Harrar and Spence 2013 table 1)

Figure 2.1 - Mean ratings of density and expensiveness based on spoon used.

In Experiment 2, using forty Oxford University undergraduates, the researchers varied the colour of the spoon used to sample the yoghurt (red, blue, green, white, or black) as well as varying the colour of the yoghurt as either naturally white or artificially-coloured pink. The perceived saltiness of the different coloured yoghurt varied with a blue spoon (ie: pink yoghurt saltier). When a white spoon was compared to a black one, more positive ratings were given.

Experiment 3 involved thirty undergraduates from Oxford University eating cheese (young or mature cheddar) using different shaped cutlery (fork, spoon, knife, or toothpick). The cheese was perceived as saltier when sampled with a knife than the other cutlery.

2.1.1. Rituals

Another factor that influences food consumption is ritualistic behaviour (defined as "symbolic activity that often includes repeated and unusual behaviours occurring in fixed, episodic sequences"; Vohs et al 2013 p1715). An

obvious social example is the "birthday ritual", where a whole cake with candles is produced for the birthday person to blow out the candles (along with a wish while others sing). Then everybody eats a slice of the cake. Individuals will have their own "little rituals" which influence their eating behaviour.

In four experiments, Vohs et al (2013) showed that "rituals enhance the enjoyment of consumption because of the greater involvement in the experience that they prompt" (p1714).

In the first experiment, 52 US undergraduates were asked to taste a chocolate bar and rate it. Half of them were instructed to perform a ritual: "Without unwrapping the chocolate bar, break it in half. Unwrap half of the bar and eat it. Then unwrap the other half and eat it". Participants in the ritual condition had significantly higher ratings of enjoyment, savouring every bite, flavour of the chocolate, and willingness to pay more for the bar than the no-ritual condition (figure 2.2). This experiment showed that a simple ritual enhanced consumption.

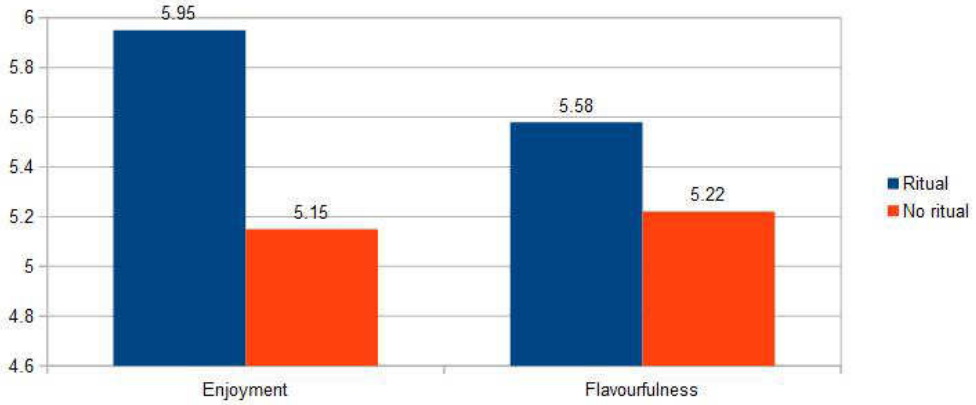


Figure 2.2 - Ratings of chocolate bar (out of 7) in Experiment 1.

Experiment 2 with 105 more students compared a ritual to random gestures before eating carrots. Participants were presented with three carrots and asked to eat them one by one. In the ritual condition, participants performed the same activity before eating each carrot - tap knuckles on the table, take some deep breaths, and close eyes briefly. The random-gestures condition involved participants doing different actions before each carrot. There was also another variable added - whether there was a delay between the ritual and eating the last carrot or not.

It was predicted that participants in the ritual

condition would enjoy the carrots more than in the random-gestures condition. This was supported - mean rating of enjoyment of 4.80 (ritual) vs 3.69 (out of 7). It was also predicted and found that the ritual/delay condition would have the highest rating of enjoyment. Anticipated enjoyment of the next carrot was also higher in this group (figure 2.3). This experiment showed that rituals and not random gestures enhance food consumption, and also the anticipation: "That is, a delay between a ritual and the opportunity to consume heightens enjoyment, which attests to the idea that ritual behaviour stimulates goal-directed action (to consume)" (Vohs et al 2013 p1718).

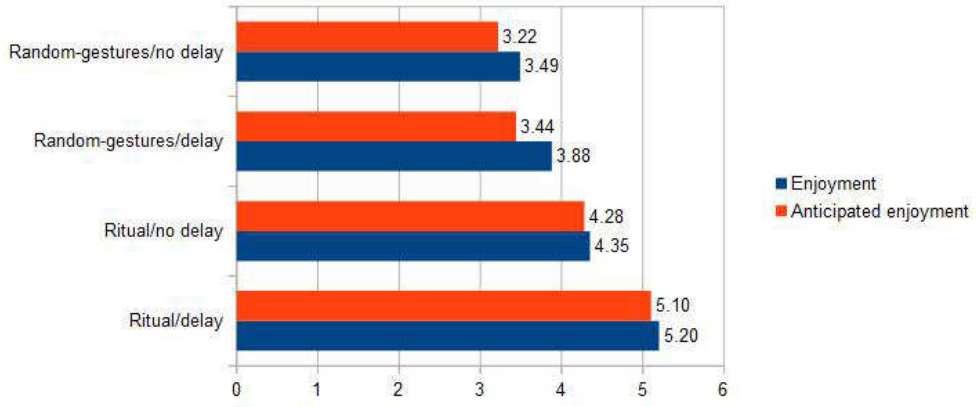


Figure 2.3 - Ratings of enjoyment and anticipated enjoyment (out of 7) in Experiment 2.

In their third experiment (with forty more students), Vohs et al (2013) compared performing a ritual with watching another do it for enjoyment of food. Participants either followed instructions to make a glass of lemonade (self-ritual condition) or watched the experimenter do it (other-ritual condition). After drinking the lemonade, participants rated its flavour (out of seven), and their emotions (out of five). The mean for flavour in the self-ritual condition was 4.55, which was significantly higher than 3.75 in the other-ritual condition. There was no difference in score of emotions. Doing the ritual was key for enjoyment. Vohs et al (2013) stated: "These data suggest that the best way to enjoy a glass of wine may be to perform the ceremonial bottle opening oneself rather than foist it off on a fellow partygoer. The beneficial effects of rituals do not appear to be linked to changes in positive or negative mood" (p1718).

The final experiment sought to establish if it was personal involvement (intrinsic interest) in the

consumption of the food that made the ritual enhance the enjoyment of the food. Experiment 4, with 87 adults, was a replication of Experiment 1, but participants were asked about their personal involvement in the experience. Those in the ritual condition had significantly higher means for intrinsic interest (eg: "eating the chocolate was fun") than the no-ritual condition.

Vohs et al (2013) concluded, overall: "Rituals have a surprising degree of influence over how people experience what comes next... our results suggest that rituals could be put to use to make a wide variety of desirable behaviours — from eating healthfully to exercising to practicing safe sex — more pleasurable. Rituals, then, might serve as a covert means to get people to do a little more of what makes life worth living" (p1720).

Table 2.1 summarises the key strengths and weaknesses of the study.

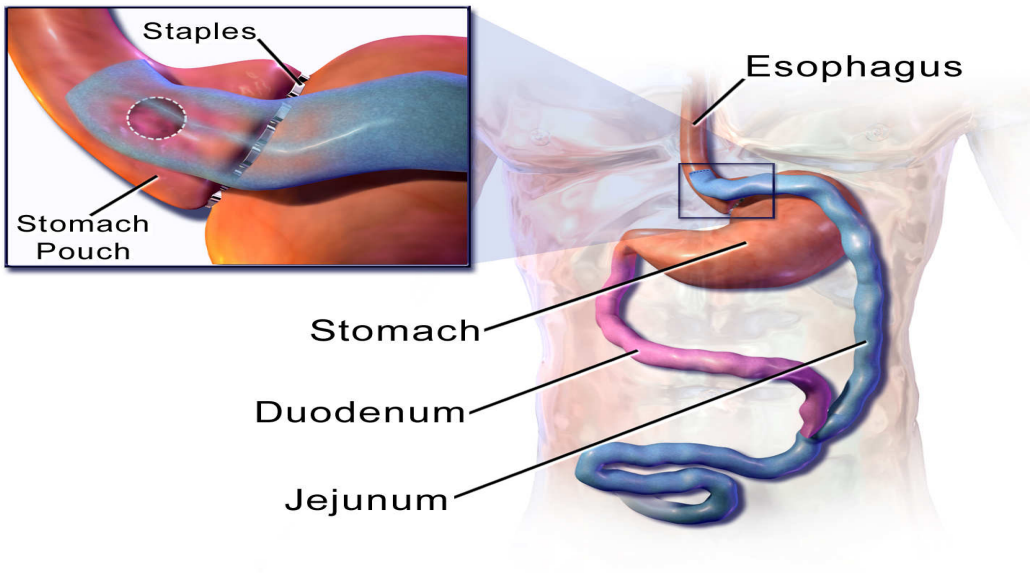
Strengths	Weaknesses
1. Standardised procedures via computer screen instructions. 2. Randomisation of participants into conditions. 3. Control and manipulation of variables.	1. Applicability of findings from limited experimental situations to real-life consumption of food. 2. Mostly students were the participants, for a small fee or extra course credit. 3. Use of self-report Likert-type scale to measure response to food (eg: ordinal scale, but mean and not median used) (appendix 2A).

Table 2.1 - Key strengths and weaknesses of Vohs et al (2013) experiments.

2.2. WEIGHT LOSS

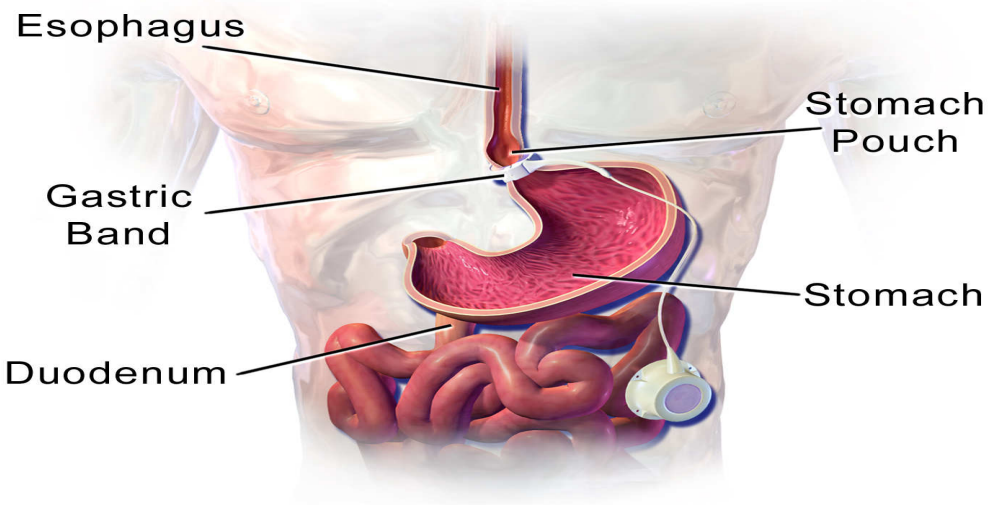
A body mass index (BMI) [35] of greater than 30 kg/m² is classed as obese, and such individual have an increased risk of health problems like type 2 diabetes and cardiovascular diseases. Weight loss options divide into surgical and non-surgical treatments. The latter involves reducing energy intake (through diet change) and increasing energy expenditure (through exercise), as well as pharmacotherapy (in some cases). The alternative is bariatric surgery, of which the main techniques are Roux-en-Y gastric bypass (figure 2.4) or laparoscopic adjustable gastric banding (figure 2.5) (Gloy et al 2013).

[35] BMI = weight (kg) ÷ height (m) ².



(Source: BruceBlaus (Blausen Medical Communications Inc))

Figure 2.4 - Roux-en-Y gastric bypass.



(Source: BruceBlaus (Blausen Medical Communications Inc))

Figure 2.5 - Laparoscopic adjustable gastric banding.

Is bariatric surgery effective for weight loss? Gloy et al's (2013) review found that it was. Eleven randomised controlled trials were found that had follow-up for longer than six months, involved participants with BMIs of thirty or greater, and compared bariatric surgery to non-surgical treatment.

Using body weight as the main outcome measure, pooling the data showed a significantly greater mean loss for surgery [36] (ie: weight at baseline minus weight after treatment). Half the studies included waist circumference, and this significantly declined more after surgery than non-surgery (16 cm greater loss) [37]. Gloy et al (2013) summarised the findings: "This systematic review and meta-analysis demonstrates that bariatric surgery is more efficient than non-surgical treatment for obesity for up to two years of follow-up. Bariatric surgery led to greater body weight loss, higher rates of remission of type 2 diabetes and metabolic syndrome, greater improvements in quality of life, and greater reductions in use of anti-diabetic, anti-hypertensive, and lipid lowering drugs" [38].

As with any meta-analysis, there is the issue of the compatibility of the studies in terms of polling the data. The authors admitted that five studies had poorer methodological quality (eg: unclear about criteria for allocation to surgery or non-surgery), and three studies had specific requirements (eg: all participants had to have made serious past attempts to lose weight before acceptance on the study). "Thus, the results presented in our meta-analysis may not apply to individuals without prior weight loss attempts" (Gloy et al 2013).

All the studies included were relatively small-scale as the total number of participants was 796. No study had a follow-up of more than two years. Other research has found that individuals regain weight in the longer term (eg: 7% 2-10 years after surgery, and 40% 1-4 years after non-surgery) (Gloy et al 2013).

2.2.1. Weight Loss Programme for Men

Men are less likely to participate in weight loss interventions (eg: 10-30% of participants of weight management programmes are male) (Hunt et al 2014b). Men require gender-sensitive weight loss programmes, like Football Fans in Training (FFIT), run by the Scottish Professional Football League (SPFL). Hunt et al (2014a) reported weight loss of about 5% of baseline weight at

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[36] 26 kg more.

[37] A small number of adverse events were reported after surgery (eg: development of iron deficiency anaemia; hernia).

[38] There was no difference between the types of surgery.

twelve months.

FFIT involved 90-minute weekly sessions for twelve weeks of physical activity, and dietary interventions (eg: goal-setting, self-monitoring), and social support run by the coaching staff at the home stadium of thirteen football teams in 2011-12. Participants were recruited mostly by the football clubs from their fans, and had a BMI of at least 28. The key element was that "the programme was designed to work with rather than against prevailing understandings of masculinity. The programme was gender sensitised in relation to context (the traditionally male environment of football clubs and men only groups), content (information about the science of weight loss presented simply, discussion of alcohol and its potential role in weight management, and branding with club insignia), and style of delivery (participative and peer-supported, which is learning that encouraged male banter to help with discussion of sensitive subjects)" (Hunt et al 2014a). Data were collected at baseline, twelve weeks, and twelve months at the club stadiums. The primary outcome was the mean difference in weight loss between intervention and control groups at twelve months. Objective measures like blood pressure were also recorded as well as self-reported dietary choice, for example.

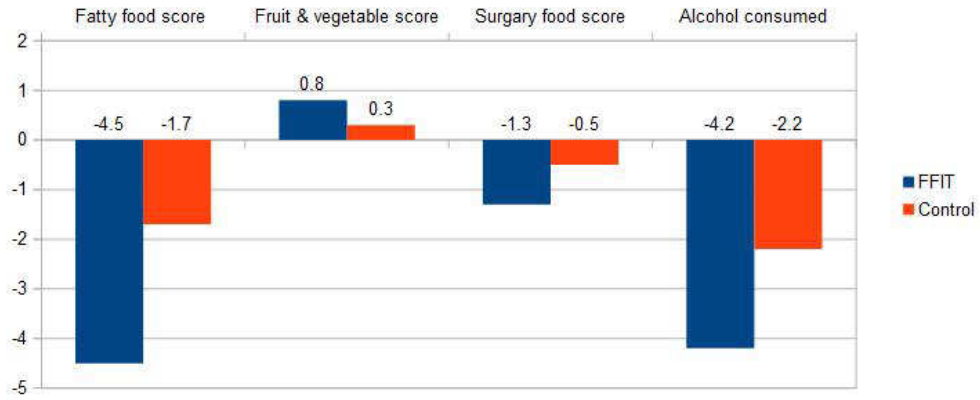
Three hundred and seventy-four men (aged 35-65 years) took part in the intervention with 333 completing the twelve-month follow-up compared to 374 and 355 respectively of the waiting list (control) group.

The mean weight loss at twelve months was 5.56 kg (4.96%) in the FFIT group compared to 0.58 kg (0.52%) in the control group. Thus the mean difference in weight loss (adjusted for baseline weight and club) was 4.94 kg (4.36%) ($p<0.0001$) [39]. Put another way, more men in the intervention group achieved a 5% weight loss at 12 months (39% vs 11% of control group).

There was also a significant increase in physical activity (minutes per week - walking, vigorous and moderate exercise) at twelve months in the intervention group compared to the control group as well as positive changes in self-reported dietary choice (figure 2.6). Other than the weight loss, the FFIT programme succeeded with "high-risk men who were not attracted to other weight management programmes" (Hunt et al 2014a).

Hunt et al (2014b) reported the responses of sixty-three participants of FFIT who attended small focus groups as to what attracted them to the programme. A

[39] This compares to mean differences in weight loss of 2.2 kg (Morgan et al 2011) and 0.6 kg (Patrick et al 2011) at twelve months in internet-based programmes with one-to-one support combining exercise and dietary change for men.



(Fatty food score range 8-68 - lower score = less; fruit and vegetable score range 0.5-6.0 - higher score = more; sugary food score range 3-16 - lower score = less; changes in units per week alcohol consumed)

(Data from Hunt et al 2014a table 3)

Table 2.6 - Mean changes in self-reported dietary choice at twelve months.

combination of "push" and "pull" factors were evident. Most important was the opportunity to do the programme at the football club they supported ("pull" factor). This went hand in hand with the "push" factor of knowing that weight needed to be lost. One man said: "I was very aware that, every time I was buying a new suit... the trouser size was getting bigger, and I just wasn't happy with that, and I just wanted to address it. And with it being, having a tie in with the team I've supported all my life, I felt that the two kind of – they, it fitted nicely. It meant I could do something and I could maybe get a wee sneaky peek behind the scenes at [Club 04 ground]" (Hunt et al 2014b p4).

While another one said: "I'm a fan, and I think that helped a lot... the fact that I was coming to [Club 05] stadium and going into the changing room and stuff like that... I mean, it was just nice. And you felt kinda part of it..." (p5).

It was important for the men that the programme included others "like them" - ie: supporters of the same football club. This was summed up by one man: "The good thing was, straight from the start, we all had something in common with each other. Rather than being sixteen strangers, we'd all something in common, and that was the club and a love for it" (p7).

Hunt et al (2014b) observed that the participants "talked enthusiastically about gaining an 'insider' view of the club through their contact with the community coaches (supplemented at some clubs by visits from club

celebrities, such as (ex-)players). This 'insider' view was reinforced by a shared commitment to the club and their informal banter with like-minded men, both coaches and fellow participants" (p6).

Furthermore, the "feeling that the programme was 'right' for them was further reinforced by what men said that FFIT was not... In emphasising that FFIT was not for women, not Weight Watchers or Scottish Slimmers, not a diet club, and so on, the men underlined how FFIT enabled them to take on what might otherwise be seen by themselves (or others) as a feminised activity (deliberate attempts to lose weight) and reclaim it as something which enhanced their sense of themselves as men" (Hunt et al 2014b p8).

The desire to avoid "feminine" activities should not be under-estimated as "masculinity" is "a precarious social status that is hard won and easily lost" which requires "continual public demonstrations of proof" (like risky behaviours and avoiding health-protecting behaviours) (Vandello and Bosson 2013 quoted in Hunt et al 2014b). "Masculinity", then, is like a resource that is accumulated through these "demonstrations of proof" ("masculine capital"; De Visser et al 2005), and it can lost through "feminine" behaviours/activities. Hunt et al (2014b) felt that "FFIT is valued by men who want to lose weight, not just because it is enjoyable and engaging, but because it enables men to 'bolster' their masculine capital through their association with football clubs, symbolically and physically, and their participation and association with other men like them" (p10).

2.2.2. Commercial Weight Loss Programmes

Jebb et al (2011) found that a commercial weight loss programme ("Weight Watchers") that involved advice about diet, physical activity, and group support for individuals referred by doctors was effective at twelve months. Over 700 individuals with a BMI of 27-35 kg/m² from Australia, Germany, and the UK were the participants. Two hundred and thirty participants completed the commercial programme and 214 the standard care (weight loss advice from a doctor) [40].

Both groups showed a mean weigh loss, but it was significantly greater for participants in the commercial programme (-5.06 kg vs -2.25 kg from baseline weight).

[40] Success and failure on such programmes has been linked to self-efficacy. This is the "belief in one's own capabilities to organise and execute the courses of action required to manage prospective situations" (Bandura 1995 quoted in Harty et al 2006). There is a degree of circularity between experience and self-efficacy. The development of the latter is influenced by experience and attributions of that experience, but these factors are themselves influenced by self-efficacy (Harty et al 2006).

Put another way, those in the commercial programme were three times more likely to lose 5-10% of their baseline weight over the twelve months. Table 2.2 shows the findings of some comparable studies.

STUDY	PROGRAMME	WEIGHT LOSS
Counterweight Programme Team (2008)	Counterweight - intensive training and support from primary care staff	12 months: -3 kg
Truby et al (2006)	4 different commercial self-help programmes	6 months: 4.9-7.3% of baseline weight vs 0.6% (no diet)
Rock et al (2010)	Jenny Craig programme	12 months: -6.6 kg vs -0.7 kg (control) 24 months: -7.4 kg vs -2.0 kg
Knowles et al (2002)	Diabetes Prevention Programme - primary care-based intensive lifestyle intervention	2-3 years: -5.6 kg

Table 2.2 - Selection of studies of weight loss programmes.

2.3. APPENDIX 2A - LIKERT-TYPE SCALES

Hartley (2013) noted the popularity of Likert-type scales in psychology (eg: used in nine of ten articles in one issue of a journal).

Hartley (2013) highlighted some methodological issues to consider with Likert-type scales:

- Whether to have a mid-point, like "unsure" or "neither agree or disagree" (eg: 5 scale points) or not (eg: four points).

- Commonly the scales have four or five scale points, and begin with 0 (or 1) at the negative end (on the left) through to the positive end (on the right). But higher scores are obtained among English speaking respondents if this is reversed (ie: positive values on the left) (Hartley and Betts 2013).

- Including occasional negatively worded items can be confusing, and they are not necessarily the opposite of positively worded ones. For example, different scores are obtained on positively and negatively worded versions of the same statement (Hartley and Betts 2013).

- Double-barrelled items (ie: containing two statements in one item) are difficult to answer and interpret (eg:

"depression is a common experience; treatment should be made available"). If a respondent agrees with this item, are they agreeing that depression is common or treatment should be available or both?

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3. THREE DIFFERENT ASPECTS OF SEXUAL BEHAVIOUR

3.1. ENERGY EXPENDITURE DURING SEXUAL INTERCOURSE

When physical exercise is talked about, in relation to weight loss, say, it covers activities like walking, running, cycling, and swimming. "However, due to the intimate and sensitive nature of sexuality, few studies have investigated if sexual activity could be considered as an exercise which involves a significant amount of energy expenditure" (Frappier et al 2013).

For example, from a decade of laboratory observations of over 600 volunteers, Masters and Johnson (1966) reported an increase in respiratory rate (up to forty respirations per minute), heart rate (110-180 beats per minute), and systolic blood pressure (30-80 mm Hg) [41].

Also in a laboratory setting, Bohlen et al (1984) studied middle-aged married couples in four sexual activities - self-stimulation, partner-stimulation, man-on-top intercourse, and woman-on-top intercourse. Heart rate increased 37% from baseline to orgasm for men with self-stimulation, but 51% during man-on-top intercourse.

Palmeri et al (2007) concluded that sexual activity for middle-aged men was the equivalent to moderate intensity on a treadmill [42], but low intensity for women [43].

However, Hellerstein and Friedman (1970) measured a mean heart rate of 117 beats per minute at orgasm among middle-aged men with their wives (which was less than the daily activity average of 120 beats per minute). This research involved wearing a portable electrocardiogram (ECG) monitor for 24 hours.

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[41] Systolic blood pressure is when the heart beats and diastolic blood pressure is measured when the heart contracts.

[42] Equivalent to Bruce protocol stage II. Bruce et al (1949) proposed standardised measures of physical exercise involving metabolic equivalent of task (METS) (ie: metabolic rate). Stage II is equivalent to six minutes on a treadmill at 3 mph (METS = 7) (source: http://en.wikipedia.org/wiki/Bruce_Protocol; accessed 14/02/2014).

[43] Bruce protocol stage I - equivalent to three minutes on treadmill at 2 mph (source: http://en.wikipedia.org/wiki/Bruce_Protocol; accessed 14/02/2014).

Most studies take place in laboratory settings, and the equipment involved limit sexual activity (eg: mask on mouth to measure oxygen consumption). Frappier et al (2013) also noted "that sexual activity is a non-steady-state activity. Thus, the heart rate-blood pressure relationship may not remain linear during sexual activity, suggesting that these physiological parameters might not be primary indicators for the measurement of energy expenditure and/or intensity for this type of activity".

Other weaknesses of past studies include their age and the subsequent improvements in knowledge, no distinction for age differences, and no comparison of energy expended in sexual and regular activity (Frappier et al 20013) [44].

Frappier et al (2013), thus, set out to investigate energy expenditure in kilocalories (kcal) of young healthy couples in their natural environment using non-obstructive and accurate measuring equipment.

Twenty-one heterosexual couples (aged 18-35 years) from Montreal, Canada, were recruited. All participants completed thirty minutes on a treadmill at 65% maximal heart rate as the comparison measure. Four different occasions of sexual activity were measured (ie: in the couples' homes when they wanted to do it). Energy expenditure in all cases was measured by the portable mini SenseWear Armband (SWA) [45]. Measuring skin temperature (via heat-related sensors) and movement (accelerometry), this, along with body weight and height, can be used to calculate energy expended [46].

The energy expended during sexual activity was about one-third to one-half of the treadmill (85 vs 245 kcal - absolute energy expenditure; 3.6 vs 8.2 kcal/min - relative energy expenditure). The energy used during sexual activity varied between occasions, and between men and women (figures 3.1, 3.2 and 3.3).

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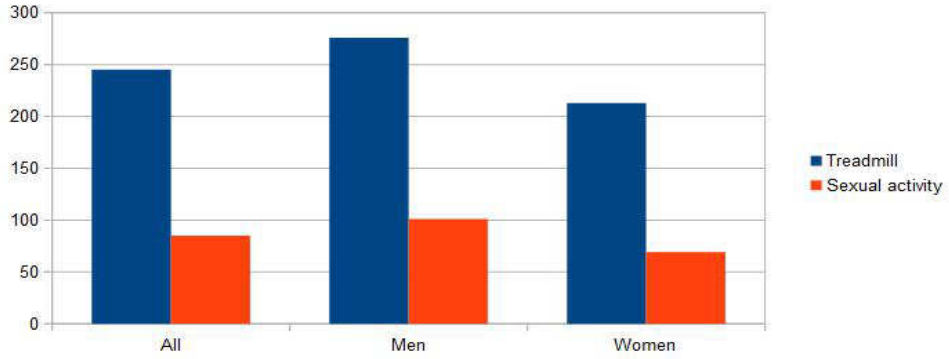
[44] "There is even a myth which suggests that energy expenditure during sexual activity is between 100 to 300 kcal per session for each individual involved... However, no scientific data has documented this claim" (Frappier et al 2013).

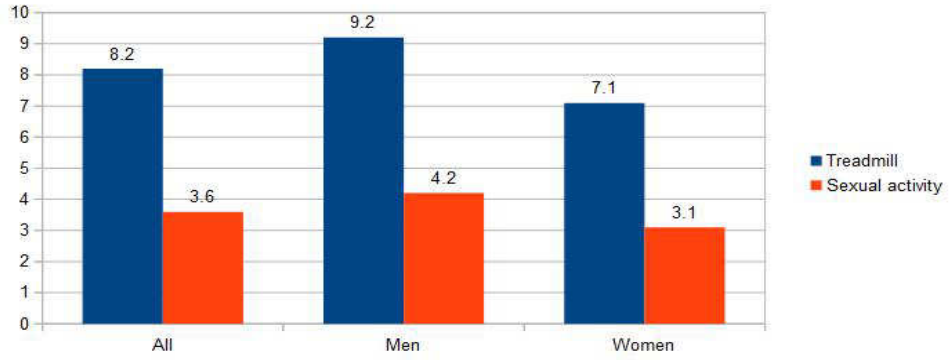
[45] See example at http://www.apccardiovascular.co.uk/sensewear_armband.htm.

[46] This method is seen as 92% accurate when compared to other measures (Frappier et al 2013). But Drenowatz and Eisenmann (2011) pointed out that SWAs provide accurate measures of energy expenditure at rest, and during low-to-moderate intensity physical exercise, but significantly underestimate it for high-intensity levels for adults. Drenowatz and Eisenmann (2011) compared the SWAs with portable measures of oxygen use during a thirty-minute run by twenty endurance athletes. The average correlation between the two measures was 0.66 (or, put another way, 66% agreement).



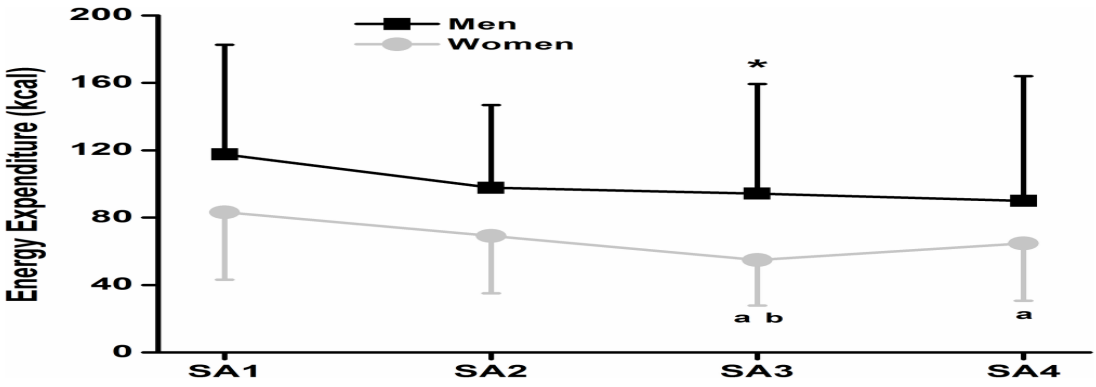
(Data from Frappier et al 2013 table 1)

Figure 3.1 - Mean absolute energy expenditure (kcal).



(Data from Frappier et al 2013 table 1)

Figure 3.2 - Mean relative energy expenditure (kcal/min).



(Values are the mean ± SD. * = Significantly different from the first session in men ($p<0.05$). a = Significantly different from the first session in women ($p<0.05$). b = Significantly different from the second session in women ($p<0.05$). SA: sexual activity)

(Source: Frappier et al 2013 figure 2)

Figure 3.3 - Differences in energy expenditure between all four sessions of sexual activity in men and women.

The intensity of exercise during sexual activity was the equivalent to moderate exercise (METS = 6) - higher than walking at 2-3 mph, but lower than jogging at 5 mph - and the treadmill was METS 8-9.

Frappier et al (2013) concluded that the "results suggest that sexual activity may potentially be considered, at times, as a significant exercise. Moreover, both men and women reported that sexual activity was a highly enjoyable and more appreciated than the 30 min exercise session on the treadmill. Therefore, this study could have implications for the planning of intervention programs as part of a healthy lifestyle by health care professionals".

Frappier et al (2013) had no control over the nature and the length of the sexual activity compared to laboratory studies. Also, as with other studies in this area, how representative are volunteers of the general population (appendix 3A)?

3.2. CONSUMING PORNOGRAPHY: BIOLOGY VERSUS SOCIOLOGY

3.2.1. Biology

Sperm competition is where the sperm of more than one male could fertilise a female. In other words, a male cannot know if he is the biological father in such situations. Across all species this has led to different behaviours to evolve either in terms of the sperm itself or how the male interacts with the female. One common strategy is for a male to increase the number of sperm in an ejaculate if other males (ie: potential rivals) are around.

In humans, "sperm competition psychology" (SCP) is a term that has been coined, and it refers to "a set of information-processing or cognitive mechanisms that, when activated, produce physiological and psychological outputs that increase the likelihood of success in sperm competition (eg: sexual arousal, motivation for in-pair copulation...). These mechanisms are activated when men perceive cues to sperm competition, such as female promiscuity and infidelity" (McKibbin et al 2013 p819).

Pound (2002) argued that SCP can be seen in the choice of type of heterosexual pornography by men. Men reported preferring videos where one woman had sexual interactions with multiple men (polyandrous [47]) to one man with multiple women (polygynous [48]). The former type of

[47] Called "gangbang" in colloquial terms.
[48] "Reverse gangbang".

pornography triggers a fear of sperm competition. But Hald (2006) found the opposite in reported choices of Danish men (ie: polygynous over polyandrous scenarios).

Both studies depended on men's honesty and recall about videos watched. McKibbin et al (2013) overcame this problem by using DVD sales data.

The researchers predicted that polyandrous images on the cover of a pornography DVD would lead to more sales than DVDs with polygynous images. One hundred and sixty-six DVDs were rated for their cover images, and the sales data were taken from a US adult DVD retailer between 2004 and 2008.

DVDs with cover images including one woman with multiple men were better sellers than DVDs with cover images of one man with multiple women. Thus the research prediction was supported, and so was SCP in heterosexual pornography choice by men. McKibbin et al (2013) pointed out: "Although we argue that men are more aroused by images suggesting sperm competition, we are not arguing that men preferentially place themselves in mating contexts that present high levels of sperm competition. Both in long-term... and short-term... mating contexts, men prefer mating with women who present a lower risk of sperm competition. However, men are more sexually aroused if they are exposed to sperm competition cues. For example, men report greater in-pair copulatory interest when the risk of their partner's EPCs [extra-pair copulation] is high... This greater arousal, we argue, motivates the purchase of DVDs with covers and screenshots that depict the more sexually arousing stimuli" (p822).

3.2.2. Sociology

As an alternative to seeing heterosexual pornography consumption as a by-product of sexual selection and evolution, sociological-based approaches [49] are interested

[49] One approach is to study pornography as part of a Media Studies course. There are "a number of compelling reasons to include sex media on courses about gender, sexuality and popular culture: because the 'public policy debate about pornography is a central issue in media studies'; because legal and political discourse on porn is simplistic and needs complicating; because porn has been 'a driving force behind the technological development and deployment of almost every media'; because it is 'a key area for feminist scholarship'; because it 'is an enormous economic force'; because it 'poses powerful questions about the relationship between form, content and ideology', 'the nature of fantasy' and 'emotional investments'; and because 'we need to teach students about how... categories operate to police taste and to impose ideological constraints' (Jenkins, 2004 pp2–3)" (Attwood and Hunter 2009 p551).

But Attwood and Hunter (2009) observed that the "framing of pornography within a reasonably respectable discipline such as Film Studies may not be an option for all academics however, and while it helpfully positions sexually explicit media as media rather than social problem, it might obscure porn texts that cannot be dignified in this way, as well as downplaying important social and political issues" (p550).

in the place of pornography in society (ie: its social meaning both at an individual and a social level) [50]. Attwood (2002) used the phrase "reading pornography" to make sense of the social position. While Juffer (1998) asked: "What are the material and discursive conditions in which different kinds of pornography are produced, distributed, obtained and consumed?" (quoted in Attwood 2002).

Attwood (2002) saw a change in the debate about pornography in society in recent years. There is "a movement away from the 'tired binary' (Juffer 1998 p2) of a debate about whether pornographic texts have fixed and simple meanings, embody and encourage clearly oppressive power relations, produce direct and quantifiable effects and can be challenged only through the regulatory mechanisms of the state, towards a range of approaches that examine 'in a less censorious way issues of visual representation, sexual excitement and sexual practice', approaches increasingly pursued not only in theoretical texts, but in 'seminars, conferences and undergraduate courses' (Kirkham and Skeggs, 1996 p106)" (Attwood 2002 pp92-93) [51].

Thus, pornography is contextualised in a wider social and cultural framework of meaning. For example, McNair (1996) referred to the "pornographication of the mainstream" as more sexually explicit material is more common place [52]. This takes place within "a wider assault on the boundaries between public and private discourse in modern Western culture": "a movement towards 'tabloidisation' has seen a massive incursion of the private and the personal into the public sphere, most notably in the form of 'reality' and lifestyle TV, confessional talk shows and celebrity gossip; 'the news without underpants' (Lumby 1997 p117). This movement

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[50] "Pornography has come to signify men's brutalisation, women's exploitation and the dangerous power of the media – and more recently, commodification, individualism, neoliberalism and a backlash against feminism. Pornography, seemingly so marginal a genre, has somehow emerged as central to understanding the dynamics of culture itself" (Attwood and Hunter 2009 p548).

[51] However, Voss (2012) observed: "Whilst a certain 'mainstreaming' of pornography has occurred, the stigma surrounding it still remains. The increased presence of sexually explicit material in contemporary mainstream culture does not necessarily lead to increased social acceptance, as only certain types of 'normative' pornography and sexual expression are acceptable... For consumers, there is still a line drawn between the porn world and the rest of pop culture..." (p392). Voss (2012) described her research of the pornography industry as a business with ethnographic observations at industry trade shows.

[52] "Loosening censorship and a widespread preoccupation with sexual desirability in mainstream culture has blurred the distinction between mainstream and obscene categories of representation, while the emergence of a range of cultural intermediaries identified with hedonistic approaches to sexuality have helped to promote a view of porn as cool. The entwining of media and communication technologies with sexual practice has elided distinctions between representation and practice, and to some extent normalized sex media within a repertoire of everyday sexual practices" (Attwood and Hunter 2009 p551).

threatens to disturb the privileging of particular expert discourses for the interpretation of private lives, to challenge conventions of decency and rationality and to resist regulatory controls and is often represented as a downward spiral, a debasing of the public sphere, a worrying turn (or return) to the emotional, personal, physical and visceral and all things 'low'" (Attwood 2002 p99) [53].

Importantly, the position of pornography in society is seen as complex and contradictory. It can represent an "outlaw discourse" (Wicke 1993), which "simultaneously threatens to overturn the established cultural hierarchy and provides the base ground on which that hierarchy is erected, it comes to stand for a whole range of social ills and anxieties (sexism, violence against women and children, neglect of the family and the moral good, the commodification of pleasure and so on), at the same time becoming the site of a 'carnivalesque' overturning of established order or of 'utopian' resolutions to actual social problems" (Attwood 2002 p97).

Add to this the emphasis on individualistic consumerism in "consumer capitalism", and pornography is something to be consumed like any other product (Brewer 2008).

The diversity of material for the consumer could result in the concept of "pornographies", where "gay porn is both like and unlike straight porn, in which Page 3 photographs, interactive sex games, amateur videoporn and dirty magazines may share the status of pornography while possessing distinct and individual features..." (Attwood 2002 p102).

3.3. ASEXUALITY

"Asexuality" is a term used to cover a lack of sexual activity, and low levels of sexual desire. There is no consensus about the definition (Hoglund et al 2014). Bogaert (2004), for example, emphasised that an asexual individual is someone who has never experienced sexual attraction to either sex.

By this definition, 195 16-59 year-olds in a UK

[53] Pornography and the Internet can be seen through two major viewpoints - (i) concerns about the normalisation of sexually explicit representations, versus (ii) fears that the Internet is seen as "a conduit of perverse imagery and sexual deviation" (Attwood and Hunter 2009). "These responses re-articulate quite familiar concerns around the loss of childhood, commodification, technology, representation, and desire, though they are entirely contemporary in focusing on addictive behaviours, women's collusion with their own objectification, adults preying on children, and the blurring of boundaries between genres such as porn and horror that depict the body in extremis, all of which suggests that we are'desperately uncertain in confronting the complexity of contemporary mores' (Weeks,2007 p124)" (Attwood and Hunter 2009 p552).

sample of 18 000 individuals (1.05%) (Bogaert 2004), or 0.4-0.9% in larger British samples (of 16-44 year-olds) (Aicken et al 2013). Among over 12 000 US individuals, the prevalence rates varied between 0.7% and 6.1% depending on the definition used - lack of sexual behaviour, lack of sexual attraction, or not perceiving self as heterosexual or homosexual (Poston and Baumle 2010).

Some studies find that asexual individuals are more likely to be female, and older individuals, whereas other studies do not (Hoglund et al 2014).

Asexual individuals are not necessarily single, though many are (eg: 80% of women and 93% of men; Brotto et al 2010) [54], because asexuality does not preclude romantic interest. In a survey of 102 self-identified asexual individuals, Scherrer (2008) distinguished aromantic and romantic. The former only wanted friendships in their close relationships, while the latter sought emotional closeness rather than sexual closeness. Brotto et al (2010) found no difference in the desire to masturbate between asexual and sexual individuals [55].

One issue is whether asexuality is a sexual problem. DSM-5 (APA 2013) includes female Sexual Interest/Arousal Disorder (fSIAD) and male Hypoactive Sexual Desire Disorder (mHSDD), while previous versions of the DSM included sexual aversion disorder. All these conditions included a lack of sexual fantasies and/or desire, and distress about this (Hoglund et al 2014).

Asexual individuals tend not to have a problem with their behaviour. For example, erotic material is perceived as neutral (ie: not positively arousing or negative - eg: anxiety-provoking). Brotto and Yule (2011) used genital and subjective measures while asexual and sexual individuals watched an erotic film. So, asexuality does not fit with sexual aversion disorder (Hoglund et al 2014).

The differences between asexuality and HSDD included distress in the latter case, and that those individuals did have desire in the past (Hoglund et al 2014). Bogaert (2006) argued that asexuality is not the same as a sexual disorder.

Hoglund et al (2014) concentrated on the absence of sexual attraction in the past year [56] in their

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[54] The majority of asexual individuals had never had sexual intercourse, and among those who had/did, infrequent was the norm (eg: once or twice a year) (Brotto et al 2010).

[55] Using the Sexual Desire Inventory, Spector et al (1996) distinguished partnered/dyadic and solitary sexual behaviours as different behaviours.

[56] The authors admitted that this time period "could arguably be problematic as it focused on the lack of sexual attraction only for the duration of the last year, which may lead to an overestimate of the true prevalence of asexual individuals, and inclusion of individuals with HSDD" (Hoglund et al 2014).

questionnaire study [57] of 3540 33-45 year-olds [58] in Finland [59]. Six different psychometric questionnaires (table 3.1) were sent out in 2005 as part of a survey using twenty-two different measures of behaviour. Eighteen of 1304 men [60] (1.5%) and 73 of 2236 women (3.3%) [61] answered "not at all" to the questions: "How often have you, on average, felt sexual attraction towards men (women) during the last twelve months?".

INSTRUMENT	REFERENCE	NUMBER OF ITEMS/SCALE	EXAMPLE OF ITEMS
Perceived Relationship Quality Components Inventory (PRQC)	Fletcher et al (2000)	6 items 7-point scale	"How passionate is your relationship?"
Actual Sexual Activity Scale (ASAS) (based on Derogatis Sexual Function Inventory; DSFI)	Derogatis and Melisaratos (1979)	Frequency of 6 behaviours 9-point scale ("not at all" to "≥4 a day")	Sexual fantasies; vaginal intercourse
Sexual Interest in Childhood		9 items for men and 11 items for women yes/no	"I talked about sex with another child" (before age of 12 years)
Female Sexual Function Index (FSFI)	Rosen et al (2000)	19 items	Sexual desire in last month
International Index of Erectile Function-5 (IIEF-5)	Rosen et al (1999)	5 items	Sexual desire in past month
Ejaculatory Dysfunction		10 items 0-2	"subjective perception of ejaculating too slowly" (in last year)

Table 3.1 - Psychometric questionnaires used by Hoglund et al (2014).

[57] All data were self-reports with no independent verification.

[58] The sample was a subset of 10 000 Finnish twins in another research project ("Genetics of Sexuality and Aggression"). This was a response rate of 36%.

[59] "Research shows that the individuals who participate in sexuality studies often have higher interest in sexual variety and more positive attitudes towards sexuality than individuals who do not participate... hence, individuals lacking feelings of sexual attraction could be underrepresented in our study" (Hoglund et al 2014).

[60] This was a low number of male respondents which could mean low statistical power in the analysis (Hoglund et al 2014).

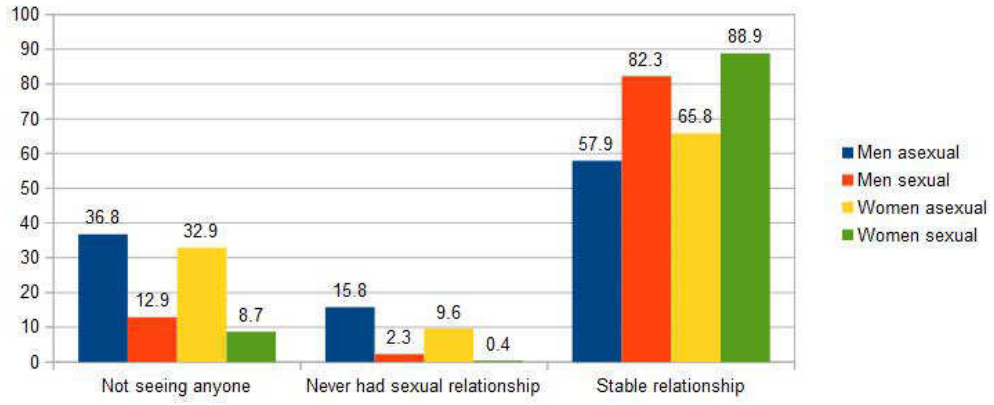
[61] The prevalence rates are not comparable between the studies because of different definitions of asexual, and sample characteristics.

The researchers tested the following predictions about asexuals:

1. They will be older than sexual individuals. There was a significant finding for women, but not for men.

2. More likely to be female. This was supported by data.

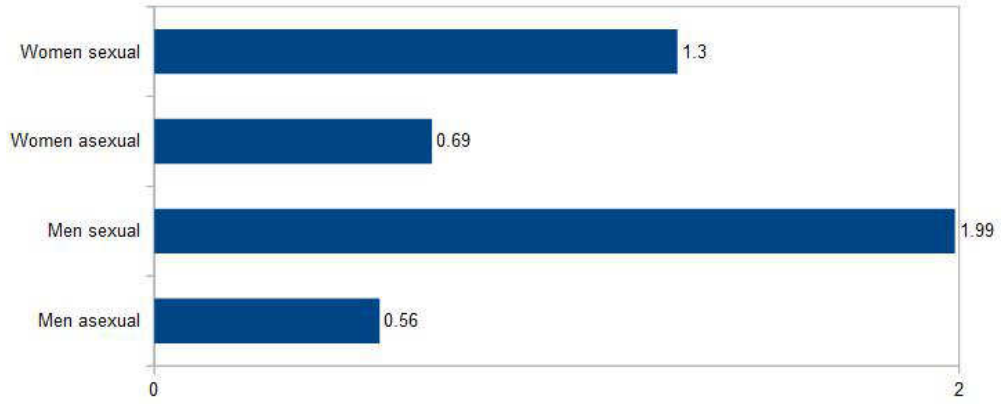
3. More likely to be single. This was supported by data (table 3.2).



(Data from Hoglund et al 2014 table 1)

Table 3.2 - Relationship status (%) in past year.

4. Less sexual activity in the past year. Asexual individuals reported significantly less sexual activity, though there was no difference for asexual and sexual men on frequency of masturbation (table 3.3).



(Data from Hoglund et al 2014 table 3)

Table 3.3 - Mean of sexual partners in last year.

5. Asexual women will have higher sexual dysfunction scores than sexual women (with no difference for men). In comparison to matched controls (27 men and 132 women), asexual women had significantly higher scores on the FSFI. There was no difference between asexual and sexual men on the IIEF-5 and the ejaculatory dysfunction measure.

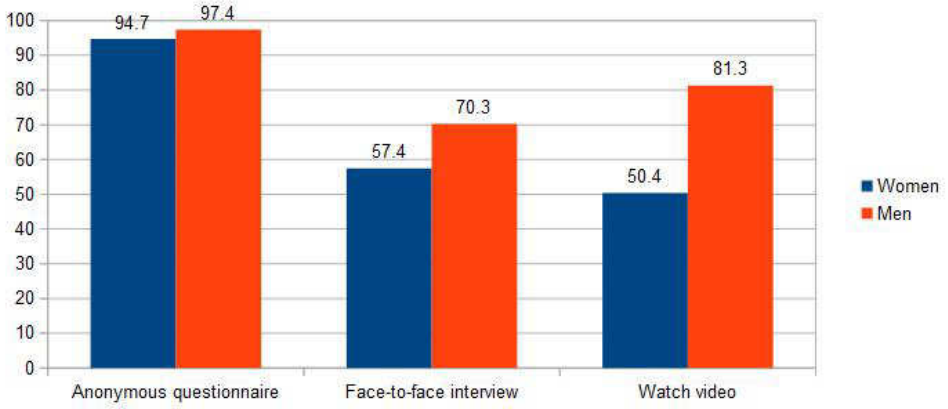
3.4. APPENDIX 3A - VOLUNTEERS FOR SEXUAL RESEARCH

Individuals who volunteer to participate in psychological research tend to be different to non-volunteers, and even more so for sexual research. Not only are such studies more likely to use students, but the students who volunteer are different to their peers. For example, they are more sexually experienced, have less traditional attitudes towards sexual issues, and higher sexual sensation-seeking (Wiederman 1999).

Studies of willingness to volunteer for sexual research tend to have a standard format. There is a self-administered (sometimes anonymous) questionnaire about sexual attitudes and behaviours, which ends by asking if the individual is willing to participate in further such research, including a face-to-face interview with a same- or different-gender interviewer, an experiment involving a sexually explicit video, or the use of physiological measures of sexual arousal. Those who say they are willing to participate or actually participate are then compared to non-volunteers in sexual attitudes and behaviours.

For example, Wiederman (1999) asked 310 male and 399 female students on an introductory psychology course at a university in the USA to complete a detailed personal questionnaire. Questions covered sexual attitudes (eg: "sexual intercourse is better - more enjoyable, intense, and satisfying - when the partners are married to each other"), sexual experience (eg: ever had sexual intercourse), sexual sensation-seeking (eg: "I am interested in trying out new sexual experiences"), and sexual esteem (eg: "I think of myself as a good sexual partner"). The questionnaire ended with a hypothetical volunteering question on their willingness to complete another anonymous questionnaire, a face-to-face interview with a same-gender interviewer, or watch a sexually explicit video and complete a questionnaire about it.

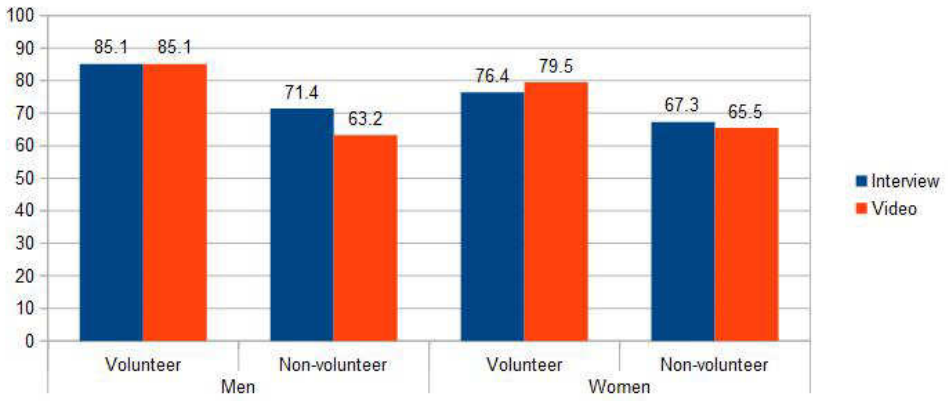
The vast majority of participants gave a willingness to complete another questionnaire, but significantly more men than women were willing to participate in the other two types of studies (figure 3.4).



(Data from Wiederman 1999 table 1 p62)

Figure 3.4 - Percentages of volunteers.

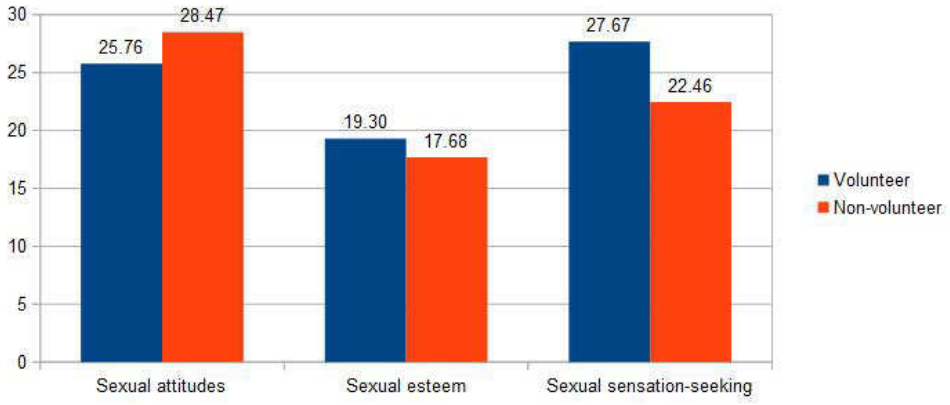
The potential volunteers for the face-to-face interview and the video were significantly different to non-volunteers in terms of sexual experience and more liberal sexual attitudes (figures 3.5 and 3.6). This study confirmed the "volunteer bias" [62] in sexual research.



(Data from Wiederman 1999 table 3 p63)

Figure 3.5 - Percentage of volunteers and non-volunteers reporting "ever had sexual intercourse".

[62] Griffith and Walker (1976) were one of the first to show this bias.



(Sexual attitudes - higher score = more traditional view; sexual esteem - higher score = greater esteem; sexual sensation-seeking - higher score = greater seeking)

(Data from Wiederman 1999 table 2 p63)

Figure 3.6 - Mean scores of volunteers and non-volunteers for sexually explicit video study on three measures of sexual attitudes.

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