The structure and function of pathogen disgust

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Abstract

Researchers have long noted that many of the multiple elicitors of disgust have some relation to infectious disease. There is an emerging consensus that disgust evolved in Animalia to direct the behaviours that reduce risk of infection, so-called 'parasite avoidance theory'. If this is correct, then the disgust motive should be structured in a manner that reflects the ways in which infectious disease can be avoided. In this study we generated a set of items based on the epidemiology of disease transmission. These were then rated for their capacity to elicit disgust by a large predominantly North American / UK sample and subjected to factor analysis to identify latent variables. Whilst a number of plausible factor solutions emerged the MAP analysis suggested six domains: atypical appearance, lesions, sex, hygiene, food and animals. This structure did not exactly mirror the transmission routes of infections, as we initially predicted, but it may rather reflect distinct kinds of behavioural tasks involved in avoiding disease. This finding makes sense from the perspective of a cognitive system that evolved under selection for a behavioural response to threats from the social and biological environment. We suggest that regularly occurring types of infectious disease problems have produced regularities in the domain structure of pathogen disgust and discuss the implications of these results for understanding the structure, function and measurement of motives such as disgust in humans and other animals.

Keywords: disgust, evolutionary psychology, infectious disease, disease avoidance

Introduction

It is unlikely to be a coincidence that many of the stimuli that elicit the emotion of disgust in humans are also implicated in the transmission of infectious disease [1-3]. Human excreta, for example, are both a major source of pathogenic viruses, bacteria, and helminths and an important elicitor of disgust. Similarly, saliva, sexual fluids, spoilt foods, ectoparasites and unhygienic behaviour are, at the same time, disgust elicitors and sources of risk of infection. With others, we have contended that the explanation for this overlap between the disgusting and the infective reflects the functional role (*censu* Tinbergen [4]) of the disgust system in preventing infectious disease [3, 5-10]. According to the parasite avoidance theory of disgust, the disgust motive is an adaptive system instantiated in neural tissue that guides behaviours that serve to avoid risk of infection [11].

This theory predicts that behaviour that reduces contact with *pathogens* and *parasites* (terms used interchangeably in this paper, see; Combes [12]), will have been under strong selection pressure throughout the evolutionary history of free-living organisms, and hence will be ubiquitous in Animalia. Examples include the avoidance of infected conspecifics in lobsters and mice [13, 14], of pathogenic wastes in nematodes and Kangaroos [15, 16] and hygienic behaviour in ants and birds [17, 18]. Support for this position is found in an increasing volume of animal literature, including this volume (for an overview see Curtis [19]).

In humans, this explanation has not always been accepted. Early models were Freudian, with disgust serving as a defence mechanism against inappropriate desires, including incest [20]. Darwin described it as a feeling related to the avoidance of offensive foods [21] and Angyal suggested that it serves to prevent overindulgence [1]. More recently, a standard model of disgust as serving to protect us from awareness of our animal natures and our mortality, and for the preservation of the moral order became accepted [2, 22-25]. In the past two decades, support for an alternative, disease-avoidance model has accumulated. There are a number of lines of argument for this. In 2001, Curtis & Biran demonstrated a close mapping between the elicitors of disgust and sources of infectious disease [3]. Later, large-sample cross-cultural experiments showed that stimuli with disease salience were rated as more highly disgusting than paired items without the disease connotation [26]. The disgust response is now known to be functionally integrated with the immune system, with

disgust elicitation resulting in short-term pre-emptive immune up-regulation [27, 28]. Fessler and colleagues found that during the first trimester of pregnancy – a period of particular vulnerability to infection – disgust sensitivity increases [5]. There is also a trade-off between the potential benefits of avoiding disease and the costs of such behaviour in terms of time, energy and lost opportunity to feed or engage in social interaction. For example, when the costs of disease avoidance behaviour increase, due to due to food deprivation or loss of mating opportunity, disgust sensitivity decreases [29-33].

Types of disgust

If the disgust adaptive system did, indeed, arise to orchestrate behaviour that leads to the avoidance of infection, and as sources of infection are distinct in the kinds of behavioural problem they pose, then it follows that there should be regularities in the disgust response that correspond to different types of infection threat. The disgust adaptive system should have an internal structure that orchestrates different types of protective behaviour. This paper aims to elucidate that structure.

An early factor structure for disgust was suggested by the work of Rozin, Haidt and colleagues [2]. The researchers generated a pool of items by asking university students to list disgusting items. Another sample then rated their disgust responses to each. Guided by a factor analysis and some prior theory, they argued that disgust has seven different kinds of input: death, hygiene, animals, body wastes, sex, sympathetic magic, body envelope violations and foodstuffs. The researchers argued that these kinds of stimuli elicit disgust because they act as aversive reminders of mortality, can contaminate and poison, or threaten the moral order. This scale was widely used but attracted criticism for its theoretical basis and lack of internal consistency [34, 35]. In a later, revised, version of the scale (the DS-R), the complexity and number of items was reduced to give three statistically better supported factors: which were labelled, somewhat arbitrarily, ‘core’, ‘animal’ and ‘contamination’ disgust [36, 37]. Thus, the DS and DS-R imply that disgust has a factorial structure, and, though the items were not generated from a pathogen perspective, almost all of the items contain direct or indirect cues of threat from pathogens.

An alternative factor structure for disgust was proposed by Tybur and Lieberman [38]. Their Three Domain Disgust Scale (TDDS), arose from their evolutionarily informed hypothesis that disgust should respond to three adaptive problems: preventing infection; optimising

mate choice; and regulating other's social behaviour through punishment and/or avoidance. Developed using methods similar to the DS above; American students and professors were asked to list things that they found generally disgusting, sexually disgusting, and morally disgusting. Confirmatory factor analysis on disgust ratings indicated that differences between participants was best captured by three factors, corresponding to the three original item pools: pathogen disgust, sexual disgust, and moral disgust [38]. In this scale, pathogen-related stimuli only form one seven-item input category to the TDDS and the authors have called for further exploration of this domain [38].

The inputs to a disease avoidance mechanism

What, then, would we predict a pathogen avoidance system in animals to be able to recognise and respond to adaptively? Pathogens are typically too small to be seen directly and so their presence must be inferred from observable cues that tend to co-occur with them. For example, aromatic compounds such as *indole* reliably predict the presence of the many pathogens that can be found in faeces. Although it is not, of itself, harmful, the smell of faeces elicits disgust and faeces avoidance behaviour in primates, including humans [3, 39]. By capitalising on co-occurring cues, the risk of contact with unseen pathogens can be mitigated.

Since epidemiology is the study of the risk of disease in populations [40], it should offer us a means of categorising disease threats. Six main transmission pathways for human pathogens can be identified [41]: (1) direct interpersonal contact, (2) interpersonally through aerosolized droplets, (3) interpersonal sexual contact, (4) contact with a secondary host or vector, e.g., a rodent or insect, (5) ingestion of contaminated food or water, and (6) contact with a fomite, (a pathogen-contaminated object). Note that, though derived largely from studies of 20th century diseases, we assume that these categories also describe ancestral pathogen transmission routes, an assumption supported by consistency in transmission pathways across related species [42]. To test our initial hypothesis that the factor structure of pathogen disgust should reflect the routes of disease transmission, we generated a set of stimuli based on a set of cues derived from five diseases from each of the above six transmission categories.

Over 2,500 participants rated these written descriptions for disgust, and exploratory factor analysis was used to identify patterns of co-variation.

Methods

Measures

Infection cue vignettes

Infectious diseases were selected at random by assigning each disease in an infectious disease handbook [41] a number, and then selecting numbers at random until we had identified five diseases from each of the six main transmission pathways. For each of these 30 diseases, cues that might be associated with disease transmission risk were extracted. To take one example, Yaws (*Frambesia tropica*) was selected as an example of a disease that is directly transmitted from person to person through skin contact with an infective individual (route 1). It is characterised by papilloma (externally projecting tumors), periostitis (inflammation around bones, which affects gait), and, in later stages, major lesions causing disfigurement and further disability. These cues – skin abnormalities and difficultly in movement – were recorded. Applying this strategy, the following types of cue arose repeatedly: presence of, or contact with; Animal and insect disease vectors, genital lesions or risky sexual behaviour, people showing signs of infection including skin or surface irregularities (e.g., scabs, sores, lesions, pus), unusual body shape (e.g., swelling, anorexia, obesity, heavy scarring, deformity, missing limbs), behavioural cues (e.g., expressions of physical pain, scratching, 'sickness behaviour', irregular gait), contextual cues associated with greater disease prevalence (e.g., poverty, poor personal hygiene, old age), cues to airborne transmission (eg hearing wheezing), unfamiliar and spoilt food, fomites and contaminated environments, and interactions with infectious substances. Based around these 14 cue categories we generated a series of vignettes, resulting in the generation of 75 items. Where possible, disease-relevant items from the TDDS and DS were reused. This disease cue set is detailed in table 1.

Study design and participant recruitment

An online survey was developed using web experiment software [43]. It included an information sheet, a consent form, a demographic information page and the 75 disease items listed in Table 1. The items were presented as the scenario in writing beside a sliding scale with 100 divisions, anchored by 'no disgust' at one end and 'extreme disgust' at the other. Participants clicked at a point along the sliding scale to indicate the strength of their

disgust response. Item presentation was quasi-randomised; the items appeared in a fixed order on each of eight pages, with the order of these pages being randomised. Participants were recruited through advertisements on Facebook with variants of the text "Participate in a brief psychology study on what makes people disgusted!", The study was also advertised on psychology websites where studies seeking participants are listed (e.g., "Psychology Experiments on the Web"). Ethical permission for the study was granted by the London School of Hygiene and Tropical Medicine's ethical review board (approval No 5930).

Analysis

Common factor analysis was used to identify latent variables underlying co-variation in the dataset. The analysis was conducted on the correlation matrix. As we predicted correlations between latent variables, we used an oblique rotation (direct oblimin) procedure. Velicer's MAP analysis was used to determine the number of factors [44]. Participants' factor scores were created by averaging the five items which loaded most heavily on each factor. The participants' *total disgust* score was created by averaging these factor scores. To assess the relationship between disgust, age and gender, we conducted a secondary analysis, using ANOVA and multiple regression.

Results

Participants

Of the 2,742 participants, 63 either failed to complete the survey, responded *no* to the question '*did you answer the questions honestly and accurately?*', reported an age < 16 or > 99, or had a *SD* of 10 or less across all disgust items (we assumed participants with low *SD* were clicking without paying attention) and were excluded from the analysis. The majority of the participants were citizens of the UK (67%), the US (20%) or Canada (6%). The mean age was 28 years (*SD* 11.6) and 66% of participants were women. Students accounted for 44% of the sample.

Factor Analysis

Data were suitable for factor analytic procedures. In all of the analyses reported below the Kaiser-Meyer-Olkin Measure of Sampling Adequacy (KMO) was .97, Bartlett's Test of Sphericity was statistically significant, $X^2 < .001$, individual item KMO statistics, extracted from the diagonal of the anti-image correlation matrix, were satisfactory (minimum value =

.94). The mean communality was .42, with a range of .22 to .63. Velicer MAP analysis indicated that 6 factors should be extracted.

Three of the factors were robust (according to criteria specified by Costello & Osborne [45], with more than five or more items with loadings of .5 or greater. Factors 2 and 4 (see Table 2) were marginally weaker, with 5 or more items with loadings above .45. Factor 6, however, was substantially weaker with just one factor loading above .4. Moreover, many of the items that loaded on factor 6 also loaded on factors 2 or 4. Given these weak loadings and cross loadings, we re-ran the analysis selecting a 5 factor solution. Factor 6 items were then largely absorbed into factor 4. In this five factor model, four of the five factors were *robust* [45] while the fifth factor had 3 items with loadings of .5 of higher. Below, we describe the content of these factors in both the five and six factor solutions.

Six factor solution: The items that loaded on factor 1 were varied but a common theme these was poor hygiene behaviour ('Listening to someone sniffle and snort continually', 'Watching a woman pick her nose', standing 'close to someone with body odour…', 'Feeling someone cough into your face') or contamination of the environment resulting from poor hygiene ('Seeing some snotty tissues left on the table', 'Walking through a city alleyway, you get a strong smell of urine', '… you see some un-flushed excrement in a toilet'). This was labelled *hygiene disgust.* Factor 2 includes items about animals (raw chicken, slugs, worms, cockroaches, teeming insects) and is here termed *animal disgust.* Factor 3 is dominated by sexual behaviour, with items about prostitution and promiscuity. We labelled this factor *sex disgust*. Factor 4 items related to irregular body shape ('…man with a disfigured face', '… someone missing a thumb', '… obese woman sunbathing', '... a hairless old cat...'), though poverty (touching a 'homeless man') and illness, ('Hearing someone wheeze heavily') also featured. As most of these items related to individuals looking or acting in an unusual ways we labelled it *atypical appearance disgust.* Factor 5 was dominated by problems with the skin and body surface, for example: '… a friend shows you a big, oozing lesion …', '…the eye is almost fully sealed and weeps constantly', 'Seeing pus come from a genital sore'. Because this factor included items about lesions and other problems with the body surface, including lesions on sexual organs, we name it *lesion disgust*. Factor 6, termed *food disgust*, includes items that describe the decay or deterioration of foodstuffs.

Five factor solution: The hygiene factor, sex, atypical appearance, and lesion disgust factors were largely unchanged by the changed factor solution. The difference lay in the treatment of food disgust items. All five of these items were absorbed into the animals factor, though the loadings of these items on this factor were low (<.4).

One factor solution: One further solution involved extracting a single factor. This general factor accounted for most of the item covariances; indeed, in a one-factor solution, only one item had a loading below .40. Table 3 displays the one and five factor solutions.

Univariate analysis of sex and age differences across six disgust factors

We generated factor scores for each participant by averaging their scores on the five items that loaded most strongly on the associated factor. (While we used the six factor solution to calculate these scores, creating scores from the five factor model would have led to identical factor scores, save the omission of the extra "food disgust" factor. This is because the five highest-loading items on the five common factors were the same.) A general disgust score was generated by averaging participants scores across these six factors.

We carried out t-tests to examine if men and women differed in their reaction to the disease stimuli as has been found in many previous studies [46] . As Figure 2 shows, while women rated all six categories of disease stimuli more disgusting than men, the magnitude of these sex differences varied. Women rated sex disgust ($t(2320) = 15.89$, $p < .001$) and animal disgust ($t(2320) = 18.57$, $p < .001$) items as about 18 points more disgusting than men, and effect sizes were large: $d = .70$ and .82 respectively. Effect sizes for hygiene disgust ($t(2320) = 10.86$, $p < .001$, $d = .48$), food disgust ($t(2320) = 10.11$, $p < .001$, $d = .44$) and lesion disgust $t(2320) = 7.15$, $p < .001$, $d = .31$) were moderate, and sex differences were small for atypical appearance items ($t(2320) = 3.68$, $p < .001$, $d = .16$).

These was no correlation between hygiene disgust sensitivity and age (r = 04, df = 2320, $p = 0.06$). All other disgust variables were negatively associated with age: sex, r = -.17, df = 2320, $p < 0.001$; lesion r = -.26, df = 2320, $p < 0.001$; food r = -.21, df = 2320, $p < 0.001$; animals r = -.12, df = 2320, $p < 0.001$; atypical r = -.30, df = 2320, $p < 0.001$; and total, r = -23, df = 2320, $p < 0.001$.

Multivariate analysis of age and sex differences across six disgust factors.

Because male participants were, on average, older, we also performed multivariate analysis exploring age and sex differences across the six disgust factors using multiple regression. The results are displayed in Table 4. These replicate the univariate analysis with one exception: older people find hygiene norm items more, rather than less, disgusting.

Correlation between the six disgust factors

The relationship between the six disgust factors was examined using Pearson's correlations. We additionally calculated correlation coefficients disattentuated for unreliability – see Table 4. The correlations between the six different factors were intermediate, ranging from .31 to .57, suggesting that these six factors do capture distinct facets of disgust. Disattenuated for unreliability, the correlations ranged from .39 to .76, suggesting a greater degree of coherence in people's responses to the items, consistent with the one factor solution presented in Table 3.

Discussion

A number of attempts have been made to explain the multifarious objects, events, behaviours, and individuals that occasion disgust. In this study we took the view that the most parsimonious explanation is likely to lie in the disgust system's functional role in motivating the avoidance of debilitating or life-threatening infection. We therefore took a different tack from previous explorations of the structure of disgust, generating a set of stimuli derived from the epidemiology of disease risk in humans and then examining patterns of co-variation of reported disgust levels in a large international sample. We assumed that clusters of stimuli that correlated strongly with each other would reflect categories of input to the disgust system. Several plausible domain structures emerged from the analysis. The MAP analysis pointed to a six factor solution. A one-factor solution had some statistical support, and a five-factor solution had fewer cross-loadings and weak factors. The five and six factor models differed only in their treatment of food items (see below). These analyses indicate that disgust takes as input the following kinds of cues:

- *Hygiene*: displays of, or physical evidence of, unhygienic behaviour.
- *Animals/ insects*: such as mice and mosquitoes that represent disease vectors

- *Sex*: behaviour pertaining to promiscuous sexual activities. (However, symptoms of sexually transmitted diseases on genitalia loaded on the *lesion* factor.)
- *Atypical appearance*: infection cues in other people including abnormal body shape, deformity, behaviour such as wheezing or coughing and contextual cues related to high risk such as homelessness.
- *Lesions*: stimuli related to signs of infection on the body surface such as blisters, boils or pus.
- *Food:* food items that show signs of spoilage. (This factor was weak and in a five factor model, these items loaded with the animal/insects factor).

These results partially supported our initial prediction that different kinds of disgust would reflect the different transmission routes of infectious disease, but they also departed from our prediction in an interesting way. It appears that cues to infectious disease threats are not categorised following the abstract biomedical categories of disease transmission risk recognised in the literature (interpersonal by contact, sexual activity or droplet, vectors, ingestion, fomite), but, rather, as categories of *recognisable* cues as to what to avoid. These include potentially contaminated *objects* such as bodily fluids, infected lesions, spoilt foodstuffs, and animals that vector disease, *practices*, such as those that run the risk of contracting sexually transmitted diseases, and *people* who display visible signs of disease or poor hygiene. This six factor categorisation makes sense from the point of view of a pathogen detection system that could not 'see' microscopic pathogenic microbes and parasites. Instead selection operated on behavioural avoidances of specific categories of people, practices and objects.

We expected our domain structure to differ from that suggested in the existing psychology literature, because we began from a functional perspective grounded in infectious disease risk avoidance. Our findings are, to some extent, consistent with the three factors of the DS-R (core, animal reminder and contamination) and also with the three domains of the TDDS: (pathogen, sexual and moral disgust). Our *food/animal* domain clearly overlaps with 'core disgust' in the DS-R (example DS-R item: 'Seeing a cockroach in someone else's house doesn't bother me'). Our one factor solution is consistent with the pathogen disgust domain of the TDDS, and our five and six factor solutions provide more granularity within it. Our *sex*

disgust domain has similar content to that of the TDDS. The *hygiene* input category, which was one of the largest in our model (in the factor model, 40% of our disease items loaded on this factor, see Table 2) was largely missing from both the TDDS and DS-R.

The DS-R and the TDDS models make different claims about the kinds of things that elicit of disgust. It is important to note, however, that these measures can only characterise inputs that were included in the original item pool. Both scales were originally generated by asking a small number of students and professors to generate lists of items they found disgusting. However, self-reported lists of disgusting items may be biased both by limited experience and by normative-pressures. People are unlikely to mention things that they rarely encounter. Stimuli associated with most infectious diseases such as sanitation, animal husbandry and ectoparasites are no longer part of many peoples' – especially American students and professors' – everyday life [47]. Further, social norms proscribe the open discussion of many disgust and disease relevant subjects. The fact that people may be unwilling to mention deformity or sexual behaviour may explain why the DS-R is missing items that relate to cues of sources of infection such as sexual promiscuity, and atypical appearance, which emerged as factors in our model.

Because we began with a prediction that the majority of disgust elicitors would play a role in infectious disease transmission, we did not focus on moral disgust. We have elsewhere suggested that moral disgust may have arisen as an extension of hygiene disgust [11]. In effect, a system that causes one to distance oneself from conspecifics who represent a possible source of infection could come to be used to distance oneself from those who perpetrate other social infractions. Expressions of disgust and a refusal to engage in social interaction are a cheap form of punishment that does not carry the likely costs associated with angry displays of aggression [48-50].

We assumed that this work would uncover different categories of *input* to the disgust processing system. However, one could argue that these six domains better represent categories of *output*; i.e. categories of desirable behavioural responses to a putative pathogen threat. Whilst a general avoidance response is appropriate for all of six types infection cue, more specific types of behaviour are called for to tackle each of these types of threat. For example, the *lesion* response should specifically limit behaviour that brings one into direct contact with wounds and sores, the *sex* disgust response limit promiscuity and

contact with the promiscuous, the *hygiene* and the *atypical appearance* disgust factors promote social distancing behaviour, *food* disgust limit the ingestion of suspect foodstuffs and animal disgust limit contact with potential disease vectors. In effect, we propose that these different categories of avoidance behaviours represent the phenotype which underwent selection under pressure from infectious disease, producing this specific architecture in the disgust adaptive system.

Whilst this work was carried out in humans, we suspect that psychological/behavioural disease avoidance systems are as ancient as the threat of parasitism, and for the different types of pathogen disgust to have diverged long before humans inherited its basic components. Hence, we should expect to see analogues of this structure across species. Behavioural responses to infectious threat should prove fertile for further research, both in humans and other animals. For example, we would predict behavioural tradeoffs to differ across the disgust domains. The *Sex* disgust response should be supressed as arousal increases [51], the *food* disgust diminish with increasing hunger, and *atypical appearance* disgust diminish as the nurture motive increases with increasing kinship. In humans and other social animals we would expect *hygiene* disgust to be supressed as the affiliation motive increases and in humans only, we would expect to see *hygiene* disgust co-vary with levels of moral outrage [52]. For each of these tests, only the specific type of disgust should be implicated, with other kinds being less affected. Trade-offs would be expected to differ with age and gender, for example, a stronger female nurture motive might explain why the well-known male and female disgust differences [10] did not here apply to the atypical appearance domain. In infants, the curiosity motive may trump hygiene disgust during potty play.

While the item pool used in this study was derived exclusively from cues related to infectious disease avoidance, it is likely that other selection pressures have shaped the evolution of the emotion. For instance, sex disgust - factor 3 in the above model - has patterns of between and within person variation that suggest that it plays a role in the avoidance of inbreeding [53-56]. Further work on pathogen and inbreeding avoidance behaviour and mechanisms in other species could help to reconstruct the relative importance of these selection pressures during the phylogeny of disgust.

What is the point of drawing yet more fine distinctions about the structure and function of disgust? There are several reasons. First, if ancestral disease avoidance is the ultimate purpose of the disgust adaptive system, then any scales that we employ to measure it should reflect this. Second, teasing out the various facets of disgust helps to generate new hypotheses, such as on the mechanics of how trade-offs between motives gain control of behaviour, or whether disgust is oral in its origins, as some contend [25] (and this work suggests it is not, as food was our weakest factor). Third, a better understanding of the structure of the brain's disease avoidance systems can assist those working in public health. By understanding the ways in which we respond to disease threats we can work with, and sometimes counteract those responses. For example, to avoid the harm that can be done when we mistakenly see atypical appearance as a cue to infection. Fourth, it is likely that malfunctioning of the disgust system's subdomains may give rise to specific clinical manifestations, for example 'heebie-jeebies'[57] and trypophobia (Kupfer, this volume) may relate to the skin lesion and animal/insect sub domains of disgust respectively. Finally, we need to better understand and measure the subdomains of disgust for the purposes of research into animal disease-avoidance behaviour.

Conclusions

We have presented evidence that the disgust motive has a factor structure that reflects the different tasks that human ancestors have had to accomplish to avoid falling prey to infectious disease. These were to avoid objects; skin lesions, spoilt foods and animal vectors, and individuals; with poor hygiene and of atypical appearance, and promiscuous sexual practices. This six factor categorisation is likely to reflect a pathogen detection system that could not 'see' microscopic pathogenic microbes and parasites directly, but could only evolve behavioural responses to categories of perceptible cues as to what to avoid; the people, practices and objects that have tended to co-occur with infectious disease. This study provides further evidence that disgust does indeed serve to prevent infectious disease, amongst other functions. It adds weight to the suggestion that parasite avoidance theory should be at the centre of future development of disgust science, for example in the examination of the behavioural tradeoffs that have to be made to meet multiple needs whilst avoiding disease, and suggests the need for further work to develop new scales for

clinical and psychological investigation. Disgust studies have great potential to elucidate the structure, function and emergence of emotions [10].

END

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Competing interests: we have no competing interests

Table and figure legends

Table 1. Disease Transmission Routes and Associated Stimuli

Transmission Route Item
Disease Vectors (animals)
A hairless old cat rubs up against your leg
A stray dog licks you on your face.
Finding a dead mouse in the corner of your kitchen.
Walking in your bare feet, you step on and squash a slug.
After losing a bet, you have to hold a fat wriggling worm in your bare hands for 60 seconds.
Direct transmission (unusual body shape)
In a crowd you notice a man with one empty eye socket.
Sharing an elevator with a man with a disfigured face.
Seeing an obese woman sunbathe.
Shaking hands with someone missing a thumb.
Fomites (body wastes)
Stuck in a wilderness area without toilets, you are forced to defecate in a field.
You see some un-flushed excrement in a toilet.
Seeing some snotty tissues left on the table.
Walking through a city alleyway, you get a strong smell of urine.
You are in an airplane when a man in the row behind you vomits into a paper bag.
Fomites (direct contact)
You see a child using a toilet brush to clean the dishes.
Seeing a chef using an apparently clean dust-pan to serve vegetables in a restaurant.
A piece of toast drops butter-side-down on the kitchen floor. You're hungry and it looks clean so you pick it up and eat it anyway.
You accidentally use someone else's roll-on deodorant.
Without realizing, you use the dog's brush to brush your own hair.
On the back of your newspaper you read the sentence: "Made from recycled toilet paper".
Direct transmission (contextual cues)
A woman with unkempt hair and dishevelled clothes sits beside you on the bus.
At a restaurant you notice you have accidentally been eating with a fork used by the person next to you.
Shaking hands with a homeless man.
Waiting in a queue, you notice a man that has not washed; you can see bits of dirt in his stubble.
On the subway, you are forced to stand close to someone with body odour and greasy hair
Direct transmission (disease symptoms)
Someone you work with develops a bad eye infection; the eye is almost fully sealed and weeps constantly.
You are introduced to a stranger; when you shake hands, you realise they have discoloured, scabby fingers.
Your friend shows you a big, oozing lesion on his foot.
The cashier handing you your change has very pale skin, sunken eyes and a rasping cough.
You see a nurse dressing an infected wound; under the yellow bandages there is a weeping sore.
Indirect transmission (airborne)
In a tight elevator you can feel people's breath on your skin.

Feeling someone cough into your face.
You see someone sneeze phlegm onto their hands
Seeing a child with a snotty nose.
Hearing someone wheeze heavily.

Fomites (contaminated environment)

You have to catch a bus but find it is filthy: the floor is sticky, the seats are stained and there is rubbish everywhere.
In your bare feet you step into wet mud which slides between your toes.
After accidentally throwing away an important document, you have to rummage through a bin containing all kinds of rubbish.
After moving into a new apartment you find an old smelly sock in the closet.
Feeling something sticky on a door handle.

Ingestion (spoilt food)

Biting into soft, brown bruise on an apple.
Finding a furry green patch on a loaf of bread.
You pour lumpy stale milk on your cereal.
Eating a sausage two weeks past its use by date.
You find a piece of steak at the back of the fridge - it smells 'off' and has a slimy texture.

Ingestion (unfamiliar food)

You are served a dish made of cow's tongue and cheek.
You crack open a boiled egg only to find a partially developed chick-foetus inside.
On television you see someone eat a raw fish head.
Eating onion flavoured ice-cream.
Helping a friend cook dinner you have to take the innards out of a raw chicken.

Disease vectors (insect)

You watch a fly crawl across your friend's sleeping face.
You notice hundreds of insects have gathered inside your desk top lamp.
Seeing tiny mites in a child's hair.
Seeing a close-up of a mosquito's mouthparts in a textbook.
Seeing a cockroach run across your path

Unconventional interactions with infective things

Seeing a man scratch his crotch on the train.
A friend admits to attempting sexual intercourse with a piece of fruit.
You learn your neighbour defecates in his back-garden instead of the toilet.
In a public bathroom you notice someone failing to wash their hands after leaving the cubicle.
Watching a woman pick her nose.
A friend tells you he sometimes cooks and eats rabbits and birds killed by cars left on the road
Listening to someone sniffle and snort continually.
An alternative medicine advocate recommends you drink a cup of urine once a week.

Sexual transmission (lesions)

On a medical TV program you see some blisters on a male's genitals.
Noticing some small red dots on your lover's genitals.
During foreplay you discover your partner has exceptionally poor genital hygiene.
At a medical history museum you see a wax model showing the effects of syphilis on the male and female body.
Seeing pus come from a genital sore.

Sexual transmission (behaviour)

You discover that your romantic partner once paid for sexual intercourse.

A street prostitute offers you sex for money.

Hearing about a woman who had sex with 7 people in one day.

Shortly after meeting someone, you take them back to your house and have sex.

Table 2. Pattern Matrix for the six factor model

Transmission Route	Item	Factor 1	Factor 2	Factor 3	Factor 4	Factor 5	Factor 6	Communality
Unconventional interactions with infective things	Listening to someone sniffle and snort continually.	0.70	0.06	-0.07	0.00	0.12	-0.20	0.48
Sexual transmission (lesions)	Seeing some snotty tissues left on the table.	0.64	0.00	0.07	-0.07	0.07	0.00	0.46
Fomites (body wastes)	Watching a woman pick her nose.	0.63	0.10	0.12	-0.03	-0.04	-0.05	0.49
Indirect transmission (airborne)	Feeling someone cough into your face.	0.60	-0.04	-0.02	-0.08	0.16	0.17	0.49
Direct transmission (contextual cues)	On the subway, you are forced to stand close to someone with body odour and greasy hair	0.59	-0.03	-0.04	0.15	0.09	0.14	0.53
Indirect transmission (airborne)	You see someone sneeze phlegm onto their hands	0.59	0.11	0.06	-0.09	0.11	0.01	0.50
Indirect transmission (airborne)	In a tight elevator you can feel people's breath on your skin.	0.53	0.06	0.09	0.11	0.00	0.02	0.44
Direct transmission (disease symptoms)	Waiting in a queue, you notice a man that has not washed; you can see bits of dirt in his stubble.	0.52	0.12	0.02	0.15	0.05	0.10	0.54
Fomites (body wastes)	The cashier handing you your change has very pale skin, sunken eyes and a rasping cough.	0.49	-0.10	0.05	0.34	0.08	-0.03	0.48
Unconventional interactions with infective things	In a public bathroom you notice someone failing to wash their hands after leaving the cubicle.	0.48	0.04	0.28	-0.02	-0.16	0.06	0.42
Ingestion (spoilt food)	You have to catch a bus but find it is filthy: the floor is sticky, the seats are stained and there is rubbish everywhere.	0.47	0.07	0.10	0.05	0.00	0.12	0.43
Fomites (contaminated environment)	Feeling something sticky on a door handle.	0.44	0.03	0.06	0.09	0.06	0.18	0.43
Fomites (direct contact)	Seeing a child with a snotty nose.	0.43	0.13	-0.03	0.11	0.12	-0.20	0.32

Fomites (body wastes)	You see some un-flushed excrement in a toilet.	0.41	0.10	0.09	0.01	0.08	0.18	0.45
Disease Vectors (animals)	Walking through a city alleyway, you get a strong smell of urine.	0.41	0.12	0.12	0.05	0.04	0.27	0.55
Direct transmission (contextual cues)	At a restaurant you notice you have accidentally been eating with a fork used by the person next to you.	0.41	0.07	0.12	0.10	-0.10	0.14	0.36
Sexual transmission (lesions)	During foreplay you discover your partner has exceptionally poor genital hygiene.	0.38	-0.04	0.07	-0.11	0.17	0.26	0.37
Disease vectors (insect)	Seeing a man scratch his crotch on the train.	0.37	0.10	0.28	0.12	-0.05	0.05	0.45
Direct transmission (contextual cues)	A woman with unkempt hair and dishevelled clothes sits beside you on the bus.	0.36	-0.03	-0.01	0.45	-0.05	0.12	0.45
Fomites (body wastes)	You are introduced to a stranger; when you shake hands, you realise they have discoloured, scabby fingers.	0.36	0.03	0.00	0.26	0.20	0.09	0.47
Fomites (contaminated environment)	You learn your neighbour defecates in his back-garden instead of the toilet.	0.36	0.09	0.27	-0.12	-0.02	0.14	0.40
Fomites (direct contact)	You are in an airplane when a man in the row behind you vomits into a paper bag.	0.33	0.16	-0.02	0.03	0.28	0.09	0.43
Ingestion (spoilt food)	You see a child using a toilet brush to clean the dishes.	0.32	0.12	0.08	-0.07	0.04	0.26	0.35
Indirect transmission (airborne)	Hearing someone wheeze heavily.	0.30	0.02	0.02	0.36	0.10	-0.11	0.35
Fomites (contaminated environment)	After moving into a new apartment you find an old smelly sock in the closet.	0.29	0.09	0.06	0.23	0.00	0.14	0.34
Direct transmission (disease symptoms)	Seeing a chef using an apparently clean dust-pan to serve vegetables in a restaurant.	0.27	0.10	0.25	-0.04	-0.08	0.20	0.35

Fomites (direct contact)	You accidentally use someone else's roll-on deodorant.	0.25	0.09	0.20	0.24	-0.14	0.08	0.30
Fomites (direct contact)	A piece of toast drops butter-side-down on the kitchen floor. You're hungry and it looks clean so you pick it up and eat it anyway.	0.24	0.20	0.15	0.11	-0.14	0.14	0.29
Fomites (body wastes)	Seeing tiny mites in a child's hair.	0.23	0.08	0.06	0.20	0.13	0.10	0.31
Disease Vectors (animals)	A stray dog licks you on your face.	0.22	0.12	0.10	0.19	-0.07	0.07	0.22
Ingestion (unfamiliar food)	Helping a friend cook dinner you have to take the innards out of a raw chicken.	0.01	0.62	-0.02	0.01	0.10	-0.12	0.42
Direct transmission (contextual cues)	Walking in your bare feet, you step on and squash a slug.	0.09	0.58	-0.06	-0.05	0.09	0.05	0.43
Disease Vectors (animals)	After losing a bet, you have to hold a fat wriggling worm in your bare hands for 60 seconds.	-0.03	0.56	0.05	0.17	-0.05	-0.10	0.37
Direct transmission (disease symptoms)	You are served a dish made of cow's tongue and cheek.	0.09	0.48	0.09	-0.16	0.13	0.11	0.42
Ingestion (unfamiliar food)	On television you see someone eat a raw fish head.	0.08	0.47	0.14	-0.07	0.10	0.09	0.42
Unconventional interactions with infective things	You notice hundreds of insects have gathered inside your desk top lamp.	0.01	0.46	0.04	0.11	0.08	0.18	0.43
Ingestion (unfamiliar food)	You crack open a boiled egg only to find a partially developed chick-foetus inside.	0.05	0.45	0.03	-0.15	0.26	0.15	0.44
Indirect transmission (airborne)	Seeing a close-up of a mosquito's mouthparts in a textbook.	-0.02	0.44	0.02	0.17	0.09	0.02	0.33
Fomites (contaminated environment)	In your bare feet you step into wet mud which slides between your toes.	0.06	0.42	0.09	0.26	-0.15	-0.01	0.33

Disease vectors (insect)	Seeing a cockroach run across your path	0.03	0.41	0.15	0.06	0.06	0.06	0.35
Disease Vectors (animals)	Finding a dead mouse in the corner of your kitchen.	0.04	0.39	0.12	0.09	0.07	0.18	0.40
Direct transmission (disease symptoms)	Stuck in a wilderness area without toilets, you are forced to defecate in a field.	0.06	0.37	0.26	0.18	-0.12	-0.04	0.34
Sexual transmission (behaviour)	You find a piece of steak at the back of the fridge - it smells 'off' and has a slimy texture.	0.18	0.36	0.00	-0.02	0.08	0.32	0.48
Unconventional interactions with infective things	A friend tells you he sometimes cooks and eats rabbits and birds killed by cars left on the road	0.02	0.34	0.28	0.02	0.07	0.16	0.43
Fomites (contaminated environment)	After accidentally throwing away an important document, you have to rummage through a bin containing all kinds of rubbish.	0.25	0.33	-0.02	0.11	0.01	0.10	0.35
Disease vectors (insect)	You watch a fly crawl across your friend's sleeping face.	0.17	0.33	0.13	0.12	-0.04	0.03	0.32
Sexual transmission (behaviour)	Hearing about a woman who had sex with 7 people in one day.	0.00	-0.03	0.76	-0.01	0.06	-0.02	0.57
Sexual transmission (behaviour)	A street prostitute offers you sex for money.	-0.03	0.02	0.72	0.05	0.03	0.02	0.56
Direct transmission (unusual body shape)	Shortly after meeting someone, you take them back to your house and have sex.	0.02	0.04	0.71	-0.08	-0.05	-0.14	0.45
Ingestion (unfamiliar food)	You discover that your romantic partner once paid for sexual intercourse.	0.03	-0.03	0.65	0.01	0.09	-0.05	0.44
Unconventional interactions with infective things	A friend admits to attempting sexual intercourse with a piece of fruit.	-0.02	0.00	0.64	0.03	0.06	0.09	0.48
Unconventional interactions with infective things	An alternative medicine advocate recommends you drink a cup of urine once a week.	0.15	0.17	0.24	-0.09	0.12	0.21	0.38

Fomites (direct contact)	On the back of your newspaper you read the sentence: “Made from recycled toilet paper”.	0.10	0.08	0.23	0.18	0.00	0.10	0.24
Direct transmission (unusual body shape)	Sharing an elevator with a man with a disfigured face.	-0.06	0.05	-0.03	0.63	0.19	-0.02	0.50
Disease vectors (insect)	Shaking hands with a homeless man.	0.14	0.00	0.08	0.58	-0.02	0.03	0.45
Direct transmission (contextual cues)	Shaking hands with someone missing a thumb.	-0.09	0.17	0.01	0.56	0.17	-0.07	0.46
Direct transmission (unusual body shape)	In a crowd you notice a man with one empty eye socket.	-0.05	0.17	0.03	0.46	0.29	-0.06	0.49
Disease Vectors (animals)	A hairless old cat rubs up against your leg	-0.02	0.05	0.08	0.45	0.07	0.15	0.33
Unconventional interactions with infective things	Seeing an obese woman sunbathe.	0.12	-0.17	0.12	0.40	0.10	0.18	0.32
Unconventional interactions with infective things	Without realizing, you use the dog’s brush to brush your own hair.	0.11	0.20	0.18	0.22	-0.04	0.11	0.30
Sexual transmission (lesions)	On a medical TV program you see some blisters on a male’s genitals.	-0.05	-0.02	0.17	0.11	0.66	0.10	0.60
Direct transmission (unusual body shape)	Seeing pus come from a genital sore.	0.08	0.00	0.08	-0.07	0.66	0.13	0.57
Fomites (direct contact)	You see a nurse dressing an infected wound; under the yellow bandages there is a weeping sore.	0.14	0.19	-0.04	0.12	0.61	-0.19	0.63
Direct transmission (disease symptoms)	Your friend shows you a big, oozing lesion on his foot.	0.12	0.15	-0.01	0.09	0.57	-0.05	0.55
Sexual transmission (behaviour)	Someone you work with develops a bad eye infection; the eye is almost fully sealed and weeps constantly.	0.18	0.00	0.08	0.17	0.50	-0.04	0.50
Sexual transmission (lesions)	At a medical history museum you see a wax model showing the effects of syphilis on the male and	-0.05	0.18	0.13	0.15	0.44	0.05	0.44

	female body.							
Sexual transmission (lesions)	Noticing some small red dots on your lover's genitals.	0.06	-0.10	0.23	0.10	0.32	0.29	0.41
Disease vectors (insect)	You pour lumpy stale milk on your cereal.	0.07	0.23	-0.04	0.02	0.11	0.47	0.43
Ingestion (spoilt food)	Finding a furry green patch on a loaf of bread.	0.00	0.29	0.04	0.22	0.01	0.33	0.38
Ingestion (spoilt food)	Eating a sausage two weeks past its use by date.	0.13	0.26	0.11	-0.02	0.04	0.28	0.36
Ingestion (spoilt food)	Biting into soft, brown bruise on an apple.	0.13	0.27	-0.07	0.12	0.03	0.28	0.31
Ingestion (unfamiliar food)	Eating onion flavoured ice-cream.	0.04	0.18	0.21	0.11	0.03	0.26	0.34

Table 3. Pattern Matrices for the five and one factor models

	Five Factor Solution						One Factor Solution	
Items	Factor 1	Factor 2	Factor 3	Factor 4	Factor 5	Communality	Factor 1	Communality
On the subway, you are forced to stand close to someone with body odour and greasy hair	0.68	-0.01	-0.04	0.08	0.09	0.53	0.66	0.43
Feeling someone cough into your face.	0.68	-0.02	-0.02	0.14	-0.13	0.49	0.59	0.35
Seeing some snotty tissues left on the table.	0.65	-0.02	0.02	0.06	-0.07	0.44	0.58	0.33
Listening to someone sniffle and snort continually.	0.63	-0.02	-0.15	0.12	0.05	0.40	0.54	0.29
Watching a woman pick her nose.	0.63	0.07	0.06	-0.04	-0.02	0.46	0.61	0.37
You see someone sneeze phlegm onto their hands	0.60	0.10	0.01	0.10	-0.08	0.48	0.64	0.41
Waiting in a queue, you notice a man that has not washed; you can see bits of dirt in his stubble.	0.59	0.13	0.00	0.05	0.12	0.54	0.71	0.50
In a tight elevator you can feel people's breath on your skin.	0.56	0.04	0.06	0.01	0.10	0.43	0.62	0.38
The cashier handing you your change has very pale skin, sunken eyes and a rasping cough.	0.54	-0.13	0.03	0.09	0.31	0.48	0.59	0.35
You have to catch a bus but find it is filthy: the floor is sticky, the seats are stained and there is rubbish everywhere.	0.54	0.10	0.09	-0.01	0.02	0.43	0.62	0.38
Feeling something sticky on a door handle.	0.54	0.07	0.07	0.05	0.04	0.43	0.62	0.39
In a public bathroom you notice someone failing to wash their hands after leaving the cubicle.	0.52	0.04	0.25	-0.16	-0.03	0.42	0.54	0.29
Walking through a city alleyway, you get a strong smell of urine.	0.52	0.18	0.14	0.03	-0.03	0.54	0.71	0.50
You see some un-flushed excrement in a toilet.	0.49	0.14	0.10	0.07	-0.04	0.45	0.64	0.41
At a restaurant you notice you have accidentally been eating with a fork used by the person next to you.	0.49	0.10	0.12	-0.11	0.05	0.36	0.55	0.30

During foreplay you discover your partner has exceptionally poor genital hygiene.	0.48	0.02	0.09	0.15	-0.18	0.36	0.52	0.27
A woman with unkempt hair and dishevelled clothes sits beside you on the bus.	0.47	-0.01	0.01	-0.04	0.38	0.43	0.56	0.31
You are introduced to a stranger; when you shake hands, you realise they have discoloured, scabby fingers.	0.44	0.05	0.01	0.20	0.22	0.47	0.65	0.42
You see a child using a toilet brush to clean the dishes.	0.41	0.19	0.10	0.02	-0.14	0.34	0.53	0.29
You learn your neighbour defecates in his back-garden instead of the toilet.	0.41	0.12	0.26	-0.03	-0.15	0.40	0.55	0.30
Seeing a man scratch his crotch on the train.	0.41	0.11	0.26	-0.05	0.10	0.44	0.63	0.40
Seeing a child with a snotty nose.	0.37	0.06	-0.10	0.13	0.16	0.26	0.46	0.21
After moving into a new apartment you find an old smelly sock in the closet.	0.37	0.13	0.07	0.00	0.18	0.34	0.56	0.32
You are in an airplane when a man in the row behind you vomits into a paper bag.	0.36	0.18	-0.03	0.28	0.01	0.43	0.62	0.39
Seeing a chef using an apparently clean dust-pan to serve vegetables in a restaurant.	0.35	0.16	0.26	-0.09	-0.09	0.34	0.51	0.26
You accidentally use someone else's roll-on deodorant.	0.31	0.11	0.20	-0.14	0.20	0.30	0.50	0.25
A piece of toast drops butter-side-down on the kitchen floor. You're hungry and it looks clean so you pick it up and eat it anyway.	0.30	0.24	0.15	-0.14	0.08	0.29	0.50	0.25
Seeing tiny mites in a child's hair.	0.29	0.11	0.07	0.13	0.16	0.31	0.55	0.30
A stray dog licks you on your face.	0.26	0.14	0.10	-0.07	0.16	0.22	0.44	0.20
Walking in your bare feet, you step on and squash a slug.	0.06	0.62	-0.10	0.08	-0.03	0.42	0.53	0.28
Helping a friend cook dinner you have to take the innards out of a raw chicken.	-0.08	0.60	-0.08	0.10	0.07	0.37	0.46	0.21
After losing a bet, you have to hold a fat wriggling worm in your bare hands for 60 seconds.	-0.09	0.55	0.00	-0.04	0.22	0.34	0.44	0.19
You are served a dish made of cow's tongue and cheek.	0.07	0.53	0.06	0.12	-0.16	0.41	0.54	0.29
You notice hundreds of insects have gathered inside your	0.05	0.53	0.05	0.07	0.07	0.43	0.59	0.35

desk top lamp.								
On television you see someone eat a raw fish head.	0.07	0.51	0.12	0.09	-0.07	0.42	0.58	0.34
You crack open a boiled egg only to find a partially developed chick-foetus inside.	0.05	0.51	0.02	0.24	-0.17	0.44	0.55	0.30
Seeing a close-up of a mosquito's mouthparts in a textbook.	-0.03	0.47	0.00	0.10	0.17	0.33	0.49	0.24
You find a piece of steak at the back of the fridge - it smells 'off' and has a slimy texture.	0.28	0.46	0.03	0.06	-0.09	0.46	0.63	0.40
Finding a dead mouse in the corner of your kitchen.	0.09	0.46	0.13	0.06	0.05	0.40	0.60	0.35
Seeing a cockroach run across your path	0.03	0.45	0.13	0.05	0.06	0.35	0.54	0.29
In your bare feet you step into wet mud which slides between your toes.	0.05	0.44	0.06	-0.14	0.26	0.32	0.46	0.22
A friend tells you he sometimes cooks and eats rabbits and birds killed by cars left on the road	0.06	0.40	0.29	0.06	-0.01	0.44	0.61	0.37
Finding a furry green patch on a loaf of bread.	0.12	0.39	0.10	0.00	0.13	0.34	0.55	0.30
After accidentally throwing away an important document, you have to rummage through a bin containing all kinds of rubbish.	0.28	0.37	-0.04	0.00	0.09	0.35	0.57	0.32
Stuck in a wilderness area without toilets, you are forced to defecate in a field.	0.04	0.37	0.23	-0.11	0.19	0.33	0.50	0.25
You pour lumpy stale milk on your cereal.	0.23	0.36	0.04	0.08	-0.09	0.33	0.54	0.29
Biting into soft, brown bruise on an apple.	0.23	0.35	-0.03	0.01	0.05	0.28	0.50	0.25
Eating a sausage two weeks past its use by date.	0.22	0.35	0.13	0.03	-0.08	0.34	0.55	0.30
You watch a fly crawl across your friends sleeping face.	0.18	0.34	0.11	-0.04	0.12	0.31	0.54	0.29
Eating onion flavoured ice-cream.	0.14	0.26	0.25	0.02	0.04	0.32	0.54	0.29
Without realizing, you use the dog's brush to brush your own hair.	0.17	0.25	0.19	-0.04	0.18	0.30	0.53	0.28
Hearing about a woman who had sex with 7 people in one day.	0.00	-0.04	0.75	0.07	0.00	0.56	0.51	0.26
A street prostitute offers you sex for money.	-0.02	0.03	0.73	0.03	0.04	0.55	0.53	0.28
A friend admits to attempting sexual intercourse with a	0.01	0.02	0.66	0.05	0.01	0.49	0.51	0.26

piece of fruit.								
Shortly after meeting someone, you take them back to your house and have sex.	-0.03	0.00	0.65	-0.04	-0.03	0.39	0.37	0.14
You discover that your romantic partner once paid for sexual intercourse.	0.01	-0.04	0.63	0.09	0.02	0.43	0.47	0.22
An alternative medicine advocate recommends you drink a cup of urine once a week.	0.22	0.24	0.26	0.10	-0.13	0.37	0.56	0.32
On the back of your newspaper you read the sentence: “Made from recycled toilet paper”.	0.16	0.11	0.25	0.00	0.14	0.24	0.46	0.21
On a medical TV program you see some blisters on a male’s genitals.	-0.01	0.01	0.21	0.67	0.07	0.60	0.58	0.34
Seeing pus come from a genital sore.	0.12	0.04	0.10	0.66	-0.11	0.56	0.57	0.32
ou see a nurse dressing an infected wound; under the yellow bandages there is a weeping sore.	0.06	0.15	-0.09	0.61	0.17	0.59	0.56	0.32
Your friend shows you a big, oozing lesion on his foot.	0.10	0.14	-0.03	0.58	0.09	0.54	0.58	0.34
Someone you work with develops a bad eye infection; the eye is almost fully sealed and weeps constantly.	0.19	-0.02	0.07	0.51	0.16	0.50	0.59	0.35
At a medical history museum you see a wax model showing the effects of syphilis on the male and female body.	-0.04	0.20	0.14	0.44	0.13	0.44	0.56	0.31
Noticing some small red dots on your lover’s genitals.	0.18	-0.01	0.29	0.31	0.00	0.36	0.55	0.30
Sharing an elevator with a man with a disfigured face.	-0.02	0.06	0.00	0.21	0.59	0.50	0.42	0.18
Shaking hands with someone missing a thumb.	-0.08	0.16	0.02	0.19	0.55	0.47	0.43	0.19
Shaking hands with a homeless man.	0.22	0.01	0.10	0.00	0.53	0.45	0.50	0.25
In a crowd you notice a man with one empty eye socket.	-0.04	0.17	0.04	0.30	0.45	0.49	0.52	0.27
A hairless old cat rubs up against your leg	0.08	0.10	0.13	0.08	0.38	0.30	0.45	0.21
Hearing someone wheeze heavily.	0.31	-0.01	0.00	0.11	0.36	0.34	0.49	0.24
Seeing an obese woman sunbathe.	0.24	-0.12	0.18	0.11	0.31	0.29	0.45	0.20

Table 4. Multiple Regression Analysis predicting Disgust Scores

Disgust		Estimate	Standard error	p
Total				
	Intercept	50.85	1.00	<.001
	Sex	10.24	0.69	<.001
	Age (years)	-0.31	0.03	<.001
Sex				
	Intercept	43.58	1.60	<.001
	Sex	16.98	1.10	<.001
	Age (years)	-0.35	0.05	<.001
Animal				
	Intercept	44.89	1.39	<.001
	Sex	17.50	0.96	<.001
	Age (years)	-0.20	0.04	<.001
Lesion				
	Intercept	67.43	1.46	<.001
	Sex	6.45	1.00	<.001
	Age (years)	-0.52	0.04	<.001
Food				
	Intercept	59.28	1.31	<.001
	Sex	8.63	0.90	<.001
	Age (years)	-0.37	0.04	<.001
Atypical				
	Intercept	40.89	1.22	<.001
	Sex	2.28	0.84	0.007
	Age (years)	-0.52	0.04	<.001
Hygiene				
	Intercept	49.02	1.27	<.001
	Sex	9.63	0.87	<.001
	Age (years)	0.10	0.04	0.006

Table 5. Pearson's Correlation between scores on Six Disgust Factors.

	hygiene	animal	sex	atypical	lesion	food	total
hygiene	**0.8**	0.62	0.51	0.5	0.65	0.71	0.91
animal	0.48	**0.77**	0.48	0.58	0.64	0.76	0.96
sex	0.42	0.39	**0.83**	0.39	0.43	0.58	0.82
atypical	0.39	0.45	0.31	**0.79**	0.68	0.59	0.86
lesion	0.53	0.52	0.37	0.56	**0.86**	0.62	0.92
food	0.54	0.57	0.46	0.45	0.49	**0.74**	1.00
total	0.75	0.77	0.69	0.7	0.78	0.78	**0.83**

Note: Raw correlations below the diagonal, (unstandardized) alpha on the diagonal corrected for attenuation above the diagonal.

Figure 1. Age and sex differences in total disgust sensitivity. Lines represent loess smoothened averages.

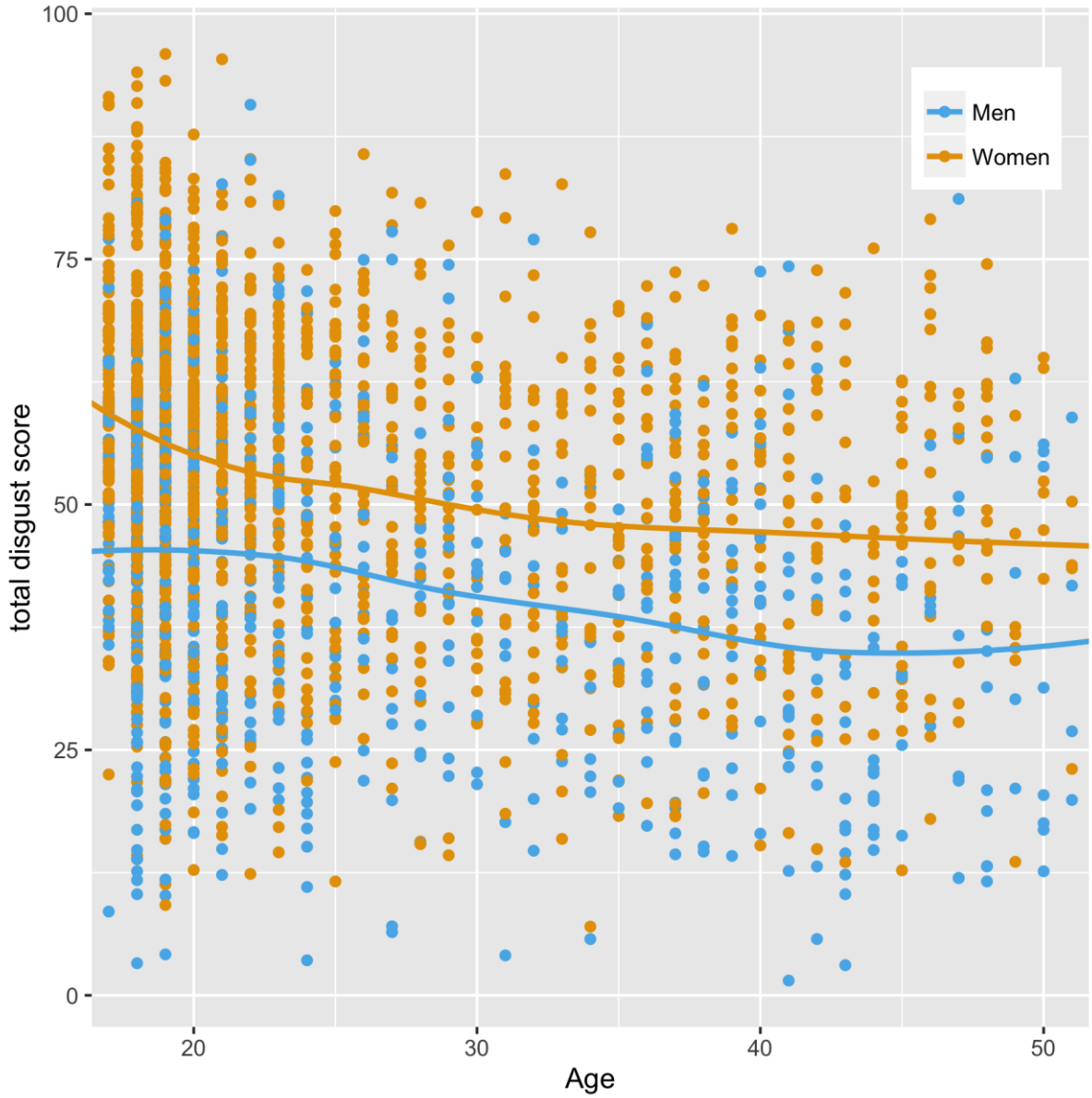
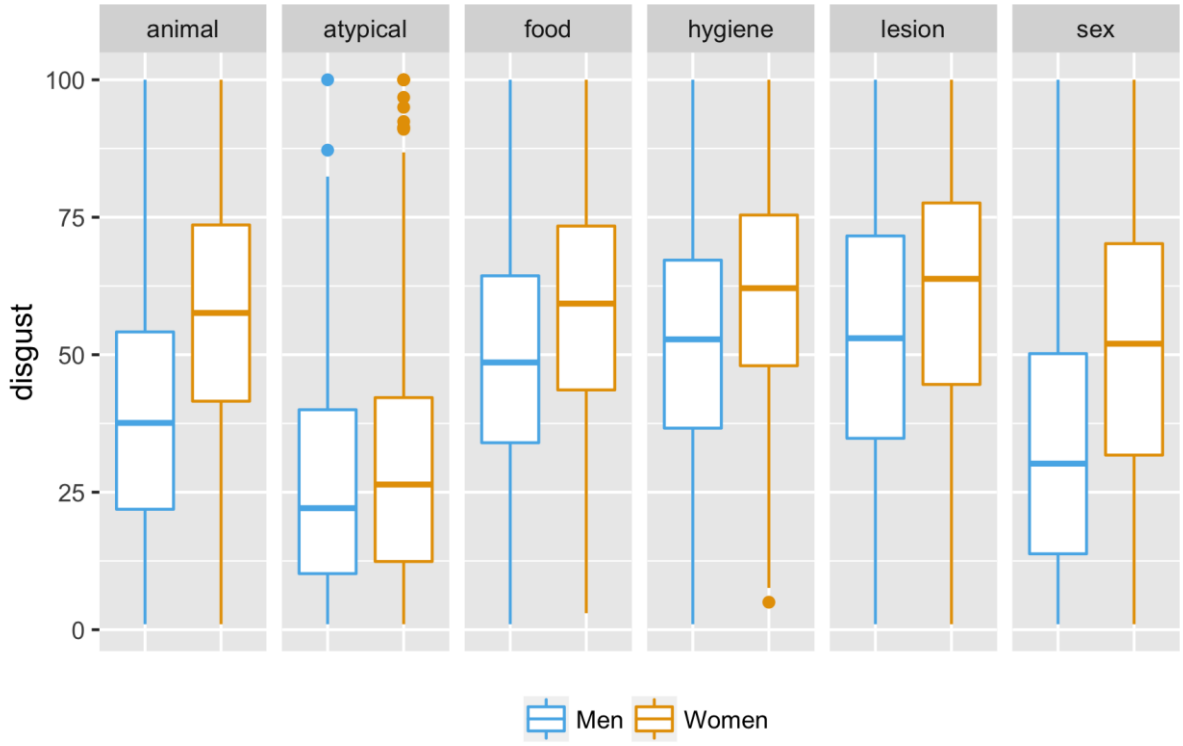

100
75
50
25
0
total disgust score
20
30
40
50
Age
Men
Women

Figure 2. Sex differences across 6 domains of disgust. Upper and lower box edges represent the 25th and 75th percentile. Whisker tips give 1.5* interquartile range, and outlying points are plotted individually.



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