

The Source Effect: Development of a Scale and Assessment of the Influence of Self-Esteem

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Abstract

The source effect for disgust is the tendency for disgust elicitors emanating from unfamiliar others to elicit higher levels of disgust than those emanating from the self or close others (Case, Repacholi & Stevenson, 2006; Repacholi & Stevenson, 2005). Prior to this research, there was no distinct measure for the source effect. One of the reasons for this was the source effect has been compared to self-disgust which already has existing measurement tools. In Study 1 ($N = 189$), to demonstrate that the source effect is different to self-disgust, a valid and reliable measure of the source effect was developed and administered with measures of self-concept, self-disgust and disgust sensitivity. Findings indicate that self-disgust is more likened to an intense experience of shame as oppose to disgust. The source effect measure was revealed to be a reliable measure of the source effect, although it did not relate with disgust sensitivity, suggesting there are potentially other influential factors for the source effect. In Study 2 ($N = 16$), a behavioural measure of the source effect was implemented through a priming and stimulus engagement experiment. Participants were primed to a shame, anger or neutral condition and then were tested for the source effect towards disgust elicitors from the self and an unknown stranger. Preliminary findings suggest that shame may cause an individual to become more avoidant of their own disgust elicitors. Potential utility of the new measures and future research directions are discussed.

Declaration of Originality

This thesis conforms to the requirements of the Master Degree by Research rules. This work has not been submitted for a higher degree at any other university or institution. All empirical research contained within this these was approved by the Human Research Ethics Committee at Macquarie University (Reference numbers: 5201600353 and 52016005548)

A handwritten signature in blue ink, appearing to be 'M. H. H. H.', is located in the bottom right corner of the page.

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The Source Effect: Development of a Scale and Assessment of the Influence of Self-Esteem

Disgust has been defined as a heterogeneous emotion that presents specific response characteristics when triggered, such as nausea, increased salivation and vomiting (Tybur et al, 2009). A disgust response can be elicited from a variety of sources including things like vomit or faeces. It has been well established that disgust has met the criteria, based on Ekman's (1992) model for emotions, to be considered a basic emotion (Rozin, Haidt & McCauley, 2009). Although there has been a great deal of research interest in the emotion of disgust over the last couple of decades, the concept of disgust directed towards the self has drawn much less attention. This thesis focusses on the concept of self-disgust and its relationship to feature of basic disgust.

The emotion of disgust has been the object of scientific scrutiny since it was first described by Darwin almost 150 years ago. In *The Expression of the Emotions in Man and Animals*, Darwin (1872) described disgust as being a response to something revolting that was primarily triggered or influenced through taste but also through the other senses. Darwin outlined that disgust was strong enough to generate a facial expression that matched the revulsion experienced. Some 70 years later, Angyal (1941) brought scientific attention to the emotion of disgust in a landmark paper, where he identified specific elicitors of disgust; highlighting offensive and foreign objects that are engaged with in an oral capacity as well as noting that various body waste products were a focus of disgust. Angyal argued that (a) there was a variation in the strength of the disgust that was related to the level of intimacy of contact with the disgust elicitor and (b) that an individual's perception of disgust can have survival implications such as identification of food items that might have become contaminated.

Despite the early interest in disgust, it was not until the development of the Disgust Scale (Haidt, McCauley & Rozin, 1994) that contemporary interest in disgust began to flourish. Through development of this scale measuring individual differences in disgust sensitivity, Haidt et al., argued that there were seven domains of disgust elicitors: food, animals, body products, sex, envelope violations, death and hygiene. Stemming from this seminal research, contemporary studies have revealed the three principal domains of disgust: sexual disgust, moral disgust and pathogen disgust (Three Domains of Disgust Scale (TDDS) Tybur et al., 2009; Olatunji, Ebesutani, & Kim, 2015). Based on these different domains, Sherlock et al (2016) outline that disgust serves different functions depending on which domain is active.

Rozin and Fallon (1987) argued that one of the primary functions of disgust was to prevent consumption or ingestion of contaminated foods. Moreover, there is much animal evidence to support the existence of evolved strategies for avoiding infection and contamination (Hart, 1990). Similarly, humans have developed behaviours that are designed to reduce contact with anything that may pose a threat of infection or contamination (Curtis, Aunger, & Rabie, 2004; Gangestad & Buss, 1993). Disgust literature on pathogen avoidance has produced a clearer understanding of what disgust is. Rozin, Haidt and McCauley, (2009) describe core disgust as being an emotional response that manifests in revulsion and immediate rejection of the eliciting stimulus, labelled as disgust elicitors. The primary purpose of the feeling of disgust is to motivate avoidance of anything that is perceived as a threat of infection or contamination. Herz (2012) likens disgust to a fear of disease and she stipulates that disgust, by design, is a developed, cognitive emotion that alerts individuals to some of the foremost threats of disease (i.e. contaminations or potential infections). Even though the definition of disgust has been made clearer through the more contemporary

research, there is still a lot more to be addressed to develop a comprehensive understanding of disgust.

Over the last two decades, there has been a surge in the psychological research on disgust and disgust sensitivity. However, Tybur et al. (2013) note that, despite the growing interest, very little has been done to ascertain the role and function of disgust as both an evolved function and as a construct related to the processing of information. Further, they argue that the development and understanding of the functional aspect of disgust will only better help with the comprehensive understanding of how the emotion directly impacts individuals. Moreover, Rozin, Haidt and McCauley (2009) argued that disgust is an important platform for contemporary research focus because it is directly relevant to ongoing concern with threats of contagion and infection within society.

Disgust Sensitivity and Individual Differences

There is a plethora of research that identifies that individual differences exist in the capabilities of individuals to process emotions (Gross & Oliver, 2003; Lindquist et al., 2013; Wang & Saudino, 2013). This research suggests that, depending on numerous contexts such as culture, cognitive ability, education and attachment, individuals can have widely different experiences depending on their capability to process emotions.

One robust finding to emerge from studies of disgust sensitivity is that women generally report higher levels of disgust compared to men (e.g. Haidt et al., 1994). Other research has shown that sensitivity to disgust is associated with increased levels of anxiety and lower openness to experiences and sensation seeking (see Rozin, 2008 for review). Interestingly, sensitivity to disgust seems to decline with age, and this effect happens faster for women (Tybur et al, 2011).

Self-Disgust

Whereas the majority of research attention has focussed on the experience of disgust towards various objects or situations, one stream of the disgust literature has explored the interesting idea of disgust towards the self. Beck (1963) explored the idea of negative thinking directed towards the self in his cognitive theory of depression. Building on from this notion, he argued that the important factor in negative self-appraisal is the emotional response that individuals have towards self-criticisms (Whelton & Greenberg, 2005). Building on this research, Overton et al., (2008) looked at the concept of self-disgust, specifically on the role it played with cognition and depression. It was identified that self-disgust is essentially a very strong sense of shame and disgust that stems from a negative appraisal of an individual's self or from a negative appraisal of an individual's actions (Overton et al, 2008; Simpson, Hillman & Crawford, 2010). Olatuniji, David and Ciesielski (2011) posited that self-disgust shares the same experience as core disgust, as defined by Rozin and Fallon (1987), however, unlike core disgust, the triggers for self-disgust often lie in how an individual perceives themselves or their actions in comparison to some form of ideal, meaning that the individual is not disgusted by some form of external trigger but rather they feel disgusted based on something they have seen or realized about themselves.

Self-disgust has been addressed in a variety of studies that have illustrated its relevance in the psychological literature. Overton et al. (2008) indicate that emotions have a significant role in the manifestation of depression and that levels of self-disgust plays an influential role in the relationship between cognitive processes and the onset of depression. Power and Dalgeish (2008) went as far as to hypothesise that depression could be characterized by the increase in an individual's feelings of self-disgust. Power and Dalgeish explored anecdotal evidence from a clinically diagnosed depressed individual which revealed that the individual considered themselves to be disgusting and unacceptable.

Self-disgust as a psychological construct has been measured using the Self-Disgust Scale (SDS) which was developed by Overton et. al (2008). This scale was derived from an existing scale called the Self-Description Questionnaire III (SDQ-III; Marsh & O'Neil, 1984) which was used to measure self-concept of university students in both an academic and a non-academic context. Overton et. al (2008) took items that mostly related to self-concept, behaviours and/or abilities that an individual engaged in or possessed and general personal appearance and adjusted them to feature more disgust relevant transitive verbs such as repulse or detest. The valence of certain items was also altered. For example, the original item "I am good looking" which is from the general personal appearance domain was altered to be stated as "I find myself repulsive". This alteration generated a new item that is both negative in valence and used a disgust relevant transitive verb. After the items were altered from the SDQ-III, analysis of the new SDS indicated that the new scale comprised of two factors; One factor relates directly to the "disgusting self" which is about self-concept and perception and a second factor that relates to "disgusting ways" which is more about individual's behaviour. The SDS was shown to correlate with the Disgust Sensitivity Scale developed by Haidt et al. (1994). This 18-item scale, which featured items like "*I find myself repulsive*" and "*I do not want to be seen*" was used to look at self-disgust as a potential mediator for dysfunctional cognition and depression. Building on this research on self-disgust and depression, three other key studies used the SDS to further investigate the relationship between self-disgust and depressive symptomology (Overton, Markland, Taggart, Bagshaw, & Simpson, 2008; Powell, Simpson, & Overton, 2013; Simpson, Hillman, Crawford, & Overton, 2010).

As research on self-disgust began to gain traction, Powell, Overton and Simpson (2014) conducted an interpretative phenomenological analysis on self-disgust in a group of females that identified depressive symptoms. This qualitative analysis sought to encapsulate

the subjective and lived experience of these individuals in order to identify the role and impact of self-disgust on depression. The findings indicate self-disgust had a strong association with depression as well as other psychological dysfunction such as eating disorders, difficulties with relationships and social interaction and body image issues. One of the observations noted was that only a small number of participants described a sick feeling but it did not seem to be described as strongly as core disgust response to disgust elicitors, that is, actual physical sickness.

Self-disgust has continued to be described as a negative emotion that has been found to be present in various clinical diagnoses. Espeset et al. (2012) identified that self-disgust played a significant role in the genesis and persistence of anorexia nervosa. Their qualitative analysis self-disgust was linked to negative self-appraisal and high levels of shame. Overall, there seems to be a recurring theme within the self-disgust literature that shows that self-disgust is inherently different from core disgust. One possible interpretation of the research on self-disgust, however, is that it tends to implicate feelings of shame more than core disgust. This presents a criticism of self-disgust in that it does not seem to share characteristics of disgust, as defined in previous literature.

The key criticism of the SDS is that several of the items do not reflect the domains of disgust outlined by Rozin, Haidt and McCauley (2009). For example, items that are phrased as *“I detest aspects of my personality”* or *“The way I behave makes me despise myself”* reflect self-appraisal but not necessarily disgust. Furthermore, the use of the disgust oriented transient verbs represents intense dislike rather than core disgust (Overton et al., (2008). This critique of the SDS is supported by Olatunji et al (2015) as they identified that the items used in the SDS were found to be weakly correlated with individual differences in disgust sensitivity; demonstrated through a correlation range of only $r = -.06$ to $.25$. Olatunji et al also identified that the SDS was essentially assessing self-concept, as it was with the original

SDQ-III. This was demonstrated through a strong, negative correlation with a self-concept construct of self-esteem ($r = -.67$). The findings suggest that self-disgust is more likely a heightened sense of shame.

Roberts and Goldberg (2007) indicated that self-disgust may be an emotion unto itself but it seems to be a specialised and harsher version of shame. It has been empirically demonstrated that disgust and shame are two completely different constructs that present unique aetiology, unique facial expressions which are rarely confused (Elfenbein et al. 2007; Keltner 1995; Tracy et al. 2009). The literature on self-disgust has likened the physiological experiences of this concept as being like the responses experienced as a result of pathogen induced disgust. This has highlighted a problem within the literature as self-disgust and shame are described as being the same thing, yet it has been found that the physiological presentation of disgust and shame is fundamentally different, for example disgust presents actual physical tendencies like increased salivation in preparation for vomiting whereas shame and self-disgust do not have these physiological components when describing a feeling of being disgusted towards the self (Scherer & Wallbott, 1994). These findings demonstrate now physiological similarities with shame and disgust, which presents the argument that if self-disgust is merely an extreme form of shame, then it also does not share any physiological similarity to disgust. Between the quantitative and qualitative research that has investigated self-disgust, the only similarity between self-disgust and core disgust is the involvement of intense negative sentiment. Unlike core disgust, the critical feature of contamination is absent from the SDS. This thesis explores whether a form of disgust towards the self exists that more closely incorporates basic properties of core disgust (i.e. contamination) than the SDS. One phenomenon that derives from the research on disgust that might reflect disgust towards the self is the “source effect” for disgust.

The source effect for disgust

The source effect for disgust refers to the tendency for disgust elicitors emanating from unfamiliar sources to elicit higher levels of disgust than those emanating from the self or close others (Case, Repacholi & Stevenson, 2006; Stevenson & Repacholi, 2005). The source effect for disgust is thought to be functional in that it reduces the risk from exposure to novel pathogens (Oaten, Stevenson and Case, 2008).

Experimental research on the source effect.

The tendency for disgust elicitors emanating from unfamiliar others to elicit higher levels of disgust than those emanating from the self has long been noted in key reviews of disgust (e.g. Angyal, 1941; Rozin et al., 2000). However, it was not until relatively recently that experimental investigations of the source effect have emerged. In the first extensive investigation of the source effect for disgust, Stevenson and Repacholi (2005) conducted a series of vignette studies investigating the source effect in terms of hedonic responses to interpersonal odours.

In this research, Stevenson and Repacholi presented a series of vignettes that described situations when an individual would encounter a variety of unpleasant smells (malodours). They set up an additional component where participants had to keep a smell diary that tracked their hedonic responses to odours they encountered in their life.

The key findings of this study indicate that more negative affect towards a malodour is experienced if the source of the odour is a stranger as oppose to the self, supporting the theory that threat or risk of disease is higher, when the cues are related to people that are encountered less frequently. Furthermore, these mechanisms of disease avoidance and disgust are developed implicitly, through mere exposure and explicitly, by having knowledge of the potential risks. Stevenson and Repacholi present a strong case for the existence of the source

effect and identified that this effect was not developed based on impressions made by individuals (halo effect) or by the social status of the individual involved. This finding indicates that the source effect exists outside of the realm of a social bias or the influences of status.

Case, Repacholi, and Stevenson (2006) investigated the source effect in relation to mother's reactions to changing soiled nappies. The study looked at a sample of forty-two mothers who all had young infants between 6 and 18 months. They were asked to complete a self-report questionnaire about the level of disgust felt in response to changing their baby's faeces-soiled nappies. In a second study, mothers were presented with a series of trials where they were asked to smell a visually concealed sample of a soiled nappy, which was either from their child or an unfamiliar child. They found that the mothers rated their own baby's nappies as less disgusting compared to the ratings of the unfamiliar nappy. The authors argues that the source effect might result in differential exposure to disgust elicitors – mothers have more frequent exposure to their child's soiled nappy compared with that of an unfamiliar child's nappy. This frequent exposure attenuates disgust selectively to their child's nappy, which also makes primary care involving the child's disgust elicitors less aversive.

In a large quantitative study, Curtis et al. (2004) included an item asking respondents who they were least like to share a toothbrush with. The higher percentages were assigned to less familiar individuals such as a postman (59%) or the boss at work (24.7%). However, there were far lower percentages assigned to best friends (1.9%) or partner/spouse (1.8%). This clearly demonstrates participant's reluctance to want to engage with a potentially contaminated toothbrush used by a stranger compared to someone they are intimately familiar with.

The source effect for disgust has also been confirmed using physiological and behavioural measures. Peng, Chang and Zhou (2012) conducted a series of studies that tested the source effect. In their first study, to replicate the findings of Stevenson and Repacholi (2005) they used a similar vignette approach where respondents self-reported feeling of disgust to a series of sentences. The second study measured physiological responses from the respondents while completing the vignettes by taking recordings of individual's heart rates. They used an approach-avoidance simulation to look at the source effect behaviourally. The critical findings reveal strong support for the source effect in replicated findings comparable to Stevenson and Repacholi, as well as clear differences in physiological and behavioural responses based on whether the source was familiar or unfamiliar to the respondent. The participants experience more intense levels of disgust, elevated heart rates and a higher propensity for avoidance when attending to disgust elicitor content from the unfamiliar stranger.

A contemporary behavioural study demonstrated the source effect through an odour experiment. Reicher et al., (2016) addressed core disgust responses and the relationship between in group and out group membership. In this study, participants were asked to smell a t-shirt that bore the logo of their university, a different university or a plain t-shirt with no affiliated logo. The authors measured walking time to wash their hands and number of soap pump used to measure levels of disgust. Results indicated that those who shared the ingroup commonality of the same university demonstrated lower disgust than the outgroup of the other university or the ambivalent non-logo group. This study demonstrates the source effect for disgust is as present and valid in an ingroup versus outgroup comparison as it is in previous research looking at self versus unfamiliar comparisons.

To date, there have been no attempts to develop a reliable individual difference measure of the source effect for disgust. The DS and the TDDS comprise items that measure

how much disgust an individual feels in response to a variety of stimuli and contexts.

However, these instruments do not permit an assessment of the source effect for disgust.

How can the source effect inform self-disgust?

Self-disgust is a construct that continues to be included in psychological research even though it seems to not be related to disgust. The source effect might be a fruitful way of assessing self-disgust because it comprises variation in core disgust toward elicitors emanating from the self, compared to those emanating from others. While disgust towards elicitors emanating from the self might usually be expected to be less aversive than the same elicitors emanating from a stranger, variation in the magnitude of the self-other difference might provide a way of assessing disgust toward the self. Specifically, a measure of the source effect, could help inform a better understanding of what self-disgust is. Previous literature has addressed individual differences with core disgust and disgust sensitivity but there has been no analysis of individual differences with regards to the source effect for disgust.

Self-disgust and the source effect

The source effect presents several interesting areas for potential research, especially given the links between psychological dysfunction and disgust. The development of a clear measure of the source effect could provide more insights into psychological constructs that extends beyond disgust sensitivity.

Self-Concept & Self-Disgust:

Through the analysis of existing literature, it has been proposed that self-disgust is more likely to be an extreme sense of shame and therefore related more to self-concept and self-esteem. Considering the source effect might be the more appropriate understanding of self-disgust, it is plausible that there might be a relationship between measures of self-esteem

and related measures of self-compassion and shame. If this relationship emerged, the source effect for disgust could provide an implicit measure of self-esteem that would not be prone to social desirability in participant responses which is problematic in the more commonly used measures of self-esteem such as the Rosenberg General Self-Esteem Scale (Rosenberg, 1965). Based on this theory, the present research will need to compare current measures of self-concept that measure levels of self-esteem and self-compassion to self-disgust and measures of core disgust to develop evidence to support these claims. Additionally, the present research will need to factor in a shame induction to address the relationship between self-disgust and shame as well as the role this plays in disgust.

Representations of the self: Ideal, Actual and Ought Self

In consideration of the propensity for individual differences to exist within the presentation of disgust, it is pertinent to consider the individual differences that exist within the paradigm of the ideal, actual and ought self and the structure of belief systems within said paradigm. Higgins (1987) indicated that there are often discrepancies present within an individual linked to the reality of the actual or own self (often referred to as self-concept) and states of the ideal self (which are often described as representations of an individual's beliefs around their own hopes, wishes or aspirations for themselves). The ought self is described as similar to the ideal self, with the notable difference being that the ought self is based on an appraisal of how an individual ought to behave or attributes they should possess. These discrepancies can often manifest in different ways, specifically in the presence of negative emotions. Higgins theory stipulates that there can be a variety of behavioural presentations when there is dissonance between the representations of self, predominantly with strong negative emotions such as sadness. These representations are important to consider in relation to self-concept, however, as the present platform seeks to measure the source effect for disgust, there is no need for additional consideration of this ideology in the disgust measures.

Further, it has been factored into the measures of self-concept being used within the present study.

Overview of the present studies

The review of literature on self-disgust above highlights some contradictory evidence in terms of what the construct is and what role it plays in relation to disgust. The literature indicates that self-disgust shares the same physical manifestation as core disgust but there is the contradictory claim that self-disgust is nothing more than a more extreme manifestation of shame. It is pertinent to address these claims by looking at how self-disgust relates to disgust from both the perspective that self-disgust is the same as core disgust and from the perspective of self-disgust as a product of self-esteem.

Whereas the most commonly used recent measures of disgust sensitivity (TDDS; Tybur et al., 2009) comprises the domains of pathogen, sexual and moral disgust, the most relevant domain for the source effect would seem to be pathogen disgust. Thus, the research described in this thesis will focus on the relationship between individual differences in pathogen disgust and the source effect. However, moral disgust will be explored due to its relationship in the literature with core and self-disgust.

Based on the review of the literature and the rationale discussed, the present research seeks to measure individual differences in the source effect for disgust and to investigate whether the source effect is related to measures of self-regard such as self-esteem and self-compassion. Furthermore, this research will explore the relationship between the source effect and self-disgust.

To address these research questions, two studies were conducted. In a first study, a source effect scale was developed and its relationship to measures of self-esteem, self-compassion and disgust sensitivity was examined. It was expected that lower self-other

differences in the source effect would be associated with lower self-esteem and lower self-compassion indicating that a person's self-concept will influence the manifestation of the source effect. The relationship between the source effect and disgust sensitivity was explored. In a second study, the effects of a disgust induction on a behavioural measure of the source effect was examined. It was expected that an induction of shame would produce a reduction in the source effect as demonstrated by similar levels of disgust towards the self compared to those of a stranger. A comparative emotional condition of anger was also implemented to control for negative affect. Self-disgust correlates highly with a negative affect state like sadness so anger was selected to provide a comparison that was unrelated to the existing variables.

Study 1 – The development of a Source Effect Scale

Method

Participants

The study was conducted advertised on psychology research websites that are open to anyone to participate in psychological research. Three hundred and fifty-two respondents attempted the questionnaires. Participants recruited from the online sample were mostly sampled from the United States, Australia and the United Kingdom.

Due to large amounts of incomplete data or failing to comply with honesty checks, 169 participants were excluded from analysis resulting in a total of 189 respondents. Demographic information was collected from participants. The participant breakdown was 128 females (*Mean Age* = 23.78, *SD* = 9.47), 58 males (*Mean Age* = 24.66, *SD* = 11.65) and 3 who indicated other (*Mean Age* = 18.67, *SD* = 1.15). The overall *Mean Age* = 23.97, *SD* = 10.12.

Materials and Procedure

This study was approved by the Human Research Ethics Committee at Macquarie University (HRED Approval Number: 5201600353). All respondents included in the sample gave informed consent (see Appendix A & B for Participant Information and Consent Forms) and completed the survey via the Qualtrics platform. The study was hosted on the online psychology research forums where participants could freely select research that they wanted to take part in. Participants clicked on the link to the study, gave consent and then completed the survey.

Respondents completed the Self Esteem Scale, the Self-Compassion Scale, the Self-Disgust scale, the Three Domains of Disgust Scale and the Source Effect scale. The order of the questionnaires was randomised and the items within each scale were also randomised. Lastly, honesty checks and demographic information was collected.

Self-Esteem: The Rosenberg 10 item Self-Esteem Scale (SES) was used to measure the participants level of self-esteem (see Appendix E for the SES, Rosenberg, 1965). This scale was included as it was necessary to gauge a respondent's self-esteem in order to identify any impact that this would have on the source effect. Respondents rated their level of agreement with the statements on a 4-point scale (Strongly agree to strongly disagree). Possible range of scores was between 10 and 40 with high scores reflecting high self-esteem. Five of the items were reverse scored. Examples of the items include: "*I wish I could have more respect for myself*" and "*I certainly feel useless at times*". Reliability was high in the present study ($\alpha = .91$).

Self-Compassion: The Self Compassion Scale – Short Form (SCS-SF) was used as an additional measure for how respondents felt towards themselves (see Appendix F for the SCS-SF, Raes et al, 2008). This scale was necessary to strengthen any findings that would

demonstrate a link between how a respondent feels about themselves and the manifestation of the source effect. Respondents rated the frequency that each statement occurred on a 5-point scale (Almost never to almost always). Possible range of scores was between 12 and 60 with high scores indicating higher levels of self-compassion. 6 of the items were reverse scored. Examples of the items include: “*When something upsets me I try to keep my emotions in balance*” and “*When I fail at something that’s important to me, I tend to feel alone in my failure*”. Reliability was high in the present study ($\alpha = .80$).

Self-Disgust: The Self-Disgust Scale was used to measure levels of disgust directed towards the self in the respondents (see Appendix G for the SDS, Overton et al, 2008). This scale was necessary to support the claim that self-disgust was much more likely to be related to self-esteem and self-compassion than to any of the actual disgust domains. Respondents rated their level of agreement with the statements on a 5-point scale (Strongly agree to strongly disagree). Possible range of scores was between 18 and 90 with high scores indicating higher levels of self-disgust. 8 items were reverse scored. Examples of items include: “*I find myself repulsive*” and “*I am an optimistic person*”. Reliability was high in the present study ($\alpha = .91$).

Disgust: The Three Domains of Disgust Scale was used to measure levels of disgust in three domains – pathogen, moral and sexual (see Appendix H for the TDDS, Tybur, Lieberman, & Griskevicius, 2009). This scale was included as a means of demonstrating that self-disgust was inherently different to any of the key domains of disgust. Primarily, the pathogen domain of disgust was used as a measure of overall pathogen disgust sensitivity for the basis of comparison against a participants’ source effect. Respondents rated their level of disgust felt towards the statements on a 7-point scale (1 indicating *No disgust at all* and 7 indicating *Extremely Disgusting*). Scores were tallied based on the three domains providing three scores on disgust. Possible range of scores on each domain was between 7 and 49 with

high scores indicating high disgust sensitivity within each domain. No items are reverse scored in this scale. Examples of items include: “*Stepping on dog poop (Pathogen)*” and “*Deceiving a friend (Moral)*”. The present study assessed the scale for reliability and it was determined to be a highly reliable scale ($\alpha = .88$ overall; $\alpha = .91$ Moral; $\alpha = .85$ Sexual; $\alpha = .76$ Pathogen).

Source Effect: To assess the source effect, a 66-item questionnaire was developed (see Appendix I for the Source Effect Questionnaire). To measure the source effect, three categories were built into the questionnaire consistent with the literature on the source effect. The questionnaire posed 22 vignettes directed towards the self, 22 towards a close friend and 22 towards an unrelated “other” who was generally positioned as a stranger to the individual participant. The source effect scale was constructed by the author with support and insight from experts from the research field, Prof. Richard Stephenson and Dr. Trevor Case. The questionnaire was loosely based on items from a previous disgust measure by Rozin, Haidt and McCauley (2009). The scale required respondents to indicate their level of disgust on a 7-point scale (0 = *Not disgusting at all*; 6 = *Extremely Disgusting*). Overall disgust towards items directed to the Self, Friend and Other were tallied. Possible ranges for the total disgust were between 0 and 132 per category. The source effect was measured by calculating difference scores between the self and the friend (possible range between -154 and +154 depending on the direction of the relationship) and the self and the other (possible range between -154 and +154 depending on the direction of the relationship). Examples of items include: “*While talking, you accidentally spit on your clothes*”, “*While talking, a friend accidentally spits on your clothes*” and “*While talking, a stranger accidentally spits on your clothes*”. To assess the reliability and quality of the source effect scale, an exploratory factor analysis was conducted (see results).

Honesty: Two honesty checks were included in the study. The first check appeared with the Source Effect items and was intended to detect inattentive responding. This honesty check items were worded as follows: *“If you are reading this question, please select ____ as your answer”*. There were 4 variations included in the source effect scale that appeared in random order. The second honesty check was presented at the end of the survey where participants were asked to provide a simple “Yes” or “No” to the statement *“Overall, I tried to answer these questions honestly”*. Participants who failed more than 1 of the first check and/or indicated “No” on the final check were removed from analysis.

Demographic items: Participants were asked to provide information regarding their gender, age and geographic location.

Analytic Strategy

Statistical Package for Social Sciences (SPSS version 24) was used to conduct all statistical analysis of data. Exploratory data analysis was conducted to ensure that the data being used was majority complete and did not violate the honesty checks. Little’s Missing Completely at Random check was conducted on remaining missing data to identify any patterns in the missing responses. There was a total of 8 missing data points in the final data set being used for analysis which were replaced with the mean for the individual item set.

Mathematical assumptions were analysed to identify the appropriate method for statistical analysis. Parametric statistical procedures of Pearson Correlations and Paired samples t-tests were used to analyse the relevant relationships and the significant differences between relevant variables respectively. Exploratory factor analysis was conducted on the source effect scale to identify if the measure is reliable and valid for accurate measurement of the source effect construct.

Results

Data Preparation

After all items were reverse scored and totalled, mathematical assumptions were tested for all included variables. Analysis of Shapiro-Wilk statistics and levels of skewness (calculated by skewness/standard error of skewness) and kurtosis (calculated by kurtosis/standard error of kurtosis) indicated that normality had been violated with 9 out of the 11 variables demonstrating significant Shapiro-Wilk statistics (See Appendix J) and 6 out of the 11 variables yielding significant skew i.e. skew >1.96 (See Appendix K) (Field, 2009). Visual inspection of histograms and detrended normal Q-Q plots as well as outlier analysis reveal the presence of outliers in all variables, however these outliers fell within acceptable ranges according to Field. Violations of normality have been cited as being less problematic with sample sizes >30 referring to central limit theorem. Accordingly, parametric analyses were conducted despite the presence of violations to normality.

Exploratory Factor Analysis

An exploratory factor analysis was conducted on the source effect questionnaire to assess the reliability of the questionnaire and to look for potential subscales that exist within. General reliability analysis for the three total disgust categories demonstrated high reliability ($\alpha = .93$ Self Items; $\alpha = .94$ Friend Items; $\alpha = .94$; Other Items; $\alpha = .82$). The above t-tests indicate the self and other was the most extreme representation of the source effect. The data were appropriate for the factor analysis (Kaiser-Meyer-Olkin = 0.84; Bartlett's test χ^2 (231) = 1,143.70, $p = <.001$). 6 factors had an eigenvalue of $>.1$, however, analysis of the scree plot indicated that only 2 factors should be analysed further. Scree plot analysis was appropriate as data set did not meet Kaiser's criterion for eigenvalue usage (Field, 2009). Results of the exploratory factor analysis, using a varimax rotation reveal a single factor in the source effect comparison of self and other which was additionally found to be highly reliable measure of

the source effect ($\alpha = .87$). Most of the variance was explained by the primary factor identified. Any residual items had such low-level loadings on independent factors that they were left into the primary analysis as oppose to creation of new factors that would hold no statistical value. This exploratory factor analysis demonstrates that the source effect questionnaire is a reliable measure.

Correlation Analysis

Pearson correlations were conducted on all the variables used in the study. As demonstrated in Table 1, there was a strong, positive correlations between self-disgust and self-esteem as well as self-disgust and self-compassion indicating that higher levels of self-esteem are met with higher levels of self-compassion. No correlations were found between self-disgust and any of the three domains of disgust i.e. Pathogen, Sexual and Moral. There was a weak, positive correlation found between the source effect comparison between the self and a friend and levels of self-compassion as well as the source effect comparison between the self and other and levels of self-compassion. A weak, negative correlation was identified between the level of disgust towards a friend and self-esteem as well as the level of disgust towards the other and self-esteem. A weak (approaching moderate), negative correlation was found between level of disgust towards the other and self-compassion, as well as level of disgust towards the friend and self-compassion indicating that the lower the self-compassion, the more likely disgust can be experienced towards friends and strangers. Disgust ratings of self, friend and other strongly, positively inter-correlated and separately correlated with Pathogen disgust, Sexual disgust and weakly, positively correlated with Moral disgust. A strong, positive correlation was obtained between the self vs friend source effect and the self vs other source effect. There were weak correlations between Age and self-esteem, self-compassion, self-disgust as well as sexual and moral disgust.

Running head: THE SOURCE EFFECT SCALE

Table 1.

Correlation Analysis of variables

	Age	Self- Esteem	Self- Compassion	Self- Disgust	Self Total	Friend Total	Other Total	Pathogen Disgust	Sexual Disgust	Moral Disgust	Self vs Friend	Self vs Other
Age	-	.193**	.153*	.159*	-.056	.031	.004	.007	-.153*	.188**	-.141	-.074
Self-Esteem		.008	.036	.029	.441	.668	.959	.919	.036	.010	.052	.310
Self-Compassion			-.	.621**	.798**	-.125	-.185*	-.145*	-.100	-.054	.013	.039
Self-Disgust				.000	.086	.011	.047	.172	.460	.858	.598	.827
Self Total				-.	.600**	-.134	-.286**	-.270**	-.161*	-.053	.016	.206**
Friend Total					.000	.065	.000	.027	.469	.830	.004	.023
Other Total					-.	.082	-.113	-.062	-.024	-.077	.056	.005
Pathogen Disgust						.260	.122	.399	.740	.295	.447	.945
Sexual Disgust						-.	.784**	.666**	.592**	.372**	.348**	.381**
Moral Disgust							.000	.000	.000	.000	.000	.000
Self vs Friend							-.	.845**	.691**	.365**	.281**	-.259**
Self vs Other								.000	.000	.000	.000	.620
								-.	.773**	.323**	.327**	-.222**
									.000	.000	.002	.000
									-.	.379**	.390**	-.108
										.000	.140	.102
										-.	.299**	.050
											.000	.497
											-.	.130
												.074
												.319
												-.752**
												.000
												-.000

*. Correlation is significant at the 0.01 level (2-tailed). *. Correlation is significant at the 0.05 level (2-tailed).

Running head: THE SOURCE EFFECT SCALE

Paired samples t-tests with a Bonferroni adjustment were used to identify significant differences between relevant variable relationships.

Results of the paired samples t-test indicate that individuals find disgust elicitors from the self ($M = 51.40$, $SD = 22.10$) less disgusting compared to a close friend ($M = 79.36$, $SD = 22.68$), $t(188) = -26.14$, $p = <.001$.

Results of the paired samples t-test indicate that individuals find disgust elicitors from the self ($M = 51.40$, $SD = 22.10$) less disgusting compared to a foreign “other” ($M = 96.78$, $SD = 21.10$), $t(188) = -35.30$, $p = <.001$.

Results of the paired samples t-test indicate that individuals find disgust elicitors from a close friend ($M = 79.36$, $SD = 22.68$) less disgusting compared to a foreign “other” ($M = 96.78$, $SD = 21.10$), $t(188) = -19.52$, $p = <.001$.

Results of a paired samples t-test indicate that the source effect is significantly less between the self and a friend ($M = -22.74$, $SD = 15.17$) compared to the self and the other ($M = -39.25$, $SD = 17.69$), $t(188) = 19.22$, $p = <.001$.

There were no significant sex differences found in the analysis of the source effect between the self and the other.

Discussion

The results of the first study revealed that the measure for the source effect was successfully demonstrated to be a valid and reliable measure of the source effect for disgust. Contrary to the original hypothesis, the source effect did not seem to be related to self-esteem, nor did it seem to have any relationship with pathogen disgust. Lastly, the analysis indicates that self-disgust is not related to pathogen disgust and shares a strong, positive relationship with measures of self-esteem and self-compassion which supports this hypothesis.

This study produced a highly reliable measure of the source effect, which confirmed that there is a robust preference for disgust elicitors that emanate from the self over those that emanate from other. However, there was no link observed between self-esteem and self-compassion and the source effect comparisons indicating that how an individual feels about themselves has no influence on how they feel about disgust items from themselves, friends or foreign sources. Further, the source effect comparisons were not associated with pathogen, moral or sexual disgust domains. Pathogen disgust was associated with the individual disgust ratings in the source effect scale. This finding suggests that the source effect scale items are being clearly identified as disgust constructs but an individual's sensitivity to these disgust elicitors bears no bearing on how disgusted they feel based on the source itself. This finding suggests that there might be a different construct that influences the development of the source effect in people which provides an impetus for further research and continued development and investigation of the source effect. It is also plausible to suggest that the use of the vignettes from the source effect questionnaire might have a ceiling effect present on just how much disgust they are able to incite in the individual given the text based presentation.

While the findings in Study 1 did not support the expectation that individual difference in the source effect for disgust would be related to measures of self-concept (self-esteem, self-compassion), there were limitations inherent in using this questionnaire approach. Specifically, this study only addressed this from a hypothetical point of view for the individual and does not address how they might respond when confronted with actual disgust elicitors. As stipulated by Kahneman (2011), individuals tend to process concepts with a more deliberate and rational approach when given time to, which the participants would have when completing the questionnaire for this study. Contrary to this, Kahneman suggests that in more real-world scenarios, individuals tend to revert to a more basic,

instinctual response method which is much faster and driven by more intrinsic forces like emotion. As previously mentioned, the text based vignettes, as presented in the online delivery, lack the real-world presentation of actual disgust triggers and stimuli and may then have a ceiling effect on how much impact they have on the individual participant.

With that perspective in mind, a second study was designed to look at the source effect using actual disgust stimuli. Based on the assumption that we might be able to identify significant differences in the source effect in a real presentation of disgust stimuli, the second study sought to create a behavioural exploration of the source effect in real time. To address the impact of self-concept on the presentation and strength of the source effect, an induction of emotional affect would be used with appropriate counter controls. To test self-concept, an experimental manipulation of shame was used to induce negative self-concept. Similarly, a neutral condition was used for comparison and an induction of anger was also used to control for the presentation of negative affect towards the stimuli.

Study 2 – Behavioural Exploration of the Source Effect

This study measured the source effect was examined through a behavioural task where participants had to engage with disgust elicitors collected from the self and from a foreign “other”. The relationship between the source effect and self-concept was measured through use of a shame induction to identify any influence on the source effect.

Method

Participants

The study was conducted with 16 participants sourced from 1st year students from the Faculty of Human Sciences at Macquarie University. Recruitment was conducted using the SONA recruitment system that is available to the students as means of obtaining credit towards their academic qualifications. Demographic information was collected from

participants. The participant breakdown was 14 females (*Mean Age* = 18.93, *SD* = 1.49), and 2 males (*Mean Age* = 20.00, *SD* = 1.41). The overall *Mean Age* = 19.06, *SD* = 1.48.

Participants from Macquarie University were given course credit for their participation.

It is important to note that the obtained *N* for this type of research was inadequate. One likely reason for the slow recruitment in this study was that it was a requirement for ethical approval that any advertisements for the study warn potential participants that they will be asked to evaluate a range of disgust stimuli and answer questions about disgust and sexual acts. Specifically, potential participants might have been reluctant to sign up for this study when they were warned about the aversive tasks upfront. This will be addressed in the limitations of the study in more detail.

Materials and Procedure

This study was approved by the Human Research Ethics Committee at Macquarie University (HRED Approval Number: 5201600548). All respondents included in the sample gave informed consent. Participants completed an online questionnaire using the Qualtrics platform and then booked a time to attend a laboratory session. Having participants complete the questionnaire prior to attending the session was an attempt to reduce any potential priming effects that completing disgust and source effect items would have on the experimental task.

Online Questionnaire

After reading the information page and giving consent, participants completed measures of self-esteem, disgust sensitivity and the source effect. Items within each scale were also randomised. Lastly, relevant demographic information was collected.

For information regarding the scales used to measure self-esteem, disgust and the source effect, please refer to the Method section for study 1.

Laboratory Session

Participants were given an information consent form specific to the laboratory session to read and sign at the commencement of the session. Once they consented, they completed a sample collection phase, priming phase and a sample interaction phase.

Deception was used in the experiment by informing participants that the experiment was a pilot test and that the activities were to test the effectiveness of the samples and that they would be used in a later experiment. This was done to reduce focus on the collected samples when the participants completed the priming task.

Sample Collection Phase: Participants were presented with items that they had to interact with to form a sample set of disgust elicitors from the self. Participants were asked to drink from a bottle of water, chew a piece of gum, blow their nose with a tissue, hold a cotton pad under their armpit and comb their hair with a comb. (See Appendix L for a full description of collection protocols). The samples were all collected cleanly and safely and then put to the side, in full view of the participant to assure the participant that the samples were not switched throughout the study.

Priming Phase: To examine the effect of negative self-concept on the source effect, participants were asked to complete the following autobiographical task for a shame condition:

Please take a few minutes to think about a particular time when you experienced a deep sense of psychological pain because you could not live up to your own or someone else's expectations. You would have felt worthless and like hanging your head and withdrawing from the situation. (Some examples might include bad

performance in sport, giving a bad presentation, failing an exam, behaving inappropriately on a date, etc.). When you have recalled such an event, please take a minute to remember that event as vividly as you can. Then, please write about this event, and your feelings during the event, in as much detail as you can.

Participants then typed their response to the follow two questions: (a) Briefly recount your personal experience. Explain what happened and who or what was involved, and (b) Describe how the experience made you feel, and how it influenced your thoughts and behaviour.

This autobiographical priming task were based on those used by Griskevicius et al. (2010). In addition to shame, parallel wording was used to induce anger, as a negative comparison condition, and a neutral condition. The procedure for these conditions was identical to the priming for the shame condition except the autobiographical task would either stimulate a priming of anger or would generate no emotional response. (See Appendix L for the protocols for the priming activity). Participants were given 10 mins to complete this task.

Manipulation Check: Immediately after the writing task, participants completed an emotion check where they would rate their current levels of shame and anger, as well as sadness, happiness and fear to not draw attention to the focus variables. Participants rated all emotions on a scale from 1 (*not at all*) to 7 (*very much*).

Sample Interaction Phase: This phase was designed to behaviourally analyse the source effect in the presence of actual disgust elicitors. Participants had their sample placed in front of them, on the left-hand side of the desk. Another sample was brought to the desk and placed on the right-hand side and this was introduced to the participant as the sample from the previous participant. This sample was fabricated under clean conditions to appear used.

Stimulus creation: The “other” sample was fabricated in the following manner:

- Bottled water: Lid seal broken and an amount conducive to a sip was removed from the bottle.
- Gum: The gum was mashed using a mortar and pestle with a small amount of water to assist breakdown of the gum.
- Tissue: Odourless petroleum jelly was placed in the centre of a tissue to simulate nasal mucus. The tissue was then scrunched up to appear discarded.
- Cotton Pad: The cotton pad was scrunched up to simulate that it had been used.
- Comb: The combs used were individually wrapped in a sealed plastic sheath. The sample comb was removed from the wrapping.

All the “other” samples were stored in the exact same manner as the sample collection in terms of being placed in clip-seal bags.

Upon presentation of the two samples, participants were asked to perform a series of interaction tasks with the samples. There were instructed to only proceed as far as comfortable and in line with what they would normally be prepared to do (based on Rozin et al., 1999). The water bottle was used as a practice trial. Participants were asked if they were willing to sip from their bottle – if yes, do so – and then asked to do the same with the “other” bottle – if yes, do so. The experimental trials followed this procedure with the remaining 4 disgust elicitors, obtaining data for the self items and the other items (See Appendix L for a full breakdown of experimental trial protocols). Each of the trials was scored based on a stage model where a participant would be asked a question of an item and would be scored and progressed to the next stage depending on the response. Each trial offered four progression choices, each resulting in an increase in score. For example, with the Gum elicitor, the

participants were first asked “*Are you willing to touch it with the tip of your index finger? (You can use the hand wash afterwards)*” which would earn them 15 points if they answered “Yes”. The next stage would ask “*Are you willing to pick it up and hold it in the palm of your hand? (You can use the hand wash afterwards)*” which would increase their overall score for the item to 30 points. A total of 60 points can be achieved for each individual item. Any “No” responses immediately terminated question/interaction with the item and no further score could be obtained for that trial. A “No” response for the first stage would result in a zero score for that item. Low scores on an item indicate higher reluctance to engage with the item. Upon completion of the interaction trials, participants were asked to rate all the disgust elicitors (both self and other) on the same 7-point scale as the source effect questionnaire (*0 = not at all disgusting; 6 = extremely disgusting*).

Debrief and Re-Consent: As deception was used in the experiment, the participants were informed and debriefed regarding the deception and given the opportunity to re-consent or to opt out with no penalty or recourse.

Analytic Strategy

Statistical Package for Social Sciences (SPSS version 24) was used to conduct all statistical analysis of data. Exploratory data analysis was conducted to ensure that the data being used was majority complete and did not violate the honesty checks. Mathematical assumptions were analysed to identify the appropriate method for statistical analysis. Parametric statistical procedures of Pearson Correlations and One-way Analysis of Variance were used to analyse the relevant relationships and the significant differences between relevant variables respectively.

Results

Data Preparation

After all items were reverse scored and totalled, mathematical assumptions were tested for all included variables. Mathematical assumption testing indicated no violation of assumptions.

Manipulation Check

To identify if the priming manipulation was successful, a one-way analysis of variance (ANOVA) was conducted.

Results were analysed using three a priori between-subjects planned comparisons. Results of the Levene's test of homogeneity of variance were non-significant meaning contrasts can be interpreted with equal variances assumed. Planned contrasts indicated that participants primed with the shame induction ($M = 4.60$, $SD = 1.14$) demonstrated higher levels of shame compared to the participants primed with Anger ($M = 2.57$, $SD = 1.51$), $t(13) = -2.82$, $p = .015$. Planned contrasts indicated that participants primed with the shame induction ($M = 4.60$, $SD = 1.14$) demonstrated higher levels of shame compared to the participants primed with the Neutral task ($M = 1.25$, $SD = .50$), $t(13) = -4.06$, $p = <.001$. There was no significant difference found between Anger and the Neutral groups.

Results of the one-way ANOVA indicate that there was a significant difference found between the scores on the *Anger* dependent variable, $F(2,13) = 5.40$, $p = .02$. Results of the Levene's test of homogeneity of variance were non-significant meaning contrasts can be interpreted with equal variances assumed. Planned contrasts indicated that participants primed with the shame induction ($M = 1.80$, $SD = .84$) demonstrated lower levels of anger compared to the participants primed with Anger ($M = 3.57$, $SD = 1.27$), $t(13) = 2.79$, $p = .015$. Planned contrasts indicated that participants primed with the anger induction ($M = 3.57$, $SD = 1.27$) demonstrated higher levels of anger compared to the participants primed with the

Neutral task ($M = 1.75$, $SD = .96$), $t(13) = -2.68$, $p = .019$. There were no significant differences between the shame induction and the neutral condition with scores on Anger. As such, the autobiographical indication of shame and anger was successful.

Correlation Analysis

Pearson correlations were conducted on the variables used in the study. As demonstrated in Table 2, there were no significant correlations between the behavioural source effect and the source effect from the online questionnaire. Further, there was no relationship between the behavioural source effect and any of the three domains of disgust; pathogen, sexual and moral disgust.

Table 2.

Correlation analysis for Study 2.

	Behavioural Source Effect	Self vs Other	Pathogen Disgust	Sexual Disgust	Moral Disgust
Behavioural Source Effect	-	-.181	-.214	-.298	.037
Self vs Other		.503	.425	.263	.892
Pathogen Disgust			-.269	.180	.251
Sexual Disgust			.314	.505	.348
Moral Disgust				.400	.501*
				.124	.048
				-	.220
					.413
					-

*. Correlation is significant at the 0.05 level (2-tailed).

Behavioural Source Effect

Composite variables were created to measure the source effect from the behavioural experiment. The differences in scores for the “other” items were subtracted from the “self” items to give a source effect for each of the four disgust elicitors. Each of the comparison

scores were totalled to create an item source effect total that would collectively measure the behavioural source effect. A reliability analysis was conducted on the composite variables that make up the measure for the behavioural source effect. The measure of the behavioural source effect demonstrated good reliability ($\alpha = .77$) with no increase to Cronbach's alpha occurring if any of the composite variables were excluded from analysis.

To identify if the strength of the source effect was different between the priming conditions, a preliminary investigation using a one-way ANOVA was conducted. Results of the one-way analysis of variance indicate that there was a significant difference between the induction conditions of shame, anger and neutral as measured by scores on the behavioural source effect, $F(2,13) = 4.49$, $p = .03$, partial $\eta^2 = .33$ (moderate). The observed power was .51, which indicates that a Type I error may be possible, therefore any further comparisons should be made with Bonferroni adjustments to minimize impact of Type I error.

Table 3.

Descriptive statistics for behavioural source effect ANOVA

	N	Mean	Std. Deviation
Shame	5	132.00	87.07
Anger	7	324.43	155.85
Neutral	4	363.75	114.48
Total	16	272.81	155.81

Results of were analysed using six a priori between-subjects planned comparisons. The assumption of homogeneity of variance was met with a non-significant Levene's test, $p = >.05$, which meant tests were based on equal variances. Due to the potential presence of Type I error within the analysis, all comparisons have been made with a Bonferroni correction to the significance value. A significant effect was found for the comparison which contrasted the shame induction group with the combined anger induction group and neutral

induction group, $t(13) = 2.996, p < .01, r^2 = .67$ (strong). A significant effect was found for the comparison which contrasted the shame induction group with only the anger induction group, $t(13) = 2.513, p = .02, r^2 = .57$ (strong). A significant effect was found for the comparison which contrasted the shame induction group with only the neutral induction group, $t(13) = 2.68, p = .02, r^2 = .58$ (strong). No other contrasts demonstrated significant effects.

Additional analysis using a between-subjects independent samples t-test revealed that the participants in the shame induction group ($M = 204.00, SD = 85.59$) were less likely to interact with their own disgust elicitors compared to the anger induction group ($M = 420.00, SD = 56.02$), $t(10) = -2.21, p = .05, r^2 = .57$ (strong). There were no significant differences between the shame induction group and the neutral induction group in terms of scores towards their own disgust elicitors, however, this comparison is approaching significance with $p = .08$. The three induction groups scored significantly higher on items from the self compared to items from the other (See Appendix M & N).

Finally, limited statistical power because of the modest sample size in the present study ($N = 16$) may have played a role in limiting the significance of some of the statistical comparisons conducted. A post hoc power analysis revealed that on the basis of the mean, between-groups comparison effect size observed in the present study (partial $\eta^2 = .33$), an n of approximately 80 would be needed to obtain statistical power at the recommended .80 level (Field, 2009).

Discussion

The results of the second study indicate that the induction of shame had an impact on the source effect for disgust in the participants. The lower scores in the shame induction group indicate that the participants were collectively less likely to engage with the disgust elicitors compared to the anger and neutral inductions. This indicates that the source effect

was being impacted by self-concept. To further validate this, the subsequent comparisons between how individuals rated their own disgust elicitors revealed that the participants in the shame induction group were less likely to engage with their own products compared to those in the anger induction group. It is plausible that the lack of significant difference between the shame induction group and the neutral are due to the low N in the neutral group, especially when you consider that the neutral group demonstrated a higher mean than the anger induction group which did yield statistically significant differences. The source effect was demonstrated to be consistent in this study in that participants in all conditions found their own elicitors more favourable than the elicitors from the other source. The correlation analysis demonstrated similar findings from the first study in that the source effect variables do not seem to have any relationship to an individual's sensitivity towards disgust elicitors.

These findings should be interpreted with caution as the N for the experiment was low reducing the generalizability of these findings. Replication of this study should be conducted with a larger sample size to validate the existing findings further and use the variables as covariates in the primary analysis from the first study. It is also noteworthy to indicate that gender was not factored into this study as a potential variable as there was a need to address the source effect from both perspectives. This is problematic when there is such a significant imbalance of gender representation in the sample used. Future replications should include gender as there is potential for there being a confound based on the stronger impact of disgust on females and stronger impact of anger on males.

General Discussion

The two studies conducted in this study demonstrated that the source effect for disgust can be measured in both a self-report context as well as in an applied, behavioural manipulation. This research was the first attempt to produce a reliable individual differences measure of the source effect for disgust. It was expected that for those who demonstrate an attenuated source effect for disgust – disgust toward elicitors emanating from the self is similar to elicitors emanating from the other- self-regard would also be lower. Using several measures of self-regard and self-concept, there was no evidence that the source effect related to self-regard in Study 1.

The second study attempted to measure the source effect behaviourally. Specifically, the study attempted to identify if reduction of self-concept through an induction of shame would have any impact on the source effect. Priming participants with an induction of shame seemed to have an impact of the source effect for disgust with participants behaving with less engagement with their own elicitors compared to those in the anger condition. The overall findings of the source effect in the behavioural study reveal consistency for the source effect in that participants were much more likely to interact with their own disgust elicitors compared to a foreign source but it seems plausible that self-regard and self-concept may play a role in how an individual reacts when faced with disgust elicitors in a real-life scenario as oppose to hypothetical contemplation.

Even though the source effect was not shown to be related to self-regards (Study 1) and demonstrated in Study 2 with limited generalizability and power, there are still many problems with the Self-disgust scale and its apparent relation to disgust. The evidence build in this research supports the notion that there may not be an equivalent of disgust towards the self, but any such reported feelings are in fact a more intense shame response. These findings

should be interpreted with caution given the present study was conducted with a non-clinical sample and was done with a very low sample size. It is noted that patients with clinical depression and eating disorders are known to experience self-disgust; future research should seek to gain a qualitative understanding of how a clinical sample conceptualises “self-disgust” and identify if this is more in line with the present theory that it is more extreme shame than actual disgust. Additionally, the findings from Study 1 clearly demonstrate the lack of relationship between the Self-disgust scale and any of the disgust domains measured by the TDDS. As such the self-disgust scale implies a misleading reference to disgust and the similarities to the experience of core disgust.

The source effect for disgust does not seem to be correlated with disgust which seems unusual. However, the results of Study 1 demonstrate that the individual disgust ratings for self, friend, and other were each significantly correlated with pathogen disgust on the TDDS. The generation of the difference scores for the source effect, in effect, controls for the level of disgust so that variation in the source effect is independent of the person’s level of disgust sensitivity. On the one hand the source effect for disgust is useful because it is not confounded by disgust sensitivity. It is currently unclear what variables the source effect is related to.

The behavioural approach to studying the source effect has potential benefit and usefulness in expanding the existing knowledge base on the source effect. Manipulating state self-regard by using shame is a promising way of further exploring the potential effects of shame on the source effect. Moreover, the investigation of an interaction between the emotion prime and an individual difference measures has the potential to cast light on the nature of the relationship between self-regard and the source effect. For example, it might be that the relationship might only be obtained for those who are particularly disgust sensitive, but not for those who tend not to be disgust sensitive. Given that there is uncertainty regarding

what the source effect relates to, as well as what can influence the strength of the source effect, behavioural methods such as this can be easily replicated to look at other potential variables that might have a contributory role in the source effect for disgust.

Speculation on what might be influencing the source effect would not be relevant without further exploration of the source effect with larger samples and the inclusion of other variables. However, there are claims that disgust reflects learning history and that it is part of the development process (Curtis, de Barra & Aunger, 2012; Herz, 2012). It is plausible that the source effect might be similar in being a learned response that is developed through the formative stages of the life span.

Future Research

The present research has generated several new research directions that can explore the source effect in more detail. The behavioural experiment used in this research presents some critical areas for future development with the source effect for disgust. Further behavioural exploration of self-regard and the source effect could further validate some of the findings from this study and give additional insight into some of factors that can impact the source effect. Further, more exploration of the individual differences of disgust sensitivity and self-regard in relation to the source effect develop a better understanding of why individuals can present polarizing source effect responses to disgust elicitors depending on the source. Additional research may help be distinguish the characteristics of the source effect to help understand what the different responses to different sources i.e. why are some disgust elicitors from a friend not as bad compared to a stranger and then alternatively why are some disgust elicitors deemed more disgust regardless of the source.

An additional factor with the source effect is that it relies on cognition. An individual must have access to cognitive information to be able to determine the source of the disgust

elicitor. A similar cognition example was demonstrated by Herz and Von Clef (2001), where individuals were exposed to an odour task and based on the presentation of different information, the response to the same stimuli changed. For example, a participant is told an odour is parmesan cheese is the presented at a later stage with the same odour but this time told it is vomit. Based on the cognitive processing, the response to the same stimuli changed. With the source effect experiment, the sensory presentations of the stimuli do not give any qualities to facilitate discrimination, i.e. a stranger's piece of chewed gum looks no different than a piece of gum the participant had chewed. Based on this cognitive perspective, there is a platform for researching characteristics of the source effect to understand how identical stimuli are processed as inherently different, through analysis of top-down processing as a function of the source effect.

Conclusion

The present thesis aimed to contribute to the existing body of knowledge on the source effect, self-disgust and individual differences in disgust. One of the primary directives of this research was to develop a valid and reliable measure of the source effect for disgust in both a self-report context as well as through a behavioural manipulation experiment. The key findings from this study indicate, when asked to self-report, there does not appear to be a relationship between and individual's perception of themselves or their regard for themselves and their response to disgust elicitors emanating from the self, a close friend or an unknown stranger. However, when confronted with actual disgust elicitors in the real world, there is some evidence that suggests that self-regard might play a role in the level of engagement with items emanating from the self. Contrary to predictions that were informed by previous disgust literature, the source effect for disgust did not share a relationship with measures of disgust and disgust sensitivity which indicates that the measure developed for the source effect is not subject to confounding influence from individual differences in disgust sensitivity. It was

established in this thesis that the findings will require additional research consideration to generate more support for the critical findings as well as continuation of research into the source effect for disgust to further understand how the construct functions, the genesis and development of the source effect and if there are other emotions that might play a role in the strength of the effect.

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Appendix A.

**MACQUARIE**
University**INFORMATION PAGE [PSY105 students]**

Project Name: *A study of disgust*

What is the study about?

You are invited to participate in a questionnaire study of disgust. The purpose of this study is to develop a scale measuring disgust to various scenarios and to see how it is related to personality.

Who is conducting the study?

This study is being conducted by Mick Weston (Michael.Weston@students.mq.edu.au) as part of his Master of Research project, under the supervision of Dr Trevor Case, from the Department of Psychology at Macquarie University (trevor.case@mq.edu.au 02 9850 7736).

What does the study involve?

If you decide to participate, you will be asked to complete an anonymous online questionnaire, which should take less than 20 minutes to complete. You will receive one point of course credit for participating. As a participant, *you are obligated to answer all questions accurately and honestly*. Answering fictitiously or haphazardly jeopardises the quality of the research.

It is not anticipated that completing the questions will cause you any distress. However, there are questions describing disgusting experiences. There are also some questions concerning negative feelings you might have about yourself. If by answering any of the questions you feel concern or discomfort, you are free to withdraw from the study. Please contact Dr Case if you have concerns about the study. If you would like to discuss any personal issues, you are encouraged to contact the University Counselling Service (Macquarie students phone: 02 9850 7497) or to contact the Mental Health Information Service for information about your nearest free service (phone: 02 9816 5688).

Who will have access to my details?

As this is an anonymous questionnaire, no individual can be identified in any publication of the results. Apart from the researchers named above, the non-identifiable data may be made available to other researchers who request it. A summary of the results of this study will be available in November 2016 on the psychology notice board (C3A Level 5).

Can I withdraw from the study?

Participation in this study is entirely voluntary: you are not obliged to participate and if you decide to participate, you are free to withdraw at any time without having to give a reason and without consequence.

Please print a copy of this information form for your reference.

I have read and understood the information above. Please indicate if you agree or decline to participate in the study by following the appropriate link below.

I Agree

I Decline

The ethical aspects of this study have been approved by the Macquarie University Human Research Ethics Committee. If you have any complaints or reservations about any ethical aspect of your participation in this research, you may contact the Committee through the Director, Research Ethics and Integrity (telephone (02) 9850 7854; email ethics@mq.edu.au). Any complaint you make will be treated in confidence and investigated, and you will be informed of the outcome.

Appendix B.

**MACQUARIE**
University**INFORMATION PAGE [non PSY105 students]**

Project Name: *A study of disgust*

What is the study about?

You are invited to participate in a questionnaire study of disgust. The purpose of this study is to develop a scale measuring disgust to various scenarios and investigate how it is related to personality.

Who is conducting the study?

This study is being conducted by Mick Weston (Michael.Weston@students.mq.edu.au) as part of his Master of Research project, under the supervision of Dr Trevor Case, from the Department of Psychology at Macquarie University (trevor.case@mq.edu.au 02 9850 7736).

What does the study involve?

If you decide to participate, you will be asked to complete an anonymous online questionnaire, which should take less than 20 minutes to complete. Please only participate if you are prepared to *answer all questions accurately and honestly*. Answering fictitiously or haphazardly jeopardises the quality of the research.

It is not anticipated that completing the questions will cause you any distress. However, there are questions describing disgusting experiences. There are also questions concerning negative feelings you might have about yourself. If by answering any of the questions you feel concern or discomfort, you are free to withdraw from the study. Please contact Dr Case if you have concerns about the study. If you would like to discuss any personal issues, you are encouraged to contact the Mental Health Information Service (Australia only) for information about your nearest free service (phone: 02 9816 5688) or contact a local health service in your country.

Who will have access to my details?

As this is an anonymous questionnaire, no individual can be identified in any publication of the results. Apart from the researchers named above, the non-identifiable data may be made data may be made available to other researchers who request it. Please send an email to Michael.Weston@students.mq.edu.au if you would like a summary of the results, which will be available in November 2016.

Can I withdraw from the study?

Participation in this study is entirely voluntary: you are not obliged to participate and if you decide to participate, you are free to withdraw at any time without having to give a reason and without consequence.

Please print a copy of this information form for your reference.

I have read and understood the information above. Please indicate if you agree or decline to participate in the study by following the appropriate link below.

I Agree

I Decline

The ethical aspects of this study have been approved by the Macquarie University Human Research Ethics Committee. If you have any complaints or reservations about any ethical aspect of your participation in this research, you may contact the Committee through the Director, Research Ethics and Integrity (telephone (02) 9850 7854; email ethics@mq.edu.au). Any complaint you make will be treated in confidence and investigated, and you will be informed of the outcome.

Appendix C.

List of online forums

1. Online Social Psychology Studies
<http://www.socialpsychology.org/expts.htm>
2. Psychological Research on the Net
<http://psych.hanover.edu/Research/exponnet.html>
3. The Inquisitive Mind
<http://www.in-mind.org/content/online-research>
4. Online Psychology Research
<http://www.onlinepsychresearch.co.uk/researchers/>
5. Reddit – Research
<http://www.reddit.com/r/research/>
6. Psychology Participants & Researchers
https://www.facebook.com/PsychologyParticipantsResearchers/info?tab=page_info
7. Macquarie University Human Sciences Facebook page for research participation
<https://www.facebook.com/humansciences.mq/>

Appendix D.

Request to advertise study for online Forums

Dear Admin,

My name is Mick Weston (Michael.Weston@students.mq.edu.au), a post-graduate psychology student at Macquarie University, Sydney, Australia under the supervision of Dr. Trevor Case (trevor.case@mq.edu.au).

I would like permission to post my study on your forum. The purpose of this study is to develop a scale measuring disgust to various scenarios and investigating how it is related to personality. This study will remain open until the 31st of August, 2016.

If you have any questions, please do not hesitate to contact me.

The ethical aspects of this study have been approved by the Macquarie University Human Research Ethics Committee. If you have any complaints or reservations about any ethical aspect of your participation in this research, you may contact the Committee through the Director, Research Ethics and Integrity (telephone (02) 9850 7854; email ethics@mq.edu.au). Any complaint you make will be treated in confidence and investigated, and you will be informed of the outcome.

Kind Regards,

Mick Weston

Advertisement [Formal] to Participate in Research

Study title: *A study of disgust.*

Researchers at Macquarie University are developing a scale measuring disgust to various scenarios and investigating how it is related to personality. If you decide to participate, you will be asked to complete an anonymous online questionnaire which should take less than 20 minutes to complete. If you are aged 18(+) you are eligible to participate. You can participate here: [insert link]

Advertisement [Informal] to Participate in Research

Hi everyone, I'm currently undertaking a Master of Research in Psychology. I am developing a scale measuring disgust to various scenarios and investigating how it is related to personality. Participation involves completing an anonymous online questionnaire which should take less than 20 minutes to complete. The study is called: *A study of disgust.* It would be wonderful if you could complete my survey. You must be over the age of 18 to participate.

If you know anyone else who would be interested and able to help me, please forward them the link.

[insert link]

If you have any questions my email is on the survey, or you can post here and I'll try my best to answer. Thanks!

Appendix E

The Rosenberg 10 item Self-Esteem Scale (SES)

Rated on a 4-point scale (1= strongly agree; 4 = strongly disagree).

I feel that I am a person of worth, at least on an equal plane with others.

I feel that I have a number of good qualities.

All in all, I am inclined to feel that I am a failure.

I am able to do things as well as most other people.

I feel I do not have much to be proud of.

I take a positive attitude toward myself.

On the whole, I am satisfied with myself.

I wish I could have more respect for myself.

I certainly feel useless at times.

At times, I think I am no good at all.

Appendix F.

The Self Compassion Scale – Short Form (SCS-SF)

HOW I TYPICALLY ACT TOWARDS MYSELF IN DIFFICULT TIMES

Please read each statement carefully before answering. To the left of each item, indicate how often you behave in the stated manner, using the following scale:

Almost never 1 2 3 4 5 Almost always

1. When I fail at something important to me I become consumed by feelings of inadequacy.
2. I try to be understanding and patient towards those aspects of my personality I don't like.
3. When something painful happens I try to take a balanced view of the situation.
4. When I'm feeling down, I tend to feel like most other people are probably happier than I am.
5. I try to see my failings as part of the human condition.
6. When I'm going through a very hard time, I give myself the caring and tenderness I need.
7. When something upsets me I try to keep my emotions in balance.
8. When I fail at something that's important to me, I tend to feel alone in my failure
9. When I'm feeling down I tend to obsess and fixate on everything that's wrong.
10. When I feel inadequate in some way, I try to remind myself that feelings of inadequacy are shared by most people.
11. I'm disapproving and judgmental about my own flaws and inadequacies.
12. I'm intolerant and impatient towards those aspects of my personality I don't like.

Appendix G.

The Self-Disgust Scale

Rated on a 7-point scale (1= strongly agree; 7 = strongly disagree).

1. I find myself repulsive
2. I am proud of who I am
3. The way I behave makes me despise myself
4. I hate being me
5. I enjoy the company of others
6. I like the way I look
7. Overall, people dislike me
8. I enjoy being outdoors
9. I feel good about the way I behave
10. I do not want to be seen
11. I am a sociable person
12. I often do things I find revolting
13. Sometimes I feel happy
14. I am an optimistic person
15. It bothers me to look at myself
16. Sometimes I feel sad
17. I detest aspects of my personality
18. My behaviour repels people

Appendix H.

The Three Domains of Disgust Scale

The following items describe a variety of concepts. Please rate how disgusting you find the concepts described in the items, where 0 means that you do not find the concept disgusting at all and 6 means that you find the concept extremely disgusting.

1. Shoplifting a candy bar from a convenience store
2. Hearing two strangers having sex
3. Stepping on dog poop
4. Stealing from a neighbour
5. Performing oral sex
6. Sitting next to someone who has red sores on their arm
7. A student cheating to get good grades
8. Watching a pornographic video
9. Shaking hands with a stranger who has sweaty palms
10. Deceiving a friend
11. Finding out that someone you don't like has sexual fantasies about you
12. Seeing some mould on old leftovers in your refrigerator
13. Forging someone's signature on a legal document
14. Bringing someone you just met back to your room to have sex
15. Standing close to a person who has body odour

16. Cutting to the front of a line to purchase the last few tickets to a show
17. A stranger of the opposite sex intentionally rubbing your thigh in an elevator
18. Seeing a cockroach run across the floor
19. Intentionally lying during a business transaction
20. Having anal sex with someone of the opposite sex
21. Accidentally touching a person's bloody cut

Appendix I.

The Source Effect Questionnaire

For this questionnaire, you will be making some ratings of your reaction to various situations involving yourself, a friend (not a romantic partner or someone you have shared a flat with), and someone you don't know. Please think of a same sex friend who is about the same age as you and type in their initials here _____. This is to ensure you think about the same friend throughout the questionnaire.

Not at all disgusting 0...1...2...3...4...5...6 Extremely disgusting

	Self	Other (friend)	Other (stranger)
1	You are cutting your finger nails and one hits you in the lip.	Your friend is cutting their finger nails and one hits you in the lip.	A passenger on a train is cutting their finger nails and one flies up and hits you in the lip.
2	You pick up napkin to wipe your mouth, and realise it contains food scraps from when you used it earlier.	You pick up a napkin to wipe your mouth, and realise it contains food scraps from when your friend used it earlier.	You pick up a napkin to wipe your mouth, and realise it contains food scraps from when someone else used it earlier.
3	You notice one of your hairs in the soup you have been eating.	You notice one of your friend's hairs in the soup you have been eating.	You notice one of the waiter's hairs in the soup you have been eating.
4	While using your toilet at home, you realise you have stepped in a little bit of urine.	While using your friend's toilet, you realise you have stepped in a little bit of urine.	While using a public toilet, you realise you have stepped in a little bit of urine.
5	You put the end of your pencil in your mouth and you notice it is damp from your saliva.	You put the end of your friend's pencil in your mouth and you notice it is damp from their saliva.	You put the end of a pencil in your mouth at the post office and you notice it is damp from someone else's saliva.
6.	You slip off your shoes in the cinema and you notice you have strong foot odour	Your friend slips off their shoes in the cinema and you notice they have strong foot odour.	A person sitting near you in the cinema slips off their shoes and you notice they have strong foot odour.
7.	While using a public toilet, you leave a faecal smell.	While using a public toilet, you notice that your friend, who had used the toilet prior, has left a strong faecal smell.	While using a public toilet, you notice the person who had used the toilet prior has left a strong faecal smell.

8.	It is a hot day and you notice you have strong armpit odour.	It is a hot day and you notice your friend has strong armpit odour.	It is a hot day and you notice another person's strong armpit odour.
9.	You see your own unflushed bowel movement in a public toilet.	You see your friends' unflushed bowel movement in a public toilet.	You see a stranger's unflushed bowel movement in a public toilet.
10.	You accidentally leave a bag of your gym clothes in the car overnight and smell them the next morning.	After mistakenly switching bags with a friend, you accidentally leave the bag of your friend's gym clothes in the car overnight and smell them the next morning.	After mistakenly switching bags with a fellow gym patron, you accidentally leave the bag of their gym clothes in the car overnight and smell them the next morning.
11.	You accidentally use a snotty tissue, that you used earlier, to blow your nose.	You accidentally use a snotty tissue, that your friend used earlier, to blow your nose.	You accidentally use a snotty tissue, that someone else used earlier, to blow your nose.
12.	While at a train station, you squeeze a pimple on your face and some yellow pus squirts onto your arm.	While at a train station, your friend squeezes a pimple on their face and some yellow pus squirts onto your arm.	While at a train station, a person sitting near you squeezes a pimple on their face and some yellow pus squirts onto your arm.
13.	While sitting in a café, you accidentally fart. It makes a strong smell.	While sitting with your friend in a cafe, you notice a strong fart smell coming from your friend.	While sitting in a café, you notice a strong fart smell coming from the person sitting at the next table.
14.	While taking out your garbage, the bag splits and you get garbage on your clothes	While taking out your friend's garbage, the bag splits and you get garbage on your clothes	While taking out the garbage from the lunch room at work, the bag splits and you get garbage on your clothes
15.	While talking, you accidentally spit on your clothes.	While talking, a friend accidentally spits on your clothes	While talking, a stranger accidentally spits on your clothes.
16.	After pouring yourself a drink, you notice that you have left dirty finger marks on the glass you are drinking from.	After pouring you a drink, you notice that your friend has left dirty finger marks on the glass you are drinking from.	After pouring you a drink, you notice that a waiter has left dirty finger marks on the glass you are drinking from.
17.	You have accidentally cut your finger and some blood has sprayed onto your shirt.	Your friend has accidentally cut their finger and some blood has sprayed onto your shirt.	A stranger has accidentally cut their finger and some blood has sprayed onto your shirt.
18.	At home, you notice some hairs on the pillow you were sleeping on.	While staying at a friend's house, you notice some of your friend's hairs on the pillow you were sleeping on.	While staying in a hotel, you notice a previous guest's hairs on the pillow you were sleeping on.
19.	You are in a medical centre and while making	You are in a medical centre and while helping	You are in a medical centre and while making their way to

	your way to the Doctor's office, you accidentally spill your urine sample on your leg.	your friend to the Doctor's office, they accidentally spill their urine sample on your leg.	the Doctor's office, another patient accidentally spills their urine sample on your leg.
20.	You find a shirt you haven't worn for a while and realise it has a bit of your vomit on it	You borrow a shirt from a friend and realise it has a bit of your friend's vomit on it	You are trying on a shirt in a store and realise it has a bit of vomit on it.
21.	You have a bad cold and you sneeze and get snot on the arm of your jacket.	Your friend has a bad cold and they sneeze and get snot on the arm of your jacket.	A train passenger has a bad cold and they sneeze and get snot on the arm of your jacket.
22.	You comb your hair and some dandruff lands on your shirt.	Your friend combs their hair and some dandruff lands on your shirt.	A person sitting next to you on a bus combs their hair and some dandruff lands on your shirt.

Appendix J.

Table 1.

Study 1. Tests of Normality

	Kolmogorov-Smirnov ^a			Shapiro-Wilk		
	Statistic	df	Sig.	Statistic	df	Sig.
Self-Esteem	.067	189	.041	.987	189	.071
Self-Compassion	.061	189	.084	.985	189	.036
Self-Disgust	.080	189	.005	.975	189	.002
Source Self Total	.088	189	.001	.980	189	.010
Source Friend Total	.059	189	.200*	.989	189	.134
Source Other Total	.082	189	.003	.957	189	.000
Pathogen Disgust	.087	189	.001	.984	189	.035
Sexual Disgust	.053	189	.200*	.980	189	.009
Moral Disgust	.085	189	.002	.952	189	.000
Self vs Friend	.062	189	.072	.978	189	.005
Self vs Other	.069	189	.028	.985	189	.046

*, This is a lower bound of the true significance.

a. Lilliefors Significance Correction

Appendix K.

Table 2.

Study 1. Descriptive Statistics

	N	Mean	SD	Skewness		Kurtosis	
				Statistic	SE	Statistic	SE
Self-Esteem	189	27.62	5.75	-.23	.18	.32	.35
Self-Compassion	189	34.03	7.76	.31	.18	.55	.35
Self-Disgust	189	64.71	12.51	-.49	.18	-.10	.35
Source Self Total	189	51.40	22.09	.37	.18	-.26	.35
Source Friend Total	189	79.36	22.68	-.28	.18	-.26	.35
Source Other Total	189	96.78	21.10	-.72	.18	.25	.35
Pathogen Disgust	189	32.89	7.46	-.28	.18	-.05	.35
Sexual Disgust	189	28.16	10.68	.12	.18	-.61	.35
Moral Disgust	189	34.43	10.35	-.60	.18	-.10	.35
Self vs Friend	189.00	-22.74	15.17	-.61	.18	.94	.35
Self vs Other	189.00	-39.25	17.70	-.39	.18	.42	.35

Note: SD = Standard Deviation; SE = Standard Error

Appendix L

Experiment Procedure and Protocols

Pre-experimental session questionnaires. Before turning up to the lab for the experimental session participants will complete the source effect scale (66-items), the self-esteem (10-items) and the Three Domains of Disgust scale (21 items) online (e.g., at home). This this should take less than 8 mins.

Lab session. On arrival at the lab, participants complete the PICF. The E then explains “You will be completing several tasks that will involve pilot testing stimuli for some other studies, so if things seem a bit disconnected and strange—that’s why.”

1. Collection of disgust elicitors from participant. The experimenter brings out a plastic tray, labelled with “A” and containing:

- 1x packet of Extra gum
- 1x small white disposable plastic plate
- 1x plastic comb in new plastic wrapping
- 1x packet of make-up cotton pads (small disks)
- 1x bottle of water (marked A)
- 1x disposable plastic cup (marked A)
- 1x box of tissues
- 3x sealable sandwich bags (each marked A)

The experimenter explains that he will need to collect a few samples from the participant for later in the study and give a brief overview of what the participant will need to do.

a) “Here is a piece of **gum**, I’ll ask you to chew it for about 30 seconds

b) “Here is a **cotton pad**. Please hold it under your armpit”

c) “Here is a **tissue**. Please lightly blow your nose and put it into the sealable bag.”

d) “Here is a brand-new **comb**. Please comb it through your hair 4 times. Then put it in the sealable bag

e) “Here is a new **bottle of water**. Please remove the lid and take a sip. Then put the lid back on and put the bottle on the tray.”

Finally, have them put the cotton pad in a sealable bag, and their gum on the plate and put this in a sealable bag. All stimuli will now be on tray A. The experimenter explains that these objects will be used again later in the study and that they **will be kept and used when testing the next participant**.

The participant will then turn their chair to face a laptop and complete the memory task.

2. Autobiographical induction task.

[Based on Griskevicius, V., Shiota, M. N., & Neufeld, S. L. (2010). Influence of different positive emotions on persuasion processing: A functional evolutionary approach. *Emotion*, 10, 190–206. <http://dx.doi.org/10.1037/a0018421>]

The E will explain that this task is different to what they have been doing, and provide the rationale that we are pilot testing the effectiveness of the wording of an autobiographical memory task that requires them to recall an event and write about it.

Neutral: Please take a few minutes to think about something you do each day. This might have been making dinner, having a coffee, or any other mundane thing that happened during your day.

When you have recalled such an event, please take a minute to remember that event as vividly as you can. Then, please write about this event, and your feelings during the event, in as much detail as you can.

Anger: Please take a few minutes to think about a particular time when you experienced a strong urge to get back at someone because you were wronged or deliberately treated unfairly. You would have felt like you were on the verge of exploding or lashing out. (Some examples might include being unfairly overlooked for a job; seeing your partner flirting with someone at a party, being falsely accused; somebody taking credit for your hard work etc.)

When you have recalled such an event, please take a minute to remember that event as vividly as you can. Then, please write about this event, and your feelings during the event, in as much detail as you can.

Shame: Please take a few minutes to think about a particular time when you experienced a deep sense of psychological pain because you could not live up to your own or someone else's expectations. You would have felt worthless and like hanging your head and withdrawing from the situation. (Some examples might include bad performance in sport, giving a bad presentation, failing an exam, behaving inappropriately on a date, etc.)

When you have recalled such an event, please take a minute to remember that event as vividly as you can. Then, please write about this event, and your feelings during the event, in as much detail as you can.

[Participants will then respond to the following two questions about the event on the laptop for 10 mins]

- a) Briefly recount your personal experience. Explain what happened and who or what was involved.
- b) Describe how the experience made you feel, and how it influenced your thoughts and behaviour.

Manipulation Check

After they have finished writing, the next screen will present the emotion induction manipulation check in random order:

Please indicate the extent to which you are currently feeling each the following emotions. All items are rated on a scale from 1 (*not at all*) to 7 (*very much*).

1. Shame
2. Anger
3. Sadness
4. Fear

5. Happiness

3. Source effect task. The experimenter asks the participant to turn back to the desk with the plastic tray labelled A, and explains “Now I will be presenting you with samples that I collected earlier.” A second tray labelled B is placed on another desk. “These are the samples I collected from the participant before you.”

“I’m going to give you a number of simple tasks, and I just want to find out whether you are willing to do them. Please don’t try to imagine what the average person would do; we want to know what you are willing to do and how you feel. The point of this is not to go as far as you can with these things. What we really want to know is the point at which you don’t want to continue. We don’t want you to do anything you really don’t want to do.” (Rozin et al., 1999).

Paper towels, a hand wash dispenser, and a glass of mouthwash are placed on the desk and the participant is told that were there for their convenience. The experimenter then administers the behavioural tasks. Wearing disposable gloves might enhance the perceived contamination risk involved in the tasks, so I think this should be avoided. Since the participants will be handling the stimuli, it shouldn’t be necessary.

Randomisation: There are 5 tasks (gum, tissue, axilla, comb, & water bottle). The order of these tasks is to be randomised. For each task, there are two stimuli: one for the stimuli collected from the participant and one for stimuli ostensible collected from another participant. Within each task, the order of these stimuli (self vs. other) also need to be randomised.

PRACTICE TRIAL: Just so you get the idea of what to do, this first task is for practice.

WATERBOTTLE-self: The E places the water bottle from tray A in front of the participant. “Here is the water bottle you sipped from earlier.”

“Are you willing to take a sip from the bottle?”

WATERBOTTLE-other: The E places the water bottle from tray B in front of the participant. “Here is the water bottle sipped by the previous participant.” [the bottle is actually untouched]

“Are you willing to take a sip from the bottle? (You can use the mouthwash to rinse afterwards)”

The E records points (as detailed below) for each participant-determined degree of exposure to disgust elicitors. This could be done using a grid that the E ticks. After a refusal, the E moves on to the next task.

EXPERIMENTAL TRIALS

GUM-self: The E removes the plate with the gum from the plastic bag from tray A and places it in front of the participant. “Here is the gum you chewed earlier.”

“Are you willing to touch it with the tip of your index finger” (15 points if yes)

“Are you willing to pick it up and hold it in the palm of your hand?” (30 points if yes)

“Are you willing to touch it to your lips?” (45 points if yes)

“Are you willing to put it in your mouth and chew it?” (60 points if yes)

GUM-other: The E removes the plate with the gum from the plastic bag from tray B and places it in front of the participant. “Here is the gum chewed by the previous participant.” [Actually, this is carefully prepared by the E to look like it has been chewed—the gum will be kneaded with a fork in a dish of water to obtain this effect.]

“Are you willing to touch it with the tip of your index finger? (You can use the hand wash afterwards)” (15 points if yes)

“Are you willing to pick it up and hold it in the palm of your hand? (You can use the hand wash afterwards)” (30 points if yes)

“Are you willing to touch it to your lips? (You can use the mouthwash to rinse afterwards)” (45 points if yes)

“Are you willing to put it in your mouth and chew it? (You can use the mouthwash to rinse afterwards)” (60 points if yes)

TISSUE-self: The E removes the tissue from the plastic bag from tray A and places it in front of the participant. “Here is the tissue you used earlier.”

“Are you willing to touch it with the tip of your index finger? (You can use the hand wash afterwards)” (15 points if yes)

“Are you willing to pick it up and hold it in the palm of your hand? (You can use the hand wash afterwards)” (30 points if yes)

“Are you willing to touch a clean edge of the tissue to your lips?” (45 points if yes)

“Are you willing to blow your nose using the tissue? (You can use the hand wash to clear your face afterwards)” (60 points if yes)

TISSUE-other: The E removes the tissue from the plastic bag from tray B and places it in front of the participant. “Here is the tissue used by the previous participant.” [Actually, this is carefully prepared by the E to look like it has been used—a small amount of petroleum jelly will be placed in the middle of the tissue to obtain this effect.]

“Are you willing to touch it with the tip of your index finger? (You can use the hand wash afterwards)” (15 points if yes)

“Are you willing to pick it up and hold it in the palm of your hand? (You can use the hand wash afterwards)” (30 points if yes)

“Are you willing to touch a clean edge of the tissue to your lips? (You can use the mouthwash to rinse afterwards)” (45 points if yes)

“Are you willing to blow your nose using the tissue? (You can use the hand wash to clear your face afterwards)” (60 points if yes)

AXILLA-self: The E removes the cotton pad from the plastic bag from tray A and places it in front of the participant. “Here is the cotton pad you held under your arm earlier.”

“Are you willing to touch it with the tip of your index finger? (You can use the hand wash afterwards)” (15 points if yes)

“Are you willing to pick it up and hold it in the palm of your hand? (You can use the hand wash afterwards)” (30 points if yes)

“Are you willing to hold it up to your nose and sniff it?” (45 points if yes)

“Are you willing to touch a clean edge of the pad to your lips? (You can use the mouthwash to rinse afterwards)” (60 points if yes)

AXILLA-other: The E removes the cotton pad from the plastic bag from tray A and places it in front of the participant. “Here is the cotton pad that the previous participant held under her arm.” [Actually, this is carefully prepared by the E to look like it has been used—it will be lightly stained with diluted food colouring to obtain this effect.]

“Are you willing to touch it with the tip of your index finger? (You can use the hand wash afterwards)” (15 points if yes)

“Are you willing to pick it up and hold it in the palm of your hand? (You can use the hand wash afterwards)” (30 points if yes)

“Are you willing to hold up to your nose and sniff it?” (45 points if yes)

“Are you willing to touch a clean edge of the pad to your lips? (You can use the mouthwash to rinse afterwards)” (60 points if yes)

COMB-self: The E removes the comb from the plastic bag from tray A and places it in front of the participant. “Here is the comb you used earlier.”

“Are you willing to comb it through your hair?” (20 points if yes)

“Are you willing to touch it to your lips? (You can use the mouthwash to rinse afterwards)” (40 points if yes)

“Are you willing to put the comb in your mouth? (You can use the mouthwash to rinse afterwards)” (60 points if yes)

COMB-other: The E removes the comb from the plastic bag from tray B and places it in front of the participant. “Here is the comb used by the previous participant.” [Actually, this is a brand new unused comb.]

“Are you willing to comb it through your hair?” (20 points if yes)

“Are you willing to touch it to your lips? (You can use the mouthwash to rinse afterwards)” (40 points if yes)

“Are you willing to put the comb in your mouth? (You can use the mouthwash to rinse afterwards)” (60 points if yes)

4. DISGUST ratings of stimuli:

To be done on the laptop.

Please rate each of the following objects that were used in this study on the following scales

No at all disgusting 0 1 2 3 4 5 6 extremely disgusting

1. The gum on the plate that you chewed earlier.
2. The gum on the plate chewed by the previous participant.
3. The cotton pad you held under your arm earlier.
4. The cotton pad that the previous participant held under their arm.
5. The tissue that you used earlier.
6. The tissue that the previous participant used.
7. The comb you used earlier.
8. The comb that the previous participants used.
9. The bottle of water that you sipped from earlier
10. The bottle of water that the previous participant sipped from.

Please briefly explain what you think the purpose of this study is... (open ended response).

Appendix M.

Table 6.

Paired samples statistics for inductions separately

				Std.	Std. Error
Induction		Mean	N	Deviation	Mean
Shame	Self Elicitor Score	204.00	5	191.38	85.59
	Other Elicitor Score	72.00	5	111.94	50.06
Anger	Self Elicitor Score	420.00	7	148.23	56.02
	Other Elicitor Score	98.57	7	89.52	33.83
Neutral	Self Elicitor Score	431.25	4	140.37	70.18
	Other Elicitor Score	67.50	4	86.16	43.08

Appendix N.

Table 7.

Paired samples t-test for inductions separately

Induction		<i>Mean</i>	<i>SD</i>	<i>t</i>	<i>df</i>	<i>Sig.</i>
Shame	Self Elicitor score –	132.00	87.07	3.390	4	.028
	Other elicitor score					
Anger	Self Elicitor score –	321.42	155.85	5.457	6	.002
	Other elicitor score					
Neutral	Self Elicitor score –	363.75	114.48	6.355	3	.008
	Other elicitor score					

Appendix O.

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MACQUARIE
University
SYDNEY · AUSTRALIA

14 June 2016

Dear Dr Case

Reference No: 5201600353

Title: *A study of disgust*

Thank you for submitting the above application for ethical and scientific review. Your application was considered by the Macquarie University Human Research Ethics Committee (HREC (Human Sciences & Humanities)).

I am pleased to advise that ethical and scientific approval has been granted for this project to be conducted by:

- Macquarie University

This research meets the requirements set out in the *National Statement on Ethical Conduct in Human Research* (2007 – Updated May 2015) (the *National Statement*).

Standard Conditions of Approval:

1. Continuing compliance with the requirements of the *National Statement*, which is available at the following website:

<http://www.nhmrc.gov.au/book/national-statement-ethical-conduct-human-research>

2. This approval is valid for five (5) years, subject to the submission of annual reports. Please submit your reports on the anniversary of the approval for this protocol.

3. All adverse events, including events which might affect the continued ethical and scientific acceptability of the project, must be reported to the HREC within 72 hours.

4. Proposed changes to the protocol and associated documents must be submitted to the Committee for approval before implementation.

It is the responsibility of the Chief investigator to retain a copy of all documentation related to this project and to forward a copy of this approval letter to all personnel listed on the project.

Should you have any queries regarding your project, please contact the Ethics Secretariat on 9850 4194 or by email ethics.secretariat@mq.edu.au

The HREC (Human Sciences and Humanities) Terms of Reference and Standard Operating Procedures are available from the Research Office website at:

http://www.research.mq.edu.au/for/researchers/how_to_obtain_ethics_approval/human_research_ethics

The HREC (Human Sciences and Humanities) wishes you every success in your research.

Yours sincerely



Dr Karolyn White

Director, Research Ethics & Integrity,

Chair, Human Research Ethics Committee (Human Sciences and Humanities)

This HREC is constituted and operates in accordance with the National Health and Medical Research Council's (NHMRC) *National Statement on Ethical Conduct in Human Research* (2007) and the *CPMP/ICH Note for Guidance on Good Clinical Practice*.

Details of this approval are as follows:**Approval Date:** 3 June 2016

The following documentation has been reviewed and approved by the HREC (Human Sciences & Humanities):

Documents reviewed	Version no.	Date
Macquarie University Ethics Application Form		Received 01/05/2016
Response addressing the issues raised by the HREC		Received 02/06/2016
Participant Information and Consent Form – PSY105 students	2	02/06/2016
Participant Information and Consent Form – Non-PSY105 students	2	02/06/2016
Advertisement (formal)	2	02/06/2016
Advertisement (informal)	2	02/06/2016
List of Online Forums	1	01/05/2016
Request to advertise study for online Forums	1	01/05/2016
Participant Questionnaire	1	01/05/2016

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Appendix P.

Office of the Deputy Vice-Chancellor
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26 August 2016

Dear Dr Case

Reference No: 5201600548

Title: *Completing a questionnaire and pilot testing a memory task and disgust stimuli*

Thank you for submitting the above application for ethical and scientific review. Your application was considered by the Macquarie University Human Research Ethics Committee (HREC (Human Sciences & Humanities)).

I am pleased to advise that ethical and scientific approval has been granted for this project to be conducted by:

- Macquarie University

This research meets the requirements set out in the *National Statement on Ethical Conduct in Human Research* (2007 – Updated May 2015) (the *National Statement*).

Standard Conditions of Approval:

1. Continuing compliance with the requirements of the *National Statement*, which is available at the following website:

<http://www.nhmrc.gov.au/book/national-statement-ethical-conduct-human-research>

2. This approval is valid for five (5) years, subject to the submission of annual reports. Please submit your reports on the anniversary of the approval for this protocol.

3. All adverse events, including events which might affect the continued ethical and scientific acceptability of the project, must be reported to the HREC within 72 hours.

4. Proposed changes to the protocol and associated documents must be submitted to the Committee for approval before implementation.

It is the responsibility of the Chief investigator to retain a copy of all documentation related to this project and to forward a copy of this approval letter to all personnel listed on the project.

Should you have any queries regarding your project, please contact the Ethics Secretariat on 9850 4194 or by email ethics.secretariat@mq.edu.au

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http://www.research.mq.edu.au/for/researchers/how_to_obtain_ethics_approval/human_research_ethics

The HREC (Human Sciences and Humanities) wishes you every success in your research.

Yours sincerely



Dr Karolyn White

Director, Research Ethics & Integrity,

Chair, Human Research Ethics Committee (Human Sciences and Humanities)

This HREC is constituted and operates in accordance with the National Health and Medical Research Council's (NHMRC) *National Statement on Ethical Conduct in Human Research* (2007) and the CPMP/ICH Note for Guidance on Good Clinical Practice.

Details of this approval are as follows:**Approval Date:** 26 August 2016

The following documentation has been reviewed and approved by the HREC (Human Sciences & Humanities):

Documents reviewed	Version no.	Date
Macquarie University Ethics Application Form		Received 12/07/2016
Response addressing the issues raised by the HREC		Received 11/08/2016
MQ Information Page for Part 1 – Online version	2	11/08/2016
MQ Information page for Part 2 – Paper version	2	11/08/2016
SONA Advertisement for First Year Psychology Participant Pool	2	11/08/2016
Thank You Statement and Referral Information Page – Online Questionnaire	2	11/08/2016
Part 1 – Online Study Questionnaire	1	12/07/2016
Experiment Procedures and Protocol	1	12/07/2016
MQ Debrief and Re-consent Information Page and Consent Form	1	12/07/2016

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