

On the relationships between disgust and morality: A critical review

Antonio Olivera La Rosa and Jaume Rosselló Mir
Universitat de les Illes Balears

Abstract

Background: Disgust is, at its core, an emotion that responds to cues of parasites and infection, likely to be evolved to protect human organism from the risk of disease. Interestingly, a growing body of research implicates disgust as an emotion central to human morality. The fact that disgust is associated with appraisals of moral transgressions and that this emotion influences moral judgments implies a remarkable puzzle: Why does an emotion that originally functions in the domain of infectious entities become such a good candidate to play the role of a moral arbiter? The aim of the present review is to clarify the nature of the relationship between disgust and morality. **Method:** First, we examine the relevant features of disgust in order to explore whether the phenomenology of disgust favors its implementation as a defensive mechanism against offensive social entities. Second, we critically review the most striking findings about the effects of disgust on moral judgments. **Results:** The revisited analysis of the literature strongly suggests a bidirectional causal link between disgust and moral cognition. **Conclusions:** We propose that the particular phenomenology of disgust (which involves a sense of offensiveness and rejection) favored the co-adaptation of this emotion to the moral domain.

Keywords: disgust, morality, moral judgment, emotion, embodied cognition.

Resumen

Sobre las relaciones entre repugnancia y moralidad: una revisión crítica.

Antecedentes: la repugnancia es, en esencia, una emoción que surge ante la percepción de objetos potencialmente infecciosos, un mecanismo desarrollado para la protección física del organismo. Por otra parte, resulta interesante que diversos estudios sugieran que la repugnancia desempeña un rol fundamental en la moralidad humana. Así, el hecho que esta emoción se asocie a la valoración de transgresiones morales y que, eventualmente, pueda influir sobre los juicios morales resulta intrigante: ¿por qué una emoción relacionada con la protección del organismo contra agentes infecciosos ha extendido su dominio al ámbito moral? **Método:** en primer lugar, examinamos las características fundamentales de la repugnancia con el objetivo de analizar si su fenomenología intrínseca pudo favorecer el hecho que deviniera un mecanismo de defensa contra los agentes que resultan socialmente ofensivos. En segunda instancia, revisamos los hallazgos más relevantes en la investigación sobre la influencia de la repugnancia en los juicios morales. **Resultados:** el análisis crítico de la literatura sugiere la existencia de un vínculo causal bidireccional entre la repugnancia y la cognición moral. **Conclusiones:** sugerimos que la particular fenomenología de la repugnancia (que implica un sentimiento de ofensa y de rechazo) facilitó la co-adaptación de esta emoción al dominio moral.

Palabras clave: repugnancia, moralidad, juicio moral, emoción, cognición corporeizada.

Conceptualization of disgust

According to Darwin (1872/1965) disgust:

“...refers to something revolting, primarily in relation to the sense of taste, as actually perceived or vividly imagined; and secondarily to anything which causes a similar feeling, through the sense of smell, touch and even of eyesight” (p. 253).

The emotion of disgust is accompanied by a number of physiological reactions (such as nausea and vomiting) that

function all together to prepare the organism for the avoidance and (ultimately) the rejection of infectious substances (Rozin, Haidt, & McCauley, 2008).

At the neurological level, the experience of disgust seems to involve the activation of certain brain areas. For example, areas of the anterior insula and the anterior cingulate cortex are activated when observing facial expressions of disgust (Wicker et al., 2003). Although there is no absolute theoretical consensus about a prototypical disgust face (Rozin et al., 2008), it has been commonly characterized by a furrowing of the eyebrows, wrinkling of the nose, closure of the eyes and pupil constriction, a curled upper lip and gaping jaw, a set of facial features that are best known as the “gape face” (Darwin, 1872/1965). The facial expression of disgust is readily identifiable across cultures (Ekman & Friesen, 1974). In our species, the gape face also accompanies the reaction of distaste, which is described as a motivational response to the ingestion of unpleasant tasting substances (Rozin et al., 2008).

Phenomenology of disgust

Disgust is a basic negative emotion, the appraisal of which involves both a sense of offensiveness and revulsion accompanied by thoughts of contamination (Angyal, 1941). Disgust is always linked with a motivation to avoid and reject any perceived offensive entity (Rozin et al., 2008). One of the most distinctive features of the emotion of disgust is the heterogeneity of its elicitors. For instance, the sense of disgust is much broader than a sensory rejection of unpleasant tastes and particular foods. Thus, disgust is elicited by certain animals (like rats, spiders, worms or cockroaches), bodily products (such as feces, sexual fluids, urine, saliva, nails, sweat, etc.), death, bad hygiene, sexual elicitors, body envelope violations (such as blood, gore and mutilation), visible signs of infection (lesions, discoloration, abnormal body proportion) and even certain offensive social behaviors, beliefs, institutions and persons (Rozin et al., 2008).

A crucial feature of disgust is its association with the process of contamination. Thus, contact with certain cues that evoke disgust can turn a neutral object into something disgusting (Rozin, Millman, & Nemeroff, 1986). Contamination can also occur without any physical contact and seems to operate in some ideational ways. For example, disgusting substances can render perfectly good food inedible by brief contact, even if there is no physical trace of the repulsive item: The idea (history) of contact is enough (Rozin et al., 1986). Consequently, when an offensive object touches a previously neutral object, some invisible essence/residue is transmitted, resulting in their permanent connection (“*once in contact, always in contact*”). Additionally, it seems that when applied to disgust, things that are similar in some properties are felt to be fundamentally similar.

Functions of disgust

Disgust understood as a pathogen-avoidance mechanism

Then, the fact that *Homo sapiens* is an omnivorous species implies an interesting adaptive challenge. As a consequence, dealing with pathogens has constituted an insidious and powerful selection pressure. Together with a physiological immune system that functions to detect and attack pathogens that intrude on our organism, disgust is understood as a biological adaptation serving to guide behavior away from substances and objects associated with pathogens and disease. Thus, from an evolutionary perspective, disgust is, at its core, an information processing system that prevents contact with infectious threats (Curtis & Biran, 2001). Consequently, disgust evolved to serve two crucial adaptive functions. First, disgust plays a crucial role in the process of food selection (Darwin, 1872/1965). The second adaptive function of disgust is disease avoidance. As mentioned above, the immune system is a reactive system, which means that it cannot prevent an animal from coming into contact with the source of infection. Based on this fact, Schaller and Duncan (2007) have suggested that natural selection designed a second defensive response that relies on perceptual cues to detect the presence of potential sources of disease. In this second system, the perception of such “signals” can trigger aversive cognitive and emotional responses that lead to behavioral avoidance.

In this context, disgust is argued to play a central function. According to Schaller and Duncan (2007) this “behavioral immune

system” uses heuristic signals, such as anomalous physical and behavioral features (e.g., skin lesions, spasms, coughing, behavioral tics), to detect the presence of disease in people. Certainly, there is a variety of evidence suggesting that there is correspondence between cues that evoke disgust and cues that signal disease (Oaten, Stevenson, & Case, 2009).

Moreover, a crucial feature of this “behavioral immune system” is specially biased toward false alarms. The fact that most parasites are virtually invisible and that the biological consequences of an eventual infection are highly costly (illness or death) justifies the viability of a system that is supersensitive to anything that superficially resembles disease. As a consequence, prejudicial responses may be directed at persons who are perfectly healthy but just look deviant.

The symbolic conception of disgust

Although there is agreement that disgust originally evolved as a pathogen-avoidance mechanism, Haidt and colleagues (1997) have suggested that the function of disgust was redefined through the processes of cultural evolution. According to this perspective, the pathogen-avoidance account of disgust needs to be complemented with a more symbolic approach.

In this context, Becker (1973) developed a theory that states that our own “creatureliness” (understood as our animal/material condition) is a critical source of our existential fear of death. Because the human body constantly reminds us of our animal condition, disgust is proposed to play a role as an affective alarm against thoughts or experiences that remind us of human materiality (in other words, an affective assertion that says “*I am fundamentally better than that*”).

Following Becker’s insights, a group of authors claim that some disgusting stimuli are threatening to human beings because they make salient people’s vulnerability to death. For example, Goldenberg and his team found that making salient mortality concerns increases the disgust reaction towards body products and animals (Goldenberg et al. 2001) and that relative to neutral stimuli, disgusting stimuli led to higher death-thought accessibility (Cox, Goldenberg, Pyszczynski, & Weise, 2007).

Nevertheless, the pertinence of the symbolic account is still a matter of debate. Thus, some researches have suggested that there is no need for symbolism to explain disgust, and that a pathogen-avoidance perspective can explain all disgust elicitors (Oaten et al., 2009; Curtis & Biran, 2001). However, as we will discuss in more detail later, a strictly physical explanation faces some problems when it needs to take account of the social version of disgust.

Typology of disgust

As mentioned above, one of the most outstanding features of disgust is the heterogeneity of its elicitors. This particularity has raised the question of how to best characterize the function of this emotion, leading to the formulation of diverse proposals.

For instance, the Disgust Scale (Haidt, McCauley, & Rozin, 1994; modified by Olatunji et al., 2007) proposed a three-factor taxonomy of disgust: core, animal-reminder, and contamination disgust. Core disgust involves a sense of potential oral incorporation, a sense of offensiveness, and the perception of contamination. “Bad foods,” certain animals, and almost all body products are subsumed within

this category. Animal-reminder disgust functions as a defensive mechanism against the existential threat that is generated from our animal/material condition. Poor hygiene, inappropriate sex, gore and death are subsumed within this category. Lastly, contamination disgust is understood as a defense of the whole body, not just the mouth, from contact with dirty or sleazy people.

The Three-Domain Disgust Scale (Tybur, Lieberman, & Griskevicius, 2009) proposed three broad categories of disgust. Pathogen disgust is a first-line of defense against objects that are likely to transmit disease or objects that resemble the source of disease. Sexual disgust is a response to the adaptative problem of avoiding sexual partners and behaviors that would impose net reproductive fitness costs. Lastly, moral disgust functions to motivate avoidance of individuals who inflict social costs at the individual and group level.

Finally, Marzillier and Davey (2004) claim that the functional heterogeneity of disgust can be better explained in terms of the discreteness of the disgust experience. Primary disgust is the disgust reaction *per se*. Elicitors of primary disgust include objects of animal origin that generate fear of oral incorporation. Conversely, complex disgust is a multi-emotional negative experience. Elicitors of this complex type not only elicit disgust (although it seems to be the dominant emotion) but also high levels of other negative emotions.

The moral dimension of disgust

The role of disgust in cultural notions about purity and contamination

As reviewed above, some authors argue that disgust is involved in morality. For instance, Shweder, Much, Mahapatra, and Park (1997) claim that there are three groups of ethics underlying moral systems. In particular, the ethics of divinity—or the “purity” domain (Haidt & Joseph, 2004; Rozin, Lowery, Imada, & Haidt, 1999)—are articulated around the emotion of disgust, which appears to make people feel that some behaviors and beliefs are higher, more spiritual, and less carnal than others. Thus, it has been suggested that some cultures are especially sensitive to purity concerns in their elaboration of moral systems. For instance, many ideas and behaviors involving hygiene and food choice are regarded as personal issues in the United States, but as moral subjects among many Hindu Indians (Shweder, Mahapatra, & Miller, 1987). Even in modern western culture, Haidt, Koller and Dias (1993) found that disgusting but harmless actions were judged as moral violations by people in the lower social classes from Brazil and United States, whereas students from high socioeconomic status in the US judged these actions to be a matter of social convention or personal preference.

Indeed, the realm of the morally disgusting is remarkably variable. For instance, when US and Japanese participants were asked to name acts eliciting disgust, most of the mentioned acts were moral offenses (70 and 61% respectively, from Haidt et al., 1997). But the particular things that elicited moral disgust in the two groups were indeed different. Students from Chicago named acts of senseless violence or cruelty, especially toward weak or defenseless people (e.g., genocides), and offensive beliefs and attitudes (e.g., racism). Students from Hiroshima reported feeling *ken'o* (disgust) in everyday social interactions when people—or they themselves— failed to satisfy their needs, or when other people abused or shamed them (e.g., “When I did not find my

name on the board where the names of the people who passed the entrance exam are posted”).

In this context, a major point of debate is the characterization of moral disgust. In particular, the qualitative nature of the emotional response and their elicitors is still unclear. As mentioned above, Tybur and colleagues (2009) argue that the moral disgust domain is constituted by standard moral violations (e.g., stealing, cheating, and lying). Likewise, Chapman, Kim, Susskind and Anderson (2009) found that standard moral violations activate the levator labii (superioris alaeque nasi) muscle region, associated with the facial expression of disgust (upper lip raise and nose wrinkle). Conversely, some authors argue that “moral disgust” is a reaction to a subclass of egregious moral offenses, those that reveal that an individual is lacking the normal human motives (people and behaviors that are morally “sick” or “twisted”).

According to Haidt and colleagues (1997), moral disgust can be described as the guardian of the lower boundary of the category of humanity: those actions that expose people moving down, people who “de-grade” themselves, elicit disgust in others (e.g., stealing from one’s own mother, or exploiting the vulnerable).

Furthermore, there is an alternative approach to the nature of moral disgust. For instance, Royzman and Sabini (2001) believe that the function of disgust in the moral domain is very much metaphorical, and that “moral” disgust elicitors are really anger elicitors described with the vocabulary of disgust for greater rhetorical effects. Nabi (2002) also suggests that the lay understanding of the word “disgust” is actually a combination of disgust and anger (see also, Lee & Ellsworth, in press). In a similar vein, Moll et al. (2005) argued that the moral dimension of disgust should be understood as a moral emotion (indignation) affiliated with disgust (rather than a variant of disgust). Interestingly, they found that disgust and indignation activated both distinct and overlapping brain areas.

Indeed, there is evidence suggesting that disgust and anger are elicited by different cues of moral situations: whereas anger is associated with the perception of harm and intentionality, disgust is typically triggered by bodily norm violations (Russell & Giner-Sorolla, 2011). Likewise, Bloom (2004) believes that, although disgust is involved in some moral judgments, these judgments are always related to physical things rather than more abstract topics. Further studies are necessary in order to clarify which cues of sociomoral disgust elicitors trigger the response (physical or, indeed, metaphorical) of disgust.

On the interplay between disgust and moral judgments

Interestingly, various studies suggest that there is an interdependent causal nexus between disgust and moral judgments. For instance, there is evidence supporting that people use their feelings of disgust as embodied information about social events. Thus, some studies suggest that incidental disgust can lead to more negative attitudes toward an entire social group. It has been shown that disgust induced by pictures and autobiographical writing increased implicit bias against homosexuals, but anger did not; (Dasgupta, DeSteno, Williams, & Hunsinger, 2009). Similarly, Inbar, Pizarro, and Bloom (2011) found that participants who were exposed to a noxious ambient odor reported more negative evaluations of gay men.

In particular, the more prevalent claim in research on disgust and morality is that disgust increases the severity of moral judgments.

Thus, Wheatley and Haidt (2005) hypnotized participants to feel a flash of disgust whenever they saw an arbitrary word in the context of a moral story. They found that when participants encountered the arbitrary word in the story, they reported higher disgust and greater condemnation of the moral violation. In the same line, Schnall, Haidt, Clore, and Jordan (2008) found that the feeling of disgust, even when it is extraneous to the action being judged, can shape moral judgments by making them more severe in people with high sensitivity to their own visceral reactions.

Horberg, Keltner, Oveis, and Cohen (2009) found that disgust, but not other negative emotions, predicted stronger moral condemnation of behavior violating the purity domain, but not the moral domains of harm/care or justice. Likewise, Eskine, Kaciniak, and Prinz (2011) found that gustatory disgust influenced moral judgments by making them more severe. In a different experimental paradigm, Moretti and di Pellegrino (2010) found that, relative to sadness, induced disgust increased rejection rates of unfair offers.

It seems that the reverse of this pattern also mediates moral cognition. Thus, a growing body of research suggests that we think about morality in terms of cleanliness; in particular, moral violations are experienced as dirty and elicit the desire to cleanse. For instance, Zhong and Liljenquist (2006) found that, when people think about a past immoral action they displayed a greater desire for cleansing products, and increased mental accessibility of cleansing-related concepts, and a greater likelihood of using antiseptic wipes. Likewise, they found evidence suggesting that physical cleansing reduced the upsetting consequences of immoral behavior.

Similarly, Ritter and Preston (2011) found that disgust towards rejected religious beliefs was eliminated when participants were allowed to wash their hands. Furthermore, this embodied relationship may be indeed specific. Lee and Schwarz (2010) found that participants who had to lie orally ("dirty mouth" condition) preferred mouthwash over hand-sanitizer, whereas those who typed the same lie with their hands preferred the hand-sanitizer. Finally, Liljenquist, Zhong, and Galinsky (2010) found that clean scents promote reciprocity and charity. Interestingly, in their study, perceived cleanliness did not differ by condition nor did it correlate with the effect, which suggests that its influence was unconscious.

In addition, Schnall, Benton, and Harvey (2008) found evidence supporting that the cognitive concept of cleanliness and the sensation of physical cleanliness can make moral judgments less severe. However, it seems that when the cleanliness prime implicates the self, feeling clean enhances moral self-perception and can, in turn, license harsher moral judgments (Zhong, Strejcek, & Sivanathan, 2010).

These studies suggest that there is an implicit psychological link between physical dirt and immorality. Nevertheless, David and Olatunji (2011) found evidence that questions the reliability of disgust as an amplifier of moral judgments. In their study, participants were asked to rate some moral transgressions that either contained a disgust-conditioned word or a neutral word. They found that transgressions containing the conditioned disgust elicitor were perceived as more disgusting, but not more morally wrong than transgressions containing the neutral word. Likewise, Olatunji, David, and Ciesielski (2012) found that disgust

experienced specifically toward the self predicts less disgust and lower punishment ratings of severe offenses, a finding that reinforces the researchers' suspicion that the influence of disgust in moral judgments is more complex than previously assumed.

In fact, there is evidence that affective priming by disgust reduces the severity of moral judgments (Olivera La Rosa, Rosselló, Munar, & Caamaño, 2012). Specifically, Olivera La Rosa et al.'s (2012) results suggest that the activation of more fine-grained disgust appraisals leads to the attenuation of the affective priming effect (reduction of the severity of moral judgments). Although the explanation of this conflicting evidence is still unclear, it has been suggested that the apparent divergence between recent studies and results by Haidt and colleagues could be a matter of methodological differences between experimental paradigms (for a similar claim see David & Olatunji, 2011).

The particular connection between disgust and morality has raised a debate about its normative implications. Certainly, the validity of disgust as a trustworthy moral guide seems to be at least questionable. As mentioned above, disgust is an emotion of extraordinary inclusiveness; it is susceptible to be triggered by certain cues even in the absence of any real threat. Moreover, because disgust can lead to more negative attitudes toward specific social groups (Inbar et al., 2011) and it can increase the severity of moral judgments (Schnall et al., 2008), it is not unreasonable that disgust sometimes could serve as the primary reason for regarding some acts as illegal, such as the consideration of some materials as obscene or in debates over gay marriage (for a similar perspective, see Nussbaum, 2004). Thus, judges or juries can feel disgust when gory or bloody aspects of a murder are described vividly, which eventually can bias the final verdict. According to this perspective, the feeling of disgust can eventually confirm the moral wrongness of its object.

Conclusion

The core of the experience of disgust involves a sense of offensiveness accompanied by thoughts of contamination. It seems that through the processes of biological and cultural evolution, disgust expanded its original function to guard both the body and the psyche from oral and moral threats. As Rozin and colleagues (2008) point out, the elicitors of disgust may have expanded to the point where the only thing they have in common is that decent people want nothing to do with them.

Although research on disgust is still a novel area, a variety of studies showed a bidirectional link between physical disgust-cleanliness and moral cognition. If this relationship is indeed domain-specific, this assumption implies that the particular phenomenology of disgust can be mediating this phenomenon.

Acknowledgements

This study was developed within a project (FFI2010-20759, La naturaleza moral y estética humana) financed by the I+D+I Plan (MICCIN). Antonio Olivera La Rosa was supported by a FPU PhD Scholarship (AP2007-02095) from Spanish Ministerio de Educación (<http://www.educacion.gob.es>).

References

- Angyal, A. (1941). Disgust and related aversions. *Journal of Abnormal and Social Psychology*, 36, 393-412.
- Becker, E. (1973). *The denial of death*. New York: Free Press.
- Bloom, P. (2004). *Descartes' baby: How the science of child development explains what makes us human*. New York: Basic Books.
- Chapman, H.J., Kim, P., Susskind, J., & Anderson (2009). In bad taste: Evidence for the oral origins of moral disgust. *Science*, 323, 1222-1226.
- Cox, C.R., Goldemberg, J.L., Pyszczynski, T., & Weise, D., (2007). Disgust, creatureliness and the accessibility of death-related thoughts. *European Journal of Social Psychology*, 37, 494-507.
- Curtis, V., & Biran, A. (2001). Dirt, disgust, and disease: Is hygiene in our genes? *Perspectives in Biology and Medicine*, 44, 17-31.
- Darwin, C. (1872/1965). *The expression of the emotions in man and animals*. London: John Murray, 1872 (reprinted Chicago, IL: University of Chicago Press, 1965).
- Dasgupta, N., DeSteno, D., Williams, L.A., & Hunsinger, M. (2009). Fanning the flames of prejudice: The influence of specific incidental emotions on implicit prejudice. *Emotion*, 9, 585-591.
- David, B., & Olatunji, B.O. (2011). The effect of disgust conditioning and disgust sensitivity on appraisals of moral transgressions. *Personality and Individual Differences*, 50(7), 1142-1146.
- Ekman, P., & Friesen, W.V. (1974). Detecting deception from the body or face. *Journal of Personality and Social Psychology*, 29, 288-289.
- Eskine, K.J., Kaciniak, N.A., & Prinz, J.J. (2011). A bad taste in the mouth: Gustatory disgust influences moral judgments. *Psychological Science*, 22, 295-299.
- Goldenberg, J., Pyszczynski, T., Greenberg, J., Solomon, S., Kluck, B., & Cornwell, R. (2001). I am not an animal: Mortality salience, disgust and the denial of human creatureliness. *Journal of Experimental Psychology: General*, 130, 427-435.
- Haidt, J., & Joseph, C. (2004). Intuitive ethics: How innately prepared intuitions generate culturally variable virtues. *Daedalus*, 133, 55-65.
- Haidt, J., Koller, S., & Dias, M.G. (1993). Affect, culture, and morality, or it is wrong to eat your dog? *Journal of Personality and Social Psychology*, 65(4), 613-628.
- Haidt, J., McCauley, C., & Rozin, P. (1994). Individual differences in sensitivity to disgust: A scale sampling seven domains of disgust elicitors. *Personality and Individual Differences*, 16, 701-713.
- Haidt, J., Rozin, P., McCauley, C., & Imada, S. (1997). Body, psyche, and culture: The relationship of disgust to morality. *Psychology and Developing Societies*, 9, 107-131.
- Horberg, E.J., Keltner, D., Oveis, C., & Cohen, A.B. (2009). Disgust and the moralization of purity. *Journal of Personality and Social Psychology*, 97(6), 963-976.
- Inbar, Y., Pizarro, D.A., & Bloom, P. (2011). Disgusting smells cause decreased liking of gay men. *Emotion*, 12, 23-27.
- Lee, S.W.S., & Schwarz, N. (2010). Dirty hands and dirty mouths: Embodiment of the moral-purity metaphor is specific to the motor modality involved in moral transgression. *Psychological Science*, 21, 1423-1425.
- Lee, S.W.S., & Ellsworth, P.C. (in press). Maggots and morals: Physical disgust is to fear as moral disgust is to anger. In K.R. Scherer & J.R.J. Fontaine (Eds.), *Components of emotional meaning: A sourcebook*. New York: Oxford University Press.
- Liljenquist, K., Zhong, C.B., & Galinsky, A.D. (2010). The smell of virtue: Clean scents promote reciprocity and charity. *Psychological Science*, 21, 381-383.
- Marzillier, S.L., & Davey, G.L. (2004). The emotional profiling of disgust-eliciting stimuli: Evidence for primary and complex. *Cognition and Emotion*, 18, 131-316.
- Moll, J., De Oliveira-Souza, R., Moll, F.T., Ignácio, F.A., Bramati, I.E., Caparelli-Dáquer, E.M., & Eslinger, P.J. (2005). The moral affiliations of disgust: A functional MRI study. *Cognitive and Behavioral Neurology*, 18, 68-78.
- Moretti, L., & di Pellegrino, G. (2010). Disgust selectively modulates reciprocal fairness in economic interactions. *Emotion*, 10, 169-180.
- Nabi, R.L. (2002). The theoretical versus the lay meaning of disgust: Implications for emotion research. *Cognition and Emotion*, 16, 695-703.
- Nussbaum, M.C. (2004). *Hiding from humanity: Disgust, shame and the law*. Princeton and Oxford: Princeton University Press.
- Oaten, M., Stevenson, R.J., & Case, T.I. (2009). Disgust as a disease avoidance mechanism. *Psychological Bulletin*, 135, 303-321.
- Olatunji, B.O., David, B., & Ciesielski, B.G. (2012). Who am I to judge? Self-disgust predicts less punishment of severe transgressions. *Emotion*, 12, 169-173.
- Olatunji, B.O., Williams, N.L., Tolin, D.F., Sawchuk, C.N., Abramowitz, J.S., Lohr, J.M., & Elwood, L. (2007). The Disgust Scale: Item analysis, factor structure, and suggestions for refinement. *Psychological Assessment*, 19, 281-297.
- Olivera La Rosa, A., Rosselló-Mir, J., Munar Roca, E., & Caamaño Barreiro, B. (2012). Effects of the time-course of disgust priming on the severity of moral judgments: Lesser severity at the shortest SOA. In C. González Ferreras, D. González Manjón, J.M. Mestre Navas & Rocío Guil Bozal (Eds.), *Aportaciones recientes al estudio de la motivación y las emociones* [Recent contributions to the study of motivation and emotions] (pp. 92-97). Sevilla: Fénix Editora.
- Ritter, R.S., & Preston, J.L. (2011). Gross gods and icky atheism: Disgust responses to rejected religious beliefs. *Journal of Experimental Social Psychology*, 47, 1225-1230.
- Royzman, E., & Sabini, J. (2001). Something it takes to be an emotion: The interesting case of disgust. *Journal for the Theory of Social Behavior*, 31, 29-59.
- Rozin, P., Haidt, J., & McCauley, C.R. (2008). Disgust. In M. Lewis, J.M. Haviland-Jones & L.F. Barrett (Eds.), *Handbook of emotions* (3rd ed., pp. 757-776). New York: Guilford Press.
- Rozin, P., Millman, L., & Nemeroff, C. (1986). Operation of the laws of sympathetic magic in disgust and other domains. *Journal of Personality and Social Psychology*, 50, 703-712.
- Rozin, P., Lowery, L., Imada, S., & Haidt, J. (1999). The moral-emotion triad hypothesis: A mapping between three moral emotions (contempt, anger, disgust) and three moral ethics (community, autonomy, divinity). *Journal of Personality and Social Psychology*, 76, 574-586.
- Russell, P.S., & Giner-Sorolla, R. (2011). Moral anger, but not moral disgust, responds to intentionality. *Emotion*, 11, 233-240.
- Schaller, M., & Duncan, L.A. (2007). The behavioral immune system: Its evolution and social psychological implications. In J.P. Forgas, M.G. Haselton, & W. von Hippel (Eds.), *Evolution and the social mind: Evolutionary psychology and social cognition* (pp. 293-307). New York: Psychology Press.
- Schnall, S., Benton, J., & Harvey, S. (2008). With a clean conscience: Cleanliness reduces the severity of moral judgments. *Psychological Science*, 19, 1219-1222.
- Schnall, S., Haidt, J., Clore, G.L., & Jordan, A.H. (2008). Disgust as embodied moral judgment. *Personality and Social Psychology Bulletin*, 34, 1096-1109.
- Shweder, R.A., Mahapatra, M., & Miller, J. (1987). Culture and moral development. In J. Kagan & S. Lamb (Eds.), *The emergence of morality in young children* (pp. 1-83). Chicago, IL: University of Chicago Press.
- Shweder, R.A., Much, N.C., Mahapatra, M., & Park, L. (1997). The "big three" of morality (autonomy, community, and divinity), and the "big three" explanations of suffering, as well. In A. Brandt & P. Rozin (Eds.), *Morality and health* (pp. 119-169). Stanford, CA: Stanford University Press.
- Tybur, J.M., Lieberman, D., & Griskevicius, V. (2009). Microbes, mating, and morality: Individual differences in three functional domains of disgust. *Journal of Personality and Social Psychology*, 97, 103-122.
- Wicker, B., Keysers, C., Plailly, J., Royet, J.P., Gallese, V., & Rizzolatti, G. (2003). Both of us disgusted in my insula: The common neural basis of seeing and feeling disgust. *Neuron*, 40, 655-664.
- Wheatley, T., & Haidt, J. (2005). Hypnotic disgust makes moral judgments more severe. *Psychological Science*, 16, 780-784.
- Zhong, C.B., & Liljenquist, K.A. (2006). Washing away your sins: Threatened morality and physical cleansing. *Science*, 313, 1451-1452.
- Zhong, C.B., Strejcek, B., & Sivanathan, N. (2010). A clean self can render harsh moral judgment. *Journal of Experimental Social Psychology*, 46, 859-862.