

## 7 A biosocial perspective on embarrassment

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On the surface, embarrassment seems like a rather straightforward, and perhaps trivial, emotion. When people recount stories of their embarrassment, their social woes are often greeted with laughter and amusement. Television audiences tune in en masse to watch embarrassing protagonists such as Michael Scott (or David Brent) in *The Office*. Yet, in spite of this perceived levity, embarrassment is frequently dreaded. People will go to astounding lengths to avoid even the shadow of embarrassment. Important decisions such as whom to help, whether to use protection during intercourse, and even whether or not to visit the doctor are all affected by the mere threat of embarrassment. As the research examining embarrassment continues to evolve, it has become increasingly clear that embarrassment is a complex and powerful emotion. In this chapter, we examine this intriguing emotion by first reviewing its proposed causes and functions, including the nature of embarrassment's nonverbal displays. We will then examine the physiological and neural correlates of embarrassment. Finally, we will review how embarrassment affects cognitions and behaviour, particularly within the health domain, and whether it is distinct from a related emotion: namely, shame.

### **Theories of embarrassment**

The situations that give rise to embarrassment are diverse. Some of the more common types of elicitors are physical pratfalls (e.g., tripping), cognitive shortcomings (e.g., forgetting someone's name), and being teased (Miller, 1992). However, the presence of an audience, real or imagined, may be the most crucial situational cause of embarrassment. Embarrassment is not often felt when one is alone (Tangney *et al.*, 1996) and behaviours that are extremely embarrassing in public are less likely to evoke embarrassment in private. For example, defecating in public would cause most people to feel intense embarrassment, yet defecating in private is rarely an emotional experience. Spilling one's drink in public

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is generally regarded as embarrassing, yet spilling one's drink in private is merely a hassle. While this may seem like a fairly obvious point, it is nevertheless an important one. It seems that the cause of embarrassment is not merely one's actions, but rather engaging in those actions in front of an audience.

The two most prominent theories for the origins of embarrassment are the social evaluation model and the dramaturgic or awkward interaction account (for detailed discussion see [Chapter 9](#) of this volume). The social evaluation model posits that embarrassment is caused by the threat of negative social evaluation (Modigliani, 1968; Miller, 1996). Accordingly, embarrassment arises when people perceive that the social image they want to project has been undermined and that others are forming negative impressions of them. The cognitive appraisals that the situation could result in damaged social esteem are key to eliciting embarrassment in this model (Miller, 1996). For example, a person who spills a drink at a dinner party is likely to become embarrassed. Based on the social evaluation account, this embarrassment arises from the spiller's perception that others are thinking more negatively of her ('What a klutz!'). While this theory has good explanatory power, as many embarrassing situations would seem to fit this account, it fails to adequately explain embarrassment that is caused by being the centre of attention. For example, the social evaluation model has a hard time accounting for why people feel embarrassment at having 'Happy Birthday' sung to them. It seems unlikely that this embarrassment is caused by evaluation threat, as the singers are likely not only friends but they are also in the midst of imparting well wishes to the embarrassed party.

The dramaturgic or awkward interaction account, on the other hand, proposes that embarrassment stems from a loss of social script (Silver *et al.*, 1987). When a person does not know how to act and does not know what the social expectations are, he or she is likely to feel embarrassment (Goffman, 1956, 1967). Thus, it is the interruption of the smooth social functioning and not social evaluation that gives rise to embarrassment according to this model. In the 'Happy Birthday' example, embarrassment is therefore caused by not knowing what to do under the spotlight of positive well wishes.

There are several studies that have compared these two accounts and their ability to explain embarrassment (Miller, 1995, 1996; Parrott & Smith, 1991; Parrott *et al.*, 1988). The general finding from these studies is that both theories are effective in explaining and predicting embarrassment. A likely explanation is that each theory accounts for a unique pathway to embarrassment. In fact, factor analyses of participants' ratings of embarrassing scenarios appear to support this conclusion.

These analyses demonstrate that embarrassing situations can be divided into three dimensions: committing a faux pas, being the centre of attention, and 'sticky situations' (e.g., asking for a loan to be repaid) (Sabini *et al.*, 1999). While social evaluation apprehension seems best suited to explain faux-pas scenarios, the awkward-interaction model seems better suited to explain centre-of-attention scenarios. Sticky situations, on the other hand, may be a combination of the two. Interestingly, centre-of-attention scenarios seem to be one of the most prominent causes of blushing (Crozier, 2004).

From an evolutionary perspective, embarrassment probably arose because in our ancestral past it was likely an adaptive way to prevent social exclusion. Humankind has evolved to depend upon group living; successful members of a group presumably have greater inclusive fitness than lone individuals. For this reason, there is an adaptive benefit to remaining a group member in good standing and preventing social ostracism. Groups often create social conventions and rules to discourage behaviours that are counter to the group's welfare. Violations of these mores can result in loss of group membership (Gruter & Masters, 1986). To prevent social ostracism, embarrassment likely developed (1) as an appeasement gesture, (2) to deter social transgressions, and (3) to motivate amends and reparation for the social wrong (Harris, 2006; Keltner & Buswell, 1997).

There are several research findings that seem to support these proposed functions of embarrassment. The first is that experiencing embarrassment does seem to motivate embarrassed individuals to act prosocially (e.g., make amends). For example, in one classic study on embarrassment, participants were asked to perform either highly embarrassing tasks (e.g., singing the 'Star Spangled Banner' or dancing to a record) or mildly embarrassing tasks (e.g., count aloud to fifty or listen to a record) while being watched through a two-way mirror by a confederate (Apsler, 1975). Afterwards, the confederate approached all the participants and asked them to help with a class project by completing a questionnaire for a half-hour each day for as many days as they were willing. A control group had not performed any previous tasks but was still asked by the confederate to help with the class project. On average, participants who had engaged in the highly embarrassing acts volunteered to help the most number of days (14.9 days), followed by those who had performed the mildly embarrassing acts (8.7 days). The control group volunteered to help the least (5.0 days). A follow-up study further revealed that embarrassed individuals were more likely to help than non-embarrassed individuals, even when the person who was asking for help had not been a witness to the embarrassing act (Apsler, 1975).

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Apparently, embarrassment produces a general motivation to act prosocially towards others, regardless of whether those others witnessed the social transgression.

This motivation to repair may even be evidenced in very basic psychological processes such as visual attention. In the only study, to our knowledge, that examined how embarrassment affects visual attention, researchers used an eye-tracker to follow the gazes of embarrassed people as they looked at still photographs of faces with angry, sad, happy or neutral expressions (Darby & Harris, 2010). They found that embarrassed individuals paid significantly more attention to the eyes in the photographs than did those who were not embarrassed and that embarrassed individuals paid significantly more attention to the eyes of angry expressions compared to neutral or happy expressions (Darby & Harris, 2010). Other researchers have noted that the eyes are especially critical in identifying complex emotions and emotional intensity (Baron-Cohen *et al.*, 1997), as well as direction of attention (Hietanen, 1999). Therefore, it may be that embarrassed individuals are attempting to gather more information about their social surroundings than non-embarrassed individuals. Thus, although embarrassed individuals may signal submission and apology through blushing (de Jong, 1999), downward glances and gaze shifts (Harris, 2001; Keltner, 1995), it appears that they still actively scan their emotional surroundings, particularly by monitoring the eyes of others, as they attempt to repair their social transgressions.

Another line of evidence that appears to support functional accounts of embarrassment is that nonverbal displays of embarrassment seem to promote positive regard in witnesses of the social transgression in a variety of situations (Keltner *et al.*, 1997; Semin & Manstead, 1982). For example, researchers showed participants several different versions of a man knocking over a store display of toilet paper (Semin & Manstead, 1982). In half of the recordings the man showed embarrassment, while in the other half he did not. The experimenters also manipulated whether or not the man was shown picking up the knocked-over display. Participants rating the different versions tended to rate the man as most likeable when he showed embarrassment, regardless of whether he picked up the display or not (Semin & Manstead, 1982). Even still pictures of embarrassment seem to produce positive feelings from viewers (Keltner *et al.*, 1997). Research on the blush, which occurs often during embarrassment, similarly finds that blushing can ingratiate the blusher to an audience (de Jong, 1999; see Chapter 12, this volume).

However, there do seem to be some limitations in the extent to which displaying embarrassment wins over an audience. In one study assessing the relationship between helping behaviour and displays of embarrassment,

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researchers had a woman (a confederate) visit several college classes to request volunteers for a research study (Levin & Arluke, 1982). During the request, the woman displayed varying degrees of composure. In one condition, she remained calm. In another she dropped her papers and became embarrassed, but eventually recovered. In the final condition, she dropped her papers, became embarrassed, but never recovered; instead she wound up handing the volunteer forms to the teacher and fleeing the classroom. As with the toilet paper study discussed previously, showing some embarrassment seemed to ingratiate her with the audience (i.e., class members volunteered the most in this condition). Of note, the extreme embarrassment condition did not increase volunteering relative to the control condition. Thus, it seems that mild displays of embarrassment may act as an appeasement gesture to others and promote favour with them, but extreme displays of embarrassment may not be as efficacious.

### Nonverbal displays

Over the years a number of studies have examined the nonverbal displays that occur during embarrassment. The behaviours most commonly noted across studies are blushing, looking away or down, smiling, and increased body movement (Asendorpf, 1990; Edelmann & Hampson, 1979, 1981; Harris, 2001; Keltner, 1995; Shearn *et al.*, 1990, 1992). Particularly fine-grained analyses of the displays of embarrassment, as well as their temporal dynamics, have been performed by Keltner (1995) and Asendorpf (1990).

Keltner (1995) used Ekman and Friesen's Facial Action Coding System (FACS; Ekman and Friesen, 1978) to code facial movements while participants experienced embarrassment and amusement. FACS catalogues distinct combinations of observable muscle movements into forty-four numbered appearance changes called 'action units'. Keltner's work found that the prototypical embarrassment expression includes frequent gaze shifts (particularly to the left), looking down, head movements and smiling, as well as attempts to inhibit or obscure the smile ('smile controls' such as pressing the lips together). People also commonly touched their faces when embarrassed. Temporal analyses found that embarrassment display onset was fairly fast and unfolded roughly over a four- to five-second period. Comparison of prototypical amusement and embarrassment displays revealed that embarrassment usually began with gazing down while amusement began with a smile, and that the smiles of embarrassment were more often accompanied and terminated by smile control attempts. Embarrassment was also more likely to

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end with a head movement. In addition, Keltner found that the first sideways gaze shift during embarrassment was to the left, in contrast to amusement which was to the right.

Research by Asendorpf (1990) focused on the temporal relationship between gaze aversion and smiling, revealing another difference between the smiles during embarrassment and those in non-embarrassed states. Asendorpf found that during embarrassed smiles (as rated by a variety of judges), gaze aversion typically took place one and half seconds before the offset of the smile's apex – the point during smiling when the lips are maximally turned up. Gaze aversion also occurred in non-embarrassed smiling but this was significantly more likely to happen after the smile apex offset, usually around a half second after. Asendorpf suggests that embarrassed smiles may be perceived as ambivalent because of the co-occurrence of gaze aversion (an avoidant behaviour) with peak smiling intensity (an approach behaviour).

## **Bodily responses**

### *The psychophysiology of embarrassment*

Like many other emotions, embarrassment is accompanied by activation of the sympathetic nervous system (SNS). For example, several studies have shown that embarrassment induces increases in skin conductance (sweat gland activity), indicating the involvement of the SNS (Gerlach *et al.*, 2003; Hofmann *et al.*, 2006; Shearn *et al.*, 1990, 1992). Increased electrodermal activity was also found in a study on vicarious or empathetic embarrassment, which was elicited when observers watched someone with whom they had previously interacted engage in embarrassing acts (Miller, 1987).

Other research suggests that just as the facial and bodily displays of embarrassment unfold in a complex and rather distinct manner across time so may the changes in cardiovascular reactivity. In two studies in our lab (Harris, 2001), participants were videotaped as they sang the national anthem of the United States, the 'Star Spangled Banner' – a song that is particularly hard to sing due to the extensive vocal range needed to hit high and low notes coupled with some rather awkward phrasing of words. An a capella solo performance of this song by itself would be embarrassing for most, but the participants were even further embarrassed by having to watch, with the experimenter and two strangers, a 2-minute videotape of their vocal performance. Throughout this whole ordeal, continuous beat-to-beat readings of each participant's heart rate, systolic blood pressure and diastolic blood pressure were

recorded. Participants' blood pressure rose substantially during the first minute of the video and continued to rise during the second minute, with an average increase of 16 mm for systolic blood pressure and 10 mm for diastolic blood pressure. This is an impressive increase given that no physical activity was involved – participants were simply sitting and watching themselves on video in the presence of an audience. Blood pressure remained significantly elevated even 5 minutes after the video had been turned off and the audience had left.

People's hearts also beat faster during the first minute of embarrassment in the Harris studies. However, unlike blood pressure, heart rate dropped back down to baseline (pre-embarrassment) levels during the second minute of the embarrassing episode. Interestingly, in both of the studies reported by Harris (2001), self-reports of the intensity of embarrassment were correlated with the increases in heart rate during the first minute of embarrassment but were not correlated with blood pressure changes. People can detect their own heart rate changes more easily than blood pressure changes (hence the common reference to hypertension as the 'silent killer') and so may more readily use heart rate when assessing the intensity of their feelings. This would fit with questionnaire studies that find that people report their heart rates increase during embarrassment (Edelmann *et al.*, 1989; Edelmann, 1987).

The decoupling of heart rate and blood pressure as embarrassment unfolds is intriguing. Research on a number of emotions such as anger and fear suggests that heart rate and blood pressure generally increase and decrease together across many emotional states (e.g., Roberts & Weerts, 1982; Schwartz *et al.*, 1981). Although caution should be exercised when comparing findings across studies, one suggestion is that the initial increase of heart rate and blood pressure followed by their decoupling, as heart rate returns to baseline and blood pressure continues to rise, may be unique to embarrassment. Hence, just as there is a complex and rather distinctive nonverbal display of embarrassment, there also may be a signature pattern of cardiovascular reactivity.

Some theorists have proposed that the parasympathetic nervous system may also play a role in embarrassment (Buss, 1980). Such a view would be consistent with early work suggesting that the anticipation of an embarrassing act (e.g., sucking on a pacifier) led to decreased heart rate relative to the anticipation of a fearful event (Buck *et al.*, 1970) and with the finding in the Harris (2001) study that heart rate decreased as embarrassment continued over a 2-minute period. However, simply measuring heart rate activity cannot tell us which branch of the autonomic nervous system is producing changes since the heart is innervated by both the parasympathetic nervous system (engagement decreases

heart rate) and the sympathetic nervous system (engagement increases heart rate). One way to determine whether the PNS is involved in physiological changes is by measuring respiratory sinus arrhythmia (RSA). Two studies have directly attempted to assess RSA activity but failed to find support for activation of the PNS during embarrassment (Gerlach *et al.*, 2003; Hofmann *et al.*, 2006). However, this work does not rule out that the PNS might affect other organs besides the heart during embarrassment.

Blushing frequently occurs during embarrassment and no description of embarrassment would be complete without considering the blush. However, given the number of other chapters in this book that specifically focus on blushing, we will keep our discussion of it relatively brief. We simply highlight a few of the more intriguing aspects of embarrassment and blushing and encourage readers to explore the remainder of the book for further information.

Some of the key research on the temporal dynamics of blushing during embarrassment has come from the work of Shearn and colleagues (Shearn *et al.*, 1990, 1992). In this work, as in several embarrassment studies, participants watched themselves sing on a pre-recorded video in the presence of an audience. Cheek and ear coloration were measured using photoplethysmography, and cheek temperature was also taken. All three measures rose significantly more during the embarrassing video compared to a fearful video (the shower murder scene in the film *Psycho*). Furthermore, during embarrassment, the intensity of cheek coloration increased as the size of the audience expanded from one to four. Blushing during embarrassment began with a sharp increase of blood flow to the face, which was followed by a slower rise in temperature. The authors point out that the visibility of the blush is due to increases in blood flow, enabling others to detect it. However, people's awareness of their own blushing is likely due to increased facial temperature (i.e., feeling one's face getting hotter). From this, Shearn and colleagues make a keen inference – other people can likely see that we are blushing before we are conscious of it ourselves. These results suggest that the decoupling of temperature and blood flow may be due to activation of separate physiological mechanisms. The notion that several physiological mechanisms affect blushing is also supported by research by Drummond (1997). He found that blocking activation of facial beta-adrenergic receptors in the sympathetic nervous system does not completely eliminate blushing during singing, which suggests that the blush involves more than one vasodilator.

While there are still many questions about the physiological changes associated with embarrassment, such as the proposed role of the PNS, it



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does appear that embarrassment has some rather unique physical concomitants, which unfold in a complex manner over time.

*The neuroanatomy of embarrassment*

While the neurological research specifically examining embarrassment is sparse, what there is seems to indicate that embarrassment is a cognitively complex emotion with widely distributed neural circuitry (Sturm *et al.*, 2006). No one area of the brain has been found to be solely responsible for embarrassment, but there is converging evidence that embarrassment is tied to the regions of the brain that seem to be important to theory of mind and self-awareness (Beer, 2007). In a neuroimaging study of healthy adults, Berthoz and colleagues (Berthoz *et al.*, 2002) found that reading stories of embarrassing situations or social transgressions was more likely than reading neutral stories to elicit activation in areas of the frontal and temporal lobes, specifically the medial prefrontal cortex, temporo-parietal region, the basal temporal cortex and the orbitofrontal cortex. These regions seem to be associated with tasks involving theory of mind and regulation of social behaviour (Berthoz *et al.*, 2002; Frith & Frith, 1999; Gallagher & Frith, 2003).

While other emotions, such as fear or anger, likely also rely on distributed neural networks that could include the frontal and temporal lobes, research on patients with frontotemporal lobe degeneration (FTLD) indicates that damage to these regions seems to have a greater impact on embarrassment than other emotions (Sturm *et al.*, 2006). FTLD is an uncommon degenerative disease in which portions of the frontal and temporal lobes of the brain atrophy, causing dementia and eventually death. Unlike Alzheimer's disease, another well-known form of dementia, the emotions and personality of the individual quickly erode during FTLD while the memory and spatial abilities initially remain intact (Levenson & Miller, 2007). FTLD patients often behave in socially inappropriate ways including overly aggressive behaviour, poor impulse control and disregard for social rules (Bozeat *et al.*, 2000; Levenson & Miller, 2007; Neary *et al.*, 1998; Rankin *et al.*, 2005). Emotionally, they seem to have severe impairments in recognizing facial expressions of emotion, empathy, self-awareness, and self-conscious emotions (Neary *et al.*, 1998; Rankin *et al.*, 2005; Rosen *et al.*, 2004; Snowden *et al.*, 2001).

Important to this discussion of embarrassment and neuroanatomy, a recent study of patients with FTLD found evidence that frontotemporal decay seems to affect embarrassment before it affects other negative emotions such as fear and anger (Sturm *et al.*, 2006). In this study, patients with FTLD and healthy control participants were unexpectedly

subjected to a loud blast of white noise similar to a car backfiring. For control participants, this loud noise typically caused a startle response and negative affect (e.g., anger, fear, sadness) followed by obvious signs of embarrassment (e.g., smile suppression, gaze aversion, blushing). In FTLD patients, the loud noise effectively elicited the startle response and negative affect but only a small minority of FTLD patients showed any signs of embarrassment. One explanation for this finding is that since FTLD damages the regions of the brain associated with self-awareness and theory of mind, patients with FTLD are less capable of comparing their own behaviour to the standard held by others. Importantly, these findings demonstrate the significance of the frontal and temporal lobes in the embarrassment experience.

Two particular areas of the frontal lobes – the medial prefrontal cortex and the orbitofrontal region – may play especially important roles in embarrassment. Research on special populations with neuropsychological disorders or impairments indicates that deficits in these areas are associated with abnormally low rates of experiencing embarrassment. Autism, for example, is a neurodevelopmental disorder related to disruptions in social functioning and theory of mind (Baron-Cohen, 2000). Neuroimaging studies find that autistic individuals, compared to psychologically healthy controls, typically have less activation in the medial prefrontal cortex (Castelli *et al.*, 2002; Happé & Frith, 1996). This region of the brain, particularly the anterior paracingulate cortex, seems to be critical to self-awareness and understanding the mental states of others (Walter *et al.*, 2004). When it comes to experiencing embarrassment, some studies suggest that autistic individuals may experience less embarrassment and engage in more inappropriate social behaviours (Capps *et al.*, 1992; Kasari *et al.*, 2001). One suggestion is that the difficulties autistic people have with embarrassment may be due to deficits in theory of mind (Heerey *et al.*, 2003), which perhaps stem from abnormal neurodevelopment (Happé *et al.*, 1996). While this proposal is largely untested, one group of researchers has found that autistic individuals, compared to control participants, have more difficulty identifying self-conscious emotions (i.e., embarrassment and shame) than non-self-conscious emotions but that this difference disappears when theory of mind dissimilarities are statistically controlled (Heerey *et al.*, 2003). Thus, it appears that some of the difficulties autistic individuals have with embarrassment may be partially accounted for by their struggles with theory of mind. Whether this is due to disrupted development in the corresponding brain areas, however, is unclear.

Another special population that experiences difficulties with embarrassment is patients with orbitofrontal brain damage. One of the key

findings to come from this line of research is that damage to the frontal lobes may impair the frequency of embarrassment, but it does not seem to actually prevent one from experiencing embarrassment. Similar to autistic individuals, people who experience orbitofrontal brain damage tend to engage in socially inappropriate behaviours and may have some difficulties understanding the feelings and emotional expressions of others (Blair & Cipolotti, 2000; Stone *et al.*, 1998; Willis *et al.*, 2010). Interestingly, when orbitofrontal patients are given paper-and-pencil tests of social norms, they are no worse at identifying appropriate social behaviours than healthy controls or patients with lateral prefrontal damage (Beer *et al.*, 2006). However, when actually engaging in a task that requires upholding social norms, orbitofrontal patients will often violate the social norm and do so seemingly unaware that their violation was inappropriate. For example, in a series of studies testing the social ramifications of orbitofrontal brain damage, Beer and colleagues found that orbitofrontal patients, compared to healthy controls, disclosed more inappropriate information to strangers and tended to be overly familiar in their teasing of strangers (Beer *et al.*, 2003; Beer *et al.*, 2006). Though observers regarded these interactions as inappropriate, the patients did not show any embarrassment and actually reported more pride in their behaviours than the control participants (Beer *et al.*, 2003). It seems that even though they are aware of the social norms, they often have difficulty applying this knowledge to their own behaviours.

It is important to note that despite these difficulties, orbitofrontal patients can, however, still experience embarrassment. Although the orbitofrontal patients in these studies did not initially report embarrassment, when shown video recordings of their inappropriate behaviour, they became significantly more embarrassed than control participants (Beer *et al.*, 2006). A tentative summary of this line of research is that the damage to the orbitofrontal lobes most likely causes difficulties with embarrassment through diminished self-awareness, but if that self-awareness is increased (e.g., by showing them video of their behaviour) embarrassment can still occur.

Together, the work on these special populations and the neuroimaging of healthy controls converges on several general conclusions about the neuroanatomy of embarrassment. First, as stated by Sturm and colleagues (2006), 'self-conscious emotions rely on complicated, distributed brain networks' (p. 2509). Second, it appears that the frontal and temporal lobes are especially important to embarrassment, perhaps because of the need for theory of mind and self-awareness. Damage or poor development in these areas seems to hinder embarrassment more than other emotions. Third, as evidenced by orbitofrontal patients,

damage to these areas causes difficulties with embarrassment, but does not prevent an individual from feeling embarrassment. Spontaneous embarrassment was less frequent but still possible. Thus, similar to physiological changes, the neural circuitry involved in embarrassment appears complicated and nuanced, but what else would one expect from such a complex emotion?

### **Cognitive effects**

In the past several years, there has been a growing interest in the effects that specific emotions can have on cognition, especially cognitions about risk. For example, fear has been found to increase risk perception and decrease risk taking while anger appears to have the opposite effect (Lerner & Keltner, 2001). But while other emotions, such as fear and anger, have been studied extensively, embarrassment has been relatively ignored in this literature until recently. To examine possible effects of embarrassment, Coffaro and Harris (2012) conducted five studies, in which embarrassment was induced via a variety of methods (including recall of embarrassing events, singing and appearing to stare at the crotches of swimmers in a picture). They found that relative to neutral conditions, embarrassment caused people to be more optimistic about their own futures and the futures of others. For example, embarrassed participants thought they were more likely to get a good job in the future, and that mortality from a variety of causes was lower for people in general. This optimistic bias is similar to that seen in anger, although unlike anger, experiencing embarrassment did not seem to influence risky decisions. When embarrassed participants were given gambling tasks or the Asian disease problem (Tversky & Kahneman, 1981), a task in which participants must decide between a risky and a certain choice option, they were no more likely than control participants to choose the risky but potentially more rewarding options. This pattern of risk perception and risk taking was replicated across several studies of embarrassment (Coffaro & Harris, 2012) and so appears robust.

Why does embarrassment elicit an optimistic bias? While the exact mechanism is unclear, Coffaro and Harris (2012) suggest that the increased optimism found during embarrassment might be due to people trying to regulate their negative emotion. They note that in their work participants were not given the opportunity to engage in the behaviours that embarrassment motivates (e.g., self-esteem restoration, appeasement, acknowledgment of embarrassment to others) and that under such circumstances participants may try to engage in mood repair

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through other means. Such an account is consistent with some other research that suggests that emotion regulation attempts can affect people's judgments and choice (Leith & Baumeister, 1996). One interesting possibility is that giving participants an opportunity to engage in social reparation might circumvent the optimistic bias created by embarrassment in the Coffaro and Harris work. Clearly, more work is needed to understand when and how experiencing embarrassment affects risk preferences, and in what way such effects differ from those of other emotional states.

### **The irrationality of embarrassment: negative real-world consequences**

Although, embarrassment can have positive effects on social functioning (e.g., amends making), it also can have serious personal and social costs. The desire to avoid even the potential of embarrassment leads people to engage, or fail to engage, in a wide range of behaviours that can be harmful not only to themselves but to others as well. For example, Sabini, Siepman and Stein (2001) have proposed that the fear of embarrassment may be one of the major factors that contribute to the well-known psychological phenomenon of bystanders failing to help others who are potentially in need (the 'bystander' effect). In many such cases, Sabini and colleagues argue, observers are uncertain whether the situation is indeed an emergency. The bystanders fail to act because they fear looking foolish if they respond as if it were a crisis situation when it is not. Other research suggests that people are not only willing to put others' well-being at risk to avoid embarrassment, but they also are prepared to put their own health, and perhaps even their own lives, at risk. Such irrational behaviour can be readily seen in unsafe sexual practices. For example, several studies have noted that concern over embarrassment is one of the factors that contribute to unsafe sexual practices such as the failure to obtain and use condoms (Dahl *et al.*, 1997; Leary & Dobbins, 1983; Moore *et al.*, 2006).

#### *Medical examinations*

A growing literature suggests that embarrassment's negative effects are particularly evident in the area of health and medical care. It is perhaps not surprising that embarrassment has been implicated as an impediment to having medically recommended examinations that involve the exposure or examination of private body parts. Embarrassment has been cited as a cause for delay or avoidance of many types of cancer

screenings including pap smears, colonoscopies, breast examinations and mammograms, and testicle examinations (e.g., Consedine *et al.*, 2004; Farraye *et al.*, 2004; Gascoigne *et al.*, 1999; Harewood *et al.*, 2002; Shaw *et al.*, 2001; Taylor *et al.*, 2002).

Due to the correlational nature of most studies that link embarrassment with medical examination avoidance, one cannot conclude for certain that embarrassment is indeed playing a causal role in health-care neglect. However, one recent experiment in our laboratory (Harris & Coffaro, 2012) provides additional support for the proposition that embarrassment is a true barrier to medical examination. Women participants were randomly assigned to either recall an embarrassing medical examination or a neutral event. They then completed several measures regarding their perceptions of their risk of cervical cancer, their embarrassment over pap smears, and their intention to go in for future cervical cancer screenings. As expected, recall of an embarrassing event led women to experience greater embarrassment and to perceive that pap smears were generally more embarrassing, which in turn led these women to report that they were more likely to avoid or delay obtaining a future pap smear relative to women in a neutral state. Interestingly, embarrassment did not affect their perceptions of risk of cervical cancer.

#### *Medical embarrassment more generally*

Most research on embarrassment has almost exclusively examined only one type of medical problem or situation in a single study (e.g., pap smears or breast screening) rather than looking at the more widespread effects that the embarrassment may play on various health-care decisions. Such research does not provide any indication of whether such phenomena are frequent or rare in the general population. Furthermore, until recently, virtually no attention had been paid to another, potentially equally important, way in which the potential for embarrassment may deter people from seeking needed medical care: prospective patients may anticipate embarrassment if they present what they judge to be worrisome symptoms and these are found to have a trivial cause.

To examine some of these issues, Harris (2006) had people complete an anonymous questionnaire over the internet, which included questions on embarrassment and health-care seeking. The sample primarily consisted of Caucasian adults from the United States and was demographically diverse with regards to age, education and income. Participants were asked whether embarrassment had led them to delay or avoid medical care across four types of medical situations that might pose

embarrassment threats. These are described in Figure 7.1. Participants were also encouraged to provide information regarding their experiences including types of symptoms and issues involved.

Figure 7.1 shows the role that embarrassment played in different types of medical situations displayed by gender and whether people reported that embarrassment was an obstacle more than once in any given situation. The numbers presented here in the text are for the sample as a whole, collapsing across all medical situations and gender. Several interesting findings emerged. First, well over half (57 per cent) of the whole sample reported that embarrassment had led to delay or failure to seek medical care. Second, although 20 per cent of the sample reported that embarrassment was an obstacle to scheduling needed medical examinations, this was not the type of situation that produced the greatest medical delay or avoidance. Instead, the most prevalent form of medical embarrassment centred on the fear of being embarrassed if a symptom turned out to have a 'trivial cause'. Despite being worried about potentially serious symptoms, over one third of the sample (36 per cent) reported that they had failed or delayed seeking medical care in order to avoid looking silly or feeling embarrassed if the symptom turned out to have a trivial cause. The most common symptoms experienced in such situations were those that might indicate cardiac distress (e.g., chest pain). Such delays are particularly irrational given that thrombolytic agents and emergency angioplasty can greatly diminish the tissue damage produced by heart attacks, but require rapid treatment to be effective (Nallamothu & Bates, 2003). Given these data, it seems quite possible that delaying or failing to seek medical attention due to embarrassment threat may be a greater cause of avoidable mortality and morbidity than previous work focusing just on embarrassing medical examinations would suggest. Consistent with this proposition, there is at least some hint in the medical literature that potential embarrassment over a false alarm does deter at least some myocardial patients from seeking prompt treatment, although quantitative information on this point is lacking (Finnegan *et al.*, 2000).

The Harris study (2006) also found that significantly more women than men reported that embarrassment had deterred or delayed them from seeking medical attention. One might wonder if this gender difference was due to women, particularly young women, facing more opportunities for embarrassing examinations (i.e., annual pap smears) than similar aged men. While this might explain some of the gender differences, it cannot explain all of them as the gender effect generalized to other types of situations. The differences between males and females can be seen in Figure 7.1. For each type of medical

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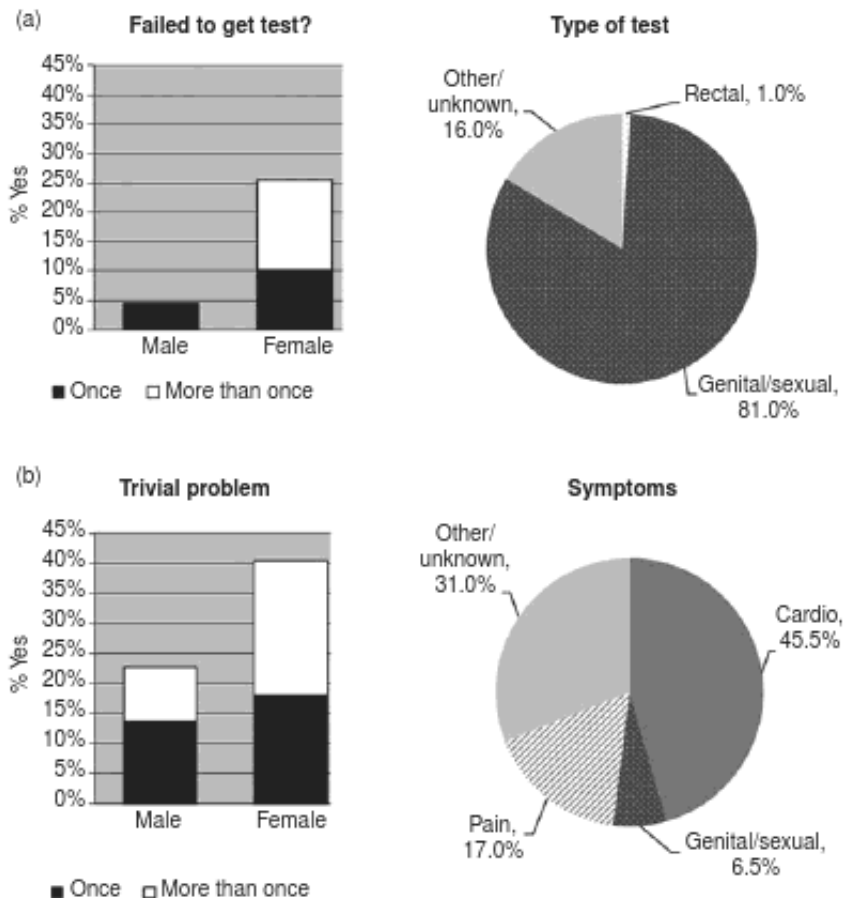


Figure 7.1 Embarrassment and delay or avoidance of medical care  
 (a) 'Have you ever failed to get a medically recommended examination (e.g., pap smear, colonoscopy) because you found the prospect of the examination so embarrassing?'

(b) 'Did you ever experience medical symptoms that you found worrisome, but delayed in seeking medical care (or failed to seek medical care altogether) because you anticipated feeling embarrassed if the problem turned out to be something trivial?'

situation, analyses of gender differences produced statistically significant results. Embarrassment was a greater deterrent for women when talking to a doctor or nurse and led them to avoid having a symptom checked out due to fear of looking silly if the symptom turned out to be of a trivial origin. In addition, people with lower



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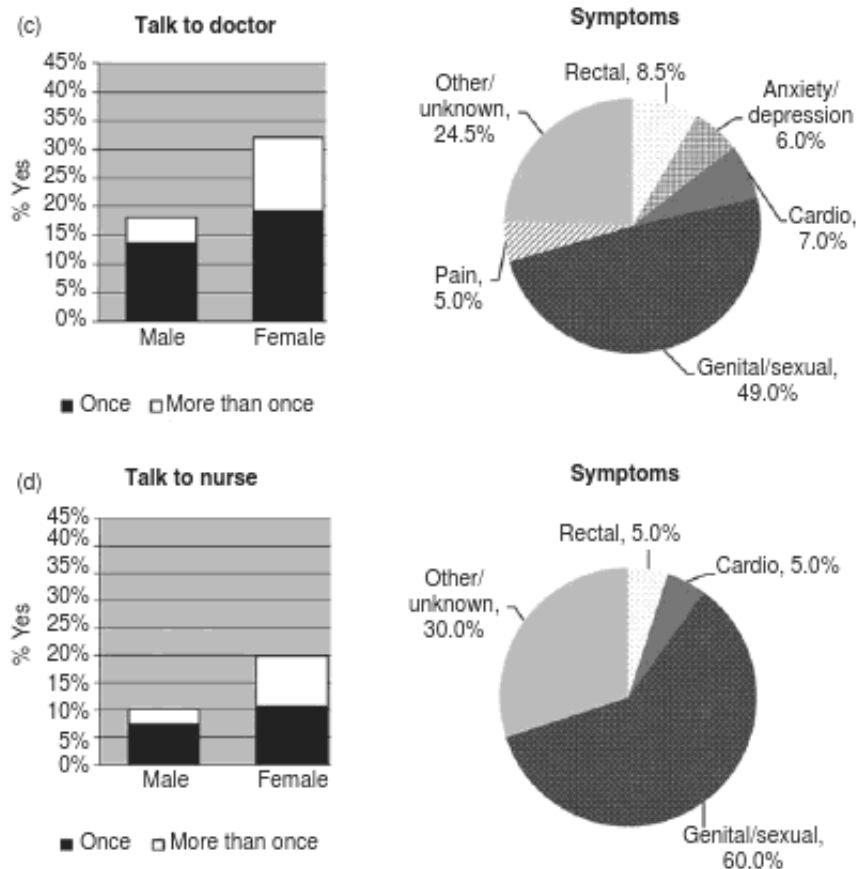


Figure 7.1 (cont.)

(c) 'Did you ever experience medical symptoms that you found worrisome, but delayed in seeking medical care (or failed to seek medical care altogether) because you felt embarrassed to talk about the symptom to a doctor?'

(d) 'Did you ever experience medical symptoms that you found worrisome, but delayed in seeking medical care (or failed to seek medical care altogether) because you felt embarrassed to describe your symptoms to a nurse in order to get an appointment with the doctor?'

incomes reported that fear of embarrassment was a greater deterrent to seeking medical care than those with higher incomes. Future health-related research should focus on special populations such as these as they seem to be the most affected and, perhaps, harmed by threat of embarrassment.

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*Types of embarrassment*

As mentioned previously, research outside the medical domain suggests there may be different forms of embarrassment – one that is aroused by awkward interactions and another that results from evaluation apprehension. Some recent work within the field of behavioural medicine also suggests that there may be at least two variants of medical embarrassment.

Noting the lack of an existing comprehensive medical embarrassment questionnaire, Consedine, Krivoshekova and Harris (2007) created a measure that included fifty-three questions that asked about people's tendencies towards medical embarrassment across a number of situations. This list included nine potentially separable categories (e.g., genital examinations, public exposure, concern over being viewed as a hypochondriac). However, factor analysis of data from young adults in the United States revealed that the items could be understood by two underlying factors. One was bodily embarrassment, which included feeling uncomfortable or awkward about the body or about being naked and examined. The other, more cognitive, factor tapped into concerns about being judged or negatively evaluated. Although the two types of embarrassment were correlated, they interacted with medical care visits differently, supporting the validity of separating the two constructs.

Evidence that bodily embarrassment and judgment-concern embarrassment are separate constructs has now emerged across three different samples, suggesting they are robust phenomena. These two factors were seen in both of the US samples examined in Consedine, Krivoshekova and Harris (2007), one made up of Caucasian and Asian participants and the other of Caucasian and African-American participants. Moreover, they also appeared in responses of Mexican participants residing in Mexico who completed a translated version of the same measure (Harris *et al.*, 2012). Interestingly, in the Mexican sample, judgment concern was subdivided into two factors: a general concern over being judged and a second factor that might best be characterized as embarrassment specifically over a doctor's judgment.

With the one exception just noted, judgment-concern embarrassment did not appear to be affected by culture or by gender. In contrast, bodily embarrassment did show effects of culture and gender. Within the United States, African-Americans were less plagued by bodily embarrassment than European-Americans and both groups reported less of this type of embarrassment than Asian-Americans. Men also reported less susceptibility to bodily embarrassment than women in all of the four ethnicities studied to date.

In summary, embarrassment seems to play an important role in health behaviours. For many people, it appears to create a large barrier between themselves and the critical care they need. Research to date suggests that there may be variants of embarrassment. (i.e., bodily embarrassment vs fear of judgment) that may differentially affect behaviours and health-care-seeking outcomes.

### **Embarrassment and shame: the same or different?**

The appearance of different forms of embarrassment is reminiscent of another ongoing debate within psychology – are embarrassment and shame different forms of the same emotion or are they actually distinct emotions? The longstanding tradition in psychology, dating back to Darwin, has been to regard embarrassment as simply a less intense form of shame (see Keltner & Buswell, 1997, for review). After all, shame and embarrassment have similar functional accounts and, as Darwin noted, the blush occurs in breaches of etiquette as well as moral failings (Darwin, 1872/1999). Cross-cultural language researchers have also noted that in many cultures embarrassment is linguistically located close to shame and it is not uncommon for one word to be used for both constructs (Edelstein & Shaver, 2007; Haidt & Keltner, 1999; Lutz, 1982). Some theories of shame are remarkably similar to the negative evaluation model of embarrassment and posit that shame is produced by the exposure of a flaw or the loss of social esteem (Ausubel, 1955; Sabini, Garvey *et al.*, 2001; Smith *et al.*, 2002). Behaviourally, both may motivate one to make reparations for the transgression (Darby & Harris, 2012), and in a medical setting shame, like embarrassment, can create problem behaviours such as leading one to discontinue visits to a physician or lie about medical issues (Harris & Darby, 2009). In short, there are enough important similarities that some researchers question the extent to which these emotions are distinct from one another (Sabini, Garvey *et al.*, 2001).

Recently, however, the emotion field has begun to shift away from the view that shame and embarrassment reflect the same affective state. Diverse evidence ranging from differing phenomenological accounts to distinguishable nonverbal behaviours has led many researchers to conclude that embarrassment and shame are two distinct emotions (Keltner, 1995; Keltner & Buswell, 1997; Miller & Tangney, 1994; Tangney *et al.*, 1996). Some of the evidence offered for differentiating these two emotions comes from work examining the types of situations that give rise to them. Several studies have found that when people are asked to recall experiences in which they felt embarrassment and shame,

embarrassing episodes tend to revolve around transgressions of social conventions (e.g., spilling one's coffee or burping in public), while shaming episodes tend to revolve around failures to meet personal standards (e.g., cheating in a test or on a spouse) (Miller & Tangney, 1994; Tangney *et al.*, 1996). Relative to embarrassment, shame or guilt is also more likely to occur over harm done to another person (Keltner & Buswell, 1996).

In addition to having some different antecedent events, people's descriptions of the phenomenology or subjective experience of embarrassment seem to contrast with that of shame. When people feel embarrassed they often describe themselves as feeling awkward and out of sorts; whereas when they feel shame they often describe themselves as feeling immoral (Miller & Tangney, 1994). In multiple studies of the affective differences between these two emotions, participants report that embarrassment is tied to humour, amusement and startled surprise, while shame is tied to disgust, anger and sadness (Miller & Tangney, 1994; Tangney *et al.*, 1996). Some studies also suggest that embarrassment is less intensely distressing than shame (Tangney *et al.*, 1996; Darby & Harris, 2012). Consequently, some researchers describe the embarrassment experience as a fleeting feeling of having erred and shame as feeling that the whole self is bad (Tangney *et al.*, 1996).

There are also several studies that suggest possible differences between the nonverbal displays of embarrassment and shame. One study of blind and seeing Olympians competing in Ju-Jitsu found that after defeat, the athletes, regardless of seeing ability, tended to slump their shoulders and narrow their chests while tilting their heads down and looking away from others (Tracy & Matsumoto, 2008). While this study did not obtain affective reports from the Olympians, failing a task is a common antecedent of shame but not of embarrassment (Keltner & Buswell, 1996). Other studies have similarly found that failure leads to frowns, body collapse and gaze aversion (Heckhausen, 1984; Lewis *et al.*, 1992; Stipek *et al.*, 1992). While there is the distinct possibility that the shoulder slump is due to disappointment and not shame, when people describe feeling ashamed they sometimes describe a physical response that includes slumping shoulders, putting one's head down and avoiding eye contact (Ablamowicz, 1992). Smiling and smile suppression, which often occur during embarrassment, are notably absent from these studies (Keltner & Harker, 1998; Lewis, 1993). One study found that others' perceptions of embarrassment were correlated with smile control attempts, but their perceptions of shame were not (Keltner, 1995). Taken together, these studies tentatively suggest that the prototypical shame expression may be characterized by head and eye

movements down (Izard, 1977; Lewis *et al.*, 1992), with perhaps a slumping of the shoulders (Tracy *et al.*, 2009), and no smile or smile suppression attempts (Keltner, 1995).

While many of these behaviours are shared with embarrassment, people seem to be fairly adept at distinguishing the prototypical embarrassment display (i.e., gaze down, controlled smile, head turn, gaze shift, face touch) from the prototypical shame display (i.e., head and eyes downcast, no smile). When people are asked to label a display of embarrassment or shame, they rarely confuse one emotion with another, regardless of whether the emotion is presented as a still picture (Keltner & Buswell, 1996) or a video recording (Keltner, 1995). In fact, one study found that when people are shown still pictures of prototypical displays of embarrassment and shame, they tend to infer that the display is caused for reasons largely in line with the suggested distinct antecedents of these emotions (Keltner *et al.*, 1997). For example, for a shame display, people tend to infer that the person committed a moral wrong, such as hurting someone's feelings; for an embarrassment display, they tend to infer that the person made a social blunder, such as tripping in public. Further, when presented with a shame display, people reported that they are more likely to feel sympathy than amusement. For embarrassment, people reported the reverse (Keltner *et al.*, 1997). The blush is another display that may distinguish shame from embarrassment. While, to our knowledge, there is little work specifically addressing this distinction, blushing is often seen during embarrassment (Edelmann & Hampson, 1979) but has yet to be empirically linked with shame.

While there is not overwhelming evidence that embarrassment and shame reflect different underlying emotional states, it appears that the two emotions are distinguishable in terms of displays, subjective feelings and antecedents. Contrary to previous expectations, there is some evidence that these differences are not due to the intensity of the emotion (Tangney *et al.*, 1996). One general limitation of this line of research, and the work on embarrassment in general, is that it has almost exclusively been done with participants from the United States, Europe or Australia. Work with a wider range of cultures, particularly those from Asia and Africa, would greatly enhance our knowledge of the embarrassment experience, its concomitants and its relationship with other important emotions.

### Concluding remarks

Embarrassment affects everything from day-to-day interactions to important life decisions. Its role in decision making, especially in risky and health-related decisions, may be more profound than many had

previously expected. Embarrassment's effects are complicated and nuanced, and there are different types of embarrassment that may differentially affect behaviour. In short, far from being the straightforward and trivial emotion that it appears to be at first blush, embarrassment is complex and powerful with far-reaching consequences.

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