

W. Ray Crozier and Peter J. de Jong

# The Psychological Significance of the Blush

Edited by

W. Ray Crozier and Peter J. de Jong



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## The Psychological Significance of the Blush

The blush is a ubiquitous yet little understood phenomenon which can be triggered by a number of self-conscious emotions such as shame, embarrassment, shyness, pride and guilt. The field of psychology has seen a recent surge in the research of such emotions, yet blushing remains a relatively neglected area. This unique volume brings together leading researchers from a variety of disciplines to review emerging research on the blush, discussing in depth issues that have arisen and stimulating new theorizing to indicate future directions for research. Topics covered include: the psychophysiology of the blush; developmental aspects; measurement issues; its evolutionary significance and the role of similar colour signals in the social life of other species; its relation to embarrassment, shame and social anxiety; and the rationale for, and clinical trials of, interventions to help people suffering from blushing phobia.

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Blushing is remarkable for two reasons. First, it is the only expression for which there is no equivalent in any other animal. All of our facial expressions and many of our gestures can be found in our fellow primates. The way we frown, bare our teeth in a smile, or beg with open hand is all basic primate communication, yet the blush is not. I do not know of any instant face-reddening in monkeys or apes. Second, blushing is highly communicative yet involuntary. Even tears can be faked more easily than the blush. We are dealing with a signal, therefore, over which we lack control. We are unable to produce it on command, and unable to suppress it if we wish it to go away. In fact, the more aware we are that we are blushing the harder it is to make it disappear.

There was a time in which biologists held heated debates about whether communication is essentially cooperative (sharing of information) or manipulative (making others act to your advantage). Blushing never came up in this debate, however. It would have thoroughly upset those who advocated that all communication serves selfish ends. If this were true, would we not be far better off without blood uncontrollably rushing to our cheeks and neck, where the change in skin colour stands out like a lightning rod? Such a signal makes no sense for a born manipulator. Charles Darwin was so puzzled that he wrote letters to colonial administrators and missionaries all over the world to see if all members of our species blushed. He speculated about the effect of skin colour (with face-reddening standing out more against a lighter background), and the role of shame and moral standing. He did so long before blushing became the respected topic of study that it now is. His main conclusion was that shame was an innate, universal reaction in our species, and that blushing evolved to broadcast it to our surroundings.

Why would a species need a shame signal that other primates apparently do not need, and why did nature not grant us more control? The most likely framework to explain this trait is that we are a species that relies on cooperation and obedience to moral rules. Nothing is more telling than how we react to transgressions. We lower our face, avoid the

gaze of others, slump our shoulders, bend our knees, and generally look diminished in stature. Our mouth droops and our eyebrows arch outward in a distinctly unthreatening expression. We feel ashamed, and hide our face behind our hands or 'want to sink into the ground'. This desire for invisibility is reminiscent of submissive displays in many animals. Chimpanzees crawl in the dust for their leader, lower their body so as to look up at him or turn their rump towards him to appear unthreatening. Dominant apes, in contrast, make themselves look larger and literally run or walk over a subordinate, who ducks into a fetal position. Daniel Fessler, an anthropologist who has studied shame in human cultures, compares its universal shrinking appearance with that of a subordinate facing an angry dominant. Shame reflects awareness that one has upset others, who need to be appeased. Whatever self-conscious feelings go with it, they are secondary to the much older hierarchical template.

But we add blushing to it, which is more than appearement or subordination. It communicates to others that we are aware how our actions affect them. This fosters trust. We prefer people whose emotions we can read from their faces over those who never show the slightest hint of shame or guilt. We have another unique characteristic that fits this idea, which is the white sclera around the eyes. They make our eye movements stand out much more than those of, say, a chimpanzee, whose eyes are all dark, and recessed in the shade of a prominent eyebrow ridge. There is no way to tell where a chimp is looking from the eyes alone (even though I always feel that apes themselves are better at this than we humans), whereas humans have trouble obscuring their gaze direction or hiding a restless gaze. Also here, we have been self-handicapped in the domain of manipulation, which must mean that evolution has favoured honest communication. Probably, trustworthiness became such a premium during human evolution that we lost deceptive capacities in order to become more attractive as cooperation partners.

The present volume addresses a critically important topic, therefore, by delving more deeply into what at first sight looks like a very simple trait. It is one that has very complex ramifications if looked at from an evolutionary perspective, however. Blushing may be part of the same evolutionary package that gave us morality.

Frans B. M. de Waal

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## W. Ray Crozier and Peter J. de Jong

#### The blush as a puzzle

The blush is ubiquitous yet scarcely understood. In the past it has attracted little scientific attention and it is only in recent years that it has begun to attract systematic investigation. We believe that the time is right for a volume that brings together the leading international researchers in this field to review and evaluate this emerging research, to discuss issues that have arisen, to stimulate new theorizing and to map future directions for research. The scientific neglect of blushing is surprising given that the facial expression of emotion has attracted so much research for many years and occupies a central place in the study of emotion. It is all the more surprising in the light of the surge of interest in recent years in the self-conscious emotions of shame, embarrassment, pride and guilt, all of which are associated with the circumstances of blushing.

Its neglect would be understandable if the blush was straightforward to understand or was of little psychological or social consequence. However, it presents many puzzles and, as we will show in this volume, has considerable psychological and cultural significance. Why does our reaction to a social predicament or to simply realizing that we are the object of others' attention take this form at this specific site on the body, particularly as it often results in drawing attention to ourselves just when we would least want it? Why should an expression of embarrassment, shame or shyness be highly visible when these emotions are associated with hiding, keeping in the background and covering oneself up? How does a blush differ from the facial reddening that is brought about by body temperature regulation mechanisms, that accompanies other emotions such as anger and indignation, that is a symptom of the skin condition rosacea or that is experienced by many women during the menopause? How does the blush of embarrassment and shyness relate to the pallor of fear? Why is a blush uniquely human? Are there comparable expressions in other species? When a sample of leading biologists was

asked during the bicentenary celebrations of Darwin's birth to identify the largest gaps in his theory, Frans de Waal, one of the world's foremost authorities on primate behaviour, nominated the blush (de Waal, 2009). We have no convincing accounts of the evolutionary origins of the blush, its emergence in childhood, its significance in social life or how it has come to have significance. Textbooks on physiology, including specialist texts on the cardiovascular system, have little to say on its physiology. In the psychology of emotion the place of the blush in embarrassment, shyness, guilt and shame is contested or, more typically, tends to be passed over.

The blush represents a lacuna in our understanding of emotion. Indeed, knowing more about it would yield considerable insight into the nature of emotion and the autonomic neurophysiological processes involved, since, for example, a blush entails cognitive processes such as the appraisal of social contingencies, the involvement of the self in social encounters, and the contribution of the face and the body to social interactions, a contribution which has particular significance in that a blush is involuntary, uncontrollable and therefore cannot be feigned. The blush also draws attention to the moral dimension of emotion since it is associated with shame and guilt, compliance with personal and social moral standards, and our capacity to reflect upon our conduct and understand its implications for ourselves and others. Moreover, it would increase our understanding of the motivational and autonomic processes involved in people's responsiveness to interpersonal distress.

Research into the significance of the blush ought to extend beyond advancing knowledge in the psychology of emotion and interpersonal processes to embrace the problems that blushing causes many individuals. A blush is part of everyday life, a fleeting change in appearance that is typically accompanied by fluster and embarrassment and that can be psychologically uncomfortable for a time. For many of us this is a transient experience that we can readily cope with, even sometimes enjoy or find amusing or attractive. However, for many individuals their blushing is a source of great distress and they regard it as having a major and adverse impact on their life. Some are prepared to undergo irreversible surgery in order to prevent reddening from occurring. Fear of blushing (erythrophobia) has become recognized as a psychological problem and is now included as a symptom of the psychiatric condition of social anxiety disorder.

#### Darwin on the blush

The Oxford English Dictionary defines the blush as a 'reddening of the face as a sign of shyness, embarrassment or shame'. It traces its origin to the Anglo-Saxon word ablisian, which is related to the Dutch word

blosen. The OED provides examples of usage dating to the sixteenth century. In these sources the blush is regarded as a sign of shame although it is also mentioned in the context of modesty and sexual attraction. The word blush as a noun and verb, and its equivalent in other languages, has remained in common use, but it was only in the nineteenth century that the phenomenon it describes was submitted to systematic analysis. A London physician, Thomas Burgess, published The Physiology or Mechanism of Blushing in 1839. He made original observations on the blush, particularly on blushing in people of different 'races', and made a distinction between the 'true blush' as a sign of shame which served as a valuable social signal, and the 'false blush' as a symptom of over-sensitivity (Burgess 1839/2009). In doing so he anticipated much later work on individual differences in blushing propensity. However, scientific investigation began with the seminal chapter in Darwin's The Expression of the Emotions in Man and Animals, published in 1872. For many years the chapter provided the definitive account of the phenomenon in the scientific literature, and it remains common for it to be cited in articles on blushing (including the chapters within this volume).

Darwin's approach to the blush exemplifies the systematic collection of evidence that characterized all his scientific endeavours. He dispatched questionnaires to correspondents around the world requesting information on cross-cultural similarities in expressions. He reports on correspondence with Dr Crichton Browne, a doctor in a mental institution, and with colleagues overseas, aiming to establish whether people who are blind and those of low intelligence blush, whether young children do, and whether people of all skin tones do so. Darwin raised questions that we have only recently started to address through the collection of systematic empirical evidence and the development of theoretical accounts.

Darwin proffered an explanation of blushing, its relation to emotional experience, its causes and psychophysiological mechanisms. He regarded the blush as an expression of shame, modesty and shyness. He argued that it is caused by attention directed towards the self: '... originally self-attention directed to personal appearance, in relation to the opinion of others, was the exciting cause; the same effect being subsequently produced, through the force of association, by self-attention in relation to moral conduct' (Darwin, 1872/1999, p. 324). It is found only among humans not because only they have a developed moral sense but because they alone have a sufficiently sophisticated capacity for cognitive self-representation. He speculated on the mechanism by means of which self-attention to one's appearance could produce a blush, proposing that

attention paid to a particular area of the body triggers vasodilatation of blood vessels in that area, resulting in increased blood flow (p. 336). Darwin played down adaptive or communicative functions of the blush, arguing, for example, that 'those who believe in design, will find it difficult to account for shyness being the most frequent and efficient of all the causes of blushing, as it makes the blusher to suffer and the beholder uncomfortable, without being the least service to either of them' (p. 335). As Dixon (2003, p. 168) remarked, commenting on the lack of emphasis on the utility of emotional expression and indeed on natural selection or sexual selection in Darwin's account, a more appropriate title for the book might have been 'The Inheritance of Useless Habits in Man and Animals'. Dixon argued that Darwin's neglect of the utility of expressions and his emphasis on the inheritance of acquired habits rather than on adaptation reflected his opposition to the theological explanation of the blush proposed by Burgess, and his reluctance to yield any ground to this position in his defence of an evolutionary thesis. Has Darwin's theory stood the test of time? This introductory chapter considers the issues that Darwin raised and indicates how these have been addressed in subsequent chapters.

#### The nature of the blush

Since the publication of Darwin's chapter much progress has been made in understanding mechanisms involved in the regulation of blood circulation. This includes factors involved in vasodilatation and vasoconstriction of the various types of arterial and venous vessels as these have received considerable attention in scientific research: for example, in the context of thermoregulation and physical exertion. We now have a much more comprehensive understanding of both the anatomy of the circulatory system and factors involved in controlling the circulation through vasodilatation and vasoconstriction. Research shows that blushing is the product of a much more complex process than that envisaged by Darwin.

The role of vasodilatation and vasoconstriction of blood vessels – for example, in thermoregulation – has received considerable attention in basic and more applied research: for example, in the physiology of physical activity (Astrand *et al.*, 2003). Vasodilatation of blood vessels has been shown to be controlled by several factors: action of the sympathetic nervous system, catecholamines circulating in the blood stream, and local factors that originate either in the blood vessels themselves – endothelial or myogenic factors – or in metabolic and other activities in tissue surrounding the vessels. The network of blood vessels in the