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## On the psychodynamics of blushing

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**Abstract**

This paper gives an overview of the physiological and psychological research in the field of blushing in the 20th and 21st centuries. For this purpose, the literature was comprehensively analysed starting in 1900 based on defined keywords. In addition, different aspects of blushing will be discussed against a psychodynamic background. The work shows how the psychodynamic concepts that have emerged over time differ from the behavioural therapy concepts. An attempt will be made to integrate the current findings into the psychodynamic concepts of shame.

**Keywords:** Blushing, flushing, psychotherapy, psychoanalysis qualitative research

**Introduction**

Blushing, also called "flushing" or "blushing", is a physiological reaction in which the blood vessels in the face, neck and upper chest dilate. This process is triggered by the sympathetic nervous system and leads to an increase in skin temperature. Flushing is a thermoregulatory response that can be triggered by various factors such as exertion, fever or emotions such as anger. It can also be a symptom of certain diseases. Blushing, on the other hand, is defined as an uncontrollable redness of the face, neck and/or upper chest in response to social attention or perceived evaluations. It occurs mainly in situations where the person feels that he or she is the centre of attention and experiences self-conscious emotions such as embarrassment, shame, guilt, joy or pride. Blushing fulfils a social function, as it signals trustworthiness and prosocial behaviour and appeases negative social evaluations. However, blushing can also lead to social stress, especially if it is excessive and occurs at inappropriate times. In such cases, it may be a symptom of erythrophobia, a fear of blushing in the context of social anxiety disorder. Erythrophobia is characterised by the fear of blushing in social situations and the worry of being negatively judged or excluded as a result. It is more common in socially anxious people and can be a precursor or maintaining factor for social anxiety disorder. Up to 50% of people with social anxiety disorder report frequent blushing, and erythrophobia is a chief complaint in about one-third of these patients. Overall, blushing plays an important role in social interactions, but can be both a normal reaction and a symptom of social anxiety disorder. Accurate differentiation between healthy and pathological blushing requires differential diagnosis and treatment by professionals in the field of psychopathology and anxiety disorders. In 2008, Ruscio *et al.* were able to show in a sample of American probands that the lifetime prevalence of social anxiety disorder is 12.1%. The age of first onset usually spans the period from childhood to the mid-20s (Ruscio, *et al.*, 2008) <sup>[49]</sup>. It is estimated that there were 10.1 million sufferers of social anxiety disorder in the European Union in 2011 (ECNP, 2011) <sup>[28]</sup>. Anxiety disorders in general represent the most common group of mental disorders in Germany, at 15.4% (Suhr, 2020) <sup>[55]</sup>. A clinical example follows:

**Casuistry**

Ms C is a 28-year-old woman who has consulted a psychologist because of repeated and pronounced blushing in social situations. She reports that this blushing has become an increasing problem over the last few years and is significantly affecting her quality of life. The symptoms she experiences include repeated, uncontrollable blushing, predominantly in social situations, especially when she feels she is the centre of attention. This occurs regardless of the environment or nature of the social situation. The blushing causes Ms C considerable anxiety and self-consciousness. She fears being perceived as strange or

incompetent by others, which in turn makes her social interaction more difficult. Ms C reports that her blushing has affected her career opportunities as she has difficulty speaking in front of colleagues or superiors. Furthermore, it has an impact on her social relationships and self-esteem.

Within the framework of the psychodynamic examination of Ms C's blushing, various aspects could be analysed. On an upper level, deep-seated fears or insecurities about social interactions manifest themselves within the symptomatology in the form of blushing. On a symbolic level, however, it is above all a dilemma that emerges from a biographical theme. In the course of the therapy, the father of the patient, who is about six years old, reveals incestuous behaviour, which points to oedipal symptoms. The diversion of blood into the face, accompanied by shame and fear, points to this psychodynamic conflict that reveals itself between the (Oedipally shaped early) desire to show oneself vs. the terror that results from it.

Blushing is a fascinating phenomenon that is interpreted in various ways within the framework of psychodynamic explanatory approaches. These approaches offer insights into the complex causes and manifestations of blushing that go far beyond the purely physiological aspects:

1. **Blushing as a conversion symptom:** One of the theoretical perspectives considers blushing as a conversion symptom. This means that it is a physical manifestation of unconscious fantasies resulting from psychological conflicts and unconscious needs. This approach assumes that thoughts or desires lying deep in the unconscious, which are usually suppressed for social reasons, are expressed physically through blushing. In this respect, blushing can be seen as a kind of outlet for the expression of inner conflicts.
2. **Blushing as exhibitionistic desires:** Another important psychoanalytical explanation for blushing focuses on exhibitionistic desires. This theory states that people who have exhibitionistic needs or a desire for attention cannot act them out openly because of social norms or inner moral conflicts. As a compromise between these repressed desires and social norms, the tendency to show oneself or to attract attention is transformed into a physiological reaction, namely vasodilation of the blood vessels in the face. The symbolic meaning of this transformation lies in the shift of blood from the genitals to the face, which could indicate a subtle satisfaction of these repressed exhibitionist needs.
3. **Blushing in response to shame and affect discharge:** An alternative theory proposed by some researchers emphasises that blushing is not necessarily associated with repressed sexual needs or exhibitionist tendencies. Instead, it argues that blushing is a vasomotor response to the affect discharge of shame. In this context, blushing is seen as a bodily response to strong emotions, whether shame or even positive emotions such as pride and joy. This view emphasises that blushing can be a form of emotional discharge that is not necessarily related to sexual or exhibitionist motives.

Overall, these psychodynamic explanations offer insights into different dimensions of blushing, emphasising the importance of unconscious processes and inner conflicts in the emergence of this phenomenon.

**Research Question:** This paper aims to present both the physiological and psychological explanatory concepts of blushing. In this context, the change in theories and models over time from 1900 to the present day is to be shown in particular. For this reason, the theories of blushing will be sorted thematically and presented in chronological order. A comprehensive overview from a physiological and psychological perspective will be given. The question will be answered on how the psychodynamic concepts that have developed over time differ from the behavioural therapy concepts. Finally, it will be answered how current findings can be reconciled with the psychodynamic theories and concepts of shame.

## Method

The underlying literature of the present work was identified by means of both systematic and unsystematic research. As part of the systematic literature search, a list was compiled with the following keywords: "blushing", "blush", "blushing", "facial blushing", "fear of blushing", "erythrophobia", "erythrophobia", "erotophobia" (historical term for erythrophobia), "psychophysiology", "blush", "blush", "shame" and "shame". The following databases were searched using these keywords: PubMed, Psynex, Wiley, the directory of open access journals (DOAJ), Deutsches Ärzteblatt, Pep-Web, Frontiers and EBSCO. Furthermore, the offer of the Hamburg State Library and also the library of the MSH Medicalschool Hamburg were searched. In addition, a non-systematic search was carried out using the snowball system for literature references in the directories of other papers. As a temporal criterion, works published before 1800 were excluded. To determine the quality of the literature identified in this way, only works by qualified authors from the relevant subject areas (medicine, psychology, philosophy, psychodynamics, poetry) were used to address the questions. Furthermore, the texts were examined for their relevance to the topic to be addressed and the quality of the sources used. Finally, books and papers from the medical, psychological, philosophical and literary fields were collected, which can be used to answer the questions of the thesis comprehensively.

## Results

**Physiology of blushing over time:** The natural scientist Charles Darwin devoted himself scientifically to the phenomenon of blushing in his work "The Expression of the Emotions in Man and Animals" (1890). Darwin was particularly interested in whether the same gestures and facial expressions express the same emotions in all human races and whether blushing is innate. He described that certain actions that express emotions are the result of the nature of the nervous system. In this context, he considered blushing to be a peculiar and human form of expression. Darwin explained blushing by the dilatation of the blood vessels in the face due to mental excitement. He emphasised that blushing cannot be influenced voluntarily and is often triggered by emotions such as fear, joy or anger. Darwin also argued that the heart is sensitive to mental arousal and that there is a reciprocal influence between the heart and the brain. The vasomotor system, which regulates the dilatation and constriction of blood vessels, is also influenced by mental arousal, which is particularly evident in blushing. The blushing often starts on the face and spreads to the ears and neck. Although the whole body can tingle and become

hot, in most cases only the face, neck and ears are affected. Darwin considered blushing to be a symptom of shame and suggested that the awareness that others are thinking about us is the central trigger of blushing. Attention focused on a particular part of the body affects the contraction of the small arteries of those parts of the body and causes vasodilation of the capillaries in the face, which causes blushing.

Darwin found no differences in the ability to blush between different cultures. He emphasised that blushing is closely related to attention to certain parts of the body, which played an important role in human history. H. I. Schou (1937) <sup>[51]</sup> extended these theories and argued that the increased metabolism during the emotions that trigger blushing leads to a rise in temperature. The body tries to keep the temperature constant and regulates the release of heat from uncovered parts of the body. The blushing could therefore be an attempt by the body to release excess heat.

Several clinical observations indicate that blushing decreases with age, possibly due to attrition of beta-adrenergic receptors over time. Blushing is often associated with fear or embarrassment, although the physiological responses to these emotions are complex. Overall, research shows that blushing is a complex phenomenon that is influenced by several factors.

Some of Darwin's findings still hold today, almost 150 years later. Mental arousal can influence the vasomotor system by activating the sympathetic nervous system. Flushing is present in all humans and has a heritable component. It typically manifests on the face, ears and neck. However, blushing is not present in infants because it does not appear until the child develops self-awareness (Darwin, 1890) <sup>[9]</sup>. The mechanisms that trigger blushing are similar to those of thermoregulation. During physical exertion or fever, blood is shifted from the centre of the body to the periphery, causing the capillaries under the skin to dilate. This allows increased blood flow and cooling under the skin. The blood then returns to the core of the body and the body temperature normalises (Härtling, 2015) <sup>[34, 36]</sup>. Social or psychological blushing, also known as "blushing", is also triggered by similar mechanisms, although they are not yet fully understood. Facial veins have been found to have beta-adrenoreceptors and intrinsic tone that mediate vasodilation (Leary *et al.*, 1992) <sup>[41]</sup>. Therefore, administration of  $\beta$ -blockers may be considered to treat flushing during the phase of vasodilation. Prostaglandins also appear to be involved in the flushing response. Local application of ibuprofen, which blocks the formation of prostaglandins, reduced flushing on the cheek (Jadresic, 2016) <sup>[39]</sup>. Psychological stress triggers the release of adrenaline into the bloodstream, causing blood vessels in the face and other parts of the body to dilate. This is thought to optimise the release of heat into the environment. Administration of the  $\beta$ -blocker propranolol has been shown to reduce flushing at the site of administration (Drummond *et al.*, 2020) <sup>[21, 27]</sup>.

### Psychology of blushing over time

In his work "The Expression of the Emotions in Man and Animals" (1890), Charles Darwin explored the phenomenon of blushing and its connection with self-attention. He postulated that shame, shyness and modesty are states that trigger blushing and that self-attention is the central element. Praise or blame of others influences blushing, with derogatory remarks triggering blushing more readily.

Darwin observed gender differences and found that women are more sensitive about their outward appearance and blush more often than men, especially older women compared to men. Shyness is closely related to fear, while modesty implies humility. Blushing arises from considering others' opinions about our appearance or behaviour, even in the absence of others, when we think about their thoughts. Blushing is thus seen as an expression of introspection and consideration of the opinions of others.

Psychoanalysis regarded blushing as a symptom of shame. An article by Feldmann from 1922 <sup>[29]</sup> described blushing with all its psychodynamic facets on the basis of a patient example. The patient suffered from erythrophobia, in which the blushing was associated with a beauty complex, self-esteem problems, exhibitionism and sexual conflicts. Feldmann interpreted the blushing as a conversion of libidinous arousal and identified Freudian penile anxiety and castration anxiety as primary causes of shame. Another case study by T. Benedek in 1925 <sup>[6]</sup> confirmed the link between blushing and genital arousal. The patient blushed in the presence of people close to her and felt ashamed about her mother. The analysis showed that the unresolved Oedipus complex and castration anxiety could be seen as causes of the symptomatology. In summary, psychoanalytic research considered blushing as an expression of shame and conversion of libidinous arousal. It was related to sexual conflicts, self-esteem problems and the transition from ego libido to object libido during puberty. Research on blushing was expanded by other theories in 1932 and 1940. Nunberg emphasised the role of blushing in shame and postulated that shame was a reaction against exhibitionism. The fear of blushing was a reaction to the repressed desire to show the genitalia, but this desire went hand in hand with castration anxiety. The psychoanalyst Bergler emphasises a different idea about exhibitionist desires. He emphasises that erythrophobia serves as a defence mechanism against latent exhibitionism. In other words, the intense fear of being seen with a reddened face prevents the exhibitionist impulse. In a sense, this fear functions as a moral justification to ward off even more taboo voyeuristic inclinations that are considered oral. Thus, erythrophobia can be said to "mask" exhibitionism in a socially acceptable yet shameful way. These patients perceive looking as a variant of oral devouring. Early psychoanalysts had the idea that blushing may express an unconscious tendency to submit and represent a need to be taken, seen or possibly overpowered as a sexual object. S. Feldmann expanded on these ideas in 1940, defining the age at which blushing becomes possible. He described avoidance strategies of those affected and identified fear of negative evaluation and feelings of inferiority as other aspects of blushing. Feldmann explained that blushing is due to strong genital maturation, sexual and social trauma of the face and general social trauma. Blushing, he said, is closely related to shameful feelings and the transition from ego libido to object libido during puberty. In 1966, Polheim described erythrophobia as a disorder of the ability to relate. He emphasised the importance of identification with the mother's breast and narcissistic mortification in the development of erythrophobia. Polheim explained that the isolation and symptoms of erythrophobia develop when the ability to relate is first intensely appealed to. Polheim blamed the isolation and withdrawal on the suppression of autonomy by a dominant parent. The tabooing of sexuality in upbringing



leads to a repressed and isolated way of life, which leads to self-insecurity. The blushing was interpreted as the expression of an attempt to break through the isolation and enter into real relationships.

In 1971, F. Karch developed a new theory of blushing and identified five characteristic features of blushing that must be considered in a comprehensive theory. He emphasised the need for a theory that takes into account the universality of blushing as well as gender and age differences and the social dimension of blushing. In 1990, Wurmser published his work "The Mask of Shame", in which he described the content of shame and emphasised that shame represents a fear of loss of love and the loss of object. He explained the relationship between shame, alienation and the psychic instances superego and id. Crozier published the book "Shyness and Embarrassment" and considered blushing as a signal of shame and an act of submission. He explained that blushing has a communicative function and acts as a non-verbal gesture of apology. In summary, erythrophobia is considered a subsyndrome of social phobia, and blushing is often associated with social anxiety. It has a communicative function that may indicate shame and self-insecurity. Self-focused attention plays an important role in blushing and can lead to a vicious cycle in which the belief to blush becomes a self-fulfilling prophecy. Behavioural therapy interventions with attention training can be helpful for erythrophobia.

Blushing can occur in the context of various emotions, including shame, embarrassment, guilt, pride, joy, modesty, anger or shyness. This can be triggered by attention to oneself, talking about intimate things and self-awareness (Härtling, 2015)<sup>[34, 36]</sup>. Of particular note is social attention, which can be undesirable as it can trigger worries about others' judgement and self-presentation, ultimately leading to social anxiety and blushing (Leary *et al.* 1992)<sup>[41]</sup>. Blushing, in the context of shame, has a communicative function in social interactions, as it can act as a non-verbal apology in explicit situations, aimed at preventing aggression (de Jong *et al.*, 2003)<sup>[13]</sup>. It is also associated with shyness and modesty, as in both cases there is a fear of not meeting certain expectations (Castelfranchi & Poggi, 1990)<sup>[8]</sup>. The diagnosis of pathological blushing is absent from current diagnostic manuals, although erythrophobia is associated with social anxiety disorder. According to ICD-10, social anxiety disorder manifests with bodily symptoms such as sweating, trembling, urination, nausea or blushing. Some patients report that one of these physical symptoms is their main symptom, which is why erythrophobics fall into the category of social phobia. However, there are two forms of erythrophobia: one in which the fear of blushing is one symptom among many in social anxiety disorder, and another in which the fear of blushing is exclusive. These differences have led to discussions about whether erythrophobia should be considered a subtype of social anxiety disorder or a diagnosis in its own right (Pelissolo *et al.*, 2012)<sup>[47]</sup>.

## Discussion

In this literature review, a comprehensive overview of physiological as well as psychological research on blushing from 1900 until today was given. Psychodynamic and behavioural concepts were compared and current research findings were reconciled with psychodynamic theories and concepts of shame.

A central difference between the psychodynamic and behavioural approaches lies in the approach. Psychodynamic, insight-oriented methods focus on clarifying and tracing psychopathology by uncovering the patient's unconscious conflicts and personal developmental history. Behavioural therapy, on the other hand, focuses on changing dysfunctional behavioural patterns and cognitions to reduce distress. In psychoanalytic literature, blushing is classified as a conversion symptom. A libidinous, genital arousal is warded off due to castration anxiety and manifests as blushing of the face. Blushing is seen as symbolic of an erection of the penis or clitoris or as a substitute for onanism. Voyeuristic and exhibitionistic urges are also suspected behind blushing. The behavioural therapy view sees blushing as a psychosocial response to various emotions, such as embarrassment, guilt, pride, shame, modesty, shyness, anger or pleasure. It can be triggered by talking about intimate things, increased self-attention and being the unwanted centre of attention. Both perspectives see blushing as a form of social communication. It can serve as an appeasement signal to inhibit aggression in social interactions or act as an act of submission and apology gesture. Current research findings show a strong link between blushing and the fear of blushing and social anxiety disorder. This could be consistent with the shame underlying blushing playing a central role and a fear of negative evaluation by others.

According to the behavioural therapist S. Härtling (2015)<sup>[34, 36]</sup>, blushing appears from about the age of three. From this age, it is assumed that the child is aware of itself (Darwin, 1890)<sup>[9]</sup>. Psychoanalytic authors also assume that children begin to blush between the ages of three and six. According to psychodynamic understanding, however, children begin to blush during this period because they reach the genital phase of their psychosexual development, which is considered a prerequisite for libidinous blushing. Moreover, this is the time of superego and ego-ideal emergence and the time from which children are expected to suppress their polymorphously perverse, genital, voyeuristic and exhibitionistic urges (Feldmann, 1960)<sup>[31]</sup>.

About the integration of current findings into psychoanalytic shame theories, it must be noted that the major differences between psychoanalysis and behaviour therapy and physiological research have made this task very challenging. The lack of compatibility of research findings has made it difficult to identify points of contact between psychoanalytic shame theories and current findings from behavioural therapy and physiological research. This is partly because the behavioural therapy literature makes no reference to the psychodynamic concepts of blushing and partly because psychoanalysis has no recent articles on the subject of blushing. So far, there have been no attempts to integrate the two fields of research. A further and perhaps all-encompassing attempt to integrate behavioural therapy and psychoanalytic concepts can be considered as an object of future research efforts. With the help of our case study, a cross-school concept could have great success. For example, it could help Ms. C. to first learn ways of dealing with and relaxing within the framework of classical behavioural therapy, in order to then be able to confront and work through the possible unconsciously effective conflicts.

Two other aspects could be investigated in future research: In most people, blushing is confined to the face, ears, neck and upper part of the chest. Darwin (1890)<sup>[9]</sup> claims that

blushing can also occur on the abdomen and arms, especially in certain indigenous peoples who usually show themselves naked. This variability of the blushing region depending on the clothing culture needs to be further investigated. Adherents of naturism could serve as an interesting sample here. Another possibility for future research in psychophysiology is the question of whether correlations exist between the tendency to flush and that to blush. Possibly there is a general tendency to blush, whether it is a blush due to physical activity etc. or a blush due to shame, embarrassment or the like. Possibly there is a general vulnerability to vasodilation of the facial capillaries which may partly explain blushing in the context of emotions such as shame.

In summary, blushing makes use of both physiological and psychological components. It possibly serves as a communication signal and is closely related to shame and social anxiety. Integrating current research findings with psychodynamic concepts of shame suggests that fear of negative evaluation by others may be a common core of these phenomena.

### Limitations

Finally, both the literature consulted and the present article have limitations. Darwin (1890)<sup>[9]</sup> stated that people who are blind from birth are also affected by blushing. They are not aware of it at the beginning of their lives when they are observed by other people. However, education provides this awareness by pointing out to the blind person in interaction that he or she is currently in focus. According to Darwin, the awareness thus gained that the gaze of the other is upon oneself greatly increases the blind person's tendency to blush (Darwin, 1890)<sup>[9]</sup>. If we assume that Darwin is correct (which would be another object of study), then scopophilia, the voyeuristic drive component in blushing, cited by Feldmann (1940)<sup>[30]</sup> and Bergler (1944)<sup>[7]</sup> cannot be a necessary condition.

Another limitation relates to the topicality of psychodynamic theories and concepts. Since psychoanalytic research cannot compete with quantitative studies of individual theories compared to the school of behavioural therapy, it has come under criticism. However, psychoanalysis continues to provide an effective framework for exploring our soul life, which is supported by empirical evidence of effectiveness (Shedler, 2011)<sup>[52]</sup>.

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