

# Hereditary prosopagnosia in self reports

<sup>1</sup>Ingo Kennerknecht

<sup>2</sup>Ulrike Trostmann

*<sup>1</sup>Institute of Human Genetics, Westfälische Wilhelms - Universität, Münster, Germany*

*Correspondence: kennerk@uni-muenster.de*

*<sup>2</sup>D-87629 Füssen, Jörg Lederer Str. 3, Germany*

[Electronic ed. 2022, Münster: Westfälische Wilhelms-Universität] DOI: 10.17879/05099603420

(German version see [29])

## Summary

People who suffer from prosopagnosia, syn. face blindness are unable to recognize others solely by their face. Reports by those affected picture the problematic nature from very different perspectives in every day life. Not only the variety, but most notably the wide resemblance of the symptoms is documented. The generation of numerous compensatory strategies, the many typical anecdotes, and the frequent deficiency of inner images concordantly describe the subjective sensibility of prosopagnosia.

**Key words:** prosopagnosia, face blindness, hereditary prosopagnosia, congenital prosopagnosia, acquired prosopagnosia, syndromal prosopagnosia

## Introduction

Prosopagnosia or face blindness is defined as the insufficiency to recognize another person solely by the face. Until to the beginning of the year 2006 this cognitive deficit was considered to be a very seldom phenomenon, usually acquired, for instance, after brain trauma, ischemic stroke or encephalitis. In 2006 [1] we could demonstrate for the first time that the acquired form is quite uncommon in fact, whereas the congenital form presenting a more than 2% prevalence ranks among the most frequent cognitive abnormalities worldwide [2,3, reviews 4,5,6].

Among almost all persons showing the congenital form of prosopagnosia additional first-degree relatives affected are to be found. But it has to be looked for explicitly since this cognitive deficiency is hardly communicated within the family. Due to the high familiarity we have coined the term hereditary prosopagnosia (HPA) for the non-acquired form [7, <https://www.omim.org/entry/610382> (access 6.6.2021)], purporting to be genetically determined and referring to etiology. However, a generally accepted term does not exist [1]. Instead, the terms congenital [4], developmental conditions [8] and childhood prosopagnosia [9] are used synonymously, and only the onset of its occurrence or its pathophysiology are described without relating it to etiology. Most often prosopagnosia is monosymptomatic, yet it can also proceed syndromal as a symptom within the context of a syndrome, for instance in the case of Asperger syndrome [10], Capgras syndrome [11,12] or Möbius sequence [13].

The worldwide frequency of prosopagnosia notwithstanding, this cognitive deficiency is practically unknown. Supposedly this has to do with the fact that the symptomatology can be fairly well covered up. However, in every-day life inconvenient situations repeatedly arise. The personal reports, all from the German-speaking region, were spontaneously sent and might be helpful. The affected individuals came across the topic by chance, e.g. in the internet on our homepage ([www.prosopagnosia.de](http://www.prosopagnosia.de)), or on account of newspaper articles and tv-reports – in particular by Günter Jauch, sternTV magazine, *Gesichtsblindheit*, 2.12.2009.

Objective of this paper is to describe the wide range of deficient face recognition based on personal reports.

The self-reports show that the affected individuals exhibit at least some of the following symptoms, which we consider to be diagnostic [3,10,16-18]

- (1) **Uncertainty in face recognition:** The leading symptom reported by affected people is the irritating lack of confidence in the recognition of faces and the inability to memorize and recognize new faces easily. Other symptoms include the inability to recognize familiar people seen unexpectedly or in crowded places, confusing unknown persons with familiar persons. Anecdotal mentioning of none-recognition of people was not taken as a positive criterion however.
- (2) Significantly **prolonged recognition time** of faces.
- (3) Development of **compensatory strategies** as indicating a longstanding and frequent problem: (i) Adaptive behaviour to cope with the impairment of face recognition; persons with prosopagnosia rely heavily upon other personal characteristics such as voice, gait, clothing, etc.. (ii) Avoidance behaviour: avoidance of places where other people could be met unexpectedly, being first to arrive for an appointment in a restaurant, or looking absent minded whenever walking in the street; (iii) Giving explanations such as "Sorry, I have forgotten my glasses" or "I was absent minded".
- (4) Repeated **anecdotal stories** of events such as having overlooked familiar people were found to be extremely helpful. Persons with prosopagnosia also typically have problems in following the actors in a movie especially when the scenes change frequently or the characters are similar (e.g., mixing up different inspectors in detective/crime films).

All senders were diagnosed with prosopagnosia at least by means of one semi-structured interview which served us as a sufficient diagnostic criterion. We could show that in subsequent neurophysiological and functional tests in 83 out of 84 probands the diagnosis of prosopagnosia could be confirmed:

The designated persons with prosopagnosia - selected in these studies by our screening questionnaires and diagnostic interviews - always contrasted to control groups when further tested by neuropsychological and functional testing for face recognition skills:

- (i) **Fifteen out of 16 participants** selected by the semi-structured interview showed significant deficits in the combined neuro-psychological test results on short-term and long-term recognition of faces. Their scores in the questionnaire-based self-assessment were significantly correlated with the overall experimental test of face recognition performance and there was no overlap with the group of persons with prosopagnosia and control individuals [16,17].
- (ii) In a distinct participant group all **21 designated persons** with prosopagnosia performed the Cambridge Face Memory Test (CFMT, [19]) significantly poorer than the control group [20,21].
- (iii) **Sixteen persons** with prosopagnosia taken from the study by Esins et al. [22], all showed significant differences in performance of all face tests as compared to a control group, while both groups did not differ in the object tests.
- (iv) **All six persons** preselected for prosopagnosia by the 2-step procedure by Verfaillie et al. [23] had impaired face recognition abilities on the Benton face recognition task compared to controls. They also showed impaired holistic processing as assessed with a gaze contingent window and mask paradigm.
- (v) **Twenty five participants** with prosopagnosia - selected like in (iv) - showed in contrast to the controls alterations of neural coding in the fusiform face area when studied by MRI [27]

Taken together, the rate of false positive persons with prosopagnosia should be low in this two-step procedure and is not expected to significantly influence the established prevalence rate.

The reports are not revised. Thus, they convey the subjective, authentic impression of those affected. Subject to personal perception, the dimension or severity of the deficiency is very diverse adducing good reasons to assume a normal distribution of the ability of face recognitions. The upper end of the scale shows the super-recognizers [24] who recognize a person after a one-time contact (e.g. at a gas station) even years later (not analyzed here). At the lower end of the scale the poor recognizers can be found (analyzed here) with smooth transition to the prosopagnostics, who, in extreme cases, do not recognize their own face [5].

The congruence between the anecdotes reported and our worldwide inquiries conducted in very different cultural population groups e.g. in China, on the island of Nias/Indonesia or with indigenous peoples of the Altiplano in the north of Peru [3] is remarkable. Time and again the media report on it, and a growing number of well-known people confess to their prosopagnosia [25]. As a matter of fact, Wikipedia has created its own site: [https://wikipedia.org/wiki/Category:People\\_with\\_prosopagnosia](https://wikipedia.org/wiki/Category:People_with_prosopagnosia) (access 18.3.21, date of page creation: August 14<sup>th</sup> 2010).

## Conclusions

Explicit asking for information on compensatory strategies and typical anecdotes already suggest the diagnosis of prosopagnosia. Further neuropsychological and functional tests characterize the anomaly (pathophysiology) and severity of a recognition deficit of faces, but they hardly impact on the initial diagnosis. Furthermore, the general absence of inner images is typical, at least that of faces. Prosopagnosia is mostly monosymptomatic i.e. without concomitant agnosias. But a syndromal form e.g. as part of the Asperger syndrome, of the attention deficit hyperactivity disorder (ADHS) or associated with zooagnosia is also known [26]. With more than 10% of prosopagnosics in this group of probands, their prevalence is five times as much than in the general population [28].

## Self reports

### Prosopagnosia

K.B., female, 20 years

*I can very well follow movies with actors whom I have already seen in several movies and who do not change their appearance much during the movie or between individual movies. Otherwise it is the voice which becomes more decisive for me in order to recognize the character.*

*I have only a few friends. When I know that they will be in front of the university's lecture hall every morning, then I go to meet them there knowing it is them. Even if there is a noticeable change in their appearance or when they come towards me, I can recognize them well, whereas the latter has more to do with their movement and gait. In other circumstances I do not recognize them. I am often asked why I do not greet them back or why I simply pass by.*

*I orientate myself more by unusual things in and around the face, like particular jewelry, birthmarks, hair, eye-catching glasses (pattern, color, shape), than by the mere face.*

*When I meet someone somewhere unexpectedly, it takes me a long time to recognize the person. However, it is much easier if I expect someone to be at a certain place at a certain time knowing that the person to meet also expects me, and approaches me by smiling, waving etc.*

*Within my family frequently tensions arose when I passed by them without greeting. Two examples: When all of my family walked by on the other side of a one-lane road and I didn't recognize them. Once my brothers run past me by half a meter only and I didn't recognize them. In the house, though, I recognize everyone immediately, because I know they live there and it's no one else. In addition, there are also things like gait, hair, and clothing.*

F.M., female, 30 years

*People often greet me or speak to me who I cannot really place. In larger crowds I find it very difficult to make out friends or acquaintances. When someone asks me to describe another person, I usually relate to height, hair color and possibly glasses.*

*Until I read more about prosopagnosia about a year ago (rather by accident), I accepted the condition as lack of concentration or scatterbrainedness, because once I get to know people better, I recognize them even in fortuitous encounters. Actually, I have been able to live with this situation quite well so far, albeit sometimes somewhat unpleasant, for this is how it has been all my life.*

*Lately, I feel relieved by the thought that this condition has nothing to do with bad memory.*

B.G., female, 42 years

*It would be a great relief for all affected parties if prosopagnosia was more widely known. It can become laborious to explain the facts to some extent. Usually a counterpart immediately tries to reassure by saying "I have that, too, I can never remember the names either." Then it always troublesome to explain that you cannot remember the names, but the people (in terms of appearance). In daily life, sometimes this can be very stressful. If one moves or has a job in which one has to interact with many different people, but finally is confident of recognizing them after years (hospital, school, politics etc.), then any change can become a strong handicap irritating affected persons and their counterparts and slowing down normal careers considerably.*

*Just two days ago I had an interesting experience: Three years from now a huge song contest will take place in our country, at which thousands of singers are to participate. Since I am involved in the local women's choir, I had to attend a preparatory meeting. Also present at this meeting were three people from the national level of the "singing hierarchy" whom I already knew from several meetings. When I entered the room and looked, I did not*

notice them (I did not recognize them). It was only when the main speaker greeted them and announced their names that I "saw them."

S.H., female, 50 years

*I came up with a rather vivid comparison of what prosopagnosia feels like.*

*When you get to know someone, you see the face as a whole, but you do not succeed in memorizing this image as a whole. At best, one remembers details, such as a particular mouth shape, nose, hairstyle or expression (look in one's eyes). Mostly or only such features are somehow distinctive.*

*However, these details are not particularly suitable to identify a person immediately and without any doubt at a next encounter. To lay emphasis on "immediately" - as described, means that it may "dawn" after some time. The inner picture then becomes clearer and clearer, the face appears more and more familiar. For spontaneous meetings this late recognition is of no use, unfortunately. And an emphasis on "without a doubt" - expresses that the individual features are just not as clear as an overall picture, therefore one often confuses people of a similar type or is not sure whether someone is Mr. A or maybe Mr. B.*

*For a better understanding you can compare it to a finished puzzle which is shown to you for a few seconds only. Thereafter 80 to 90 percent of the pieces will be taken away. Since the remaining pieces do not make that much sense on their own, details are also easily forgotten. You can try to actively "learn" them, but ~~still~~, the next time you meet you have only a few puzzle pieces to match and not the whole picture.*

*This came to my mind while listening to the radio, when Madonna sang and I thought to myself that I actually recognize Madonna only by the gap between her teeth.*

D.B., male

*[. . .] I do not recognize people on a second encounter. For example, in order to be able to recognize a new employee in the street, I need to see him every day for about two weeks. Yet, one year later I would probably not recognize this person, not even when being addressed by him/her. But if this person introduces him-/herself to me after I had to do with him/her for a longer time, then I would recognize him/her, otherwise not even then. However, people who I have known for years I would also recognize years later. Do I possibly suffer from prosopagnosia? To my knowledge, the description does not fit exactly. If I come to know somebody and meet him again one hour later, I naturally recognize the person, but would not do so one week later. In such a case, I mostly recognize a person only if I know for sure that it is him/her. At such moment, I think to myself that I can be sure to have seen this person before. Just today, this happened to me with a workman whom I have seen twice already. I surely would not have recognized him in the street. But had he addressed me he would have seemed familiar to me particularly after having seen him twice during the past weeks.*

*Just yet, I do not even know anymore how he looked like and would not recognize him in the street. I only remember him having short hair, if not even a half-bald head. He wore glasses and was accompanied by a pudgy woman carrying a little dog in her arms. She appeared a bit too old for him, and seemed to be insecure.*

*After knowing people for a longer period of time I remember their faces years-long. In today's SternTV show I have learned that almost all people memorize faces at a first encounter and recognize them later, even from the crowd. Is that true? But on the other hand, I am able to read a lot from finest facial traits of a known person or stranger and react accordingly. This helps me along in my job and amazes my colleagues over and over. Trains of thought can almost always be read out. Is that something so special?*

M.B., male

*[. . .] Short and precise: I think I may "suffer" from prosopagnosia. Where can I have it signed off to finally be clear about it, and to be able to explain to others that I am NOT arrogant because I do not greet. It once happened to me that I found myself in the wrong lecture which I realized only by the contents lectured. In the supermarket as a child I did not look for my mother but for her eye-catching jacket, etc. I could give many more examples . . . [ . . . ].*

A.E., female

[. . .] The TV show by Günther Jauch (Annotation: SternTV, *Gesichtsblindheit*. 2.12.2009) reported on prosopagnosia. Until to this day I did not know that it is a disease. I thought it had always to do with me, that I were absentminded and had a deficiency to recognize someone. But in some way I am glad not to be alone with it (my sister has the same problem). The problem is, that living in a village and sometimes do not recognize or only vaguely recognize people, I am inevitably thought of as being conceited etc., etc. – I just do not greet them. But it can really be difficult facing somebody – and nothing. I then think somehow and somewhere – but nothing. It is not easy, really. My son is 10 years old, but until today I cannot judge whether or not he has the same deficiency. [. . .].

F.M., 30 years

[. . .]. It is already a while ago since I have read about it for the first time. However, I realize that this issue keeps playing on my mind. I am often greeted or addressed by people but cannot get a read on them. Within a crowd of people, I find it difficult to make out friends or acquaintances within a crowd of people. If someone asks me to describe another person, I mostly rest on height, hair color and perhaps glasses. I was rather by chance, a year ago, that I have read more about more about prosopagnosia. Until to that moment, I have shrugged it off as my own lack of concentration and muddle headedness, because once I know someone better then I recognize him also at accidental meetings. Up to this point I could quite well live with it, even with its occasionally awkward situations, for I do not know any other my whole lifetime. But the idea that it has not necessarily to do with my poor memory, does not get out of my head lately. [. . .].

M.G., female

[. . .]. I think that I have prosopagnosia and find that there are two sides to the problem of “blindness of the face“. On TV (annotation: sternTV, *prosopagnosia*, 2.12.2009) emphasis was only put on the non-recognition of faces and associated problems. But I also suffer from being unable to REMEMBER anybody. Not one single face is memorized. I do not know how my parents, my colleagues or close friends look like. I really cannot remember ANYONE. After having met with a person who is important to me, I try to envision her/his face, again and again. It only works out vaguely and only for a short time, as if my short-term memory could memorize faces briefly only. But it would not last long, then it is gone, leaves me frustrated and afraid of not being able to recognize the person the next time. It compares to a highly complicated mathematical formula in my head which I cannot solve.

If I do not “practice memorizing“ then the face will be out of my head one minute later already. But I can remember rough details, for example hair or a pair of glasses. After I have “studied“ a person for a while, I can handle the description of e.g. straight, medium-length, lightish hair. It is like studying vocabularies. For example, if I think of Claudia I briefly and roughly see her bodily frame. Regarding her head it is not blurred, no, it is simply not there. It compares to the “Void“ in the “Never ending Story“. And then the words “straight, lightish, medium-length hair“ come up. Uuh-huh!

People recognize each other by looking each other in the face. Therefore it would be rather impolite to first look downward (on to the shoes which I can well remember, just as the clothing style, which keeps changing, however). If I encounter people it is always like seeing them for the first time in my life. Then I think “how interesting, is this what Christiane looks like?“ I recognize people by their voice (!) and absolutely by their way of walking and moving respectively out of a crowd of hundreds of people. But if somebody just stands there without saying anything I stand no chance.

In everyday life I use diverse techniques for recognizing people. For example, at work I recognize my colleagues by their car. I see the yellow Twingo, “ah, Jasmin is in the office“. I have no idea what Jasmin looks like, but the name helps, if necessary. It gets difficult if they park their cars somewhere else, because two of my colleagues do not have a car. Consequently, no car on the parking lot means it is either Sandra or Thomas. So simple, man or woman. But if I recognize by the voice that it is Sabine, then I am confused and indignant and mostly ask “Where in the world have YOU parked?“

At Christmas parties or meetings it gets really bad. Then people dress differently. Since I never know if the snatches I have in my head either match the person concerned or the person seated next to me, I prefer to keep silent. This is the reason why I never voluntarily join lunches with my colleagues or works outings. If I have to go to such event it is very helpful for me if I meet with somebody beforehand who then leads the way to the table in the restaurant. It is „pure stress“ for me. In such case, I act by a method of selection: a group, medium age, more women than men. Only after recognizing a voice I know: “Now, I guessed right.“

Otherwise, the following method of selection helps: Visit to my grandmother in the hospital. Two beds in the room, both of them women, both of them mute, both of them motionless in their beds. "Oh, one of them is not that old yet. So the other one may be my grandmother, hopefully." Yet, it has happened to me that I found myself sitting at the wrong bedside holding a stranger's hand. Ever since I can only relax if I find a medical chart with the correct name on it. The deficiency to recognize faces hampers everyday life. For example, shopping in a super market. When I see people I always ponder on knowing them or not and start feeling internal stress. I cannot solve the problem unless the person concerned addresses me or walks in front of me. But communication between humans does not function this way. People look at each other, then recognition flashes through their minds followed by a natural reaction. As for me, I look at people, get afraid and quickly look the other way. This hurts people and puts me very much under pressure. Therefore, I often envision a person and his or her characteristics before I may possibly encounter him or her. I then watch for these characteristics, but can only relax when I do not see them.

I do not recognize faces in my dreams either. That means, I dream of people I am on friendly terms with, but I do not see them. That compares with walking next to somebody and always looking down on the ground. I notice and know that it is Angela, for instance, who walks by my side, but I do not see her. Before falling asleep I often practice "to recognize faces". So far, I was convinced to manage eventually, because I wish so much for it to happen.

I am so glad to have found your site. It is so relieving to know that it is not my fault or a daily failure. I never grasped how delinquents in crime movies or novels can be convicted through confrontation of persons. From my view it is not only the most doubtful method in the world, but also has value as evidence in court!! This I now understand with a smile.

I still respond stubbornly and defiantly to the fact that this deficiency may not be treatable, because I am convinced that I will improve.

When I have practiced a lot and see a photo of a known person knowing it is him or her (features, method of selection or caption) then the image of this person briefly flashes through my mind. It does not even last a second, but it is there. Therefore I try to make a mental note of photos of people, to first remember them (very difficult, a real top performance of my brain, which I can rarely and briefly cope with). But if I manage I will succeed in doing the second step at one time or another.

It is good to know that there are others who are familiar with this way of "running the gauntlet" in everyday life, and that I do not have to take this deficiency so badly any longer. Now I can say to a friend who got offended or hurt: "I am sorry, but I suffer from face blindness. I really like you, I simply did not recognize you." [ . . . ].

J.G., female

[ . . . ]. My face blindness is innate. A deficiency which I share with my father and one of my brothers. I know very well myself about these sometimes awkward situations reported: animated conversations with totally unknown people whom I believe to know; a complete blackout if a known person appears unexpectedly, etc. Funnily enough, but I do not have this problem with animals. My compensatory mechanisms function quite well most of the time, and blackouts I bear with a sense of humor. This way I have worked as an HR manager in a company of 500 employees and have recognized most of them within the professional environment, but not on a Saturday in the pedestrian mall ☺ [ . . . ].

J.H., female, (letter 1)

Since a few years I know that I am probably affected myself. I will give three examples out of numerous ones in my life:

I am teacher at a large school center. During recess supervision together with a colleague, I catch a student smoking. I want to take the student to the secretary's office in order to have the catalog of measures rattle off. But the student runs away from me. It is found out that he has given a wrong name. My colleague thinks that we should pass through the classes and try to identify the student. Since this undertaking seemed unpromising to me I asked: "And how do you want to recognize him still?" He replied "Well, I have seen him!"

During my 2 years of teacher training, I sat next to a very nice colleague in the staff room every day. A few times, we met in the afternoons and got along well. After I got a new position, he helped me set my kitchen within two days of painstaking work. A few years later at a concert I am warmly addressed by a man who appears to be completely unknown man to me. I ask for his name. Thereafter I can correlate the appearance with the memory of a photo of him in my photo album. In comparison to the photo he has not changed appearance.

At school, with the help of photos and doing a lot of repetitions, I laboriously memorize the names of my students who I see daily. One hour a week I also teach in two other classes. Even after two years I am not able but to

*confidently address only a small number of students of conspicuous appearance. Since the children change their appearance within weeks when growing older, the photos I always take during the first hour do not help me a lot, however. I can tell by the names if it is an efficient or academically weak student and what kind of problems they have, but I just cannot assign it to the person.*

*Had I known earlier of this deficiency I would possibly have chosen a different profession. I like to be a teacher, but it often makes my work difficult. Neither it is pleasant for the students if I do not know their names Presumably my father was affected as well. My mother always complained of him that he never recognized people who shared the pew with him every Sunday. He also was a teacher and consistently used seating charts. He kept asserting that it was unlikely to remember names and faces of students who one sees once a week only as it is in his case. [ . . . ].*

J.H., female, (letter 2)

*[ . . . ]. It is most certain that my late father suffered from face blindness. It may be of interest for you what I know about my three siblings. I sent all three of them a link of your homepage and a photo from the internet showing nine allegedly known faces without any hair. I had not recognized anybody although I continued asserting that Mrs. Merkel is the politician who I would always recognize even in caricatures. When I saw the solution I was able to identify Barak Obama by his complexion and Mrs. Merkel by her chubby cheeks. My two daughters (26 and 28 yrs.) recognized four or five persons straight away. Apparently, my sister R. (55 years) is affected as well. She lives in Switzerland and has a passion for horses. Her reply:*

*Hallo, J.,*

*I have never heard of this before.*

*The faces in the test did not mean anything to me. However, this is not necessarily meaningful, since I seldom watch TV (may be three times a year) and "Swiss types" are more likely presented in the newspapers (if I take one in hand once in a while). I rather memorize people by their hairstyle, their voice or first and foremost by their way of moving. Colleagues who had cut or dyed their hair I did not recognize a priori; on the other hand did I recognize acquaintances only by their way of movement in the dark against a faint source of light. It is much easier for me to recognize horses ;).*

*The recognition of movements is easier for me than that of faces, which, I assume, results from the intensive preoccupation with the animals.*

*P.S. Sometimes I only barely recognize myself on photos unless I remember how I was dressed.*

*[ . . . ]. My sister M. (55 years, fraternal twin of R.) claimed that she was not affected. She had recognized Barak Obama and wondered not to have recognized Michael Jackson after the solution. Otherwise she did not recognize anybody else. She teaches musical instruments and believes that she could recognize her violin students (individual instructions) and mostly their parents also. But then she talked about her children's choir. She has been rehearsing for 6 weeks with 15 children. Photos she had taken at first did not help much, since one week later the girls wore barrettes or braids. Now each choir member carries a name chart. Boys are much more difficult to memorize, because they all seem to look the same, whereas the girls wear at least a different hairstyle. She defended the same thesis as my father once. That is to say that their faces cannot be memorized if the students are seen only once a week. When asking her if she has difficulties when watching a movie to recognize the woman in bed who suddenly wears her hair loosely, she replied that it would not be a problem for her. Then again she wonders why in older movies not a blond-haired and a dark-haired actor were chosen, because in such movies she often cannot distinguish between victim and delinquent. She would not remember not having recognized people, except for a recent encounter in the street with an acquaintance. Well, but this person wore a hat and a thick coat. We agreed that she might be affected as well, "but not as much as you". [ . . . ].*

*My brother (57 years), too, only recognized Barak Obama clearly. Many faces seemed familiar to him and he was able to match many names after the solution. Both his wife and son identified a good deal more persons. In conversation with him, he seemed less affected. He did not know of many of my difficulties, and the examples he cited such as not having recognized someone on one occasion seemed to be single cases and of little importance; for example, a more or less select group of people always attends the annual meeting of friends of old music. Despite seeing them only once a year he knows all of these people. This time a woman arrived whom he did not remember, but who presumably was there once in previous years. Also he cannot relate to the problems with movies. Only secondary roles which only briefly come on the scene can make him feel insecure sometimes. [ . . . ].*

Once again I mulled over your question about how it was as a child at school. I remember that in my first schoolyear a boy was killed in an accident on his way to school. We were told about by the teacher. I had me shown the place where he was seated. Until today I see the empty seat remembering that it was in second row on the left but contrary to my class mates at that time I could not at all remember that boy.

Once again I wish to thank you for the kind and informative talk which has evoked all sorts of memories and solved some puzzling experiences. Now I try to take my deficiency with a little bit more of a smile. Recently I could quite well entertain a party with it, whereupon also other guests came out with all kinds of interesting and in parts funny situations and deficiencies. Physicians among the guests seemed to have informed themselves via google, because all of the sudden they showed an increase of knowledge. This may be helpful for those affected.

In conclusion, my probably typical personal story which has opened up and is explained by the following: In 1992 my daughter stayed abroad in the USA. A half year later we went to visit her there. She was to pick us up at the airport together with her guest father. Now she told me that in an e-mail I had informed her of the clothes I would wear at which she was very surprised. I was certain she would need to identify me, since the people waiting at the arrival gate always watch closely the individual travelers step out while I would have to look around into a large crowd of people without recognizing her. We had not seen each other for half a year after all. Until today, when I am to pick up her "guest siblings" at that time from the airport, I am always a little worried whether I would still recognize them each time one year later. So far it has always worked out well. Fortunately they are rather distinctive. [...].

#### E.K., female

[. . .]. With the term prosopagnosia I have possibly found a name for my problem. I am a teacher, and each time I get a new class it is the same for me: all of the students look alike somehow. Just after I have learned that Arno is seated in the left row on the third place the seating order will be changed. I call up Arno, looking to the left side as always: Then I realize perhaps that he is not sitting there anymore and I am immediately stranded. However, at the end of the year I know that Arno was sitting to the left on the third place. Students of the lower grades find this quite funny and point me in the right direction just like: Gerrit: green watchband. I myself find it less funny if I say Varvara, receive a shaking of the head, but then remember Svenja after all.

I build mnemonics: green ear piece, green, hunt – not Diana, but Diane. Wherever Diane will be seated, I recognize her, the ear piece, . . .

If this description should be sufficient and suggests prosopagnosia then, apart from interested and kind facial expressions from a student or the parents as soon as they head my way, are there any other means which may facilitate social interaction without having to throw into the conversation sometime: "Now, I have to ask again, you are . . . ?"

#### F.K., female, 34 years

[. . .]. A while ago in a TV show I took notice of prosopagnosia. I have similar problems with identifying a person, but I do not perceive it to the extent as was demonstrated by the exemplary family on TV.

After I have more profoundly concerned myself with it in the internet reading that there is no mild "form of prosopagnosia", I feel completely insecure now. Either you suffer from it or not. I am able to recognize people – however, I cannot find out for myself if I only "link" it to faces or unwittingly to other things.

It was the TV show which struck me that I myself may suffer from prosopagnosia, because I could very well sympathize with the situation. Before that time, I was often annoyed, that I had confused people or did not recognized them. But until now I always blamed my "bad memory" for it, just as other people may have a hard time to memorize dates of birth, names or telephone numbers (which adds to my problem on top of it). In fact, I always found it embarrassing, but took it for granted: „This is how it is!“

But contrary to the apparently "common" symptoms that is to fundamentally view somebody as a stranger, in my head I often associate a completely different image with the person concerned. Each time the effect surprises me anew

The owner of the stationery shop across the street serves as an example. Since six years, I have been visiting the shop more or less regularly, around one or two times a month. Each time I am astonished anew, because the owner behind the counter looks completely different than the image of her I have in my mind. Some time ago, this resulted in an embarrassing situation when asking her astonished about her new hairstyle – but she has been wearing her hair like this (very short) since years. I am sure that she has shoulder-length hair, but it is impossible for me to amend this incorrect information in my head and to correct my imaginary picture of her. Otherwise – and that is so awkward about it – I really do not recognize her if I come across her outside her store e.g. during shopping, because her hair looks "wrong". The problems of recognition, which I have usually, arise solely with



people who I do not see frequently or for the first time. I need to have a person seen repeatedly and best frequent in succession, in order to be able to memorize the characteristics of a face. But even then “mistakes” happen, because as “identifying code” I have memorized a “wrong” picture. By the way the same goes for my family practitioner by the way. I have been knowing him since six years, but in my head I have a different picture of him than what I see in reality. Naturally, in his office I recognize him immediately. But I have not yet paid attention to why I recognize him, although he looks different (or similar only) than in front of my inner eye. I have not (consciously) encountered him while shopping. He drives a very noticeable car. But it would certainly catch my eye if another male person would be sitting in the car (my family practitioner has grey hair and a “goatee”).

Regarding neighbors or “passing acquaintances” I could give you quite a few examples from my life which had me come up with the idea to suffer from face blindness as well. Also, I am one of them who furtively sound out their husband about the person he has just talked to, because this person does not mean anything to me – just happened the day before yesterday with the longtime companion of my neighbor.

However, in contrast to this is the recognition of my family. I straightaway recognize my children (5 and 6 years), my husband, my sister, my brother-in-law – all of them with whom I have a lot of contact (at least at close range). It can become problematic only in a larger crowd of people e.g. at a fair attendance, in the swimming pool or at the Christmas market. But these are situations where everyone may have confused his “own” people on one occasion. Therefore, for me this does not count as an indication of the disease.

But seeing my relatives from a distance can cause me little problems, which until now I always blamed on my eyesight (I suffer from corneal curvature which is compensated by glasses). My sister once approached me (without having expected her). I spotted the person on the bridge and by gait and build, I thought of my sister. But the jacket unsettled me, because on that day she wore a different one than usually. Only after she had come closer, approximately at 5 m distance from me, I recognized her eventually.

It was more for fun that I made a “test of recognition of faces” in the internet. It was about celebrities whose hair was “cut off”. I found the test as such amazing, because Ben Stiller for example - actually one of my favorite actors – I did not recognize at all. Others I mistook with each other (Jennifer Aniston with Sarah Jessica Parker, and Bill Clinton with Elvis Presley). During the testing 30 “celebrities” were shown to me altogether out of whom three I did not remember by their names. Ten out of them I either confused with each other or “recognized” them by their names not before the solution. This resulted in a rate of 63%. Now, do I suffer from a deficiency or am I simply forgetful (an insufficient eyesight can be excluded after a recent check-up at the ophthalmologist. My glasses turned out to be okay as well)? Sometimes I was imputed with the attributes “impolite” or “scatterbrained” which caused me to greet everyone on the street in my surroundings (especially here, at this place) for fear to offend someone whom I ought to recognize.

Meanwhile I tell people upfront that I have problems with recognizing face. This avoids unpleasant situations effectively. But I still would like to know whether it is a genetic disorder or can be attributed to another cause [ . . . ].

A.L., female

[ . . . ]. Since a while I have been knowing of the so-called face blindness, but have not further occupied myself with it. Yet, if I look closer into the texts on your website, I find them very impressive. [ . . . ]. Until now I could often compensate my lacking recollection of faces by looking for other distinguishing characteristics. However, this did not save me from the one or other unpleasant situation. It is particularly difficult for me to identify people from other culture complexes like Africa or Asia. But also the recognition of family members on older photos can become problematic. In my mind I cannot even reconstruct my own face, and if so then only in parts which cannot be assembled to a whole picture yet. The same goes for my friends and acquaintances in whom I recognize single characteristics only from my memory, but no faces. According to my mother’s account she cannot “well recognize faces either”, but she thinks that it is more distinct in my case. The lack of this ability is simply blamed on the fact that memorizing faces is just not possible. On the other hand it would be reassuring to know that it is about a disorder [ . . . ].

K.N., female

[ . . . ]. It would be interesting for me to know if already young children could be tested for prosopagnosia. My son is three years old, and my husband as well as my father-in-law suffer from face blindness. There is no other explanation for it that when the same woman is flirted with twice within three weeks, without realizing that it is the same woman. Or, when a less familiar colleague offers to print a ticket and the next day you do not

remember who the person was. The lack of eye contact and exercising restraint in larger groups of people speak for it.

As for my son sometimes there are suspicious facts of which I am not sure, however. For example, it has happened that he has not recognized our neighbor - whom he knows since he was born - in another situational context asking who that person was. Also, he sometimes believes to know people because they happen to have long, blond hair, but who are total strangers, in fact. In addition, like my husband he struggles with larger groups of people (e.g. kindergarten) [ . . . ].

P.W., male, 80 years

[ . . . ]. At the age of 21 or 22 it dawned on me that in my case it is **not** about a particular variation of forgetfulness, but it is something qualitatively different from what more or less strongly befalls almost all people. And in the course of 20 more years I have realized that it is completely impossible to find real understanding in persons who are not affected. You most frequently hear: "Oh, yes, the same happens to me, I can barely memorize faces." At best I got a lot of good advices: "You have to look at people intensively." And another funny comment: "Why not look at it in a positive way, you meet new people every day." But if you only once do not recognize they themselves, they are bewildered if not disgruntled.

In the 80 years of my life, so far I have not noticed an essential worsening of the condition, but neither the slightest improvement. It is really embarrassing if I still need to ask who is Gilda and who the countess after the 2<sup>nd</sup> act of a stage performance.

A few more examples in the following:

1. For many years I worked in a company which operated 35 outposts in the country. Colleagues frequently came to the main office to attend training courses. During lunch break I was joyfully and friendly addressed by a lady while I desperately tried to remember from which of the outposts she came. Finally I was pretty sure: she came from G., but I remained careful during our conversation. On parting, I said "I need to go to my clocksmith now". Completely astounded she looked at me - she was no colleague from another branch, but the clocksmith's wife who I had been knowing for at least 15 years!

2. I had already been living for three years in a condominium of 10 parties when I encountered Mr. D. at the front door. I did not recognize him and did not want to let him in - "why don't you ring the bell where you wish to go". It took a few more years until we became reconciled.

3. During the first years after I had retired I went to visit my company a few times. Each time former colleagues crossed paths with me. We friendly greeted each other, but I desperately tried to remember their names and to bring them into line with the proper department. Worst of all was to be asked to relay an important message to Mrs. X who I came to see, because I had not the foggiest notion, whose message I was to convey! For that reason I avoid any personal contact with colleagues and turn down all invitations. If I tell about such mishaps (almost) everyone finds them pretty funny. But they are not! (...). The well-meant advices by friends, sad to say, proved to be useless. For example „Just remember something particular of the person!“ Two ladies living in the house I have confused with each other for years. I was told, „ but you know that A is taller than B“. But what does it serve me, if I encounter only one of them? The fact, that people frequently change their appearance (not only women with their changing hairstyles) adds to the problem. [ . . . ]

K.S. female, 50 years

[ . . . ]. After a long odyssey I accidentally came across the site [www.prosopagnosia.de](http://www.prosopagnosia.de). I first looked it up under personal deficiency. I did not know of this disorder being named face blindness.

As a matter of fact, I have always been seeking refuge in flight [ . . . ]. Since two years I have been living together with my husband in a small village. Here everyone greets everyone, which I perceive as a great relief. Constantly confusing people with each other has caused me a lot of embarrassing situations. Sometimes I have this uneasy feeling of being stared at and then ask myself whether or not I know the person. Wishing to have to recognize as few people as possible keeps me from extending the circle of people around me, for which I have developed strategies already. For example, I can very well remember vehicle registration marks enabling me to greet in due time. Some people have characteristics for which I inwardly keep a nickname. That often helps. People of prominent appearance I then recognize relatively well. But there are too many who look somehow alike. For example, when I was a young girl one of my father's work colleagues has helped me with a breakdown of my car - after that I did not recognize the man anymore. During my training period we have taken photos of each other. The other trainees asked for photos from me and reminded me often of them. But I was afraid to pass the photos

to the wrong girls. I could not bring the girls in line anymore. Many looked alike in some way. I worked in sales – it was hell! For a while we were compelled by the management to address every client. Some of them I have addressed at least three times. Consequently, I got many a ticking-off. These are only a few examples. All of this has been running throughout my life. [ . . . ]. My whole life I have been suffering from psychological strain, which I would like to get resolved. [ . . . ].

J:R., female

[. . .]. Ever since I have read a report in the journal „Stern“ about face blindness, approximately 11 years ago (annotation: ca. 2004), I suppose to be suffering from innate prosopagnosia.

It is very difficult for me to recognize family members, my partner or friends at fortuitous encounters. But also when being in a restaurant with a familiar person and I need to leave my seat for a short time (as for the restroom or buffet), I must fix the number of the table on my mind, since I would not recognize a seated person in particular, not in a larger group either with all persons being familiar to me. Then I must recall the outfit my friends are wearing. One man who I found very likable I have repeatedly "got to know". We worked together in a disco for some time, and each time I thought of him as being „a new one“, because his clothing style varied strongly.

In order to recognize people I orientate myself by the way they dress as well as by their voice (I do outstandingly well in recognizing German synchronized voices), gesticulation, the way of walking. Some actors who show distinctive facial features I can very well recognize, however.

C.S.

[. . .]. On occasion I do not recognize people when I meet them in situations or surroundings where I do not expect them to be. For example, work colleagues have approached me whom I walked past at the station without recognizing them. (Three of them confronted me directly with the situation; and who knows how many do not even bring the problem up). The same goes for me insofar that it is ungraspable for me that others watch a movie and know who the actors are whom they had also seen in another movie already. On the other hand, politicians or moderators I do recognize. I think it has to do with the fact that they rarely change their haircut or clothing style. In a well-known surrounding, I have no problem with the recognition of my fellow men and to get a read on them. Admittedly, if I try to visualize very familiar people (parents, friends, work colleagues) I see hair, posture, body shape, clothing style, but no face. Also, only now I become aware of the fact, that in public places I try to avoid direct eye contact with people for fear not to recognize somebody who therupon might think that I do not want to greet him.

Until today I thought of this problem as a form of indifference. But now I am no longer sure if this is true. Is it possible that one has learned to evade this deficiency in such way that only occasional moments make you stumble? [ . . . ].

M.S., female

[. . .]. Since about 1 – 2 years I have been knowing or speculating that I, too, suffer from it. Therefore I have filled out the questionnaire on your website. I found the link on sternTV.de, a site have already visited once before. Because I found the questionnaire a little inexact (ref. (3, p 28)), I wish to describe my experiences and symptoms more specific in detail.

It has always been difficult for me to memorize faces. For a long time I thought it may be due to the fact, that I often do not face people directly when talking to them, or that I am simply scatterbrained.

I often slid into an awkward situation. For example, at a party I introduce myself repeatedly to someone whom I obviously met before (and with whom I had even longer conversations before). This is because I could not place the face. Or, when somebody greets me, but I absolutely do not know who the person is. Or I simply walk past people, because I do not recognize them (in spite of the fact that I do not avoid parties). In particular, when I have casual acquaintances only or when I have not seen people for some time. Then I have big problems. As to my recollection of their faces they blur into an indistinct mass. And when I meet these people again, I often do not recognize them. Often I felt like a complete moron. Even my girlfriend, whom I have been knowing for twelve years, I once have not recognized at the station. I had not seen her for a longer time.

People, who are around me all the time, I always recognize time and again. I also recognize certain celebrities who can always be seen somewhere. The same with people whom I see frequently. I can visualize them even though it takes a little longer sometimes until I they are stuck in my mind.

*If I get to know a new group somewhere, it is rather difficult for me as a start. It was the same in the past when I entered a new class in school. The memorizing took a few days ... .*

*In a movie with actors unknown to me, and on top of when they resemble each other (for example two women of similar type), can get me fairly confused. I then have to concentrate myself very hard, but I often cannot completely catch up on the storyline any more, because I missed the action. I have considerably less problems if I know the actors. Voices I can very well distinguish and often comment on it like "oh, isn't it the synchronized voice of this one or that one". Sometimes, in everyday life, I recognize people by their voices. Also, I have often fixed the clothing of people on my mind – for example in the disco. But this works only for one evening, because the next time they may wear something different.*

*I deal with my problem quite overtly. If I get to know someone who is new to me, I point my problem out early and explicitly mention it online. I think it is better if others understand about my problem, for should my face recognition fail, it would be only half as bad.*

*By the way, I have discovered the term prosopagnosia for the first time in connection with an article on crown princess Victoria of Sweden (ref. 25). She had outed herself in public. I only thought, okay, that sounds familiar to me whereupon I have googled the term and read reports on people's experiences. This was like a revelation for me. A lot of it could have happened to me as well, and, as a matter of fact, a lot of it has happened to me in similar ways. Finally, from that moment on a spade was called a spade. It was really great to experience that others are not better off!*

*But I think to suffer from a moderate form of prosopagnosia, because people who are close to me I almost always recognize, and my mirror image is unfailingly familiar to me (really very extreme cases are known of) [ . . . ].*

*Therefore I want to ask you, if you know of cases or is there any research done on an age-related deficiency? Could age-related degeneration, dementia or Alzheimer's disease abet and aid the problem? [ . . . ]. (ref. 26) and following reports)*

### **Late Onset of Prosopagnosia**

V.M., female, 63 years

*[ . . . ]. Lately I have been realizing that I cannot memorize faces well anymore (if I want to hold fast on the face in my thoughts) as well as in a direct face-to-face encounter. If I am taken by surprise, e.g., if I get tapped on my shoulders from behind and greeted by an acquaintant, or if I unexpectedly stand in front of a person, then it can happen that the face does not mean anything to me at the first moment. I bridge it by pretending to search for the name. If the person opposite gets ahead of me by telling his/her name, then I can match the face. But it can happen, that I do not recognize acquaintances in unfamiliar surroundings, e.g., the saleslady who I see not dressed in her usual business outfit and being at another place. In general I can recall or recognize familiar faces (back to my childhood), but my ability to recognize new acquaintances, as well as politicians, singers or actors is rather missing. Examples: For a long time I could not memorize the face of Mr. Herzog, the German Federal President, even though he was repeatedly seen on TV. I watched the movie "Lost in Translation" featuring Scarlett Johansson. While everybody enthused about her, to me her face remained unrecognizable. The same goes for Heidi Klum in her early stages. While my sister went on her naturalness (!), I did not recognize her face. By now, as for her and Mr. Herzog, a recognition effect has occurred (probably due to the influence of the media presence . . . ).*

*You are right, the celebrities are not the problem. It is the every day awkwardness not to recognize a greeting person. Do I have to friendly greet him back? . . . as a well known acquaintant to me . . . ? or rather in a more distant manner . . . ? All you want not to curry favor with somebody, neither do you want to be indifferent or arrogant.*

*More and more often I ask myself, if this is an age related degeneration, a sign of dementia or Alzheimer? During the to show it was talked about " being born with it". That does not go for my case.*

## Prosopagnosia vs. poor face recognition

S.M., female

[. . .]. Since I recognize family members and friends fairly well, I wonder if perhaps an attenuated form of prosopagnosia exists? But before picking up my daughter from kindergarten I need to think about the jacket she wears, otherwise I would not recognize her among the bunch of kids. I also identify my husband in the office by his jacket or other characteristics (short hair, glasses). If both, my daughter and my husband, are not in a larger group, then I have no problem to recognize them. Friends and acquaintances I recognize, too, whereas the recognition of older classmates is really bad. The men I recognize seldom if ever. Regarding the women I have difficulties with some of them, e.g. regularly passing by a former class mate in the fitness studio, until she addresses me.

Also, a former landlord I did not recognize any more. The cashier of a store is familiar to me at other places, too, but where I know him from I do not know at the moment. The same with a participant of a gymnastics group whom I also recognize at other places, but do not know where to know her from. This happens to me with a lot of people whom I regularly see at a certain place, but whom I cannot "get a read on" some place else. People whom I meet only once I never recognize anyway.

I often feel awkward about it. If I meet someone in town I make conversation as if knowing the person well, simultaneously trying to find out who the person is, if at all possible. My husband does not even insist on introducing the person to him, because he knows that I do not recognize the person anyway. [. . .].

## Prosopagnosia + ADHS

C.C., female, 60 years

[. . .]. It was an incredible relief for me to discover (at almost 60 years) that prosopagnosia exists, and that "it is not my fault". After I had come across it, it became clear to me that my father had this deficiency, too. It puzzles me how he, as a PR-manager at times (of a very big company), has cheated his way through!

The social implication of prosopagnosia is horrific. One is believed to be arrogant, indifferent, self-centered, and taking the bull by the horns is not without risk. Being aware of that, burglars, hold-up murderers and rapists can rub their hands so that even wearing a badge (as goes for the opponents of shaking hands) becomes inadvisable.

It really strikes me how differently it crops up (I have no problem with people who have finally wound up in my long-term memory), but another time I cannot distinguish between commissioner and perpetrator in a crime movie. Unlike color blindness, dyslexia and alike, something steady I think, I would really like to get an explanation for it. However, I have experienced it the other way around, too: People, whom I have not seen in years, turned up on a flea market and were flabbergasted about me immediately knowing who they were. Evidently I am a lighter case. My hair stood on end reading that there are people who do not recognize their own children.

Some years ago I also realized to be "blessed" with ADHS (one of my sons and perhaps my daughter, too) raising suspicion that there is a connection. [. . .].

## Prosopagnosia + Autism + Concomitant Agnosia

M.N., female, (letter 1)

[. . .]. The autism test was interesting. It was found that W. (son) – as assumed – shows autistic characteristics in sub-areas, while other traits are attributed to a retarded maturing process. The physician found it highly interesting, that W. recognizes positive facial emotions but no negative ones at all.

We have managed that he and his best friend will attend the same class. This will always provide him a point of orientation of where the class as a group will be within a given time. Apart from that he has made other contacts already and begins to match names. For the rest he plays with children of whom he does not know whether or not they are in his class. At the open school day to come I will hear how the teachers handle it, whether W. seldom looks at them or reacts on a "stern" look. I am anxious to know.

I also have a question regarding a side issue my son and I are sharing. We do not see things ;-). When I clear the table or sort pens, part of it is always left behind or I overlook a red pen. When I clean up, I mostly look back

once, look into another room, and when I look again, then I realize that there still lies a red pen on the stack or a knife on the table.

This happens to W. with his school things. He can have them all packed, but he would not find the largest things in his satchel or on his writing desk. He overlooks them. [ . . ].

M.N., female, (letter 2)

[ . . ]. I have talked with W. about movies and the recognition of people. That was VERY interesting. In cartoons GOOD and EVIL are always clearly denoted by clothing and appearance. But in a series with several main actors and recurring minor parts it is a different case:

Series 1 (three men, one woman, two recurrent supporting actors):

- woman 1 is prominently dressed – clearly recognizable by her clothing
- actor 1 stands always in the middle, between the two others – therefore he assumes, that it is him
- actor 2 is recognized by his way of speaking
- actor 3 is the main actor and has a funny haircut
- woman 2 is mostly shown at her workplace
- supporting actor 1 he does not recognize any more
- supporting actor 2 he recognizes because he is the “oldest fellow“ in the series (very old with a walking stick)

Series 2 (three men, two women)

- woman 1 is an African woman - the only one in the series;
- woman 2 is always shown together with actor 1;
- actor 1 is only recognized, because he always offers the woman a coffee;
- actors 2 and 3 are not recognized.

As one can see, he recognizes people by recurring scenes like position, coffee cup, skin color, haircut. The actors whom he does not recognize have always different assignments, often stand together with other persons, wear similar clothing.

M.N., female, (letter 3)

But now a few more examples from W. and from my “actual“ life. In school W. is considered a downright friendly child. Since his main distinguishing characteristic is his language, he greets everybody in order to sound out with whom he has to do. The teachers who know about his problem greet him first to have him know with whom he has to do outside the classroom.

When he had to relay a message to his French-teacher but only knew of her to have blond hair and a French accent, during recess he and his friend sat down in front of the teacher’s lounge and addressed each blond woman until they got the right one. Once he said with a laugh: “Everyone at school know me, but I do not know anybody“. W. handles the situation in a marvelous way. Only once he was annoyed after he was invited by a girl to go for an ice cream, but did not know anymore who out of the 10 girls she was. The only one in class he recognizes without a problem is a conspicuously quiet, cheeky girl.

As I can say for myself, people with whom we have made emotional contact, positive or negative, are easier memorized. Someone I am cross with I recognize longer lasting than “normal“ contacts.

Once, at a flea market W. amazed me greatly. Unfortunately I had not made a mental note of the colors of the clothes my family members were wearing, and so, within seconds they had “disappeared“. After a while W. jogged my elbow though I stood with my back turned on him. My first question was: “How have YOU found me?“ He answered that I was the only woman carrying a BLACK canvas bag.

Surprisingly, in the Cologne Cathedral, during summer vacation, I have always immediately found again my people and W.’s friends without any problem. If they stood together as a group they stuck out everywhere for me. But a soon as one of them separated from the group, I had trouble finding him again. Thus, are people as a group in our memory no longer “human beings“, but a “cluster“ only, or so? On the other hand, at a meeting of a group of regulars at school I once sat down at the wrong table, because familiar faces also sat there. To find the right group had not functioned ;-).

During a class party I met two mothers with whom I have not had nothing to do so far. Both wore long, dark, straight hair. Looking at them I instantly knew, that I cannot tell them apart. Thereupon I deliberately tried to make a mental note of further details in order to be able to tell them apart. Surprisingly, it did not work out! As soon as I had talked to someone else my memory was blank again, and I did not know any more who the mother

of child A was. It does not function to just memorize people permanently. As already said, once there is an emotional connection, it is easier.

Overlooking things in his school bag, which are in it, however, is a big problem for W. It gets him entries galore in the class book. We are still puzzling over a trick.

But I can feel with him, since I constantly overlook something in my household, too. Having missed an object stresses me out. Currently the situation is awful regarding my bike. I simply do not recognize it. If there stands another black bike next to mine and has two bicycle baskets on top of it, then all is lost. After I will have found out which of the two is mine, I am flabbergasted how "different" the other one looks. And then I ask myself how I could take them as equal. Why does my brain recognizes the difference at a time? [. . .].

### **Prosopagnosia + Asperger syndrome**

S.R., female

[. . .]. I can recognize faces very well, can read something in somebodies eyes and can judge people (pertinent to my position as personnel consultant). However, I often do not memorize the people ... . Having seen a photo of the one who sent in his application can be helpful. It is easier for me to recognize faces from a photo. On my last steady job I drew up a booklet of individual descriptions of persons and their places in the office. "Office in front to the left, glasses, dark hair, rather small, reminds me of ... (some person known to me), name = Stefan". Well, after a few weeks I was able to designate all of the 10 persons. If somebody greets me I greet back and then ask my friend who it was. Recently I had an appointment with a non-medical practitioner whom I had met before twice. So I ring the bell of his office, he opens and I become frightened, because actually I had someone completely different expected ... .

Well, until now nobody has noticed my shortcoming. I get along with it quite well. Purpose of my appointment with the non-medical practitioner was a bio-regulation-measurement which resulted in high measured data of the thalamus and the adrenal gland. Therefore, I have an increased interest in the matter. Previous MRTs of the brain had never shown any results. Hence, it is the first time in my life, that my disorder could be seen! My troubles in detail: recognition of people, numbers, estimation of distances, equilibrium, frequent stumble and obdormition of feet and legs, occasional amnesia. But worst of all is the lonesomeness. When I was a child my mother told me that I were unable to love people. In addition, she could not have affection for me, only towards my sister. If someone asks me, I answer that I do not have a family. I broke the contact, after I always had the feeling to perturb or not being wanted. I do not know the feeling of family. I observe this feeling in my friend when she is together with her three children and/or with her sister. I can see how they enjoy the situation. I cannot imagine for myself to feel this way. Moreover, I never had the feeling to belong to somewhere. Now I wonder whether my mother was unable to love me because I was not able to love her?

Neither do I really have sentiments like confidence, pleasant anticipation and missing someone. I confide in one whom I give credit for something (competence, knowledge, experience). I only trust myself knowing that in case of betrayal I can manage the situation. If I think that I could not handle a betrayal, I will keep it to myself. It is similar with missing someone. I have been loving my partner for 13 years. But when I am away, I am simply away. I know that it is nice to be together. But I cannot understand the feeling when he is not present. Once we have separated on a temporary basis. He moved out. It was only a few days later that I could not feel anymore how it was to have lived with him together. It was as if he had never lived there together with me. Sometimes "I split persons". Thus, the nice guy whom I talked to at length in the ice-cream parlor and the gas station attendant at my gas station. It is the same person, but I am not capable of perceiving it. For me it functions through knowing; to know, that a vacation will turn out wonderful, to know, that it is nice at home, to know, whether or not it is good to talk about personal affairs with someone. As to that I have no sentiments.

Is there a coherence between "to perceive a feeling for human beings" and "to not recognize faces"? [. . .].

K.B., female, 20 years

(Annotation: the report refers to the questionnaire in ref. [3, p.28])

[. . .]. If there are actors in a movie whom I know and whom I have already seen in several movies, who do not change their look very much neither during the movie, nor in the individual movies, then I can follow a movie quite well, otherwise it is less likely. Then the voice is crucial for me in order to remember who of the actors is speaking.

*I have few friends only, and when I know that they ought to be there, e.g. every morning I meet with two of them in front of the lecture hall, then I know it is them. Also, if they have very conspicuous characteristics, e.g. extraordinary hair color, then I can recognize them well. The same, when they approach me. In this case it is rather their gait than their face. Otherwise I do not recognize them either.*

*Occasionally it is brought to my attention that I do not greet back or simply pass by.*

*I cannot right away tell if a face is familiar to me. I rather orient myself by remarkable items and characteristics of and around the face such as particular jewelry, birthmarks, hair, striking glasses (model, color, form) than by the face itself.*

*Yes, I just need some time if I encounter somebody somewhere unexpectedly. It is easier if I expect somebody at a certain time and at a set place. All the more so since the person opposite me expects me, too, and comes up to me (be it in the strict sense of the word or figuratively, such as by smiling, waving etc.)*

*Within my family a lot of times (minor) tension arose, because once again I have passed by them without greeting. Two examples: my whole family came my way on the other side of a single track road, but I did not recognize them. On one occasion my brothers passed by me at half a meter's distance, and again I did not recognize them. However, in the house I recognize all of my family immediately, because I know it is them who should be there and nobody else.*

*Normally I know where all my personal things are, usually always at their appointed place. In case they are not there I know where I have put them, though. In case someone else has put them away I would not find them quickly. The same happens in the supermarket. I know where things are set up and I try to find what I am looking for (in my head I have an image of it and compare it with what I see). However, if it is not at its usual place due to a rearrangement, or due to a different kind of packaging, I will not find it quickly, and sometimes not at all.*

*I mostly recognize people by their voice, but also by their walk, hair, clothing. I keep in my mind the picture of a photo of a rose which I have seen lately and a picture of how I would draw a rose myself (in a rather comic like fashion).*

*In my thoughts I cannot imagine my friends well. I know how they are, I remember very well times I spent together with them, what who of them has said, what we have done together, but I have no memory of how they look like. In all of my memories there is no picture of a person/a face, only fragments at most, e.g. hair color.*

*Famous people I am able to recognize immediately, but only under the premise that they have a particular conspicuousness, which I have already noticed in a movie and which remains unchanged.*

*Most of the people seem unfamiliar to me.*

*Never did I need to judge the gender of a person by his or her face. There are other factors which are crucial for me, such as stature, hairstyle, posture, clothing: Sense of orientation: none, if I do not know a place. If I get to know a place I devise a plan in my head which shows me where I have to go in order to get from A to B. However, getting from C to B proves to be difficult for me even though I know the distance between A and C.*

*Attractiveness: I think that I have no opinion on the attractiveness of faces which I see. It is simply faces only.*

*To read emotions/moods in a face: in general, dealing with or recognizing human emotions is difficult for me (annotation: I was diagnosed with Asperger, which has probably to do with it).*

*I avoid meetings with a lot of people. I am acquainted with a few people only. Passing acquaintances do not mean anything to me. Therefore, the possibility of overseeing someone is more of a secondary matter even though it can cause unpleasant situations if I do not recognize someone who expects exactly that from me.*

*People who I have seen briefly only, I have difficulties to memorize the following day, in particular if I have seen that person only a few times. If the person belongs to my friends it is as difficult as always to recognize him/her the following day even if I have seen the person briefly the day before (this naturally does not exclude, that I do not recognize him/her, because he/she has changed a certain characteristic by which I usually recognize him/her).*

*I inevitably have a lot of contact with a lot of people (large lecture halls want to be filled by a lot of students accordingly). But actual contact – in the sense of making conversation – I do not really have.*

*Annotation about the methods of recognition: I have never really thought about by which I recognize a person. But the above methods described seem to be the ones who help me every day (consciously or unknowingly) to get along with persons who are important to me, whereby my expectation, so I believe (since person X shares the same lecture with me shortly, person X must be here) plays a role. [ . . ].*



## **Prosopagnosia + Intellectual giftedness + Asperger syndrome + ADHS**

S., female

[. . .]. Since I have been suspecting for years, that I, too, suffer from this disorder, I now feel like having to write about it. As early as in adolescence I had little contact to other people, because I could not associate them any more at a different place. For that I was deemed arrogant etc.

I always say, that "I get to know new people every day". Naturally it is not like that, because birthdates, horoscopes etc. I can memorize quite well.

In fact, it gets bad for me only if, e.g. if I meet a fellow worker during shopping without recognizing her. Or, like in summer, after I have asked a friend out for an ice cream, but then was unable to recognize her in a different surrounding.

I have a 12-year old son who seems to suffer from this face blindness. For example, it was in fourth grade that he could not match the names with his classmates, all of which were his buddies; even after a more exact inquiry he could not match names with faces. So we have rehearsed it with the help of photos. At the age of six he was also diagnosed with ADHS due to an attention deficit. In addition we went to a center for autism, where suspicion of Asperger autism was addressed. Currently we are in therapy at a child psychologist, who also confirmed ADHS, mentioned suspicion of Asperger autism once more and ascertained intellectual giftedness.

Most of all, I am very worried about the autism since recognizing faces and reading emotions from faces cause him great difficulties and impair his social conduct considerably.

## **Prosopagnosia + ADHS + Synesthesia**

A.P., female, 47 years

[. . .]. It was not before last Sunday that I was very consciously confronted with my problem, that is to recognize people who I actually (ought to) know. I volunteered for election assistant at the local election where I was assigned the job to check off eligible voters from the electoral register. In doing so it was extremely striking to me, that I did not recognize people from the community who immediately greeted me and whom I had talked to before. I really needed their certificate of the right to vote in order to match it with their names. But often, after I knew their names that way even then I could not get a correct read on a person. I have been living in this village of 500 residents since eight years. I live on a farm and have helped with harvest work from the beginning. Since about four years I am active as minute taker at the local council. Due to my two dogs and a goat which accompanies me on my daily walks almost all people know me here. It is certainly an unusual sight to see. Especially the children know Paula, the goat, by name and likewise they all know me. Within the scope of my involvement on the farm I got to know a lot of people. Fortunately, at this place one helps each other. I am greeted in a friendly way – but then I do not know who it was and try to hide it. In principle not being able to recognize faces was never too big a problem for me. Anyway, outwardly I could somehow compensate with my friendly manner. However, I often felt abashed when I did not recognize someone with whom I had anything particular to do. I tried to cover it up and to make a straightforward conversation until it became clear by remarks of the other person where he or she knows me from. Here I need to add, that I have little difficulties to memorize someone if encountering him/her is related to the situation when I met him/her the first time. Example: if I met the dog trainer at the dog obedience school, I immediately knew who she was. But on one occasion, when she stood in front of my door, I did not recognize her (although I had attended her dog obedience school weekly for more than half a year). Or: if I meet somebody in his house or garden, I know where to place him. However, if I encounter the same person in the super market of the nearby town, then I have no clue who this person is. Most of my life I have believed that my difficulties with recognizing other people would have to do with a lack of interest in them, that I do not mindfully look at them. Along with it you should know, that since my early adolescence I have a disposition to depression. Since 20 years I am in psychiatric or psychotherapeutic therapy. Most of the time the diagnosis was depressive episode, as well as an emotionally unstable personality disorder. And since about four years I have been attested with ADHS (confirmed by a medical specialist). Thus, it seems hardly surprising that I blame myself of lack of interest in other people. However, being a very empathetic person is contradictory to that. I am highly capable of reading in other people whether or not they feel well, of sensing what they might need in order to feel better, and I am very zealous to take care of others. [. . .].

But back to prosopagnosia: while I know each and every cow and are able to tell most of the chickens apart, I am not able to memorize the faces of those people whom I frequently have to do with. Unless they distinguish themselves by any striking characteristics (height, stature, peculiarities of movement, gait etc.), I keep confusing

people's names. Unless I see two persons right in front of their own house, I would confound them when they only look a little bit alike. Would these two persons stand next to each other presumably, they were not that similar – but I simply forget the faces of those who do not stand in front of me at that very moment. In my mind's eye, I cannot even recall the faces of my loved ones. It is only the hair color (both my sister and my mother are red-haired) and more or less the stature which I can imagine. My brother is almost bald-headed (but right now I would not know if he is really bald-headed or if it is only an extreme short haircut), my father wears a beard, I think. A cleft chin shows when he does not wear a beard. I cannot imagine the faces of my closest friends either. And I could never draw a person's face from memory. I memorize my neighbor's red hair, I recall that he often wears a braid or a hat, but I can neither memorize the shape of his mouth nor his eyes. Best of all I can memorize his nose, probably because it is slightly hooked. Nevertheless, I recognize these people when they stand in front of me. In other words, close friends and family members I recognize even if I encounter them somewhere in another surrounding. However, if I am going to pick someone up from the station or being picked up myself, I would not know before how to describe the person's looks. All right, that these people look around the track for me also, recognize me and come up to me. It is exactly this inability to imagine a face prior to an encounter which has often irritated me. I is like a haze in my mind's eye, a blind spot. But most of the time I think that I have managed quite well to compensate the problem, to carry it off well. Every now and then I use the excuse to be short sighted (since a few years or so). This gives me some time to think who the person coming up to me might be and to recognize him by his movement and voice in the meantime. And if I had recognized this person only after he had recognized me, then it simply had to do with my shortsightedness.

Something that has been striking me my whole life time, which unsettles me, and of which I have nobody told about as of yet is the phenomenon, that I am unable to imagine my own face. Not only could I precisely describe how I look like, no, in my mind's eye I see myself somehow – different. Thus, I am always irritated anew and feel awkward if I see my reflection in a mirror, for example in a store window. The inner picture of my face has even other contours, in some measure. Since I find my own face in the mirror so very „strange“, that I always have to say to myself anew: If I regard faces of familiar people as „right“, or even beautiful, and then find it normal how they look like, then it should be the same the other way around, should it not? Each face is unique. Why should mine be more off-key than any other? Thus, it must have to do with the fact that I am simply not familiar with the reflection of my face. But the others should have got accustomed to my looks, haven't they? As for me, somehow I perceive every person as handsome, but it is more the charisma of the one I see. Why should my friends not see me the same way? Over time, I became aware of not being a bad person. Regarding my face it just about works the way as it does for many people when they suddenly hear their voice from a tape recorder (as far as I know). One's own voice sounds strange to oneself. Perhaps it sounds different from the tape than hearing it from within.

As for me, that it might have to do with prosopagnosia occupies my mind ever since the occasionally embarrassing moments during election last Sunday, as mentioned earlier. There people reacted to me in an almost reproachful manner after I have not recognized them in the setting of the polling location knowing that we know each other. It is only now that several encounters with people who greeted me and talked to me as if they knew me have crossed my mind. I could not get a read on them until something during our talk indicated a correlation. Then I knew where to “place” them, even though I still did not remember a matching name. According to your descriptions on your site [www.prosopagnosia.de](http://www.prosopagnosia.de) and having been struggling through life remarkably well, in my case it is, if at all, congenital prosopagnosia.

In addition, I am a synesthetic (which I know since a few years only). I make a mental note of names, numbers, dates and terms by means of colors which the letters and figures mean to me. This ability has certainly made up for many a situation just because of “colorful memory hooks”. I was always a good learner in particular when it was about words and special terms because of the colorful pattern I have in front of my eyes. If I want to fix a person's name on my mind, in the context of prosopagnosia it specifically means for me that I consciously associate a detail of a person's appearance, his stature or ways to dress with the colors of single letters of his name. Ulrike has blond hair and likes to wear black. The U is anthracite-colored, the L is almost white. Joachim is very tall and slender and wears black jeans most of the time. The J is a vertically long drawn, dark grey letter. Louise has a rather dark complexion (more so than her sister Helene). This warm shade is mirrored by the OU (the OU is auburn). Helene, on the other hand, is blond and has a fair complexion which matches the light yellow of the E in her name. In spite of that it usually takes quite some time until I can memorize names. However, I am an alert person and therefore do not miss if the name is mentioned by others which often avoids embarrassing moments. Naturally, over time I became a bit more relaxed and have no problems to admit to myself the deficiency I have. If I volunteer: “I surely have to ask your name twice, because I am not good in memorizing names” then it is less embarrassing. Once the names are firmly anchored (as a color pattern), then I can retrieve them without

difficulties. For me this all seems to fit the description of the phenotype of congenital prosopagnosia. According to that those affected do not become aware of suffering from it, sometimes throughout their life, because they have learned well to compensate for it. And there is another aspect coming to my mind: If I watch a movie I often cannot tell specific persons apart if they resemble each other in more than one characteristic (e.g. height and hair color). Consequently, it can happen that I do not understand the action at all which is somehow awkward. (in fact, in real good movies the actors are usually clearly represented.) [ . . ].

## Prosopagnosia + Zooagnosia

I.S., female

[ . . ] Based on the descriptions and experience reports I believe that I belong to the 2% of the population who are unlucky with having this particular conspicuousness. It would at least explain a lot, even though my “non-recognition“ applies to animals, too. For example, after my dwarffig parrots stay in an aviary I could not identify them without doubt, much to the astonishment of the caretaker. And before I have picked up my dog from the breeder I had to look at him twice to make sure that he is the right one. I have this problem with people by all means which has a negative effect on career (networking) and on everyday life. Who was my waiter?, where do I know this person from?, or do I know this person at all (in case of uncertainty it is better to friendly greet)?

After having read this article and after my research in the internet there are some questions still:

[ . . ]. Is it really that easy for other people to recognize faces? On Saturday during a family celebration I have carefully asked around and noticed that at least one of my half-brothers has this problem. He explains that he simply has no interest in memorizing faces/names of casual acquaintances. [ . . ].

## References

- 1 Kennerknecht I, Grueter T, Welling B, Wentzek S, Horst J, Edwards S, et al. First report of prevalence of non-syndromic hereditary prosopagnosia (HPA). *Am J Med Genet Part A*. 2006 Aug 1;140(15):1617–22.
- 2 Kennerknecht I, Pluempe N, Welling B. Congenital prosopagnosia - A common hereditary cognitive dysfunction in humans. Vol. 13, *Frontiers in Bioscience*. Front Biosci; 2008. p. 3150–8.
- 3 Kennerknecht I, Edwards SD, Van Belle G, Wang-Elze Z, Wang H, Hämmerle JM, Durak Aras B, Thomas C, Christian Thomas Ch. (2021). Prevalence of hereditary prosopagnosia – a worldwide survey“. [Electronic ed. 2021, Münster: Westfälische Wilhelms-Universität] DOI: 10.17879/37069549382,
- 4 Behrmann M, Avidan G. Congenital prosopagnosia: Face-blind from birth. Vol. 9, *Trends in Cognitive Sciences*. Elsevier Ltd; 2005. p. 180–7
- 5 Kennerknecht I, Kischka C, Stemper C, Elze T, Stollhoff R (2011) Heritability of face recognition. In Tudor Barbu (ed.) *Face Analysis, Modeling and Recognition Systems*, ISBN 978-953-307-738-3, InTech - Open Access Publisher, Rijeka, Croatia, pp163-188
- 6 Kennerknecht I. (2022). Prosopagnosie - oder das fremde Gesicht in meinem Spiegel. [Electronic ed. 2022, Münster: Westfälische Wilhelms-Universität] DOI: in preparation
- 7 Schwarzer G, Huber S, Grüter M, Grüter T, Groß C, Hipfel M, et al. Gaze behaviour in hereditary prosopagnosia. *Psychol Res*. 2007 Sep 10;71(5):583–90.
- 8 Nunn JA, Postma P, Pearson R. Developmental prosopagnosia: Should it be taken at face value? *Neurocase*. 2001;7(1):15–27.
- 9 Young AW, Ellis HD. Childhood prosopagnosia. *Brain Cogn*. 1989;9(1):16–47.
- 10 Grueter M, Grueter T, Bell V, Horst J, Laskowski W, Sperling K, et al. Hereditary prosopagnosia: The first case series. *Cortex*. 2007;43(6):734–49
- 11 Silva JA, Leong GB. Visual-perceptual abnormalities in delusional-misidentification. *Can J Psychiatry*. 1995;40(1):6–8.
- 12 Young AW, Reid I, Wright S, Hellawell DJ. Face-processing impairments and the Capgras delusion. *Br J Psychiatry*. 1993;162(MAY):695–8.
- 13 Bate S, Cook SJ, Mole J, Cole J. First Report of generalized face processing difficulties in Möbius sequence. *PLoS One*. 2013 Apr 24;8(4)
- 14 Kennerknecht I, Pluempe N, Welling B. Congenital prosopagnosia - A common hereditary cognitive dysfunction in humans. Vol. 13, *Frontiers in Bioscience*. Front Biosci; 2008. p. 3150–8.
- 15 Grueter M, Grueter T, Bell V, Horst J, Laskowski W, Sperling K, et al. Hereditary prosopagnosia: The first

- case series. *Cortex*. 2007;43(6):734–49.
- 16 Stollhoff R, Jost J, Elze T, Kennerknecht I. Deficits in long-term recognition memory reveal dissociated subtypes in congenital prosopagnosia. *PLoS One*. 2011 Jan 25;6(1):e15702.
  - 17 Stollhoff R, Jost J, Elze T, Kennerknecht I. The early time course of compensatory face processing in congenital prosopagnosia. *PLoS One*. 2010;5(7).
  - 18 Dinkelacker V, Grüter M, Klaver P, Grüter T, Specht K, Weis S, et al. Congenital prosopagnosia: Multistage anatomical and functional deficits in face processing circuitry. *J Neurol*. 2011 May 1;258(5):770–82.
  - 19 Duchaine B, Nakayama K. The Cambridge Face Memory Test: Results for neurologically intact individuals and an investigation of its validity using inverted face stimuli and prosopagnosic participants. *Neuropsychologia*. 2006;44(4):576–85.
  - 20 Esins J, Schultz J, Wallraven C, Bühlhoff I. Do congenital prosopagnosia and the other-race effect affect the same face recognition mechanisms? *Frontiers in Human Neuroscience*. 2014; (8):759.
  - 21 Esins J, Schultz J, Stemper C, Kennerknecht I, Wallraven C, Bühlhoff I. Corrigendum: Do congenital prosopagnosia and the other-race effect affect the same face recognition mechanisms? *Front Hum Neurosci*. 2015;9(May):294. doi:10.3389/fnhum.2015.00294
  - 22 Esins J, Schultz J, Stemper C, Kennerknecht I, Bühlhoff I. Face perception and test reliabilities in congenital prosopagnosia in seven Tests. *Iperception*. 2016 Feb 16;7(1):204166951562579.
  - 23 Verfaillie K, Huysegems, De Graef SP, G. Van Belle G. Impaired holistic and analytic face processing in congenital prosopagnosia: Evidence from the eye-contingent mask/window paradigm, *Visual Cognition*. 2014, Mar 16, 22(3-4):503-521.
  - 24 Russell R, Duchaine B, and Nakayama K. Super-recognizers: People with extraordinary face recognition ability." *Psychonomic Bulletin & Review* 16, no. 2 20 (APR, 2009): 252-257.
  - 25 Kennerknecht I. Acquired and hereditary prosopagnosia - in history, fiction literature, biographies, and live celebrities. [Electronic ed. 2022, Münster: Westfälische Wilhelms-Universität] DOI: 10.17879/05099616841
  - 26 Bornstein B, Sroka, Munitz H. (1969) Prosopagnosia with animal face agnosia. *Cortex* 5(2), 164-169
  - 27 Haeger A, Pouzat Ch, Luecken V, N'Diaye K, Elger Ch, Kennerknecht I, Axmacher N, Dinkelacker V (2021) Face processing in developmental prosopagnosia: Altered neural representations in the fusiform face area. *Frontiers in Behavioral Neuroscience* 15: 283 ff
  - 28 Stemper C. Prosopagnosie bei Hochbegabten. Dissertation, Westfälische Wilhelms-Universität Münster, 2017
  - 29 Kennerknecht I (2022) Prosopagnosie (syn. Gesichtsblindheit) – Berichte von Betroffenen. [Electronic ed., Münster: Westfälische Wilhelms-Universität]. DOI: 10.17879/05099607353