1.0 Introduction

Table of Contents

1.0 Introduction

2.0 Neuroscientific Context

2.1 History

2.2 Face Perception, Recognition, & Individuation

2.3 Prosopagnosia

2.4 Causes

2.5 Types

2.6 Effects

2.7 Treatments, Cures & Further Research

3.0 Critical Analysis

3.1 Target Audience & Purpose

3.2 Scientific Relevance & Accuracy of Information

3.3 Media Article Evaluation

4.0 Appendix

5.0 References
“Face Blindness – Prosopagnosia” is a video segment from the scientific North American TV series, The Host. It was first aired on American television in July of 2008, and posted immediately afterwards onto Youtube for access by the rest of the world. The five minute clip identifies the recently detected disorder, Prosopagnosia, as one whereby persons are capable of recognising geometric facial features of humans (including their own), but incapable of perceiving and recording such information in a holistic representation. Persons are often unable to recognise a face even moments after an initial observation.

Interviewed during this media item is Jeff Wasserman, a middle-aged male photographer for The Journalist, and the photo editor of the National Post. He is also a sufferer of Prosopagnosia whom was born with the disorder. Questions asked of him relate to his personal experiences of inability to consciously recognise familiar faces, including his own. He explains the impact such inabilities have upon the rest of his life with respect to his friends and family, strangers and journalistic career. Particular exemplification is of faces he fails to recognise of people of importance to him in his daily life, and of celebrities whom he photographs but does not have the opportunity to spend excessive time with to understand their person. Thus Jeff speaks of the ways in which persons undergoing Face Blindness attempt to associate faces with names - by categorising individuals based on their individual features (e.g. “Middle-aged, balding men”, or “slim, attractive dark-haired women”), rather than on the entirety of their face.

Doctor Morris Moscovitch, Glassman Chair in Neuropsychology at the University of Toronto comments throughout the clip, acknowledging that Jeff’s experiences are not uncommon amongst Prosopagnosia sufferers in general.

The Host’s interviewer, Hilary Doyle ends the segment by discussing the statistically represented occurrence of Faceblindness in various regions of the world, and it’s ever-growing detection amongst people everywhere. She advertises the website www.faceblind.org whereby tests can be taken to detect the disorder by the common person.

(http://www.youtube.com/watch?v=XLGXAtSpN00)

This video segment “Faceblindness – Prosopagnosia” by The Host is of interest to us, because we were until now entirely unknowing of the concept of Face Blindness. To us, it was unheard of that some persons could be capable of recognising certain facial features of individuals, but then unable to recall such information at a later time so that names could be associated with faces (M. Nishimura et. al., 2010).

However, through research we discovered the relatively high numbers of young and old people whom live with this disorder, worldwide.

We also found that Prosopagnosia is a condition which can be developed at various points in one’s life, and not just inherited as in the example of Jeff Wasserman in the video segment (C. Thomas et. al., 2008).
Therefore, we agreed that investigation into the symptoms, types, causes, effects, treatments, cure and prevention of this disorder was not only important to persons whom had inherited Prosopagnosia, but also to all persons, including ourselves. Hence we selected to study the disorder that is Prosopagnosia, and the video segment of The Host, “Faceblindness – Prosopagnosia”.

2.0 Neuroscientific Context

- 2.1 History

Reports of Prosopagnosia date back to the 19th century, but the publication of German neurologist Joachim Bodamer’s paper on Prosopagnosia in 1947 was a key defining moment for the international neuroscientific world. Bodamer’s paper named the condition from the Greek words ‘prosopon’ meaning ‘face’, and ‘agnosia’ meaning the ‘absence of knowledge. Thus a neuroscientific definition was coined, ‘Prosopagnosia – a case of a disorder in the recognition of faces while the perception of them is retained.’ Bodamer also stipulated difference between types of the disorder – Acquired and Developmental Prosopagnosia (H. Ellis, 1990). Since then, further classifications have been made, so that now these two types may be categorised as either ‘Apperceptive’ or ‘Acquired’.

Excessive studies of Face Blindness have occurred in more recent decades, as the prominence of neurological disorder within society is greater than many had once predicted. Specifically, statistics show that approximately two per cent of the entire human population suffers from Prosopagnosia (J. Marotta et. al., 2001).

- 2.2 Face Perception, Recognition, & Individuation

Face perception, possibly the most highly developed visual skill in humans, is the process by which the brain and mind understand and interpret the (human) face. Faces provide extensive information capable of facilitating social communication amongst individuals. Visual perceptual skills permit identity recognition through perception of aspects and proportions of facial structure (i.e. nose, mouth, eyes, ears, etc), as well as in the way each structure functions to demonstrate expression (e.g. The way one’s eyes gaze, or the way lips contort into a pout). However, there exists a more difficult skill – the capability of an individual to physically process such information presented by faces (J. Haxby et. al., 2000).

Face individuation is face recognition at the individual level. The extensive neural network of the brain which encompasses several of the ventro-medial regions which comprise the right hemisphere, is believed to play an important role in facial processing. These areas are of the occipital pole to the temporal pole, and then throughout both the inferotemporal cortex and superior temporal sulcus. Specifically, fusiform
face area (FFA) (located within the ventral temporal cortex), responds preferentially to a broad category of faces. The FFA is also a controversial region of the brain, as countless studies have investigated whether it is optimised for the processing of stimuli in a configural and holistic fashion (J. Marotta et. al., 2001). Spatial-temporal multivariate analysis is used to map these areas of the brain involved in individuation (P. Rotshtein et. al., 2005). Notably, however, common neuroscientific understanding is that face recognition seemingly relies on encoding the configuration of facial features, rather than identifying the individual features (M. Moscovitch et. al., 1997).

(T. Takahashi et. al., 2006)

Thus, in correctly processing facial proportions and expressions, one is allowed to identify origin, emotional tendencies, health qualities, and some social information of another person. The concept of face perception and recognition therefore is intertwined with the importance of face individuation, whereby one is able to recognise an individual’s facial characteristics, and thereby identify that person accordingly. However, regular face perception, recognition and individuation is often taken for granted, and the processes can very easily be affected by a number of genotypic and phenotypic factors, thus hindering social communication (J. Haxby et. al., 2000).

- **2.3 Prosopagnosia**

Otherwise known as Faceblindness or Facial Agnosia, Prosopagnosia is a visual agnosia, and a disorder which refers to a severe deficit in consciously recognising a person from their face.

While some people report a very selective impairment that only influences the recognition of faces, others find the deficit extends to the recognition of other stimuli, such as objects, cars, or animals. Many people also report deficits in other aspects of face processing, such as judging age or gender, recognising certain emotional expressions, or following the direction of a person's eye gaze. Finally, a substantial proportion of prosopagnosics report navigational difficulties. Such ultimately hinders vital human processes of face perception, recognition and individuation necessary for social communication (M. Behrmann, 2007).

- **2.4 Causes**
Prosopagnosia is thought to be the result of abnormalities, damage, or impairment in the right fusiform gyrus, a fold in the brain that appears to coordinate the neural systems that control facial perception and memory. Prosopagnosia can result from stroke, traumatic brain injury, or certain neurodegenerative diseases. In some cases it is a congenital disorder, present at birth in the absence of any brain damage. Congenital prosopagnosia appears to run in families, which makes it likely to be the result of a genetic mutation or deletion. Some degree of prosopagnosia is often present in children with autism and Asperger’s syndrome, and may be the cause of their impaired social development (C. Thomas et. al., 2008).

(It must be noted that Prosopagnosia is not related to memory dysfunction, memory loss, impaired vision, or learning disabilities.)

### 2.5 Types

Prosopagnosia may be an acquired, or developmental heterogeneous disorder. It has variable severity, selectivity and neural basis.

Acquired Prosopagnosia results from damage to the occipital lobe and/or ventral temporal lobe of the brain. The areas most commonly affected are the fusiform face area, or occipital face area. Damage could occur to such regions due to any number of methods, but commonly including trauma and stroke. Acquired prosopagnosia varies in both behavioural manifestations and the location and extent of underlying lesions which develop due to brain damage (H. Ellis et. al., 1990).

Developmental Prosopagnosia is a face-recognition deficit that is lifelong, manifesting in early childhood, and that cannot be attributed to acquired brain damage. However, a number of studies have found functional deficits in DP both on the basis of EEG measures and fMRI. It has been suggested that a genetic factor is responsible for the condition. The term “hereditary prosopagnosia” was introduced if Developmental Prosopagnosia affected more than one family member, essentially accenting the possible genetic contribution of this condition (B. Duchaine, 1999) (M. Cherkasova et. al., 2001).

### 2.6 Effects

Degrees of impairment of the disorder range from moderate to severe and debilitating. Some people with Prosopagnosia may only have difficulty recognizing a familiar face, whilst other people will be unable to discriminate between unknown faces. Others may be completely incapable of distinguishing a face as being different from an object, whilst some persons with the disorder are unable to recognize even their own face (M. Behrmann, 2007).

Apperceptive and Associative Prosopagnosias therefore distinguish between severities of the condition.
Apperceptive Prosopagnosia is a more severe type of Face Blindness, as it represents an inability to name or place people whom sufferers can see. More Apperceptive variants of Prosopagnosia are linked to fusiform damage. Alternatively, Associative Prosopagnosia is a more common, but less severe type of Face Blindness. It is linked to anterior temporal damage, and although Associative Prosopagnosia patients are unable to identify a face, a limited understanding of the relevance of a face is still retained (J. Barton, 2008).

As Face Blindness impairs human communication via face perception, recognition and individuation, it inevitably forces people with this condition to use alternate secondary cues to retain information about those whom they interact with (e.g. hair colour, body shape, voice, clothing). Such compensatory mechanisms challenge Prosopagnosics on a daily basis, and for some patients these conditions quickly cause severe social consequences for the individual, their colleagues, friends and family. Some Prosopagnosics find these alternate mechanisms so difficult to adopt and rely solely on, that they opt to avoid social interaction all together, develop depression and/or problems with interpersonal relationships and their career (M. Behrmann, 2007).

- **2.7 Treatments, Cures & Further Research**

There is currently no cure for Prosopagnosia and there are few successful therapies. However, it is possible to manage Prosopagnosia through the use of various alternative cues, as previously mentioned (M. Behrmann, 2007).

With further research into these cues used by Prosopagnosics, it is possible to gain a greater understanding of how normal people recognise faces with respect to what kind of information processes are particularly important. Additional studies into the types of Prosopagnosia will generate better understanding of the locations and critical roles of brain areas involved in normal face perception, recognition and individuation. Hopefully such information will lead to treatments and cures of Prosopagnosia in the future (J. Barton, 2008).
3.0 Critical Analysis

3.1 Target Audience & Purpose

The Host’s video, ‘Faceblindness – Prosopagnosia’ is directed at a very wide audience of men and women of various ages and ethnicities. The purpose of this video is seemingly to create awareness of Prosopagnosia by presenting viewers with a basic understanding of the condition and its effects, and to encourage them to test themselves for Face Blindness.

3.2 Scientific Relevance & Accuracy of Information

Although the video content was scientifically accurate, and relevant to its responders, information which could be expressed was limited to a very simple form due to the type of audience at which it was directed.

Specifically, in ‘Faceblindness – Prosopagnosia’, Dr Morris Moscovitch briefly, yet simply, accurately and adequately defined Prosopagnosia as being “a disorder in face recognition. It means they (sufferers of the disorder) can see it’s a face, they know it’s a face, but they don’t know to whom the face belongs. They don’t know the person by looking at the face. They recognise features, but what they have trouble doing, is putting the features altogether into a gestaltimate, a kind of a whole. A person with Prosopagnosia will be able to see this as a face, be able to recognise that it is made out of different objects, but he will not be able to identify this face as unique.” This definition complies with that of several scientific journals, including Cognitive Neuropsychology. (M. Behrmann et. al., 2007). I feel Dr Moscovitch’s explanations of neuroscientific concepts were appropriately summarised and worded for the audience which this video clip targets – English-speaking people of both genders, all ages and ethnicities alike. Particularly appropriately worded and thus highly commendable was his explanation of how Prosopagnosia comes to fruition from an otherwise healthy brain. “As far as we know, there’s nothing obviously wrong with their brains. There may be some subtle problems that they have, either connecting the regions that are necessary for face recognition with each other, or in having those regions smaller” (Galina Avidan et. al., 2008).

Unlike the interviews with Dr Moscovitch which intended to give The Host viewers a basic scientific background on the agnosia, the interviews with Jeff Wasserman were conducted to demonstrate the effects of Developmental Prosopagnosia upon his own life, both on a personal and social level. He is even presented with scenarios which test his level of face perception, once again connecting with viewers on a very basic level. Persons watching the video whom suffer from the disorder of Prosopagnosia would be able to relate to the anecdotal content Jeff delivers, by drawing similarities between the personal and social effects of the agnosia upon his life, and their own lives. For the more general public, such anecdotes would communicate a casual insight into a disorder which is apparent in today’s society, but which receives limited media attention and is therefore often unheard of to the common person. However, there are limitations to the video focusing only on Jeff’s condition. Doing so not only
generalised his symptoms as the norm of Developmental Prosopagnosia sufferers, but the video also failed to identify any other types of Face Blindness such as Congenitive, Apperceptive and Associative Prosopagnosia. To provide a fairer, and more valuable outline of visual agnosias, I feel The Host should have also discussed how the aforementioned types of Prosopagnosia differ in development and effects (F. Gao et. al., 2007).

Commendably, The Host interviewer Hilary Doyle mentioned the varying degrees of the Face Blindness disorder. She provided examples of those ranging from mild to intense, by classing someone whom cannot recognise their own children as having a severe, debilitating form of Prosopagnosia, and Jeff as ‘moderate’, even given his career in the media industry as a photographer and photo editor.

Doyle also spoke about the importance of detecting persons suffering Prosopagnosia, but did not address any methods of treatment, cure, prevention or further research into the disorder. At the end of the segment, Doyle did however encourage viewers to test themselves for Prosopagnosia due to rising numbers of persons diagnosed worldwide. In particular she quoted statistics of Germany, “In Germany they’ve researched it a little bit more, and it turns out that 2-2.5% of the population in Germany has Prosopagnosia (face blindness). It’s pretty high. So right now everybody should go on this website because they’re looking to find more people in North America who have this. “ She is referring to ‘www.faceblind.org’. It’s part of a research centre collaborative between Harvard and University College Lindan, and there are two tests that you can do on the site. Really interesting. One is for celebrities, one is for strangers. And people with regular face recognition should score at least 85.” This is important due to the relevance of the disorder to everybody (M. Moscovitch et. al., 1997).

3.3 Media Article Evaluation

As outlined above, the video does not discuss Prosopagnosia in great detail. However, the information that is provided remains unbiased and scientifically accurate. Its explanations and demonstrations are also brief and worded simply as is appropriate for the target audience at which it is directed, as use of such techniques make the film easy to follow. Thus I feel The Host’s, ‘Faceblindess – Prosopagnosia’ video was engaging, entertaining and informative, and overall very suitable for it’s broad target audience of people of all ages, worldwide.

http://3.bp.blogspot.com/_kfvtjN2MmDI/TNoFKUBt2DI/AAAAAAAAx4/WoKoxJIoKHI/s1600/small-sfmoma_fisher_04_close_agnes.jpg
4.0 Appendix

Topic selection for this wikispace was difficult for our group, as everyone seemed to be strongly interested in largely differing areas of neuroscientific study. Initially only one of our group members was particularly keen on studying this topic of Prosopagnosia, as the rest of us knew very little about Face Blindness. Upon viewing the suggested video “Faceblindness – Prosopagnosia” by The Host, we collectively felt the topic to be too simple.

However, after much deliberation and compromise, we opted to study Prosopagnosia. Our extensive research into the concept of Prosopagnosia also disproved our previous, inaccurate concerns of simplicity – both of the disorder and of the content of the Youtube video itself. In fact, we decided to use this video clip after viewing countless others and finding them far too involved and scientific to analyse, as they used examples of advanced cases, terminology and scientific studies far beyond our understanding.

Additionally, we opted to select this media item because it was recent and therefore a relevant study, as it was aired in 2008 on both American television and posted on Youtube immediately afterwards. Having only been properly classified over the last couple of decades, countless neuroscientific studies of Prosopagnosia have consequently been sparked worldwide. Such recent research into the disorder provided us with an abundance of information on the topic in various forms (journal articles, video clips, magazine publications, personal anecdotes of Prosopagnosia sufferers and their families, etc.). Whilst all these forms of information were largely beneficial to our own understanding of Prosopagnosia, it was the journal articles sourced from world-renowned neuroscience and neuropsychology journals which we used as supporting evidence for our wiki, because we understood such published neuroscientific documents to be reliable sources of academic integrity.

It must also be highlighted that we selected to study this topic because we feel it is a matter relevant to society of the twenty-first century, as it affects far greater numbers of people than we would have ever expected, and because it is possible for anyone (including ourselves) to develop the condition due to both genotypic and phenotypic causes.

The comments made by reviewers about the draft of this assignment were particularly helpful - positive and largely constructive, and all feedback was appropriately addressed in editing the final version of the assignment.

Reviewers suggested the Introduction was too lengthy, so sentences were shortened and removed where possible. With regards to the Neuroscientific Context, much more focus was placed on the depth of the information in this section (particularly with respect to the genetic cause of the disorder, and to lesion studies), as recommended by the reviewers. Further editing has meant there are now less quotations of the video relayed in the Critical Analysis, and rearrangement of information has meant there is more of an address of the overall quality of the media item in the concluding paragraph as recommended by reviewers. Also as advised, a Table of Contents was added to the wikispace, minor spelling errors corrected, headings underlined, more images combined in the presentation, and a banner used for the title.
of the assignment.

It should be noted that ALL concerns of the reviewers were accepted and incorporated, and none rejected or dismissed. All reviewer feedback was greatly valuable in final edits of the wikispace.

http://debtorby.typepad.com/connections/images/chuck_close_rug_1.jpg

5.0 References


Maya Nishimura, Jaime Doyle, Kate Humphreys & Marlene Behrmann (2010), ‘Probing the Face-Space of Individuals with Prosopagnosia’, Neuropsychologia, Vol.48, No.1, p1828-1841


**Topic Title: Prosopagnosia**

- Youtube item: "Faceblindness - Prosopagnosia" ([http://www.youtube.com/watch?v=XLGXAiSpN00](http://www.youtube.com/watch?v=XLGXAiSpN00))

**Group Members:**

- Aimee-Marie Satumba (z3378067)
Neuroscience Fundamentals

- Alexandra Mantzouridis (z3378294)
- Kathryn Kacperek (z3376276)
- Morgan Jones (z3323697)

All good - approved

Work plan:
Form a Facebook Neuroscience group whereby topic ideas for study can be shared and discussed. Meet as a group once a week following Neuroscience practical/tutorial on a Friday afternoon for 1 hour.

Division of Labour:

- Alexandra: Take minutes at meetings, submit topic and work plan in wiki by Monday August 6th at 10am, draft introduction about agnosias in general and posopagnosia specifically (worth 15%) and appendix (worth 10%) of our topic by Monday September 10th at 10am. Provide review comments on project by Monday September 17th at 10am. Complete final copy of introduction and appendix by Monday September 24th at 10am.
- Aimee: Draft the neuroscientific context with respect to causes and treatments of prosopagnosia (worth 50%), and analysis of such information (worth 25%) of our topic by Monday September 10th at 10am. Provide review comments on project by Monday September 17th at 10am. Complete final copy of neuroscientific context by Monday September 24th at 10am.
- Kathryn: Draft the neuroscientific context with respect to possible cures of prosopagnosia (worth 50%), and analysis of such information (worth 25%) of our topic by Monday September 10th at 10am. Provide review comments on project by Monday September 17th at 10am. Complete final copy of neuroscientific context by Monday September 24th at 10am.
- Morgan: Draft the neuroscientific context with respect to further general research on prosopagnosia (worth 50%), and analysis of such information (worth 25%) of our topic by Monday September 10th at 10am. Provide review comments on project by Monday September 17th at 10am. Complete final copy of neuroscientific context by Monday September 24th at 10am.

Additionally, all group members must edit the wiki on at least two occasions over more than a one week period, comment on editing activities in the history page of the wiki, and contribute to discussion of topic on wiki discussion pages.

Deadlines:

- Form group, submit topic and work plan in wiki by Monday August 6th at 10am
- Have a draft of project ready by Monday, September 10th at 10am
- Provide review comments on your allocated project by Monday, September 17th at 10am
- Final project must be submitted by September 24th at 10am

Meetings:
- Minutes of first meeting (Meeting 1)
- Minutes of meeting about planning (due August 10th) (Meeting 2)
- Minutes of meeting about editing (due September 7th and 21st)