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An independent academic psychologist, based in England, who has written extensively on different areas of psychology with an emphasis on the critical stance towards traditional ideas.

A complete listing of his writings at http://kmbpsychology.jottit.com.

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1. TRAFFIC NOISE EXPOSURE AND HEALTH

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1.1. TRAFFIC NOISE AND HEALTH

Living close to an airport and the consequent exposure to aircraft noise is associated with psychological effects, like sleep problems [1], and nervousness, and physiological effects, like hypertension [2] (Correia et al 2013).

The Hypertension and Exposure to Noise near Airports (HYENA) study involves six European countries [3], and a sub-sample of women living with aircraft noise of 60 decibels (dB) [4] and above had significantly higher levels of morning saliva cortisol than women exposed to less than 50 dB (Selander et al 2009a). No association between noise exposure and saliva cortisol was found among men in a Swedish sub-sample of the HYENA study (Bluhm and Eriksson 2011). In this same sub-sample, night-time aircraft noise increased the risk of hypertension 1.15 times (Bluhm and Eriksson 2011).

Correia et al (2013) found a statistically significant association between exposure to aircraft noise and hospitalisation for cardiovascular disease (eg: heart failure; heart rhythm disturbances) among over 65s in the USA. Many studies have concentrated on one airport, whereas Correia et al (2013) included data related to 89 airports in 2009, and over six million local residents. Noise levels in decibels (dB) in over 2000 zip code areas surrounding the airports were calculated from US Federal Aviation Administration (FAA) data.

After controlling for individual characteristics, like sex (but not diet or smoking), socio-economic status (SES) of zip code area, level of air pollution and road

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[1] For example, "during sleep the noise from aeroplanes or heavy goods vehicles may be categorised as danger signals and induce the release of stress hormones" (Ising and Kruppa 2004 p5).

[2] As measured by self-reports, objectively, or anti-hypertension medication use.

[3] A study of aircraft and road traffic noise of nearly 5000 45-70 year-olds for over five years (Jarup et al 2005).

[4] Examples of decibel levels: whisper (20 dB), conversation at home (50), motor car at 65 mph at 25 feet (70), motorcycle at 25 feet (90), thunderclap (120), jet take off at 25 feet (150) (Source: http://www.industrialnoisecontrol.com/comparative-noise-examples.htm).

density (ie: automobile noise and pollution), every 10 dB increase in aircraft noise led to 3.5% more cardiovascular hospitalisations. But this effect had a threshold of 55 dB.

This study was based on secondary data (eg: medical records) analysed retrospectively), and no interviews with local residents (primary data), for example. The researchers are dependent on the accuracy of the medical records. The information for zip code areas were average taken from census records, and may not represent the individual (eg: high SES individual living in low SES zip code area).

A slightly different study in Korea (Rhee et al 2009) compared long-term residents within five kilometres of either a military helicopter base or a military aircraft base, and a control group. Hypertension was increased in the exposed groups, but only statistically significantly for those living near to the helicopter base.

Recent studies have reported increased cardiovascular effects for increased road traffic noise exposure in the Netherlands Cohort Study on Diet and Cancer, the Stockholm Heart Epidemiology Program, and a Danish study of over 50 000 residents (Davies and Van Kemp 2012).

Michigan State University-College of Human Medicine (2009) grouped the research on environmental noise and blood pressure into panel studies with small samples (eg: 20) and short-term measures (eg: 24 hours), and cohort studies with large samples over longer time periods.

An example of a panel study would be Haralabidis et al (2008), which found an increase in blood pressure (measured at 15-minute intervals over one night) in response to aircraft noise among 140 participants (part of HYENA study). Barragard et al (2009) is an example of a cohort study of nearly 2000 individuals in Sweden and the response to road and train noise. Hypertension increased nearly two-fold for noise at 56-70 dB. But this impact was only significant for men.

Davies and Van Kemp (2012) identified the issues in relation to the link between noise and cardiovascular disease:

i) The size of the effect of noise.

ii) The noise threshold where risk increases significantly.

iii) The effect of traffic noise and air pollution (TrAP) together (or separately).

iv) Vulnerable populations who are at greater risk - eg: children; adults with chronic illness.

v) Variables that modify the effect of noise - eg: location of bedroom in relation to road; length of exposure.

vi) General variables - eg: gender.

1.2. NIGHT-TIME NOISE

Maschke et al (1995 [5] quoted in Ising and Kruppa 2004) recorded increased stress hormones (and poor subjective sleep ratings) among 28 individuals living near to Berlin Tegel Airport in Germany (mean noise level: 30 dB). An increase in adrenaline was found on the first two nights of measures, and increases in cortisol on nights 3 and 4. Note than recorded simulated night flight noise was used for eight nights (Ising and Kruppa 2004).

Harder et al (1999 [6] quoted in Ising and Kruppa 2004) played simulated flight noise to fifteen participants for 37 nights (and silence for three control nights). Cortisol levels increased on noise nights 2 and 3, then dropped, but showed a higher permanent baseline (ie: over 24 hours).

Nocturnal traffic noise produces a similar effect (Ising and Kruppa 2004). Among 115 children, those living with moderate traffic noise (>60 dB) had more cortisol metabolites (ie: measure of increased cortisol) in their night-time urine than children living in quieter areas (<50 dB) (Evans et al 2001).

Belojevic et al (2008) found a greater risk of hypertension among men (but not women) who slept on the "street side" for more than 10 years in seventy central Belgrade streets, Serbia. The measure of night-time noise was taken for over 2500 adults.

Though individuals may not wake to night-time railway noise (ie: self-reported sleep disturbance), an increased heart rate (ie: objective measure) can occur to levels of 45-77 dB (Tassi et al 2010).

In a study in west India, Banerjee (2013) compared 105 individuals with night-time city road traffic noise exposure above 50 dB with 116 individuals below that on self-reported sleep disturbance in the past year. Sleep disturbance was greatest for noise at 61-65 dB, and increased for every subsequent 5 dB increase in noise.

[5] Article in German.
[6] Article in German.

Older age and length of residence in the city also increased the effect. Women reported more sleep disturbance than men. It was calculated that about a quarter of the difference in sleep disturbance between noise-exposed and non-exposed individuals was due to noise (as opposed to other variables like SES).

1.3. SWEDISH RESEARCH

Bluhm and Eriksson (2011) summarised the recent epidemiological studies in Sweden on noise and cardiovascular effects:

1. Aircraft noise - Rosenlund et al (2001) compared two random samples around Stockholm Arlanda airport for self-reported hypertension. Average aircraft noise levels of 55 dB increased the risk 1.6 times, and 1.8 times for an average of 72 dB. This was a cross-sectional study with nearly 3000 participants.

In a study than compared two different groups ten years apart round the same airport, Eriksson et al (2007) found a relative risk of hypertension of 1.2 for average noise above versus below 70 dB among middle-aged men.

2. Road traffic noise - For example, Bluhm et al (2007) found increased hypertension among women, in particular, and long-term residents (more than ten years) living near busy roads in Stockholm County. This was based on a postal questionnaire completed by over 600 respondents (and adjusted for age, smoking, occupation, and house type).

Selander et al (2009b) used the case control design to study the relationship between myocardial infarction (heart attack) and road traffic noise. This involves taking cases (heart attacks) and working backwards looking for differences compared to controls (matched no heart attacks). The risk of heart attack was 1.12 based on long-term exposure to road traffic noise above and below 50 dB. Where noise from other sources could be isolated in the analysis, the risk was 1.38 (Bluhm and Eriksson 2011).

3. Railway noise - For example, in a questionnaire study, Blum et al (2009b) found increased annoyance and sleep disturbances, but not self-reported hypertension based on living close to the busy railway line running north in Stockholm County.

1.4. UK RESEARCH

The National Noise Incidence Study 2000-1 (Skinner and Grimwood 2002) found that more than half of the UK

population was exposed to more than the World Health Organisation's (WHO) recommended day-time noise (55 dB), and just over two-thirds the night-time level (45 dB).

Stansfeld and Crombie (2011) found eleven articles on environmental noise exposure and cardiovascular disease (including hypertension, myocardial infarction, and coronary heart disease) in the UK in their review of studies. Two large scale studies in Caerphilly, Wales, and Speedwell in Bristol are important. The former was called the Caerphilly Collaborative Heart Disease study, and over 2000 men's traffic noise exposure in 1979-83 (baseline) was calculated. Generally, there was no significant association between traffic noise exposure and subsequent cardiovascular effects, but there were significant differences in blood pressure between the two extremes of noise exposure (Babisch et al 1988). Stansfeld and Crombie (2011) noted: "Interpretation of these findings should be cautious: although there was extensive adjustment for the confounding factors, the baseline study involved multiple comparisons and none of these indices showed convincing gradients by noise level".

The study in Speedwell involved over 2000 men aged 45-63 years. The data were subsequently combined with that from Caerphilly (eg: Babisch et al 1999). There were differences between the two extremes of noise exposure, but not significant associations. Stansfeld and Crombie (2011) observed: "Overall, although a statistically significant association was not demonstrated for road traffic noise exposure and ischemic heart disease, the studies could have been underpowered to demonstrate small effects and the evidence was suggestive of effects, taking into account more precise noise exposure and duration of exposure, indicated by the length of residence and room orientation". When there was a pre-existing cardiovascular disease, noise was a risk.

The road traffic and aircraft noise exposure and children's cognition and health (RANCH) study (van Kempen et al 2006) recruited children aged 9-10 years around London Heathrow and Amsterdam Schipol airports. Aircraft noise exposure was associated with increased blood pressure, but the results varied between the two samples, and depending on the analysis (eg: variables controlled for). Stansfeld and Crombie (2011) said: "Overall, there was little consistency in the results, making it difficult to be certain of an effect of environmental noise on children's blood pressure".

Stansfeld and Crombie (2011) summed up: "The recent HYENA study results suggest that aircraft noise and road traffic noise are related to hypertension. The Caerphilly study results on hypertension are somewhat tentative, but

suggestive of a positive relationship between road traffic noise exposure and hypertension, once exposure misclassification is reduced by considering the duration of exposure, window opening, and room orientation in relation to noise exposure. Moreover, they do suggest that people with an existing disease might be more vulnerable to noise effects and that higher annoyance responses in the absence of any disease may be a risk factor for hypertension. Nevertheless, because of the size of the sample, and the relatively low levels of road traffic noise in a small rural town, the effects of noise on blood pressure in the general population may be underestimated by these studies".

1.5. VULNERABLE GROUPS

"Vulnerability refers to the susceptibility of a person, group, society or system to physical or emotional injury or attack. It has also been described as the degree to which people, property, resources, systems and cultural, economic, environmental and social activity is susceptible to harm, degradation or destruction on being exposed to a hostile agent or factor... In epidemiology, a high-risk group has been defined as a group of people in the community with a higher-than-expected risk for developing a particular disease, which may be defined on a measurable parameter, an inherited genetic defect, physical attribute, lifestyle, habit, socioeconomic and/or educational feature as well as the environment" (Van Kamp and Davies 2013 p153).

The main vulnerable groups are children and older adults who could have different physiological responses to noise than adults generally, and individuals with low SES, who experience the noise differently due to psychological factors (eg: learned helplessness) (Van Kamp and Davies 2013). For example, 70% of children at a school near a major road in Nigeria with a noise level of 65-85 dB had concentration problems (Ana et al 2009), while adults over 60 years old in Bogota, Colombia, experiencing traffic noise reported lower health-related quality of life (Parra et al 2010).

However, Van Gerven et al (2009) found an inverted U-shaped pattern for annoyance to road and air traffic noise and age. In other words, children and elderly adults were less annoyed than adults generally.

Other vulnerable groups mentioned in Van Kamp and Davies's (2013) review of the literature (for 2006-2011) included individuals with chronic illness, those with tinnitus or other hearing impairment, noise-sensitive people, shiftworkers, individuals with serious mental illness, and foetuses. For example, noise affected the

sleep of shiftworkers, and individuals with physical and mental illness more (Muzet 2007).

In the GLOBE study in the Eindhoven region of the Netherlands, de Kluizenaar et al (2013) found that individuals with a history of cardiovascular disease had a greater risk of further problems from traffic noise exposure, but not the sample as a whole, while older residents (65-74 years) were more affected by air pollution from road traffic.

The study began in 1991 when a postal questionnaire was sent to a stratified sample of nearly 8000 15-74 year-olds in eighteen districts of south-east Netherlands. The sample was stratified by age, degree of urbanisation, and socio-economic status. Hospitalisation for cardiovascular disease data were collected for the next thirteen years, along with calculations of traffic noise and air pollution exposure.

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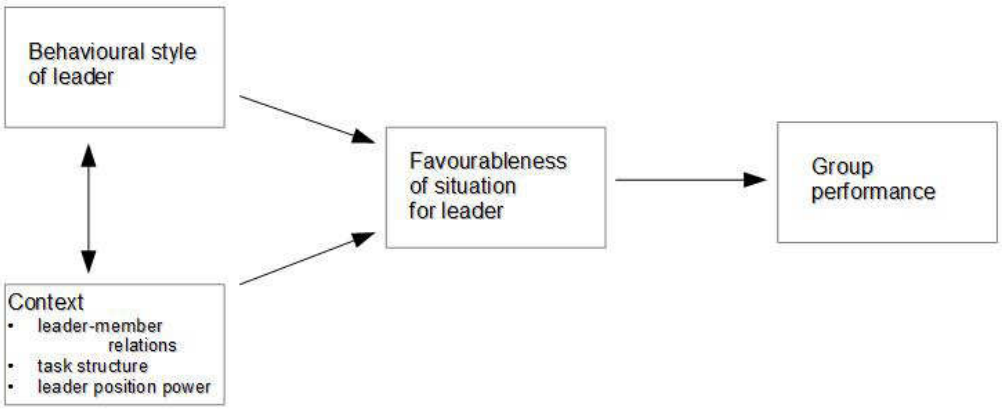
2. FIEDLER'S CONTINGENCY THEORY OF LEADERSHIP

2.1. Details of theory
2.1.1. Key evaluations of Fiedler's theory
2.2. Validity and reliability of LPC Scale
2.3. References

2.1. DETAILS OF THEORY

Interest in leadership has often focused on what makes the best leader as if a simple set of criteria can be established. Unfortunately, this is not the case, and the best type of leader or certain characteristics may be appropriate in one situation but not in another. This has led to contingency theories of leadership - matching the style of leadership to the situation.

Historically, the best known contingency theory is that of Fiedler (1967). Task success in a group depends on the behavioural style of the leader and the context in which the group is performing the task (figure 2.1).



(Based on Rollinson et al 1998 figure 11.5 p346)

Figure 2.1 - Fielder's contingency theory.

The context (or "situational control") has three aspects:

i) Leader-member relations - ie: quality of relationship between the leader and the group/followers. A favourable situation for the leader is the "ease of influencing subordinate behaviour" (Rollinson et al 1998).

ii) Task structure - ie: the nature of the task. With a high task structure, there is a clear, unambiguous

and routine task to perform and the leader's role is limited, whereas the opposite is true with low task structure.

iii) Leader position power - ie: formal authority that leader has to direct subordinates, and reward and punish performance.

The behavioural or leadership style is assessed by the least preferred co-worker (LPC) Scale. Using 16 or 18 bipolar dimensions [7] (eg: co-operative - unco-operative; friendly - unfriendly) and an eight point scale, the leader rates the subordinate who they are least successful at working with (figure 2.2).

	1	2	3	4	5	6	7	8	
unpleasant	_	_	_	_	_	_	_	_	pleasant
tense	_	_	_	_	_	_	_	_	relaxed
backbiting	_	_	_	_	_	_	_	_	loyal
insincere	_	_	_	_	_	_	_	_	sincere
unkind	_	_	_	_	_	_	_	_	kind
hostile	_	_	_	_	_	_	_	_	supportive
distant	_	_	_	_	_	_	_	_	close

(Source: Clark and Meldrum 1996)

Figure 2.2 - Items from LPC Scale.

A high LPC score is a leader who is positive about the least preferred co-worker (ie: relationship-oriented leader), while a low LPC score is characteristic of a task-oriented leader (table 2.1) [8].

Putting the leadership style and context together, Fielder concluded that in extremely good and bad situations, the task-oriented leader is most effective, while the relationship-oriented leader is better in inbetween situations (table 2.2) [9].

[7] There are slightly different versions of the LPC Scale.

[8] Low score = 18 (minimum) - 57, and high scores = 64 - 144 (maximum) (Clark and Meldrum 1996).

[9] More recently, Ellyson et al (2012) argued that task-oriented leaders are always best the US military, based on a survey of over 800 soldiers in peace-time. Overall, the strongest predictors of leader success in this situation were the personality characteristic of conscientiousness (in the five-factor model: extraversion, openness, conscientiousness, agreeableness, and emotional stability), and goal-oriented.

High LPC Scorers: Relationship-oriented leader	**Low LPC Scorers:** Task-oriented leader.
Give more favourable evaluation of least preferred co-worker.	Give more favourable evaluation of most preferred co-worker.
More often describe least preferred co-worker as bull-headed, dogmatic, overly talkative, and intelligent.	More often describe least preferred co-worker as not intelligent, careless, slow, incompetent, and obnoxious.
Give more favourable evaluation of group when members less intelligent.	Give more favourable evaluation of group when members more intelligent.
Blame themselves for group failure on task.	Blame other members for group failure on task.
Are liked by group members in stressful situations.	Are liked by group members in stress-free situations.

(Based on Rice 1978b table 1 pp1204-1205)

Table 2.1 - Five differences found between high and low LPC scorers.

Leader-member relations	**Task structure**	**Leader position power**	**Favourableness of situation**	**Most effective leadership style**
Good	High	Strong	High	Task-oriented
Good	High	Weak	High	Task-oriented
Good	Low	Strong	High	Task-oriented
Good	Low	Weak	Medium	Relationship-oriented
Bad	High	Strong	Medium	Relationship-oriented
Bad	High	Weak	Medium	Relationship-oriented
Bad	Low	Strong	Low	Task-oriented
Bad	Low	Weak	Low	Task-oriented

Table 2.2 - Interaction of context and leadership style.

This theory sees that ineffective groups can be improved by the changing the leader (ie: "engineering the job to fit the leader"; Fiedler 1965), or by changing the three contextual variables (eg: task structure - break down jobs) (Fiedler and Garcia 1987).

Fiedler et al (1976) developed a leadership training programme called "LEADER MATCH" that teachers leaders to adapt their behaviour to meet the goals of their group. It involves individual learning requiring 4-6 hours to complete that works through aspects of the contingency theory. Leaders in a variety of situations (eg: police; US government organisations) were given higher performance ratings after "LEADER MATCH" than leaders who

did not do the training (Fiedler and Mahar 1979).

Fiedler and Mahar (1979) compared 190 cadets in the Reserve Officers' Training Corps in the western USA who underwent "LEADER MATCH" with 215 cadets who did not. The rating of leader performance was based on platoon advisors and peers, and it was significantly higher for the trained than untrained cadets (mean: 103.6 vs 979.9). Note that the "LEADER MATCH" was only a small part of the cadets training.

2.1.1. Key Evaluations of Fiedler's theory

a) The validity of the LPC Scale (eg: Graen et al 1971). The LPC score is not fixed, but can change over time, and is influenced by gender of leader in relation to group members (Gross 1992).

b) Other contextual variables (eg: "follower satisfaction" ignored; Rollinson et al 1998).

c) The relationship between answers given by leaders to LPC scale and their actual behaviour.

d) Showed that one best style of leader does not fit all groups (ie: importance of group task).

e) Sees an individual's leadership style as "relatively permanent and reflects deep-rooted psychological characteristics" (Rollinson et al 1998).

f) Fiedler sees the relationship between leader and follower as determining the appropriate leadership style for the situation, whereas other contingency theories (eg: "situational leadership"; Hersey and Blanchard 1988) believe that the leadership style determines the relationship between leader and followers (Rollinson et al 1998).

2.2. VALIDITY AND RELIABILITY OF LPC SCALE

Construct validity is established by the correlation of the LPC score with other measures of the same behaviour. For example, a personality or behaviour measure that is similar to what the LPC score represents. Fiedler and Chemers (1974) admitted a fruitless search over twenty years (at that point) to find such correlations. There should also be clearly defined theoretical constructs that explain such correlations.

Schriesheim et al (1979) argued that the LPC Scale had no such constructs, mainly because "every time evidence accumulates, the construct definition has been changed" (p287).

Fielder and Chemers (1974) defined the LPC score as "the degree to which an individual is ready to reject completely those with whom he cannot work, an attitude which is reflected by describing them... on attributes which are not directly related to work" (quoted in Schriesheim et al 1979 p288). So, for content validity, the LPC scale should include only non-task, personal characteristics (but it has task-related items) (Schriesheim et al 1979). Content validity is evident where a questionnaire has "items that are a representative sample of the construct's theoretical domain, and... that the measure be free from items measuring extraneous or confounding variables" (Schriesheim et al 1979 p288).

Test-retest reliability is the correlation of scores by the same individual at two points in time (figure 2.3), and is used to establish the stability of the questionnaire. Fielder (eg: 1967) argued that the LPC Scale had good test-retest reliability, while Rice (1978a) noted that studies found a "tremendous range in test-retest reliability coefficients".

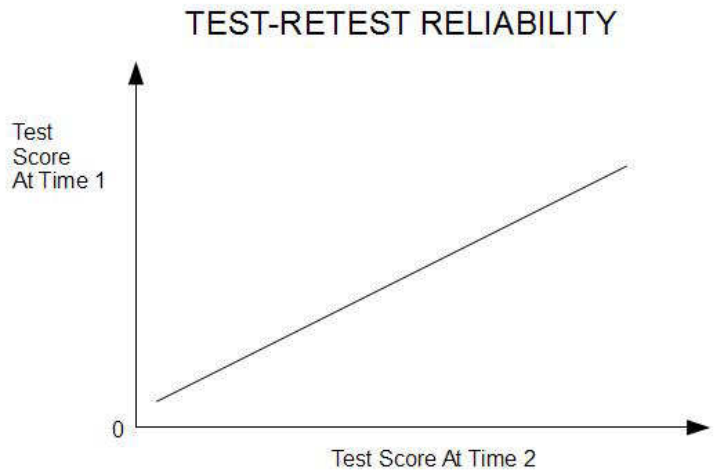


Figure 2.3 - Test-retest reliability.

Internal reliability is the consistency in answering similar questions the same way throughout the questionnaire. This is calculated by correlating the score of similar items. Schriesheim et al (1979) argued that correlations of +0.9 or more are necessary, and they said that the LPC Scale only achieves +0.7.

Parallel forms reliability involves the correlation of total scores by the same individual on two different versions of the same questionnaire. The problem in establishing this type of reliability for the LPC Scale is that there is no standard LPC Scale (Schriesheim et al 1979).

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3. PERCEIVED TRUSTWORTHINESS OF FACES AND EYES

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3.3. References

3.1. FACES

Perceived trustworthiness is information that individuals gain from viewing a face, say. For example, in economic trust games, males with longer and narrower faces are given more money (ie: perceived as more trustworthy) (Stirrat and Perrett 2010). Of course, perceived trustworthiness is not necessarily the same as actual trustworthiness [10].

In terms of impression formation, trustworthy faces are also perceived as happier, and untrustworthy ones as angrier (Oosterhof and Todorov 2009) [11]. The researchers presented computer generated Caucasian faces to sixty undergraduates at Princeton University, USA. Half the faces had characteristics previously rating the face as highly trustworthy and half as highly untrustworthy. The faces were manipulated to show "weak happy", "medium happy", "weak angry" or "medium angry" expressions. The participants rated the faces on a scale of "very angry" (-50) to "neutral" (0) to "very happy".

Trustworthy faces showing happy were rated as significantly happier than untrustworthy happy ones (mean: 15.4 vs 3.3; $p<0.001$), while the opposite was the case for faces showing angry (mean: -17.7 untrustworthy vs -0.4 trustworthy; $p<0.001$).

Then the researchers morphed the faces very quickly (using the dynamic stimuli paradigm). A happy untrustworthy face changing into a happy trustworthy face was perceived as happier than a trustworthy face that did not change, while a happy trustworthy face changing into a happy untrustworthy one was perceived as less happy than an unchanging untrustworthy face.

When an angry trustworthy face changed into an angry untrustworthy one, this as perceived as angrier than an unchanging angry untrustworthy face, while an untrustworthy angry face becoming an angry trustworthy one was seen to be less angry than an angry trustworthy face that did not change.

The research showed that not only do changes in

[10] Accurate and swift assessment of who to trust has an important evolutionary basis (Todorov 2008).
[11] Perception of trustworthiness involves the amygdala, as individuals with damage to that area of the brain cannot judge trustworthiness appropriately (Adolphs et al 1998).

expressions of emotions affect the impression of the individual's personality, but that changes in the structural features of the face affect the perception of the emotion expressed. This suggests "a shared basis of perceptions of face trustworthiness and expressions of anger and happiness" (Oosterhof and Todorov 2009 p132) (ie: the shared perceptual basis hypothesis).

3.2. EYE COLOUR

Combining the work on faces and trustworthiness with eye colour, Kleisner et al (2010) found that "brown-eyed males tend to have a face shape that suggests happiness, and hence, higher perceived trustworthiness while blue-eyed males tend to have a face shape that indicates anger and, hence, lower perceived trustworthiness" (Kleisner et al 2013 p1) [12].

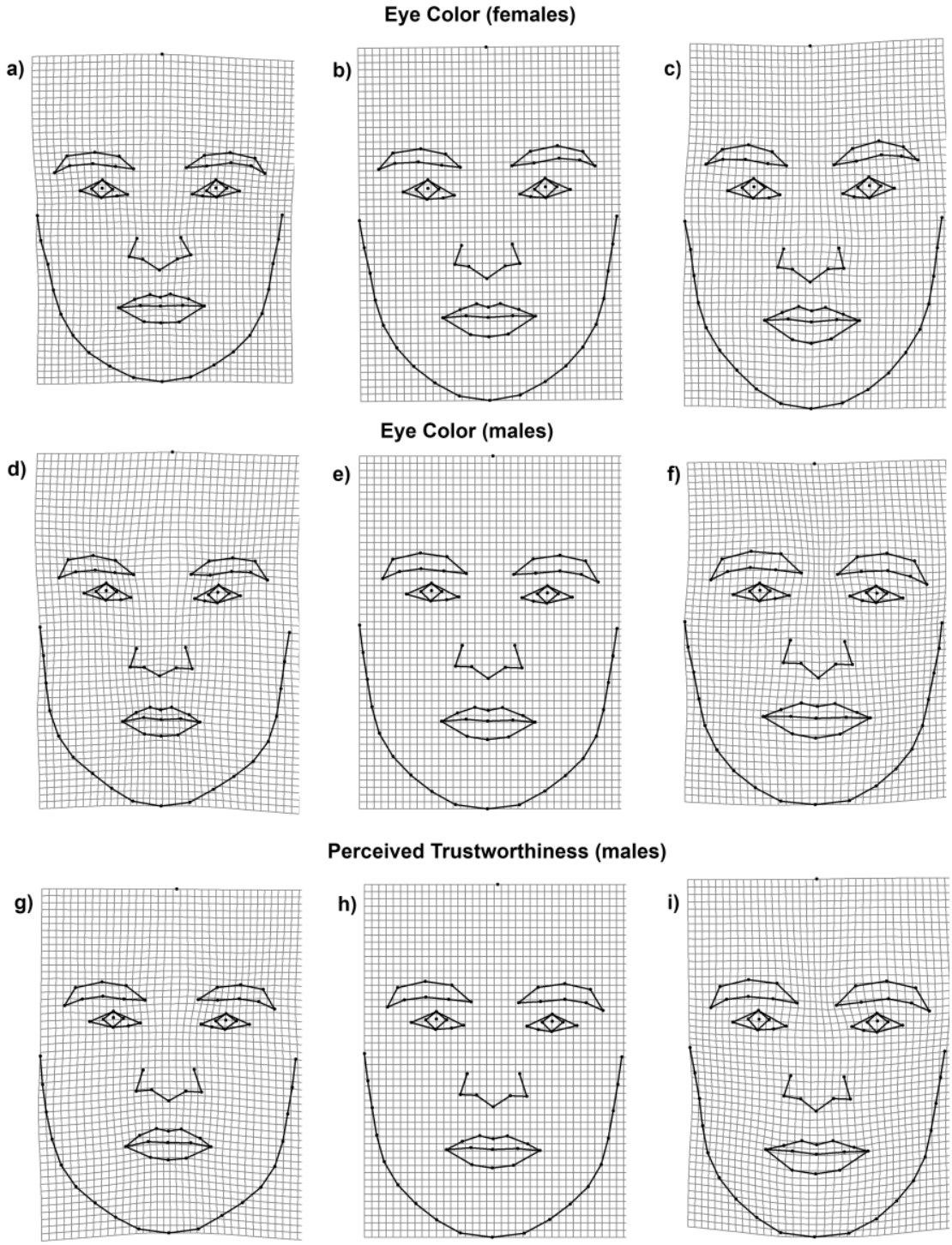
Kleisner et al (2013) investigated this idea further. Eighty students at a university in Prague, Czech Republic, agreed to have facial photographs taken. Using only brown and blue-eyed photographs, 238 more students rated the trustworthiness of the faces on a ten-point scale (where 10 was "very untrustworthy").

The researchers re-coloured the eyes in the photographs (ie: brown to blue and vice versa), and asked another 106 students to rate trustworthiness.

The researchers also took geometric morphometric measures of the faces (ie: distinguished the shape of the faces) (figure 3.1).

Overall, brown-eyed faces were perceived as more trustworthy than blue-eyed ones (figure 3.2). But this difference was not significant for the re-coloured photographs. This led the researchers to conclude: "brown-eyed individuals tend to be perceived as more trustworthy than blue-eyed ones within a population with variable eye colour, but it is not brown eyes that cause this perception. It is the facial morphology linked to brown eyes" (Kleisner et al 2013 p6).

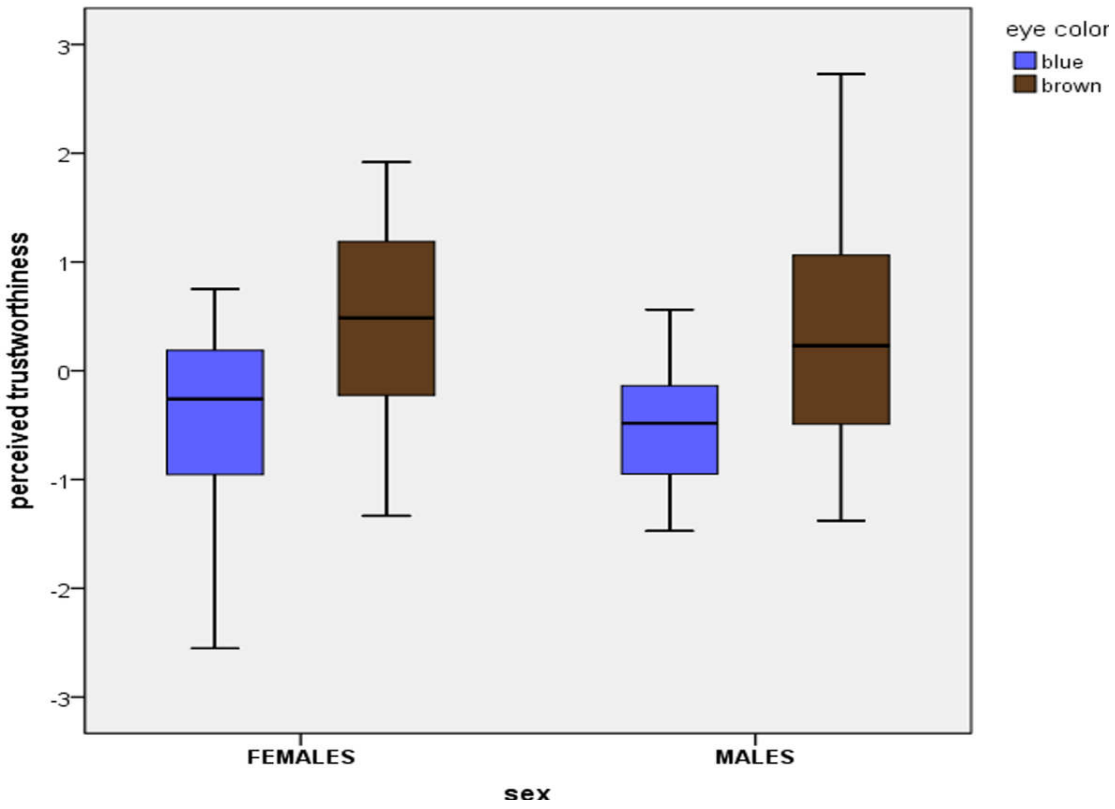
[12] There is some evidence that eye colour is actually linked to differences in behaviour. For example, pre-school blue-eyed boys are socially warier than brown-eyed boys with no difference for girls (Coplan et al 1998).



((a) blue-eyed woman; (b) average female face; (c) brown-eyed woman; (d) blue-eyed man; (e) average male face; (f) brown-eyed man; (g) untrustworthy-looking man; (h) average male face; (i) trustworthy-looking man)

(Source: Kleisner et al 2013 figure 2)

Figure 3.1 - Geometric morphometric visualisations of faces and perceived trustworthiness.



(A plus number equals greater perceived trustworthiness than the average (0), and a minus number is less than average)

(Source: Kleisner et al 2013 figure 1)

Figure 3.2 - Median z-scores of perceived trustworthiness of blue-eyed and brown-eyed male and female faces.

3.3. REFERENCES

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