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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.

# CONTENTS

# 1. ANIMALS COMMUNICATING ABOUT FOOD QUALITY



## 1.1. TYPES OF COMMUNICATION

Not only do animals communicate about the presence or location of food, the quality of the food is also communicated. This is important because poor quality food can be harmful.

Olfactory, chemical and auditory cues are three important ways of communicating such information.

i) Olfactory cues.

Galef and Wigmore (1983) offered a rat (Rattus norvegicus) (figure 1.1) a choice of two novel foods, while they observed another rat eating one of the foods. The observer rat chose the food eaten by another rat when they had previously interacted with that rat. Olfactory cues were seen as communicating information about food when the rat was known.

(Source: US Federal Government; public domain)

Figure 1.1 - Brown rat.

Rabbit pups (Oryctolagus cuniculus) (figure 1.2) raised by mothers fed different diets preferred the diet of their mothers. Information was transferred via odours in the faeces of the mother in the nest, during pregnancy (ie: into placenta), and during lactation (Bilko et al 1994).

(Source: Thermos)

Figure 1.2 - Rabbit.

ii) Chemical cues.

The pheromone trails of ants can include information about food quality, either in terms of the presence of a trail, or in the intensity of the trail.

In reference to the latter, Jackson and Chaline (2007) designed an environment for a small colony of Pharaoh's ants (Monomorium pharaonis) in their laboratory. Much of the environment was made of smoked glass which aided in measuring the pheromone trails. In one condition a syrup feeder with high quality food (ie: high sugar content) was placed close to the colony, and in the other condition low quality food (ie: low sugar content).

There was a difference in the intensity of the pheromone trail in the two conditions. With the high quality food, fed ants (those returning from the food source) laid a trail with greater intensity than the unfed ants (those going towards the food source). In the low quality food condition, there was no difference

between fed and unfed ants in their trail intensity.

Other species of ants, like the Black Garden ant (Lasius niger), communicate food quality by not leaving a trail if the food quality is poor and only leaving a trail when the food quality is high (Mailleux et al 2000).

The difference in behaviour in the species of ants is that Pharaoh's ants always leave a pheromone trail for aiding navigation, whereas Black Garden ants sometimes leave trails while using visual memory of routes more often (Jackson and Chaline 2007).

iii) Auditory cues.

Species can have specialised calls depending on the quality of food (known as referential signals) (eg: male domestic chickens, Gallus gallus domesticus, to a hen; Marler et al 1986; appendix 1A). But the sound of eating is also used. For example, agoutis (Dasyprocta punctata)(figure 1.3) respond to the rasping sound made by a companion gnawing on a nut (Galef and Giraldeau 2001).

(Source: Tedmek; public domain)

Figure 1.3 - Agouti.

Bugnyar et al (2001) reported different calls by ravens (Corvus corax) (figure 1.4) approaching food in an experiment in a park in the Austrian Alps. The different calls signalled information including the quality of the food.

Three types of food were left separately in two quantities by the researchers - meat, kitchen leftovers (meat and mainly vegetables), and wild boar chow. The experiment involved four 10-minute periods - prior to food (baseline phase), food shown but not available (presentation phase), food available phase, and after feeding (control phase after feeding). The calls of the ravens were recorded, and three types were focused upon - "haa" calls (long yells), "who" calls (short yells), and "chii" calls (high-pitched long yells).

(Source: Donar Reiskoffer)

Figure 1.4 - A raven.

Ravens gave significantly more "haa" calls to the presence of meat (either by itself or in the kitchen leftovers) than to chow (mean: 8 and 7 calls per minute vs 4 respectively during presentation phase). Meat is viewed as good quality food by them. The "haa" calls did not vary with the quantity of food.

"Who" calls were more frequent when less found was

left - an average of two calls per minute during the food available phase of the experiment when one bucket of food present vs less than one when there were three buckets of food. "Chii" calls, given mainly by juveniles, did not vary with the type of food.

## 1.2. NOVEL FOOD

Many animals are cautious or rejecting (neophobic) towards novel foods. But when one individual has successfully tried it, communication allows other individuals in the group to accept it. Such communication about novel food has been studied experimentally and observed naturally among many monkeys, like baboons, vervet monkeys, and capuchins (Snowdon and Boe 2003).

Watching others in the social group is one form of communication here. For example, young common marmosets (Callithrix jacchus) ate more of an unfamiliar food when in the presence of adults eating it rather than alone or when adults eating familiar food (Vitale and Queyras 1997). On the other hand, Fairbanks (1975) found no evidence of observational learning about adulterated foods to avoid (eg: bread infused with an emetic) among pigtail macaques (Macaca nemestrina) and spider monkeys (Ateles geoffroyi).

Snowdon and Boe (2003) investigated the communication of unpalatability of adulterated favourite foods among cotton-top tamarins (Saguinis oedipus) (figure 1.5) housed at the University of Wisconsin-Madison, USA. Vocal and visual cues appeared to be involved. In the presence of adulterated favourite foods (white pepper added to peaches and tuna), there were about half less food-associated calls by individuals eating them, and about three times more alarm calls as compared to unadulterated food.

Visual reactions of disgust on eating the adulterated food were also a way of communicating.

(Source: Nilington; public domain)

Figure 1.5 - A cotton-top tamarin.

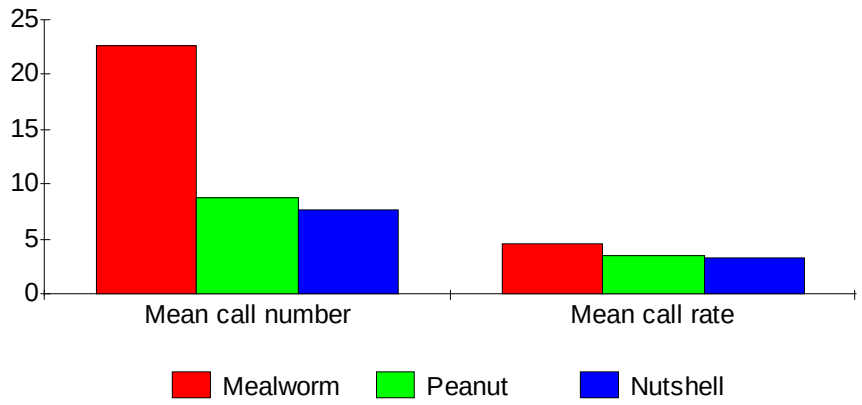
## 1.3. APPENDIX 1A - MARLER ET AL (1986)

Six heterosexual pairs of Silver Sebright bantam chickens at the Rockefeller University Field Research Centre in New York were studied. The cockerel of the pair was presented with one of four food types - mealworms (most preferred), peas, peanuts, and nutshells (control) - which the hen could not see. The number of calls and the rate of calling of the cockerel in response to the food (sender) and the reaction of the female (receiver) were recorded. Each pair undertook sixty trials, giving 360 trials in total (of which 77% had food calling).

The mean number of calls by the cockerels was greater for preferred food than the others, and the rate of calling was also faster (figure 1.6). The females were more likely to approach the male after the call for preferred food (82% of trials for mealworms compared 40% for nutshells).

Overall, hens were more likely to approach a food-calling cockerel than a silent male, and more likely if

there were many calls delivered rapidly (ie: call for preferred food).




(Source: Marler et al 1986 table 1 p190)

Figure 1.6 - Calls to different foods.

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## 2. OLDER ADULTS AND EATING DISORDERS

Traditionally, eating disorders and body image distortions are viewed as problems of younger women including teenagers (and even younger). The common age for first presentation of anorexia nervosa and bulimia nervosa is 16-25 years old (Scholtz et al 2010). The first onset of anorexia nervosa after adolescence has been called "tardive anorexia" (Dally 1984), and later onset (after 25 years old) of bulimia nervosa has also been reported (Mitchell et al 1987).

But eating disorders among much older women (ie: post-menopause), that is first onset rather than relapse by younger sufferers, has rarely been reported [1], and there are a few studies of body dissatisfaction across the lifespan (eg: Webster and Tiggermann 2003).

In an early study, Ryle (1936) mentioned a 59 year-old among 51 cases. While Kellett et al (1976) described the case of the first onset of anorexia at 52 years old in an English widow, who developed the condition after her adult children left home. Beck et al (1996) reported eleven cases of eating disorders with onset after age 40 from three eating and weight disorders clinics in the USA (less than 1% of case load). The oldest was a 77 year-old woman with anorexia nervosa (bulimia sub-type).

Hsu and Zimmer (1988) described five cases of women over 55 from the Western Psychiatric Institute in Pennsylvania, USA. Concurrent depression or a previous history of depression was also evident among the cases.

Gowers and Crisp (1990) reported the case of an eighty-year-old woman whose anorexia had returned at 65 years old after fifty years of remission since the first adolescent onset. The authors saw "anorexia nervosa as providing an adaptive biological solution to an existential conflict and we would see the re-emergence of our subject's anorexia nervosa as an attempt to utilise a previously discovered coping strategy to keep negative emotions at bay (in this case panic and depression rooted in her long-standing sense of insecurity, reactivated by her husband's death). Her control of her body weight could be seen as giving her a sense of purpose and single mindedness, thereby reducing to the point of exclusion once again her emotionality at a time of personal uncertainty" (p757).

There was a contested case of anorexia with a 94 year-old woman who had stopped eating (Bernstein 1972), but "her prompt recovery with ECT throws doubt on the diagnosis" (Kellett et al 1976).

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[1] Symptoms of eating disorders could often be mixed with or attributed to other health problems (Mangweth-Matzek et al 2006).

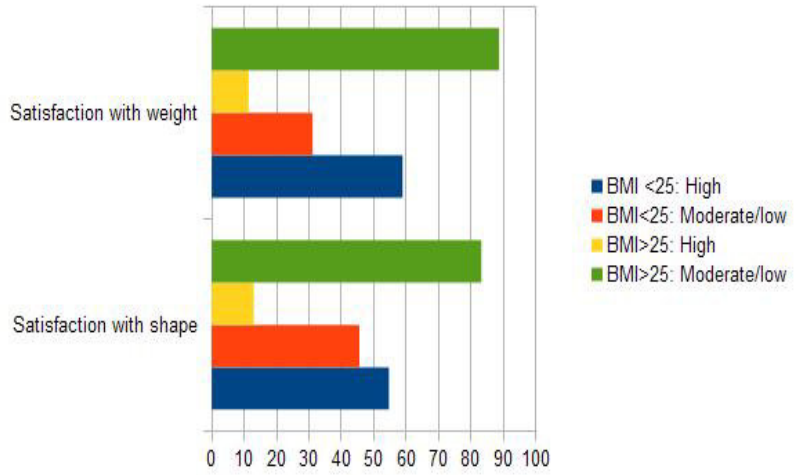
In a South Australian population sample, Hay (1998) reported that problematic eating disorder behaviours were more common in older adults (greater than 30 years old) than expected. Overall, 3.2% of the 3001 interviewees over fifteen years old had regular episodes of binge eating, while 1.6% used strict dieting or fasting and 0.8% purging to control weight. The mean age of binge eaters was 35 years, 31 years for strict dieting or fasting, and 40 years old for purging.

Mangweth-Matzek et al (2006) surveyed one thousand women aged 60-70 years in Innsbruck, Austria about their eating behaviour, weight control, and body attitude. Four hundred and seventy-five questionnaires were completed.
Here are the key findings:

i) Just over half the women (56%) controlled their eating to prevent weight gain. A very small number of women controlled their weight in extreme ways - eg: use of laxatives or diuretics (6%), and vomiting (1%).

ii) The mean current body mass index (BMI) was 25, but the desired mean was 23.

iii) The majority of respondents had low or moderate satisfaction with their shape and weight (64% and 63% respectively), but 75% agreed with the statement, "I really like my body". Significantly more women with a BMI above 25 (ie: above normal weight range) were dissatisfied with their body than women with a BMI under 25 (figure 2.1).




(Source: Mangweth-Matzek et al 2006 table 1 p584)

Figure 2.1 - Satisfaction with body (% of respondents).

iv) 18 women (3.8%) could be diagnosed with a current eating disorder based on their replies, and 21 more women (4.4%) showed single symptoms of eating disorders, like binge eating.

Hsu and Zimmer (1988) gave two reasons for why eating disorders may be becoming more common in older women:

a) The general increase in eating disorders in recent years will mean that some individuals will continue to suffer and/or relapse in later life.

b) It is "possible that even elderly women are beginning to succumb to the social pressure to be slim" (p133).

To establish if older cases of eating disorders were first presentations or relapses from younger onset, Scholtz et al (2010) examined case records at St. George's Eating Disorder Service in London. Twenty-six individuals over the age of 50 who were referred to the clinic in the previous ten years with sufficient clinical notes were included in the study. Eleven of them agreed to an in-depth interview.

The researchers found no evidence that anorexia nervosa had first appeared in later life. All cases showed onset before 25 years old. However, because of the small sample, the researchers did not dismiss the possibility of late onset anorexia existing.

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## 3. MEASURING MALINGERING, AND FALSE NEGATIVES AND POSITIVES

The study of malingering has increased in interest in recent years, particularly with the increase in personal injury cases. For example, individuals faking or exaggerating the effects of a brain injury by malingered cognitive impairment (eg: faking memory problems) or lack of effort on tests. How to establish if an individual is malingering? A number of tests have been developed including the Test of Memory Malingering (TOMM) (Tombaugh 1996) and the Dot Counting Test (DCT) (Boone et al 2002).

- TOMM - This test involves fifty drawings of common objects which have to be recalled fifteen minutes later. It is an example of a symptom validity test, and is used to detect fake memory problems. A mean score of less than 45 is taken as a sign of malingering (Rosenfeld et al 2010). Research has shown that it has strengths in terms of detecting such faking (eg: not affected by knowledge of consequences of traumatic brain injury), but also limitations (eg: not accurate with severely brain damaged patients)(Vilar-Lopez et al 2008).

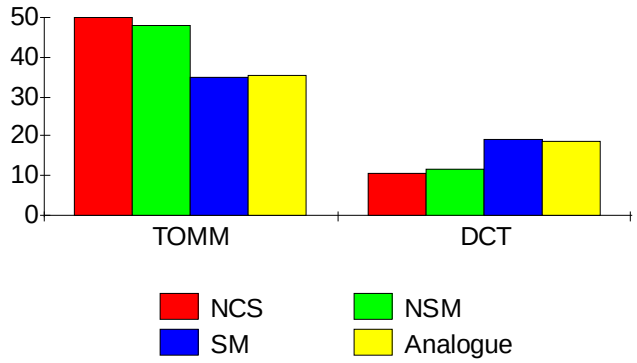
- DCT - Individuals are asked to count the number of dots on a card which are either grouped in a pattern or randomly distributed. The more dots on the card, the longer it takes to count them as well as it does to count non-grouped dots. Individuals, who are faking by lack of effort, can be detected by their time on the counting (eg: no difference for grouped and non-grouped dots) (Lezack 1995).

Boone et al (2002) compared 100 individuals suspected of malingering and 251 people with known clinical conditions (eg: dementia) on the DCT. There were differences between the two groups on mean time to count grouped dots, difference in time between counting grouped and non-grouped dots, and number of errors.

Vilar-Lopez et al (2008) used these two malingering detection tests with 54 patients in Spain diagnosed with mild traumatic brain injury (loss of consciousness of up to 30 minutes) in 2003-4. Of these, thirty were not involved in compensation seeking for the injury (NCS group), 14 individuals were involved in compensation seeking but not suspected of malingering (NSM group), and ten individuals seeking compensation and suspected of malingering (SM group) [2]. A group of 54 students who were encouraged to fake impairment were also used (analogues).

[2] This was based on previous malingering detection tests and neuroimaging measures.

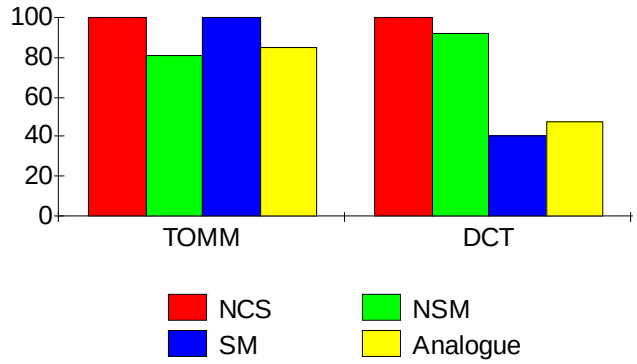
For the TOMM, the SM scored significantly lower than the NCS and NSM groups, and similar to the analogues. On the DCT (combined score), a similar pattern emerged as with individual DCT scores like number of errors (but this time a higher score was a sign of faking) (figure 3.1). So, overall, the NCS and NSM groups scored similar, and they were significantly different to the SM and analogue groups. Vilar-Lopez et al (2008) took this finding as evidence of the discriminant validity of the two tests. However, the DCT had more false positives (ie: rated as malingering when not; NSM individuals as malingering) and false negatives (ie: malingers not spotted; SM not malingering) (figure 3.2).




(TOMM - lower score = faking; DCT - higher score = faking)

(Source: Vilar-Lopez et al 2008 table 2 p371)

Figure 3.1 - Mean TOMM and DCT (combined) scores.




(NCS/NSM - correct classification = not malingering; SM/analogue - correct classification = malingering)

(Source: Vilar-Lopez et al 2008 table 4 p373)

Figure 3.2 - Percentage of correct classifications of malingering.

False positives and false negatives challenge the accuracy of a test (table 3.1).

| | IN REAL LIFE: ILL | FAKING |
|---|---|---|
| TEST SAYS: | | |
| ILL | True negative | False negative (test has missed real case) |
| FAKING | False positive (test has misclassified individual) | True positive |

Table 3.1 - Assessing malingering accurately.

One way to overcome this problem is by the use of multiple measures of malingering (though this is not foolproof). Rosenfeld et al (2010) compared 87 psychiatric patients (honest group) with 29 members of a community sample in the USA asked to fake some form of mental illness [3] on four measures of malingering including TOMM.

Overall, 52.6% of the participants were accurately classified after the battery of tests (table 3.2). But there were no cases of false positives by all four tests (ie: psychiatric patients classified as fakers) and no cases of false negative (ie: "fakers" classified as mental illness).

| | IN REAL LIFE: MENTAL ILLNESS | FAKING |
|---|---|---|
| TESTS SAY: | | |
| MENTAL ILLNESS | 47 | 15 (false negative) |
| FAKING | 40 (false positive) | 14 |
| | psychiatric sample (n = 87) | community sample (n = 29) |

Table 3.2 - Number of individuals accurately classified in Rosenfeld et al (2010) study.

[3] They were given the following script: "I want you to pretend that you have been arrested and charged with robbery. Your lawyer tells you that you will be convicted because someone has already identified you as the robber. You decide to pretend to be too mentally ill to face trial. Now we're going to give you a series of tests that doctors use to decide whether someone is able to stand trial, what sort of symptoms they have, and whether or not they are faking. Keep in mind that it is very important that you fool the doctors into thinking you are too mentally ill to be tried, but if they realise you are faking you may get even more time in jail so do your best without getting caught" (Rosenfeld et al 2010 p66).

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# 4. INHERITING BORDERLINE PERSONALITY DISORDER

Borderline Personality Disorder (BPD) is characterised by emotional problems, impulsivity, interpersonal relationship difficulties, identity disturbances, and cognitive impairments (APA 2000). It was estimated that 1% of adults in the general population in the USA suffer from it (Lenzenweger et al 2007).

If BPD is inherited, its prevalence should be higher in biologically related family members of sufferers than in the general population. This is the case.

Distel et al (2009) recruited twins and their parents, siblings, and spouses from the Netherlands Twin Register and the East Flanders Prospective Twin Survey in Europe. This produced 5017 twins (2651 identical and 2366 non-identical), 1266 of their siblings (472 brothers and 794 sisters), 3064 parents (1357 fathers and 1707 mothers), and 939 spouses of the twins (595 husbands and 344 wives).

BPD was measured by the 24-item Personality Assessment Inventory - Borderline Features (PAI-BOR) (Morey 1991) (Dutch translation). Each item is scored from 0 to 3 (maximum score = 72), and the cut-off point for BPD is 42 and above.

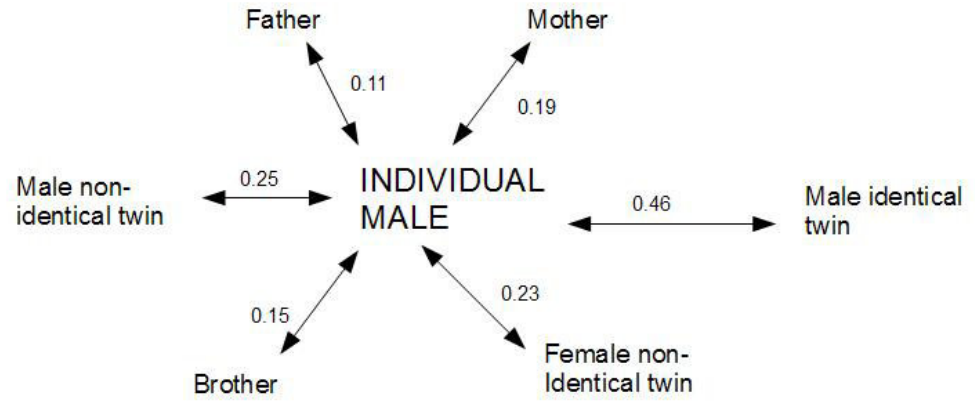
The PAI-BOR scores of individuals were correlated to show the degree of similarity (table 4.1, figure 4.1).

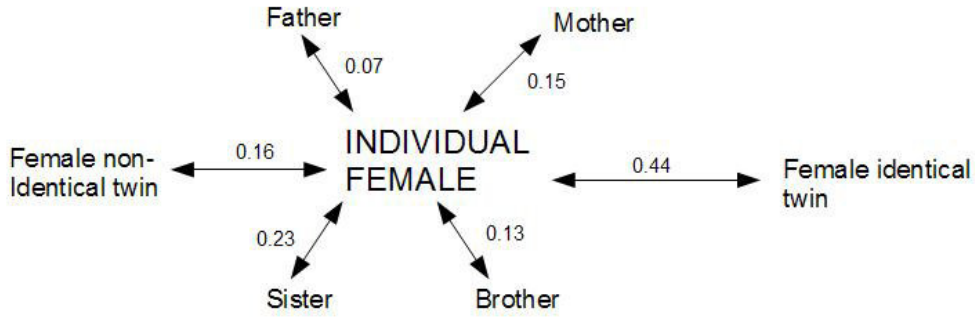
| RELATIONSHIP | GENETIC RELATEDNESS | AVERAGE CORRELATION |
|---|---|---|
| Identical twins | 100% | 0.45 |
| Non-identical twins/siblings | 50% | 0.19 |
| Parent-offspring | 50% | 0.13 |
| Spouse | Unrelated | 0.22 * |
| Strangers in general population | Unrelated | 0.01 ** |

(* Though spouses are genetically unrelated, individuals choose their partners including those similar to themselves; ** Lenzenweger et al (2007))

(Based on Distel et al 2009 figure 2)

Table 4.1 - Mean correlations for BPD scores.




(Based on Distel et al 2009 figure 2)

Figure 4.1 - Mean correlations for BPD scores.

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