Semantic charged stimulus to be utilised on the Emotional STROOP in eating disorders early detection

Results from a Portuguese sample, by 14-25 age group*

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Summary: Since the report from Cattell (1886) about the Colour and Word reading task, and the further formulation of the interference task (Stroop, 1935) the interest on this field has really been improved. The versatility, speed of administration and simplicity are the most characteristics pointed to the Stroop test on several investigations with patients with eating disorders (Ben-Tovim et al., 1989; Green & McKenna, 1993; Mogg, Kentish & Bradley, 1993; Walker et al., 1992). At the same time, emotional and cognitive abnormalities on internal and environmental information processing are typical characteristics on eating disorders (nervous anorexia and bulimia) (Nisbert, 1968; Fairburn, 1985, 1987; Fairburn e Garner, 1988), clearly involved on the Stroop task.

In this article we present the results from the first study realized with European Portuguese language, with PSITCA Test – Screening Protocol on Eating Disorders Behaviour / Protocolo de Screening para identificar transtornos do comportamento alimentar (Cabaco et al., in press). We present the results of the first phase of the research project, bilaterally financed by the Luso-Spanish Actions, directed by Professors M. J. Loureiro, from Beira Interior University - Portugal, and A. S. Cabaco, from Pontifícia de Salamanca University – Spain.

Key Words: Stroop Task, Eating disorders, Cognitive and Emotional Abnormalities.

Since the report from Cattell (1886) about the Colour and Word reading task, and the further formulation of the interference task (Stroop, 1935) the interest on this field has really been improved. Some authors have even categorised the importance that the test has achieved has a rare phenomenon (Esgalhado, 2002).

Emotional and cognitive abnormalities on internal and environmental information processing are typical characteristics on eating disorders (nervous anorexia and bulimia) (Nisbert, 1968; Fairburn, 1985, 1987; Fairburn e Garner, 1988). Authors like Jensen & Rohwer (1966) and others (Dyer, 1973) states that the emotional Stroop effect is a simple method to evaluate the anxiety intensity of bulimic and anorexic patients, regarding to factors like body morphology and food.

This procedure rely on the belief that naming the colour of words with emotional contents take some advantages over other techniques developed to measure emotional alterations related with emotional disturbs, phobias, and others (Cf. Loureiro MJ, Cabaco AS, Castro JA & Esgalhado MG, 2002).

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1 See Loureiro et al. (2002) to analyze the first article about part of the results of this project.
A lot of research has been developed in order to demonstrate the potential utilization of the Stroop phenomenon as a screening test (Ben-Tovin & Walker, 1991; Rogers & Green, 1993; Mogg, Kentish & Bradley, 1993; Vitousek & Hollon, 1990; Cooper & Fairburn, 1987, 1989; Cooper et al., 1987; Walker et al., 1992; Armas, 1997) sustaining the considerable amount of published articles over the last decades on psychiatric patients with diversified ethiology (namely phobia) and severity (Watts, McKenna, Sharrock, & Trezire, 1986).

The study on attention mechanisms of selective processes and its implications on information cognitive processes are one of the most interest areas on contemporary Cognitive Psychology (Loureiro et al., 2002). The Stroop task is utilised on the clear majority of research projects, considering the basic and the applied field (Arana, Cabaco and Sanfeliu, 1997). According to Mc Leod (1991) only in the last half a century more than 400 hundred articles using by some way the Stroop task were published. Basically, the Stroop task presents a measure of the subjects’ ability to classify information from the environment and selectively react to it. By this way, the Stroop interference cartoon presented to the subject represents a measure of the subjects’ ability to classify the information from the environment and selectively react to it. Once the attention predisposition is a central aspect on emotional behaviour this could explain the major importance that this task has achieved on the applied field, mainly clinical, as for a predictive diagnostic point of view, as for more diversified fields, like depressions, phobias, schizophrenia or psychosis (Cabaco, 1998; Cabaco & Armas, 2000). The phenomenon of attention predisposition are not only a sub-product of a emotional disturbance but is also important for the occurrence of it. All this factors taken together contributes to a dynamic process that elicits small increases on emotional states, leading to low emotional disturbances. The frighten stimulus became more relevant, leading to a posterior increase on emotional disturbance (Loureiro et al., 2002). Data from several studies suggests that subjects that suffer from a given type of pathology are usually slower in a word colour-naming task, if this word has some relation with its clinical condition, on Stroop emotional version (Williams et al., 1997; In Loureiro et al., 2002).

Some investigations on the psychopathology field have demonstrated that the selective emotional attention to relevant stimulus, could affect the subject’s performance on certain tasks, in which the information processing could be disruptive (Loureiro et al., 2002). The utilization of frightening stimulus (social and physical) related with the particular pathology have shown that those who suffer from the same pathology, spend more time in reacting to that stimulus, comparing to normal subjects.

The versatility, speed of administration and simplicity are the most characteristics pointed to the Stroop test on several investigations with patients with eating disorders (Ben-Tovim et al., 1989; Green & McKenna, 1993; Mogg, Kentish & Bradley, 1993; Walker et al., 1992). Other cognitive tasks could be clearly biased by factors like self-report (that could lead to a distortion of responses), intentional denial, and so fort. Stroop task, on contraire, are not to be directly influenced by this factors, once this task only could be directly influenced if the subject deliberately slow down the performance (Ben-Tovim, Walker & Douros, 1993;
Green, Elliman & Rogers, 1996; Vitousek & Hollon, 1990).
The emotional Stroop task could be, by these means, of major importance in
detailed psychopathological studies in order
to discriminate clinical disturb as like
anorexia and bulimia (Cooper, Anastasiades & Fairburn, 1992; Channon, Hemsley & De Silva, 1988), in the calculation of
several pathologies effects, or even in the
effects of some treatments of the same
pathology (Ben-Tovim & Walker, 1991; Cooper & Fairburn, 1992) (See also
Cabaco & Armas to a review).

**Objectives**

The main goal of this article stands on the
research of eating disorders from a
cognitive point of view, on the sequence
of prior published research (Loureiro et al.,
2002). From a practical point of view we
had in mind the importance on the
development of instruments, based on the
emotional Stroop effect, to be utilized by
Portuguese clinicians and researchers.
According to Loureiro et al. (2002) the
direct translation of word stimulus from
other languages, having Portuguese
language has the reference, could constitute
itself as a strong methodological bias. In
this article we present the results from the
first study realized with European
Portuguese language, with PSITCA Test –
Screening Protocol on Eating Disorders
Behaviour / Protocolo de Screening para
identificar transtornos do comportamento
alimentar (Cabaco et al., in press).

In this article we present the results of the
first phase of the research project,
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Actions, directed by Professors M. J.
Loureiro, from Beira Interior University -
Portugal, and A. S. Cabaco, from Pontificia
de Salamanca University – Spain.

**Methods**

**Sample**
The research was developed in two clearly
distinct phases.
In the first phase (study 1) we have utilized
what we have named a “Rational Criteria”:
a set of words (10) related with semantic
categories of “food” and “body” were
selected. A set of words related with
semantic neutral (“casa” / “house”, “sofa” /
“sofa”, etc.) and emotional (“suicídio” /
“suicide”, “morte” / “death”, etc.)
categories (20) were also selected.
The selection process has been realized
with basis on previous studies from the
Spanish team on former research in Spanish
and Portuguese (from Brazil) language,
taking in consideration the contextual
differences.
In the second phase (Study 2) we have
utilized what we have named “Formal
Criteria”:
“Use Frequency”, “Familiarity”,
“Understanding Level” and “Imagering
Evocation Degree”.
These “subjective indices” were evaluated
in a Likert Scale ranging from “0”
(nothing) to “5” (totally), and were scored
by 375 Portuguese subjects of the present
study, representing a sample ranging from
the ages of 14 to 25 (See also Loureiro
et al., 2002).

**Procedures**

Parting from the original Spanish Test,
presented in Spanish language (with
researches in Spain, Argentine and Chile),
Portuguese language (Brazil) and British
language (EEUU) we have selected a set of stimulus words, considering the specific characteristics of words semantic contents, possible double meanings and utilization frequency (representation) on the respective age group traditionally believed to be more vulnerable to these type of pathology.

**Results**

The available data are related to the subjective indices ("Use Frequency", "Familiarity", "Understanding Level" and "Imagering Evocation Degree"). The average, the standard error and the respective \( n \) for each category are presented.

Table 1 shows data about the Neutral Words. Use frequency of such words are clearly elevated, compared with what could be expected to be considered as the average (2,50). In this sample, the average utilization of Neutral Words is clearly elevated with the exception of “bandeira” / “flag” (2,17) and “pedra” / “stone” (2,23). Concerning on emotional content words “Use Frequency” (Table 2), the average is lower, as could be expected, once their utilization could be more expectable in emotional charged life events. Only two variables (words) presents average incidence superior to that that could be considered normal (2,50): “medo” / “fear” (2,60) and “triste” / “sad” (2,89) (probably these words are the most colloquial one and by these means, also the most utilized words by “normal subjects”).

Regarding to the “Use Frequency” on eating disorder (Table 3), the results shows a clear similarity with the neutral words utilization. Only to variables (words) shows an average use lower than the expected (2,50): “obesidade” / “obesity” (1,69) and “gordura” / “fat” (2,37). In fact, this similarity was already expected from the beginning, once, despite its relation with the eating disorder, these words are highly colloquial, and, by this way, they constitute the usual lexical repertoire of normal subjects (they are related with daily food habits).

<table>
<thead>
<tr>
<th>Table 1. Neutral words</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Frequência de uso</strong></td>
</tr>
<tr>
<td><strong>Use Frequency</strong></td>
</tr>
<tr>
<td>N</td>
</tr>
<tr>
<td>Casa</td>
</tr>
<tr>
<td>Sofá</td>
</tr>
<tr>
<td>Calor</td>
</tr>
<tr>
<td>Armário</td>
</tr>
<tr>
<td>Jardim</td>
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<tr>
<td>Gato</td>
</tr>
<tr>
<td>Tapete</td>
</tr>
<tr>
<td>Bandeira</td>
</tr>
<tr>
<td>Cortina</td>
</tr>
<tr>
<td>Pedra</td>
</tr>
</tbody>
</table>
The analysis of table 1 shows that, regarding to “Familiarity”, The Neutral words are clearly elevated, compared with what could be expected to be considered as the average (2,50). In this sample, and just related to Neutral Words, none of them shows an average lower than 2,50.

Regarding to the “Understanding” on Activation Words of Emotional Content (Table 2), the majority of the variables presents results lower than 2,50 ( “Desastre” / “Disaster”, “Terror” / “Terror”, “Fracasso” / “Fiasco”, “Vítima” / “Victim”, “Acidente” / “Accident”, “Perigo” / “Danger”, “Ameaça” / “Treat”, “Suicídio” / “Suicide”), which could mean that in this sample, the subjects are not really used to the utilization of such words, in terms of its daily repertoire, when compared with the rest of the test words.

<table>
<thead>
<tr>
<th>Frequeência de uso</th>
<th>Familiaridade</th>
<th>Compreensão</th>
<th>Imagem</th>
</tr>
</thead>
<tbody>
<tr>
<td>Use Frequency</td>
<td>Familiarity</td>
<td>Understanding</td>
<td>Imagery</td>
</tr>
<tr>
<td>N</td>
<td>Mean</td>
<td>S.D.</td>
<td>N</td>
</tr>
<tr>
<td>Medo Fear</td>
<td>375</td>
<td>2,60</td>
<td>1,36</td>
</tr>
<tr>
<td>Desastre Disaster</td>
<td>375</td>
<td>1,99</td>
<td>1,46</td>
</tr>
<tr>
<td>Terror Terror</td>
<td>375</td>
<td>1,93</td>
<td>1,52</td>
</tr>
<tr>
<td>Fracasso Fiasco</td>
<td>375</td>
<td>2,22</td>
<td>1,39</td>
</tr>
<tr>
<td>Vítima Victim</td>
<td>375</td>
<td>1,87</td>
<td>1,48</td>
</tr>
<tr>
<td>Acidente Accident</td>
<td>375</td>
<td>1,84</td>
<td>1,56</td>
</tr>
<tr>
<td>Perigo Danger</td>
<td>374</td>
<td>2,49</td>
<td>1,52</td>
</tr>
<tr>
<td>Triste Sad</td>
<td>375</td>
<td>2,89</td>
<td>1,44</td>
</tr>
<tr>
<td>Ameaça Treat</td>
<td>374</td>
<td>1,68</td>
<td>1,53</td>
</tr>
<tr>
<td>Suicídio Suicide</td>
<td>375</td>
<td>0,91</td>
<td>1,44</td>
</tr>
</tbody>
</table>
Finally, regarding to “Familiarity” on “Activation Words on Food Content” (Table 3), the same pattern is observed, and none of the variables shows an average lower than 2,50.

<table>
<thead>
<tr>
<th>Table 3. Activation words on Food content</th>
</tr>
</thead>
<tbody>
<tr>
<td>Frequência de uso Use Frequency</td>
</tr>
<tr>
<td>N</td>
</tr>
<tr>
<td>Açúcar Sugar</td>
</tr>
<tr>
<td>Barriga Stomach</td>
</tr>
<tr>
<td>Bolo Cake</td>
</tr>
<tr>
<td>Enorme Big</td>
</tr>
<tr>
<td>Fiambre Ham</td>
</tr>
<tr>
<td>Gordura Fat</td>
</tr>
<tr>
<td>Obesidade Obesity</td>
</tr>
<tr>
<td>Peso Heavy</td>
</tr>
<tr>
<td>Calorias Calorie</td>
</tr>
<tr>
<td>Gelado Ice cream</td>
</tr>
</tbody>
</table>

The analysis of table 1 shows that, regarding to “Imagering”, The Neutral words are clearly elevated compared with what could be expected to be considered as the average (2,50). In this sample, and just related to Neutral Words, none of them shows an average lower than 2,50.

Regarding to the “Imagering” on Activation Words of Emotional Content (Table 2) only three variables, “Fracasso” / “Fiasco” (2,40), “Ameaça” / “Treat” (2,20) and “Suicídio” / “Suicide” (1,90), presents results lower than what could be the Expected Average (2,50).

Finally, regarding to “Imagering” on “Activation Words on Food Content” (Table 3), the same pattern is observed, and none of the variables shows an average lower than 2,50.

Conclusions

We believe that the present data could be of major importance for Clinical and Health Psychologists, General Practitioners and other professionals in their professional praxis, on the research line that has been developed, namely from a diagnostic point of view (Loureiro et al., 2002). Once this data were collected in normal subjects (free of any known or diagnosed pathology) they could be postulated as reference data, in order to help the interpretation of results of subjects with scoring deviations, that could be suffering any type of general emotional disturbances related with daily food habits. We propose a further analysis, comparing normal subjects to “pathological subjects” (subjects suffering from food behaviour pathology or feed habits related disorders).
References


Cattel, J.M. (1886) The time it takes to see and name objects. Mind, 11, 63-65.


