MEMORY FOR ANGER WORDS IN PORTUGUESE-FRENCH BILINGUALS

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1. Theoretical framework

Memory can be influenced by emotional stimuli in a great variety of ways. Some studies point out the difference between subjects low and high on a particular emotional characteristic (e.g. low and high anxious subjects or depressive ones), others refer the distinctive bias emotional material elicits either on implicit or explicit memory. For the purposes of this paper, the key theories about emotions and memory are those of Bower (1981) about mood congruency effects and of Ellis & Ashbrook (1988) with their resource allocation model about the role of emotions on the quantity of cognitive capacities.

The effects elicited by emotions depend on the specific task the subjects have to perform. Memory research distinguishes between the emotional effects on implicit and explicit memory (e.g. Graf & Mandler, 1984; Roediger, Weldon & Challis, 1989). With implicit memory tests, the subjects are not explicitly directed to search their memory for previously learned material. For instance, they have to complete word stems with the first word that comes to their mind after being exposed to the experimental stimuli (primed). On the contrary, in explicit memory tests –free recall and recognition– there is a clear appeal to the stored material. Thus performance in implicit memory tests is a result of integration and in the explicit ones it is dependent on a deeper cognitive process, i.e., an elaboration which consists of integration but also involves developing connections to the schema and other contextual cues present at encoding. Some authors (e.g. Mathews *et al.*, 1989) proposed that sometimes there is no bias for emotional

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material (threatening material) in explicit memory tests. They argue that the subjects, in this case anxious subjects, avoided engaging in elaborative processing of dangerous cues. On the contrary, in implicit memory tests, normal controls showed a greater priming effect for non-threatening than for threatening words whether anxious subjects have a relative bias for threat material (Mathews, 1993). Other authors have found an identical avoidance mechanism in similar studies (Foa & Kozak, 1986) suggesting that subjects prefer to turn away from an unpleasant mood state (Isen, 1984).

In a previous study that we conducted with Portuguese monolinguals using identical material and the same kind of tasks as in the present work, we have found that participants also avoided processing anger words in an elaborative way as they recalled fewer of them (Martins, 1999).

Studying emotional processing in the case of bilinguals is a challenge. Understanding how monolinguals process emotions is difficult enough, it becomes even more complex when dealing with bilinguals. Bilinguals vary in levels of proficiency in their two languages.

Some researchers consider the age of acquisition of each language to be fundamental, defining early bilinguals those who begin to learn a language in early childhood, and late bilinguals those who learn it in late childhood or adulthood. As the question is specifically related with the degree of proficiency, it is reasonable to accept that "bilingualism is the regular use of two (or more) languages and bilinguals are those people who need and use two (or more) languages in there everyday lives" (Grosjean, 1992).

Most studies on bilingualism attempt to describe the degree of language integration in bilingual memory. The reading of literature suggests that authors use different terms to designate each kind of integration (e.g. Francis, 1999). For instance, compound and coordinate were first used by Weinreich (1953) to describe the mental configurations of the phonological and semantic representations of translation equivalents in bilinguals. Nowadays authors use them to designate two kinds of bilinguals: compound bilinguals being those who have learned two languages simultaneously in a common context and coordinate bilinguals the ones who have

learned the languages either in different times or in different contexts (e.g. Oliveira, 1999).

In this context it is reasonable to suppose that the cognitive differences found in bilinguals must be present when they have to perform a memory task for verbal material. This cognitive specificity should be responsible for and also explain some of the differences presented on performance. For instance, in the previous studies we developed with Portuguese/French bilinguals we reported some cognitive differences on their performance when compared with Portuguese and French monolinguals, namely on dichotic listening tasks (e.g. Oliveira, Castro & de Sousa, 1999; Oliveira & de Sousa, 2001). This should be particularly interesting when verbal material is also emotional. For coordinate bilinguals it might be the case that the first time experiencing and labeling of certain emotions occurs only in the native language, suggesting that emotions might be differently coded in two languages (Altarriba, 2002). The native language may have a crucial role during childhood being part of the child's affective world and associated to a particular set of thoughts and feelings (Guttfreund, 1990).

Across languages studies frequently refer that the subjects' personal stories are richer in the more dominant language than in the second one (Javier, Barroso & Muñoz, 1993). Social and cultural context may shape the way one organizes and structures emotional experience (Kitayama & Markus, 1994).

In our previous study for the adaptation of STAXI –State-Trait Anger Expression Inventory (Spielberger, 1988)–, we had some problems, namely with the normative values of some scales for identical populations, once they were normally higher in our Portuguese sample except for the Control Scale (Martins, 1995). It seems that there are cultural differences, namely on the way people experience and express emotions. It is possible that early experiences which are important for personality development are different in both cultural contexts, leading to different kinds of attachment (e.g. Magai & McFadden, 1995), or that social patterns are different for what is acceptable in terms of emotional expression (e.g. Lazarus, 1991).

Some researchers argue that in the process of therapy or counseling memories from childhood and adolescence are richer when recalled in the same language (Schrauf, 2000). Bilinguals can also be more verbally expressive since they use more

than one language and decide which one to use. For instance, when referring to troubling events bilinguals can use the second language to serve a distancing function. Marcos (1976) referred to this process as the detachment effect. The second language is usually acquired in a more emotionally neutral setting than the first language (Bond & Lai, 1986).

If we consider only words, it is known that they may elicit different emotions in the native language when compared with the second language. Taboo words (as may be the case of anger words) have been associated with greater anxiety when presented in the native language instead of the second language (Gonzalez-Reigosa, 1976).

It may be the case that the encoding of some socialized practices or childhood memories is done in the mother tongue and that the second one functions as a tool for non-emotional issues and for memories from adulthood.

The aim of the present work is to study the possible existing differences between monolinguals and bilinguals in the processing of emotional verbal material when compared with neutral material and to specify, in particular, whether there are differences in the processing of anger words. It is also important to verify whether there is a difference when bilingual subjects use each of their languages. As the subjects have to perform a recall memory task, they were given an elaborative encoding task (a like/dislike rating booklet) in order to improve explicit test performance and maximize the chance of finding an explicit memory bias. This rating task allows dissociating implicit and explicit memory tests as it improves performance for the first ones and does not affect the others (e.g. Graf & Mandler, 1984; Roediger, 1990; Schacter, 1992).

2. Method

2.1. Participants

Eighty subjects participated in the study. All of them were students ending their graduate studies in Humanities from two different Schools of Teacher Education. Fifty of them were Portuguese monolinguals and 30 Portuguese/French bilinguals. The participants average age was 24.08±5.09.

Anger characteristics of participants were accessed with the STAXI –Sate Trait Anger Expression Inventory (Spielberger, 1988) adapted for this Portuguese population

(Martins, 1995) in order to exclude subjects with levels unusual for this kind of population. None of the participants were excluded.

Participants were divided into Portuguese monolinguals and Portuguese/French bilinguals. Half of the bilinguals did the whole tasks in Portuguese and half in French. Material was presented in the language in which they had to respond.

2.2. Materials

2.2.1. Rating booklet

The booklet was composed of 32 anger, 16 neutral, 16 emotional positive words and 10 neutral distracter words (5 at the beginning of the list and 5 at the end). Words were randomly assigned to a position in the booklet with the constraint of three consecutive presentations of the same word type (anger, neutral, positive).

2.2.2. Recognition task

In this task a list of 32 anger, 16 neutral, and 16 positive words was presented to participants. Half the words of all types corresponded to words from the booklet the subjects had seen and half were new ones. Words were randomly assigned to a position either for being seen or not being seen, as for being anger or not anger words.

2.3. Procedure

2.3.1. Rating task

Participants first had to read the words in the booklet in order and circle a number on the scale from 1 to 5 that corresponded to how much they liked or disliked the word. No time limit was given to complete the task.

2.3.2. Recognition task

Subjects were given the recognition form with 64 words (32 previously rated and 32 new) and were told to circle all the words they remembered rating in the booklet and to cross out all the words they did not remember rating.

3. Results

As the number of words for each type was different, subsequent analysis had to consider their percentage. In general, participants recalled significantly more neutral words (M=.92±.15), than positive (M=.80±.17) or anger words (M=.78±.16) ($t(79)=-6.3$, $p<.000$).

Data from the recognition test were analyzed in two ways. Firstly we calculated the correct answer ("circle the words you have just seen in the booklet and cross out those that were not there"). This information allows to access item recognition (old or new). For item recognition, hit rate was defined as old words identified. False-alarm rate was defined as the percentage of new words identified. Item recognition performance was defined as indexed by hits minus false alarms.

First, results were analyzed to compare Portuguese monolinguals with Portuguese/French bilinguals. The analysis of the percentage of the different types of old words recognized for monolinguals and bilinguals shows that there is a type of word effect ($F(2,156)=6.20$, $p<.003$) (Figure 1). The t-Student test for dependent samples shows that bilinguals recognize more positive words ($M=.85\pm.14$) than monolinguals ($M=.77\pm.18$) ($t(78)=-2.34$, $p<.02$).

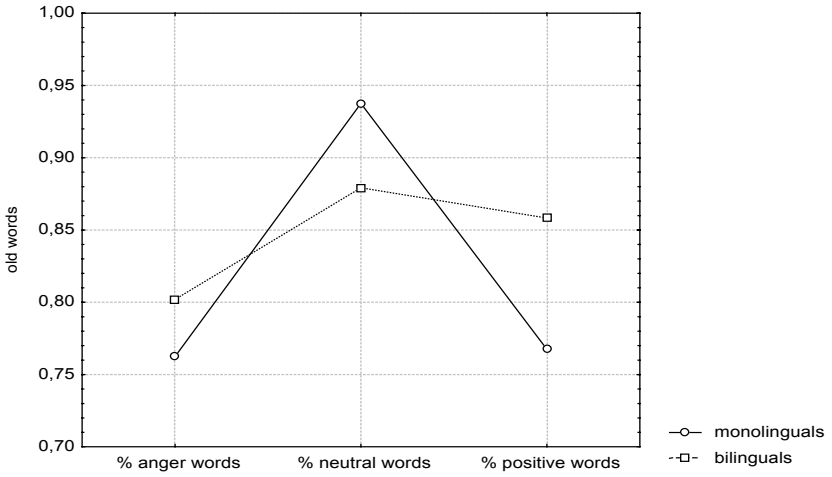

Figure 1. Percentage of identified words.

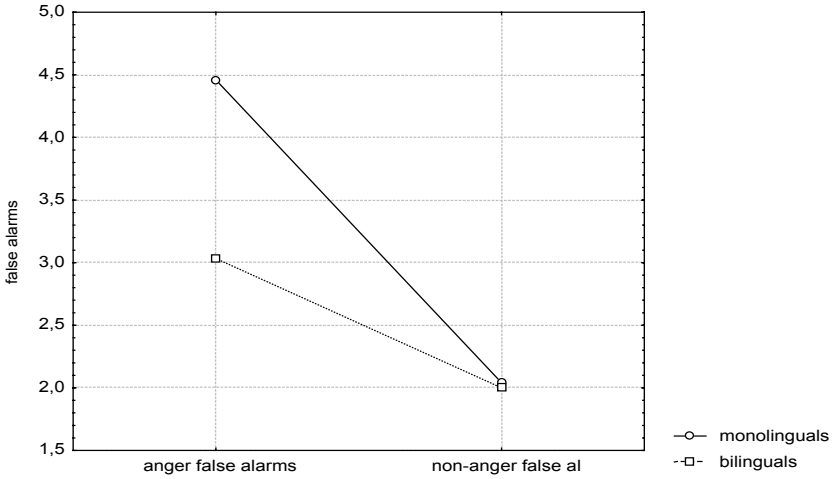

Figure 2. Number of false alarms.

As it is an objective of this study to know whether there is a difference of performance for anger words we analyzed anger words vs. non-anger words for all subjects. The number of false alarms for the anger words, when compared with the other words taken together (positive+neutral words) shows a group X type of word effect ($F(1,78)=5.48$, $p<.02$) (Figure 2). This difference is due to a significant difference between monolinguals and bilinguals, with monolinguals having more false alarms for anger words (4.46±3.02) than the bilinguals (3.03±1.97) ($t(78)=2.30$, $p<.02$).

There were no significant differences in the data between the two groups of bilinguals, those who used Portuguese and those who used French to perform the tasks. In spite of this, we have compared Portuguese monolinguals with those two groups separately. Comparison of the three groups for the percentage of item recognition performance (hits minus false alarms) identified a significant interaction between group and recognition performance ($F(4,154)=5.73$, $p<.0002$) (Figure 3). There is also a significant difference between bilinguals performing the task in French (M=.68±.18) and monolinguals (M=.48±.21) for anger words ($t(63)=3.36$, $p<.001$).

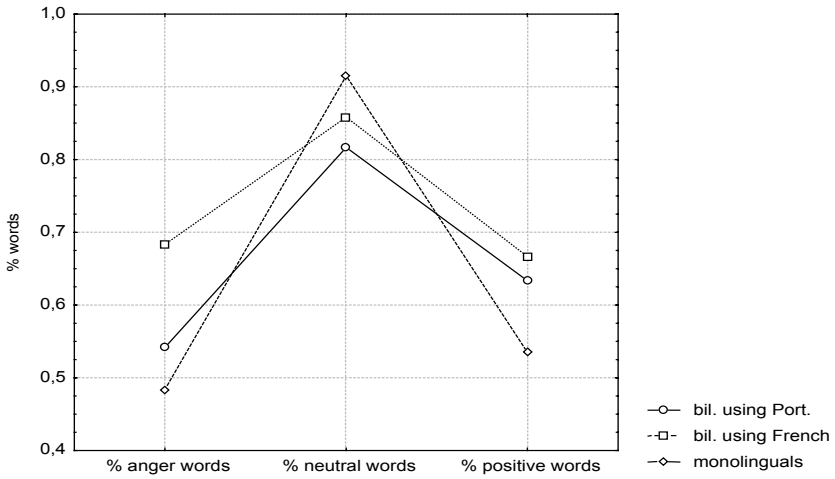

Figure 3. Percentage of item recognition performance.

In this analysis, bilinguals performing in Portuguese have a mean similar to monolinguals for anger words and to bilinguals performing in French for neutral and positive words.

A comparison of the percentage of the different types of words already seen correctly recognized, identified a significant interaction between Group and type of word ($F(4,154)=3.44$, $p<.01$) (Figure 4). There is a significant difference between

bilinguals performing in French and monolinguals for anger words, with bilinguals having a higher percentage of old words circled (M=.85±.14) than monolinguals (M=.76±.16). This is also the case for positive words (M=.88±.13 for bilinguals and M=.77±.18 for monolinguals).

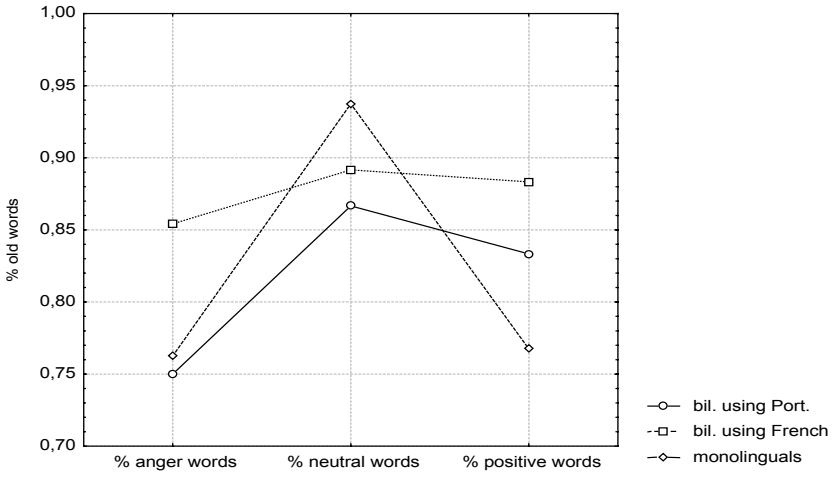

Figure 4. Percentage of identified words.

4. General discussion

The way we interact with ourselves and with the world is shaped by the way we have been raised. As a result, bilinguals' languages may have a different impact on their interaction with the social and emotional world.

In this study bilinguals performing in Portuguese had different results when compared with those who performed in French. Their performance when using Portuguese was similar to that of monolinguals, particularly with anger words. Authors (e.g. Foa & Kozak, 1986; Mathews *et al*, 1989) refer the presence of a mechanism of avoidance in some studies about some mood states as if the subjects were avoiding processing what upset them or simply what could be responsible for a mood change. This mechanism, although present in all experimental situations, is significantly more visible for monolinguals and for bilinguals performing in Portuguese.

It has been reported in many studies (e.g. Altarriba, 2002) that bilinguals use their languages differently, especially in emotional contexts. When using the mother tongue their emotional reports are richer (Javier, Barroso & Muñoz, 1993). Therapists sometimes see a clinical benefit in switching to the other language in order to decrease

anxiety or pain, namely when addressing some troubling and taboo issues, as may be the case of anger. The second language may serve a distancing function for emotionality (e.g. Marcos, 1976). Another interesting point would be to know whether this mechanism really depends on the mother or, on the contrary, is dependent of the specific characteristics of a language when compared with the other in their original social contexts (Guttfreund, 1990).

Anger is an emotion particularly shaped by cultural and social factors (e.g. Kitayama & Markus, 1994). Different cultures accept and allow its expression in very different ways and this fact is obviously culturally transmitted. Each language makes it possible to assess those differences especially when it is acquired in a very early period of life.

As a reflection of this we believe that for the bilingual participants in our study we have studied Portuguese must be their mother tongue if not in proficiency at least in emotional terms once their parents were Portuguese living in France.

Future studies should be carried out in order to extend these findings using different experimental methods. When studying the bilinguals' emotions it is important to understand the relationship between the languages, the moment people begin to have contact with them and the different role they play on the individual lives of bilinguals. Knowledge of this could help distinguishing bilinguals not only by their language proficiency or quantity of use but also by the importance each language has in their affective lives and how they use them differently in the case of emotional issues.

Bibliographical references

Altarriba, J. (2002). "Bilingualism: language, memory and applied issues". In W.J. Lonner, D.L. Dinnel, S.A. Hayes, & D.N. Sattler (eds.). *Online readings in psychology and culture* (unit 4, Chapter 4).

Bond, M.H. & T.M. Lai (1986). "Embarrassment and code-switching into a second language". *Journal of Social Psychology* 126, 179-86.

Bower, G.H. (1981). "Mood and memory". *American Psychologist* 36, 129-48.

Ellis, H.C. & P.W. Ashbrook (1988). "Resource allocation model of the effects of depressed mood states on memory". In K. Fiedler & J. Forgas (eds.) *Affect, cognition and social behavior*. Toronto: Hogrefe.

Foa, E.G. & M.J. Kozak (1986). "Emotional processing and fear: exposure to corrective information". *Psychological Bulletin* 99, 942-58.

Francis, W.S. (1999). "Cognitive integration of language and memory in bilinguals semantic representation". *Psychological Bulletin* 125(2), 193-222.

Gonzalez-Reigosa, F. (1976). "The anxiety-arousing effect of taboo words in bilinguals". In C.D. Spielberger & R. Diaz-Guerrero (eds.), *Cross-cultural anxiety*. Washington D.C.: Hemisphere.

Graf, P. & G. Mandler (1984). "Activation makes words more accessible, but not necessarily more retrievable". *Journal of Verbal Learning & Verbal Behavior* 23, 553-68.

Grosjean, F. (1992). "Another view of bilingualism". In R. Harris (ed.), *Cognitive processing in bilinguals*. Elsevier Science Publishers.

Guttfreund, D.G. (1990). "Effects of language usage on emotional experience of Spanish-English and English-Spanish bilinguals". *Journal of Consulting and Clinical Psychology* 58(5), 604-07.

Isen, A.M. (1984). "Towards understanding the role of affect in cognition". In R.S. Wyer & T.K. Srull (eds.), *Handbook of social cognition*. Hillsdale, NJ: Lawrence Erlbaum.

Javier, R.A., F. Barroso & M.A. Muñoz (1993). "Autobiographical memory in bilinguals". *Journal of Psycholinguistic Research* 22, 319-38.

Kitayama, S. & H.R. Markus (eds.) (1994). *Emotion and culture. Empirical studies of mutual influence*. Washington, D.C: American Psychological Association.

Lazarus, R.S. (1991). *Emotion and adaptation.* Oxford: Oxford University Press.

Magai, C. & S.H. McFadden (1995). *The role of emotions in social and personality development*. New York: Plenum.

Marcos, L.R. (1976). "Linguistic dimensions in the bilingual patient". *American Journal of Psychoanalysis* 36, 347-54.

Martins, F. (1995). "STAXI". In L. Almeida, M. Simões & M. Gonçalves (eds.), *Provas psicológicas em Portugal*. Braga: APPORT.

Martins, F. (1999). *Influência das emoções no desempenho cognitivo: ira e processamento da informação*. Instituto de Educação e Psicologia, Universidade do Minho, Portugal.

Mathews, A. (1993). "Anxiety and the processing of emotional information". In L. Chapman, J. Chapman & D. Fowles (eds.). *Progress in experimental personality and psychopathology research*. New York: Springer.

Mathews, A., K. Mogg, J. May & M. Eysenck (1989). "Implicit and explicit memory bias in anxiety". *Journal of Abnormal Psychology* 95, 131-38.

Oliveira, A.M. (1999). *Processamento de informação em bilingues*. Instituto de Ciências Biomédicas de Abel Salazar, Universidade do Porto, Portugal.

Oliveira, A.M., S.L. Castro & L. de Sousa (1999). "Verbal information processing in Portuguese/French bilinguals in a dichotic listening task". In M.G. Pinto, J. Veloso & B. Maia (eds.), *Proceedings of the 5th International Congress of the International Society of Applied Linguistics*. Porto: FLUP.

Oliveira, A.M. & L. de Sousa (2001). "Activação lexical numa prova de reconhecimento visual verbal com bilingues de português/francês". In A.S. Silva

(ed.), *Linguagem e cognição: a perspectiva da linguística cognitiva*. Braga: APL.

Roediger, H.L. (1990). "Implicit memory: retention without remembering". *American Psychologist* 45, 1043-56.

Roediger, H.L., M.S. Weldon & B.H. Challis (1989). "Explaining dissociations between implicit and explicit measures of retention: A processing account". In H.L. Roediger III & F.I.M. Craik (eds.), *Varieties of memory and consciousness: Essays in honor of Endel Tulving*. Hillsdale, NJ: Erlbaum.

Schacter, D.L. (1992). "Understanding implicit memory: A cognitive neuroscience approach". *American Psychologist* 47, 559-69.

Schrauf, R.W. (2000). "Bilingual autobiographical memory. Experimental studies and clinical cases". *Culture & Psychology* 6, 387-417.

Spielberger, C.D. (1988). *State-Trait Anger Expression Inventory, Research Edition, Professional Manual*. Odessa, Florida: Psychological Assessment Resources, Inc.

Weinreich, U. (1953). *Languages in contact: Findings and problems*. New York: Humanities Press.