



# Emotaix.pt: A tool for analyzing emotional vocabulary in European Portuguese

Sara Costa

University of Porto



# Why is it important to study emotional vocabulary?

- ❖ Expressive writing has a great potential as a therapeutic tool in diverse clinical settings.
- ❖ Pennebaker and collaborators (1986) - healing relationship between writing about emotional events and health:
  - ❖ Improved emotional and physical health
  - ❖ Psychological well-being
  - ❖ Personal growth
- ❖ Using the basic expressive writing paradigm (Pennebaker, 1997), several studies have shown different effects of experimental disclosure on various outcomes parameters: **psychological health; physiological functioning; reported health; health behaviors; subjective impact of intervention; and general functioning/life outcomes** (Frattaroli, 2006; Smith, 1998).



# Other tools for analyzing emotional lexicon:

- ❖ **EMOTAIX** (Piolat & Bannour, 2009) – EMOTAIX’s database contains 2,014 references.
- ❖ **Linguistic Inquiry and Word Count** (LIWC; Pennebaker, Francis, & Booth, 2001) - LIWC’s database contains about 2000 words or references.
- ❖ Other computerized text analysis programs:
  - ❖ DICTION program (Hart, Jarvis, Jennings, & Smith-Howell, 2005)
  - ❖ The General Inquirer (Stone, Dunphy, & Smith, 1996)
  - ❖ Latent Semantic Analysis (LSA; Foltz, 1996)
  - ❖ Analyzing Emotion-Abstraction Patterns (TASC/C; Mergenthaler, 1996)

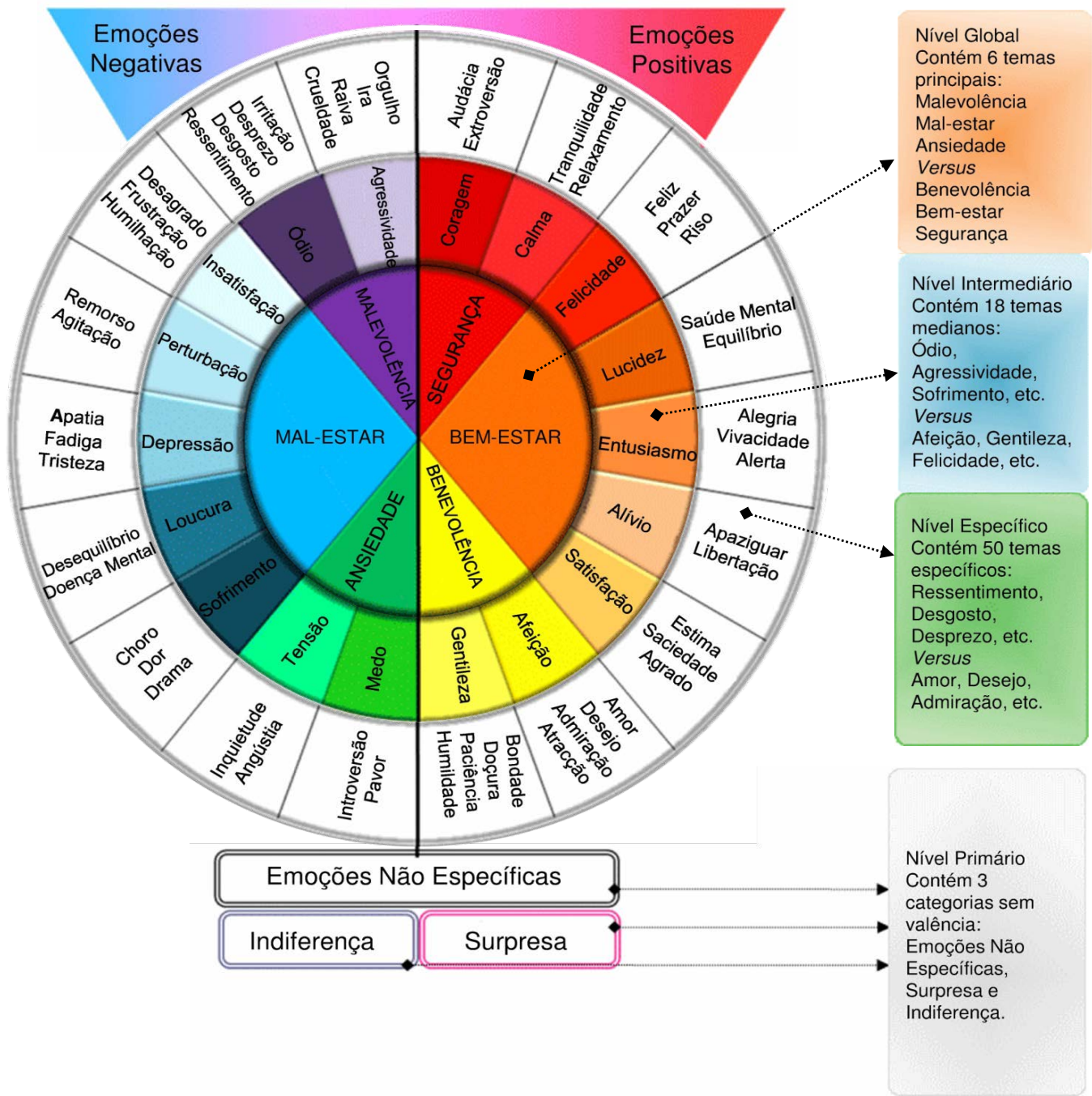


# Emotaix.pt

- ❖ Portuguese emotional lexical database.
- ❖ Portuguese adaption of the French database EMOTAIX (Piolat & Bannour, 2009).
- ❖ Comprises about **4000 Portuguese emotion words** organized by their **valence** (positive vs. negative) and **nature** (semantic category).
- ❖ This tool offers a fine-grained analysis of the emotional lexicon that along with valence, structures semantic categories around three hierarchical levels (viz., global, intermediate, and specific; see next Figure).
- ❖ The structure of Emotaix.pt was extended with three additional categories, which valence is neutral or its definition is context dependent: 1) surprise (includes synonymous related to surprise); 2) impassiveness (contains words expressing absence of emotion; 3) unspecified emotions (words with ambivalent emotional significance).



# Graphic Representation of Emotaix.pt



Global Level Intermediate Level Specific Level Intermediate Level Global Level

MALEVOLÊNCIA [850]	ÓDIO [462]	Ressentimento [93] Desgosto [49] Desprezo [189] Irritação [131] Crueldade [193]	Amor [121] Desejo [45] Admiração [87] Atracção [47] Bondade [95]	AFEIÇÃO [300]	BENEVOLÊNCIA [503]
	AGRESSIVIDADE [388]	Raiva [64] Ira [31] Orgulho [100]	Doçura [38] Paciência [37] Humildade [33]	GENTILEZA [203]	
MAL-ESTAR [1.191]	SOFRIMENTO [172]	Drama [63] Dor [83] Choro [26]	Feliz [18] Prazer [42] Riso [43]	FELICIDADE [103]	BEM-ESTAR [549]
	LOUCURA [283]	Doença Mental [151] Desequilíbrio [132]	Saúde Mental [6] Equilíbrio [46]	LUCIDEZ [52]	
	DEPRESSÃO [278]	Tristeza [89] Fadiga [104] Apatia [85]	Alegria [32] Vivacidade [92] Alerta [17]	ENTUSIASMO [141]	
	PERTURBAÇÃO [141]	Agitação [110] Remorso [31]	Apaziguar [64] Libertação [64]	ALÍVIO [128]	
ANSIEDADE [245]	INSATISFAÇÃO [317]	Humilhação [131] Frustração [98] Desagrado [88]	Estima [51] Saciedade [16] Agrado [58]	SATISFAÇÃO [125]	SEGURANÇA [194]
	MEDO [129]	Pavor [103] Introversão [26] Angústia [61] Inquietude [55]	Audácia [84] Extroversão [36] Tranquilidade [55] Relaxamento [19]	CORAGEM [120] CALMA [74]	
SURPRESA [30]		NÃO ESPECÍFICAS [338]		INDIFERENÇA [22]	

Additional Categories



# Next version of Emotaix.pt

- ❖ A web-based application of the Emotaix.pt database - will allow ease of access and user-friendly automated texts analysis.
- ❖ Integration of an Emotional Lexicon Analyzer (Emotaix.pt + EmoSpell; Maia, 2017) within HandSpy 3.0
- ❖ Synchronization with psychophysiological data channels (e.g., heart rate, skin conductance) and handwriting production data.



# Experimental Study

- ❖ Validity of **Emotaix.pt** was tested in a pilot expressive writing study, in which we asked college students to write about personal negative, positive or neutral experiences.

## Participants

27 Portuguese students, 20.1 years, from 1<sup>st</sup> and 2<sup>nd</sup> years of Integrated Master Psychology.

## Procedure

Data collection occurred in laboratory during a single 30-min session and the participants were tested individually.

Participants wrote in isolated individual booths and under conditions of rigorous anonymity.

Text 1 (6 min)

Text 2 (6 min)

Text 3 (6 min)

Within Subjects Design

Continuous record ECG, EDA and handwriting were stored.

Positive → Neutral → Negative





# Experimental Study

## Measures

- Psychophysiological measures: participant's physiological activity was assessed using two measures: heart rate and skin conductance. Physiological data was collected using the BIOPAC MP30 system and software BIOPAC lab.
- Writing logging and measures: Participants wrote their texts using a Live Scribe smartpen and A4 paper sheets. Text production was analyzed using HandSpy software.
- Expressive writing topics:
  - Write about the most traumatic and upsetting experience that you have ever experienced in your life and describe in detail your deepest feelings and thoughts associated with that experience.
  - The neutral topic requested participants to write about their daily routines, by describing in purely objective terms the actions performed in a typical day.
  - Write about the most happy and joyful experience that you have ever experienced in your life and describe in detail your deepest feelings and thoughts associated with that experience.



# Results: Emotional Vocabulary

Emotaix.pt was used to analyse the Portuguese emotional lexicon expressed in the collected texts.

- ❖ Emotional words used by the participants were **congruent** with the experimental conditions.
- ❖ A small amount of words belonging to the opposing valence was also present in both negative and positive conditions.
- ❖ Neutral condition elicited the **least amount** of emotion words.

## Writing Condition

	Positive	Neutral	Negative	ANOVA	
	(n = 27)	(n = 27)	(n = 27)	<i>F</i>	<i>p</i>
	<i>M (DP)</i>	<i>M (DP)</i>	<i>M (DP)</i>		
Emotional Words	11.81 (4.52)	2.85 (2.40)	13.48 (5.53)	77.20 <i>F</i> (2, 52)	.00
Positive Words	6.41 (3.87)	1.26 (1.16)	1.93 (1.80)	32.43 <i>F</i> (1.413, 36.742)	.00
Negative words	0.96 (1.13)	0.33 (0.73)	6.48 (4.17)	49.87 <i>F</i> (1.144, 29.752)	.00



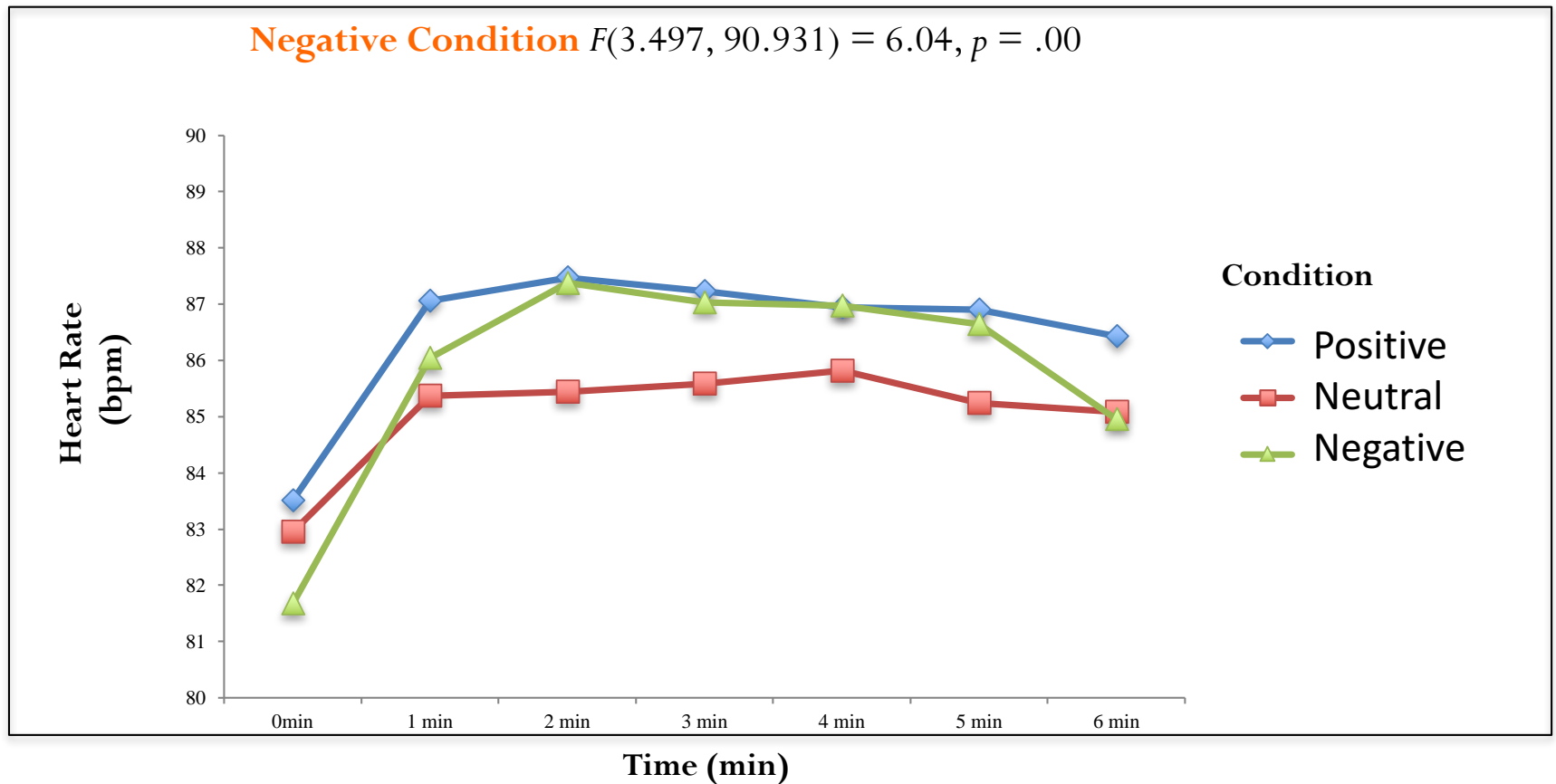
# Results: Heart Rate

Repeated Measures ANOVA

**Positive Condition**  $F(2.740, 71.241) = 2.95, p = .01$

**Neutral Condition**  $F(2.976, 77.376) = 1.90, ns$

**Negative Condition**  $F(3.497, 90.931) = 6.04, p = .00$



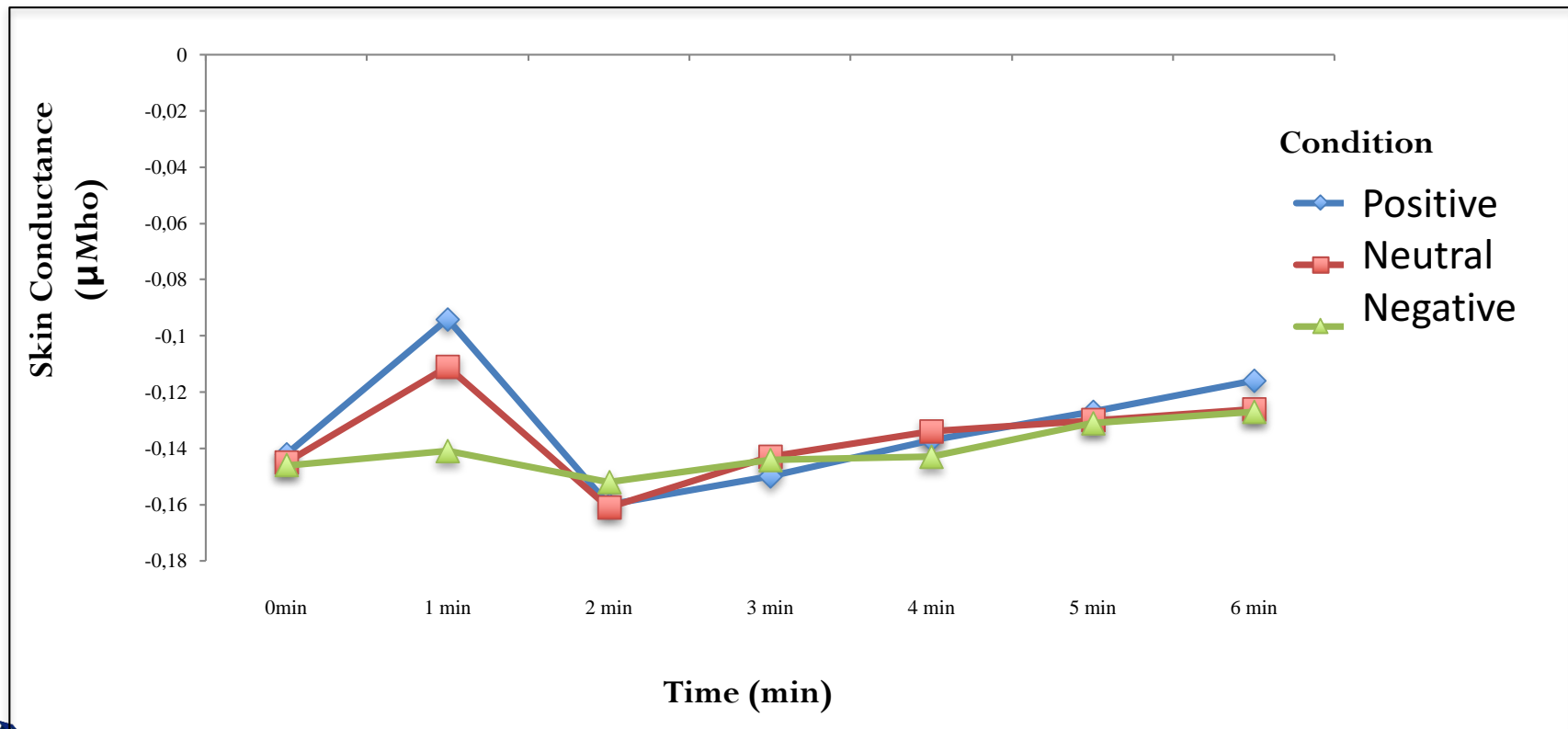
# Results: Skin Conductance

Repeated Measures ANOVA

**Positive Condition**  $F(3.260, 84.755) = 8.97, p = .00$

**Negative Condition**  $F(2.976, 77.376) = 1.90, ns$

**Neutral Condition**  $F(3.700, 96.188) = 8.70, p = .00$



# Summing Up

- ❖ This study showed that when individuals are given an opportunity to disclose deeply personal aspects of their lives, they readily do so and write about their deepest feelings and thoughts.
- ❖ Findings allowed checking for the validity and usefulness of Emotaix.pt as a tool for exploring the emotional vocabulary in the Portuguese language.
- ❖ We also found that expressing positive and negative emotions through writing leads to an increase in heart rate.
- ❖ However, the impact of the written production in electrical skin conductance level is limited to the first minute and just for the writing about positive emotions or about a superficial topic.
- ❖ The written production measures proved to be barely affected by the emotional content of the texts.



# Future Work

- ❖ Despite the numerous healing effects the mechanism through which expressive writing operates is still poorly understood.
- ❖ In our recent work, we propose that mind-body interactions during writing (M-BW), has revealed by an exploration of psychophysiological indexes and linguistic markers, might prove instructive to further understanding of how expressive writing operates:

- ❖ Emotional processing: disinhibition of repressed thoughts and feelings, better self-regulation of emotions, and extinction of thoughts and feelings due to repeated exposure.

and/or

- ❖ Cognitive/linguistic processing: the act of making sense of an experience and of organizing the traumatic memory into a more adaptive schema about self, others and the world.



# Thank you for your attention!

For further details, please contact:  
[saracosta@fpce.up.pt](mailto:saracosta@fpce.up.pt)

