

Additional Information on the Spanish Corpus for Sentiment Analysis towards Brands

María Navas-Loro¹, Víctor Rodríguez-Doncel¹, Idafen Santana¹, and Alberto Sánchez²

¹ Ontology Engineering Group, Universidad Politécnica de Madrid, Spain

² Havas Media, Madrid, Spain

Taxonomy

The four aspects of interest in the LPS BIGGER³ project for each tweet with respect to the brands, exposed graphically in Fig. 1 are the following:

- **Sentiment Analysis** identifies emotions towards a brand in a post beyond polarity, distinguishing between four sentiments and their direct opposite: *love* and *hate*, *happiness* and *sadness*, *trust* and *fear*, and *satisfaction* and *dissatisfaction*. Also secondary emotions are considered for each of these basic emotions (see Table 1), and a ninth category, called *NC2*, is added for those tweets expressing no feeling. It must be noted that these feelings are not exclusive: the same tweet can be considered *love*, *trust* and *sadness*, or even *satisfaction* and *dissatisfaction*.
- **Purchase Funnel** places the post's writer within the consumer decision journey, determining whether the Twitter user has purchased a product or is thinking to do it. The opinion given by a customer that already acquired a product gives different information than that provided by a person just thinking about purchasing it: the former might focus on the qualities of the product whereas the latter probably would be related to its promotion. Five different stages are considered: *Awareness* (the user writes about the ad campaign of a brand), *Evaluation* (the user is comparing brands or considering a purchase), *Purchase* (the user is purchasing a product or waiting for its arrival), *Postpurchase* (there is evidence that the user has bought the product) and *Review* (an opinion on the product is given).
- **Marketing Mix** comprises the different marketing strategies the customers can evaluate, also known as the four Ps: *product* (including quality, design and guarantee), *price*, *promotion* (affiliate marketing, sponsorship and advertising) and *place* (point of sale and customer service)[1].
- **Meaningful Brands** a metric that measures the value of the brand, based on the customer's well being. It is divided in *marketplace* (relating the product to performance such as quality and price), *personal wellbeing* (such as self-esteem, healthy lifestyles, fitness or happiness) and *collective wellbeing* (the role brands play in communities).

³ <http://www.cienlpsbigger.es/>

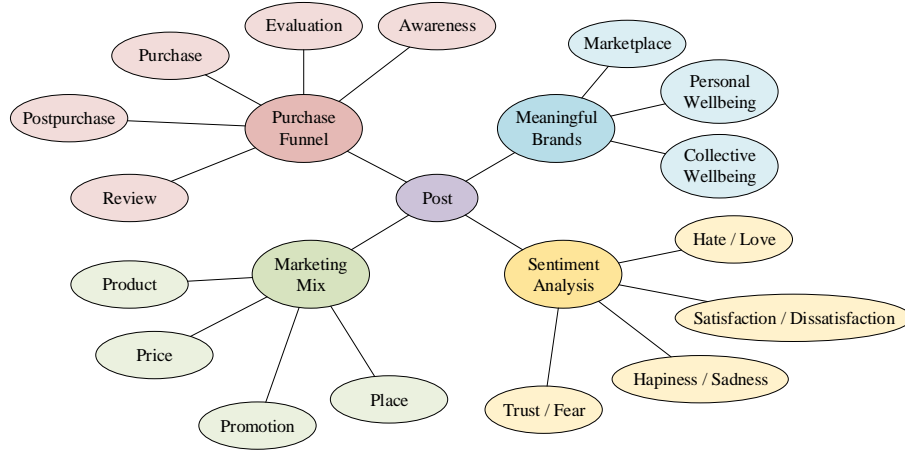


Fig. 1. The four aspects of interest for each tweet.

Emotion	Related emotions
Trust	Optimism, Hope, Security
Satisfaction	Fulfillment, Contentment
Happiness	Joy, Gladness, Enjoyment, Delight, Amusement, Joviality, Enthusiasm, Jubilation, Pride, Triumph
Love	Passion, Excitement, Euphoria, Ecstasy
Fear	Nervousness, Alarm, Anxiety, Tenseness, Apprehension, Worry, Shock, Fright, Terror, Panic, Hysteria, Mortification
Dissatisfaction	Dislike, Rejection, Revulsion, Disgust, Irritation, Aggravation, Exasperation, Frustration, Annoyance
Sadness	Depression, Defeat, Hopelessness, Unhappiness, Anguish, Sorrow, Agony, Melancholy, Dejection, Loneliness, Humiliation, Shame, Guilt, Regret, Remorse, Disappointment, Alienation, Isolation, Insecurity
Hate	Rage, Fury, Wrath, Envy, Hostility, Ferocity, Bitterness, Resentment, Spite, Contempt, Vengefulness, Jealousy

Table 1. Main emotions and their secondary emotions.

Tagging criteria

Three different people intervened in the tagging process of the corpus. Main emotions and their related secondary emotions are exposed in Table 1; the brands analyzed, derived from the LPS BIGGER project, can be found in Table 2. The criteria followed is exposed below:

- When the emotion is not obvious, the message must be marked as *NC2* (sometimes the meaning is not evident from the message alone). Messages that are evident advertising by the brand community managers, automatic messages or messages related to brand-events are also tagged as *NC2*.
- If you are sad and you have a *Mahou* (Spanish beer brand), the tag should not be *sadness*. The emotion must be sparked by the brand/product.
- A deep *dissatisfaction* is *hate*, a deep *satisfaction* is *love*. *Fear* is understood as the opposite of *trust*.
- The document “*I am satisfied with X but...*” is tagged as *satisfaction*, *trust* plus whichever negative sentiment follows.
- If a desired product is not found, *satisfaction* and *sadness* are tagged.
- Love emoticons are tagged as *love* and musical as *happiness* (unless irony happens). *Love* typically implies *happiness*.
- *Happiness* is only given to products already acquired, not to future purchases. The wish for a brand (“*I would like to have X*”) is tagged as *trust* and *satisfaction*, and possibly *love*.
- If the purchase is recurrent, then the document is tagged as *trust*; a future purchase is also typically labeled as *trust*.

Sector	Brand
BEBIDAS (BEVERAGES)	Cruzcampo, Heineken, Estrella Galicia, Mahou
AUTOMOCIÓN (AUTOMOTIVE)	Citroën, Fiat, Hyundai, Kia, Peugeot, Toyota
BANCA (BANKING)	Bankia, Bankinter, BBVA, Sabadell, ING, La Caixa/Caixabank, Santander
ALIMENTACIÓN (FOOD)	Auchan, Bimbo, Hacendado, Milka, Pascual, Puleva
RETAIL	Alcampo, Carrefour, Decathlon, Ikea, Leroy Merlin, Mediamarkt, Mercadona
TELCO (TELECOM)	Amena, Lowi, Movistar, Orange, Vodafone, Yoigo
DEPORTES (SPORTS)	Adidas, Nike, Reebok

Table 2. Sectors and Brands in the corpus.

The SAB corpus

The corpus comprises 4548 tagged messages, covering 7 sectors and 8 emotions, with a distribution⁴ shown in Table 3. Also the percentages are given in Table 4.

	HAT	SAD	FEA	DIS	NC2	SAT	TRU	HAP	LOV	TOT
FOOD	5	4	0	28	181	153	149	50	44	367
AUTOMOTIVE	0	1	5	11	508	33	17	6	5	551
BANKING	32	6	92	146	561	8	3	0	0	712
BEVERAGES	15	8	5	131	253	302	225	51	53	686
SPORTS	16	17	2	87	430	123	78	32	74	653
RETAIL	27	10	13	100	1,057	119	118	31	28	1,328
TELECOM	32	2	0	73	152	21	15	8	3	249
TOTAL	127	48	117	576	3,142	759	605	178	207	4,546

Table 3. Number of posts per sector and emotion, and the total amount for each.

	HAT	SAD	FEA	DIS	NC2	SAT	TRU	HAP	LOV	ANY
FOOD	1.36	1.09	0	7.63	49.32	41.69	40.60	13.62	11.99	50.68
AUTOMOTIVE	0	0.18	0.91	2.00	92.20	5.99	3.09	1.09	0.91	7.80
BANKING	4.49	0.84	12.92	20.51	78.79	1.12	0.42	0	0	21.21
BEVERAGES	2.19	1.17	0.73	19.10	36.88	44.02	32.80	7.43	7.73	63.12
SPORTS	2.45	2.60	0.31	13.32	65.85	18.84	11.94	4.90	11.33	34.15
RETAIL	2.03	0.75	0.98	7.53	79.59	8.96	8.89	2.33	2.11	20.41
TELECOM	12.85	0.80	0	29.32	61.04	8.43	6.02	3.21	1.20	38.96
TOTAL	2.79	1.06	2.57	12.67	69.12	16.70	13.31	3.92	4.55	30.88

Table 4. Percentage of posts per sector and emotion, and of posts with any emotion.

In order to evidence the intrinsic subjectivity of emotion tagging, one of the sectors (BEVERAGES) has been completely tagged by two additional people. We calculated the inter-annotator agreement using both the Fleiss' kappa [2] between the three taggers for each emotion and the Cohen's kappa [3] for pairwise inter-agreement. As shown in Table 5 for BEVERAGES, there are several emotions that scarcely appear in the corpora, being therefore statistically insignificant and leading to unrealistic kappas. We show the relevant results in Table 6; for both kappas values under 0 can be interpreted as no agreement (or as not different agreement than the one that would be expected by chance), being 1 the maximum agreement. Inter-agreement is notably low, even negative in

⁴ The data corresponds to that provided by Tagger 1.

	HAT	SAD	FEA	DIS	SAT	TRU	HAP	LOV
FOOD	2.69	2.15	0	15.05	82.26	80.11	26.88	23.66
AUTOMOTIVE	0	2.33	11.63	25.58	76.74	39.53	13.95	11.63
BANKING	21.19	3.97	60.93	96.69	5.30	1.99	0	0
BEVERAGES	3.46	1.85	1.15	30.25	69.75	51.96	11.78	12.24
SPORTS	7.17	7.62	0.90	39.01	55.16	34.98	14.35	33.18
RETAIL	9.96	3.69	4.80	36.90	43.91	43.54	11.44	10.33
TELECOM	32.99	2.06	0.00	75.26	21.65	15.46	8.25	3.09
TOTAL	9.05	3.42	8.33	41.03	54.06	43.09	12.68	14.74

Table 5. Percentage of emotions in non neutral posts.

some cases. Even when the highest appears in NC2, a higher agreement would be expected at least in if there is any emotion or not.

DISSATISFACTION					NC2				
Fleiss' kappa	0,372				Fleiss' kappa	0,384			
Cohen's kappa		A1	A2	A3	Cohen's kappa		A1	A2	A3
	A1	-	0,204	0,594		A1	-	0,304	0,528
	A2	0,204	-	0,264		A2	0,304	-	0,405
	A3	0,594	0,264	-		A3	0,528	0,405	-
Average: 0,354					Average: 0,412				

SATISFACTION					TRUST				
Fleiss' kappa	0,245				Fleiss' kappa	0,02			
Cohen's kappa		A1	A2	A3	Cohen's kappa		A1	A2	A3
	A1	-	0,124	0,560		A1	-	0,177	0,033
	A2	0,124	-	0,122		A2	0,177	-	-0,018
	A3	0,560	0,122	-		A3	0,033	-0,018	-
Average: 0,269					Average: 0,064				

Table 6. Inter-agreement between taggers for relevant emotions in BEVERAGES.

References

1. Neil H Borden. The concept of the marketing mix. *Journal of advertising research*, 4(2):2-7, 1964.
2. Joseph L Fleiss and Jacob Cohen. The equivalence of weighted kappa and the intra-class correlation coefficient as measures of reliability. *Educational and psychological measurement*, 33(3):613-619, 1973.
3. Jacob Cohen. A coefficient of agreement for nominal scales. *Educational and psychological measurement*, 20(1):37-46, 1960.