



What Makes a Best Exemplar in the Affective Domain?

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This paper is part of a broader multilingual research project that addresses the relationships between affective phenomena (as units of personal experience), concepts (as units of cognitive processing) and the lexical items we use in talking about affective experience (as units of verbal communication). The focus will be here on data obtained in six Scandinavian and Romance languages (N=1093) with the help of a reasoning task that supplemented a free listing and a ranking task. The task was specifically designed for assessing whether informants' choice of best (or most typical) exemplars of a superordinate category in the affective domain relies on a similarity-based strategy of attribute matching and family resemblance computation as suggested by prototype theory. As a consequence, the instructions were formulated so to encourage the use of a similarity-based comparison in justifying the choice of best exemplars. The responses provided by the informants show instead that participants may resort to a variety of alternative criteria (frequency, complexity, basicness, intensity, cultural or personal meaning, etc.) for assigning best-exemplar status. It is contended that such alternative criteria are consistent with a theory- (or knowledge-) based approach to concepts and categorization and that a hybrid, multi-strategy approach is more suitable in order to account for categorization in the affective domain.

Keywords: emotions, categorization, prototype, knowledge-based, Scandinavian, Romance

1. Introduction

1.1. Overview

Over the past decades, prototype theory (hereafter PT) has been one of the most prolific approaches in categorization and concept studies. Various versions of PT and various methodological paradigms have been applied to a variety of categories and domains of experience, including emotion. Although, as early as the end of the '70s, cognitive scientists began to point out some weaknesses, PT continues to be a very popular approach to categorization, especially in cognitive linguistics. The study reported here is part of a broader investigation aimed at collecting systematic data on affective categories and concepts in European languages.ⁱ The data analyzed in this study have been collected in a supplemented free-listing task designed for exploring the criteria underlining people's choices of best (i.e. most typical) exemplars of an

affective superordinate category and, more specifically, whether this exploits family resemblance in an attribute-matching strategy. I will begin with a brief outline of the predictions made by the most popular version of PT and of PT-inspired research in the affective domain. I will then move on to describing the procedure, to reporting the results and discussing them on the background of both PT and alternative approaches to categorization, pleading in my concluding remarks that a multiple-strategyⁱⁱ approach allows for a more suitable account of categorization in the affective domain.

1.2 Prototype Theory: Claims and Predictions

During the '70-s a growing body of evidence put forward by Rosch and her colleagues suggested that categorization might be a probabilistic process, with category membership relying on characteristic or typical properties. The notion of typicality (or goodness of example) is thus central to this version of PT. Similarity as a basis of concept and category formation was also revised to fit a model inspired by semiotics and philosophy of language, importing into psychological theory Wittgenstein's notion of *cluster concepts* and the structural principle of *family resemblance*. Family resemblance was shown to predict typicality (Rosch and Mervis 1975; Rosch, Simpson and Miller 1976): the more similar to the overall representation of the category a member is, the more typical it is. The similarity model employed in this framework takes into account both shared and distinctive features and a cue validity algorithm is employed for obtaining family resemblance scores. More specifically, shared and distinctive features identified for the various members of a category are weighted for how often they occur within the category, weights are then summed up and the sum of the weighted scores of all attributes listed for an item constitutes the family resemblance scores. This decides in turn whether the specific item meets a threshold criterion for class-inclusion. High correlations between family resemblance scores and typicality ratings obtained in their studies led Rosch and colleagues to conclude that typicality derives from family resemblance.

While similarity is the factor that drives category formation and is responsible for category coherence, attribute matching until reaching a membership decision is the operation underlying categorization processes. It follows that best exemplars (or prototypes) should be characterized by those features that are most recurrent and characteristic of a given category.

Prototypicality was posited as a predictor of “virtually all of the major dependent variables used as measures in psychological research” (Rosch, 1978: 38), including order of acquisition, membership judgments, probability and order of output in a listing task or probability of eliciting the superordinate category name. Moreover, prototypes act as cognitive reference points (Rosch 1975b): typical members or prototypes will be used in reasoning and communication when accessing less prototypical members but not the other way around.

This theory gained rapid acceptance in cognitive psychology and nowadays continues to be a very popular and influential framework in categorization studies, especially among cognitive linguists. Measures collected in tasks

probing the various variables mentioned above are today largely employed as measures of prototypicality due to these posited predictions: e.g. frequencies obtained in a free-listing task are commonly assumed to be indicative of the typicality of the single items.

1.3 Prototype Theory in the Affective Domain

Following Rosch's approach to categorization, Fehr and Russell (1984) suggested that emotion concepts are prototypically organized rather than defined in terms of a set of singly necessary and jointly sufficient attributes. Accordingly, concepts that most readily come to mind, or which are judged more often or faster as belonging to this category are also the concepts that are considered to be more central or prototypical exemplars of the category. Unlike Rosch and colleagues however, when testing the family resemblance hypothesis (studies 6-7), Fehr and Russell have obtained only modest correlations between family resemblance scores and other typicality measures. Several reasons have been suggested in order to account for such unexpected results, including methodological inadequacy (although they have replicated Rosch's approach), different attribute accessibility (attributes of psychological states may be more difficult to articulate than attributes of everyday objects) or even different category structure (the internal structure in the emotion domain depends less on family resemblance).

Studies 1-3 of this paradigm were replicated on Palauan (Smith and Tkel-Sbal 1995) and Turkish samples (Smith and Smith 1995). Although interpreted as confirmatory, these studies have never obtained high correlations comparable to those obtained by Fehr and Russell. Both Smith and Tkel-Sbal (1995) and Smith and Smith (1995) comment on the limits of the explanatory power of PT when applied to their data and highlight ways in which the superordinate categories probed by them differ in respect to the Canadian English *emotion*.

Shaver and colleagues have focused instead on the hierarchical and family resemblance structure of the American English concept of *emotion* and its equivalents in other languages (Chinese, Bahasa Indonesia, Basque) as revealed by cluster analysis applied to data collected in an unconstrained sorting task (Shaver et al. 1987, 1992, 2001; Alonso-Arbiol 2006). Although the raw data indicated a great deal of individual variation in the sorting task, a 4-5 cluster solution at the basic level of categorization was proposed for all languages, with languages showing most significant variation at the subordinate level of categorization. A similar procedure was employed, and with similar results, by Fontaine et al. (1996, 2002) using data collected on Dutch and Indonesian samples.

Finally, in an 8-study paradigm, Zammuner (1998) approached the Italian superordinate category *emozione* with the aim of gaining insight into conditions of EMOTIONNESS, i.e. criteria that predict class-inclusion. The paradigm included prototypicality judgments, frequencies in a spontaneous production task, and reaction times in word categorization in order to assess EMOTIONNESS, as well as normative ratings on dimensions such as valence, intensity, and duration, in order to assess whether these would predict EMOTIONNESS. Zammuner linked thus prototype approaches to

dimensional approaches to affective space, based on the assumption that, if emotionness reflects graded structure then ratings on the affective dimensions shall predict emotionness judgments. As in previous dimensional studies, measures of intensity, valence and duration correlated positively with one another. Of these, only intensity showed a highly significant correlation with typicality (as obtained in typicality ratings), but appeared to be less correlated with free-listing and class-inclusion frequencies. Based on these results, Zammuner advocated a hybrid view, including aspects of the classical and prototype-like approaches. This paradigm was replicated to a large extent by Niedenthal et al. (2004) in a study probing the French category *emotion*. The results collected on French speaking samples indicated both intensity and valence as significant predictors in the speeded membership judgment. Prototypicality ratings were again predicted significantly only by intensity ratings.

1.4 Beyond Prototypes

By the end of the '70s and the beginning of the '80-s, more and more studies in the field of concept and categorization research were revealing the inadequacy of PT and other similarity-based approaches in addressing various effects that would arise in categorization experiments. Experimental evidence pointed to both theoretical and methodological shortcomings. One major difficulty when operationalizing the notion of prototype - which is of relevance in the context of this study and which most often seems to be overlooked, especially when extending PT to new domains of experience - derives from the rather contradictory definition of the notion of prototype one can find in Rosch's studies. This definition is consistent with both probabilistic and exemplar approaches to concepts and categorization, which traditionally are viewed as contrasting models:

prototypes are defined more broadly – for example, as abstract representation of a category, or as those category members to which subjects compare items when judging category membership, or as the internal structure of the category defined by subjects' judgments of the degree to which members fit their “idea or image” of the category. (Rosch and Mervis 1975: 575)

Although prototype models are commonly classified as a probabilistic approach, one of the variants of the exemplar view - the *(multiple) best examples model* according to which the most typical or most frequent instances are stored in the summary representation of a category – was actually suggested by Smith and Medin (1981) to be implicit in Rosch's work (especially Rosch 1975a and the discussion on cognitive reference points in Rosch 1975b).

If prototypes are understood as summary representations of a category, i.e. an abstraction averaged across all members of the category (as the cue validity algorithm would imply), then prototypes capture central tendencies rather than clearest cases (i.e. what is commonly referred to as best exemplars). If instead people resort to clearest cases in making categorization decisions, this has contrasting representational implications, where exemplars rather than an abstraction averaged across all members are retained in conceptual

representation. How one understands and operationalizes the notion of prototype has further implications for how one understands and operationalizes the notion of family resemblance (see also Komatsu 1992 for a similar point), as a relation of similarity between an exemplar and all other members of category (the exemplar option) or as similarity in relation to central tendencies of a category (the summary representation option). Similarity in the affective domain has been so far assessed in sorting tasks or similarity judgments of individual members. The issue is explored here in a task that asked participants to justify their choices of best (most typical) exemplars by using attribute matching to central tendency.

2. Methodology

2.1 The Procedure

The data examined here have been obtained in a supplemented free-listing task. The participants were first presented with a general affective category (Bokmaal Norwegian *følelse*, *kjensle*, Danish *følelse*, Swedish *känsla*, Castilian Spanish *emoción*, *sentimiento*, Italian *emozione*, *sentimento*, Romanian *emoție*, *sentiment*) and asked to give as many examples as possible for this category in 2 minutes. Following the free-listing (task 1.1), the participants have been invited to select from their own lists those 3 examples that best and most clearly represent the superordinate category (task 1.2a). Successively, they had to select the one exemplar that best represented the category (task 1.2b). In order to avoid a common bias in typicality-related tasks in the affective domain, the participants were specifically warned that the most representative or clearest example may be a negatively, as well as a positively valenced example, and that their choice should have nothing to do with valence, personal likes / dislikes, moral implications, etc. Finally, in a reasoning task, the participants (N=1093) were asked to account for their choice of best exemplar. In order to do so, they were instructed to first describe the general category, then the example that was selected and finally show how the description of their example matches that of the category (task 1.3). Since it has been observed that basic knowledge tends to be omitted in attribute listing tasks, the participants were instructed to imagine that they were writing this answer as an explanation given to a friend from another planet who had absolutely no idea of what emotions are.

All tasks were first explained and exemplified orally, but instructions were also printed on paper. The participants were told they would have 5 minutes for completing task 1.3, since time pressure would presumably allow for “the top-of-the cognitive deck” to surface in the responses (Smith et al. 1995); in reality they were allowed to write until finishing their responses.

2.2 Equivalence Issues

2.2.1 Choice of Superordinate Category

Until recently, investigations into the realm of affect, addressing both the nature and the structure of emotional concepts as they are “translated” in the emotion lexicon, focused almost exclusively on the English superordinate

category *emotion*. More and more it is contended, however, that this category, with its conceptual, semantic and functional implications might not be universal and that emotions might not even constitute a natural kind. When the purpose of a study is to uncover conceptualizations at work in a specific language, a straightforward import of a foreign category, assumed to be equivalent to a readily available label that, in a context or another, appears to satisfy the criterion of translation equivalence in the target language, may lead to misleading and forcefully uniformed results.

A great deal of evidence appears to indicate that general categories in active use in the affective domain in other languages than English might have a broader or narrower scope, pointing, beyond expected commonalities, to important differences. Lutz (1986) has explicitly argued against “the tendency to treat [English] emotion concepts as conceptual primitives and universals” (Lutz 1986: 47), claiming that the Ifalukians (the Micronesian population that constituted the object of her research) do not possess a conceptually equivalent term to the English *emotion*. Emically-oriented literature indicates that a satisfactory equivalent of the English *emotion* as a general category with a comparable scope and similar implications as above appears to be rather the exception than the rule. Evidence in this sense has been reported for Tahitian (Levy 1973), Japanese (Mastuyama et al. 1978), Samoan (Gerber 1985), Gidjingali in Australia (Hiatt, 1978), Chewong in Malaysia (Howell 1981), Bimin-Kuskusmin of Papua New Guinea (Poole 1985), or Palauan (Smith and Tkel-Sebal 1995: 88).

One does not need to travel that far from the Western world to find such examples. In Turkish, there seem to be three terms used “somewhat interchangeably in discussing concepts that parallel emotions: *duygu* (a Turkish word that corresponds to “feelings”); *heyecan* (an Arabic term denoting excitement and enthusiasm, corresponding to the English *passion* in its archaic sense); and *his*, the Arabic equivalent of *dugyu*” (Smith and Smith 1995: 105). Another example is Russian: the word *chuvstvo* (derived from *chuvstvovat* “to feel”) corresponds both to *feeling* and *emotion*, while the plural form *chuvstava* refers rather to cognitively based feelings, that is to emotions (Wierzbicka 1999: 25). Based on such findings Wierzbicka (1999: 24) claimed that the English word *emotion* “embodies a concept which is itself an artifact of the English language”, without having exact equivalents in other languages. It seems to be the case that, in the affective domain, languages exhibit most often a superordinate category that would elicit similar exemplars to those elicited by the English *emotion*, but also items that would fall outside this category.

Romance and Scandinavian languages, which are the focus of this paper, are no exception. One issue derives from the fact that superordinate categories in active use among speakers of Scandinavian languages appear to have a broader scope than the English *emotion*, including, for example, drives and sensory categories, as the data collected in 1.1 appears to indicate. On the other hand, languages may possess several superordinate categories grouping affective experiences in specific ways and this may also reflect an etymological stratification. The languages sampled here have an affective superordinate category labeled by a term supposedly derived from a verb ‘to feel’: Romanian

sentiment, Italian *sentimento*, Castilian *sentimiento*;ⁱⁱⁱ Danish *følelse*, Swedish *känsla*, Norwegian *følelse*, *kjensle*.^{iv} In parallel, there is also a late borrowing that formally resembles the English *emotion* which is indirectly related to a Latin (*e*)*motio(nem)*: Romanian *emoție*, Italian *emozione*, Castilian *emoción*, Danish *emotion*, Swedish *Emotion*, Norwegian *emosjon*. Often, the category referred to by the latter series appears to be less coherently configured in laymen's understanding and its use in Scandinavian languages is virtually restricted to expert literature. This is not to say that speakers of these languages would not be able to give examples for this general category that may or may not coincide with those that native speakers of English would list. The point is that, in a study aiming at uncovering laymen's categorizations in the affective domain as reflected by the usage of the Emotion lexicon in a given language, one would only benefit by adopting an emic approach, identifying first the relevant superordinate category (or categories), namely the one(s) that appear(s) to be better understood, consistently represented, immediately recognized. It is the author's firm belief that it is important to compare these coexisting superordinate categories, especially if in active use, in order to assess their relationships, the extent to which they resemble or differ, the extent to which they overlap or cover specific areas of the affective domain, or the extent to which they are coherently represented in laymen's theories. A theory and analysis of the overall domain of affect and of the relationships holding between all general categories is beyond the scope of this paper. For the purposes of the study reported here, distinct data sets have been collected for each superordinate category that is actively used by native speakers in everyday interactions, as part of their everyday lexicon. The criteria employed in order to identify them are detailed in the following section.

2.2.2 Equivalence and Translation Procedures

The instructions in each of the 6 languages sampled in this study (Danish, Bokmaal Norwegian, Swedish, Castilian Spanish, Italian and Romanian), have been first formulated by the author who is sufficiently proficient in all these languages. Native speakers have then received the instructions for back-translating them into English. At this stage, the slot where the superordinate category aimed at eliciting responses was supposed to be inserted has been left empty. No deviations have been observed in the back-translated versions in any of the languages; as a matter of fact, given the simplicity of the vocabulary in which the tasks have been formulated, the back-translations were virtually identical.

After this step was completed, native speakers were randomly^v asked to provide translations in their own language for the English term *emotion*. Other informants were asked to provide general categories in their native languages for a series of English terms such as *love*, *fear*, *anger*, *sadness*. Their responses were further compared with translations offered by bilingual dictionaries and contexts provided by monolingual lexicons. The solutions that converged across all these procedures were retained for data collection.

Further native speakers have been asked to read the instructions in their native language and signal possible confusions or any other issue that could potentially bias data collection. They were also asked to perform the task and

were consulted individually for assessing whether the instructions fit the purposes. No issues were detected, with one exception – a spelling error in the text of the Norwegian instructions: the Bokmaal conjunction introducing a subordinate infinitive clause *å* has been automatically “corrected” by the author’s Danish version of Microsoft Word and replaced by its Danish equivalent *at*.

2.3 The Sample

An overview of the responses collected from the participants in the tasks above is presented in Table 1: columns 1 through 3 give information on the categories employed, including category codes that will be used throughout this paper when reporting the results; columns 5 through 8 cover participant statistics (gender, age), column 4 shows the number of participants completing task 1.1., while the last two columns indicate the number and percentage of those who completed task 1.3. For the languages where two superordinate categories have been sampled, respondents participating in data collection for one category would not participate on the other.

The Danish data (N=168) were first collected in a non-supplemented free listing task in May 2008; the small amount of participants answering to 1.3 is due to the fact that a second round of data collection in February 2009 (N=25) has taken place in which participants were provided with a list of examples (selected from real responses covering different typicality ranges) and asked to perform only 1.2a,b and 1.3. The Swedish, Norwegian, Romanian and Italian data have been collected in the autumn of 2008, while the Spanish Castilian data have been collected in March 2009.

All participants were ‘non-expert’ undergraduate students enrolled predominantly in business, economy, political sciences or IT classes; a small amount of them were also humanities students. Due to an extremely high predominance of female students in the Romanian sample, data have been also elicited from students attending the Polytechnic and the University of Architecture and Urbanism.

The feedback received after task completion showed that the respondents had no difficulty with the free-listing task and the reasoning task. Few participants have commented however on task 1.2a, b, stating that all examples they provided are equally representative examples and thus their performance in these tasks is based on random selection.

Table 1 - Sample overview

Language	Eliciting Category	Category code	Task 1.1	Gender			Age	Task 1.3	
				M	F	NM**		tot	%
Romanian	SENTIMENT	ROS	153	35	117	2	20,29	139	90.26
	EMO! IE	ROE	100	18	82	0	20,6	99	99
Italian	SENTIMENTO	ITS	178	58	118	2	21,8	161	90.45
	EMOZIONE	ITE	114	49	63	3	22,71	113	99.12
Spanish	SENTIMIEN	SPS	119	61	42	16	20,6	115	96,64
	EMOCIÓN	SPE	110	40	53	17	21	99	90
Danish	FØLELSE	DAF	(168) *	37	131	1	21,69	25*	100
Swedish	KÄNSLA	SWK	98	51	45	2	24,28	90	91.84
Norwegian	FØLELSE	NOF	102	49	53	2	26,32	97	95.10
	KJENSLE	NOK	92	43	45	2	24, 63	88	95.65

*Free-listing was performed independently of reasoning

**Not mentioned

3. Results and Discussion

All the responses obtained in task 1.3, which constitute the focus of this paper, have been inputted into a database using QDA Miner (® Provalis Research). Each response has been recorded as a separate case, accompanied by variables such as gender, age, mother tongue, choice of best exemplar, superordinate category code (see column 3 in Table 1 for the acronyms that will be used hereafter for referring to the superordinate categories).

A codebook (see Table 2) has been constructed in order to assess whether, as predicted by PT, respondents will resort to an attribute matching strategy (consistent with a family resemblance explanation of typicality) when justifying their choice of clearest cases in task 1.2b.

Table 2 – Overview of codes

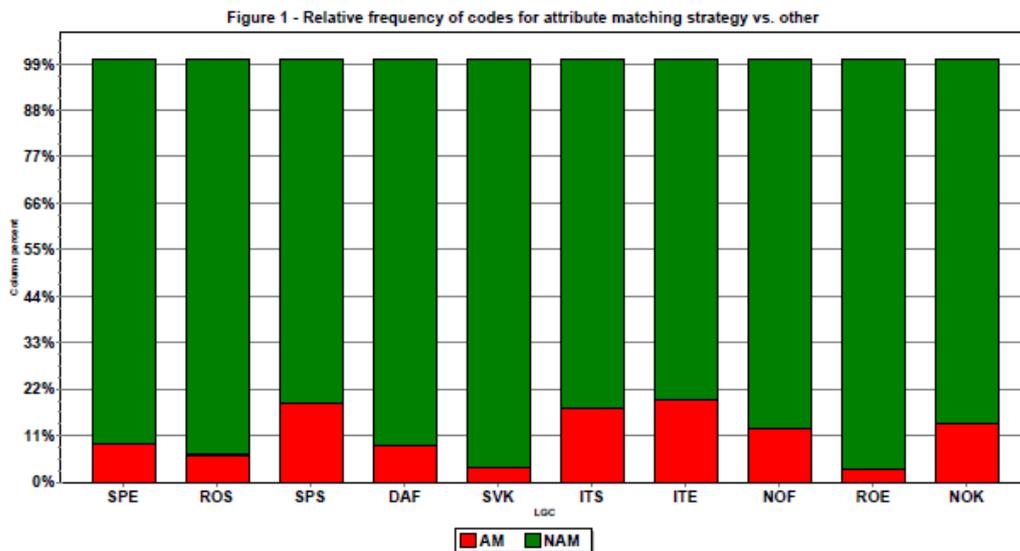
Code name	Acronym	Code description
Attribute matching	AM	The respondent mentions at least one attribute shared by the superordinate category and his/her choice of clearest case; this attribute is explicitly or implicitly matched between the two
No attribute matching	NAM	The respondent does not match any attributes between superordinate category and clearest case
General category and best exemplar	GC/BE	The respondent gives a minimal description of both the superordinate category and clearest case. At least one attribute counts as a minimal description
Only best exemplar	BE	The respondent ignores the superordinate category and focuses only on the clearest case
Only general category	GC	The respondent ignores the example that was selected and focuses on the superordinate category

If respondents would mention at least one feature shared by the exemplar and the superordinate category as accounting for their choice, the case was interpreted as indicative of an attribute-matching based choice of best exemplar (code AM). If the respondent would resort instead to other ways of accounting for their choice of clearest cases, the case was interpreted as not being consistent with an attribute matching strategy (code NAM). An initial scrutiny of the data indicated that, for the purposes of this analysis, it was also

important to account for how often respondents offer a description of both the superordinate category and of the clearest cases (see Table 2).

No difficulties were encountered in applying the codes and no ambiguous cases were identified. Since the two codes are mutually exclusive, overall frequency of code occurrence and number of participants (cases) in whose responses an attribute matching strategy has been identified coincide. The results show that only 9,2% (in all 101 cases) of the participants resorted to this strategy in providing a justification for their choice of clearest case.

Although there was important variation between the 10 data sets, the number of participants employing an attribute matching strategy is relatively low, varying between a bit more than 3% (ROE or SWK) to up to 18-19% (SPS, ITE, ITS, see Figure 1).



Since a number of participants, instead of explicitly comparing the clearest case and the superordinate category, would focus on only one of them, there was a possibility that the results displayed above would be a consequence of participants' failing to comply with this requirement. Code co-occurrence scores were computed as a check. Of the 337 participants who provided both a description of the superordinate category and of the clearest case, only 95 resorted to an attribute matching strategy. A similarity index computed using Jaccard's coefficient (so that equal weight was given to both matches and non matches), reflecting the strength of the co-occurrence relationships among codes, returned almost identical scores for the AM and NAM codes (.26 and .25 respectively) in relation to providing a description for both the superordinate category and clearest case. Although NAM and GC/BE co-occur much more often than AM and GC/BE, the low similarity score for the former is a consequence of NAM co-occurring equally often with GC (342 cases) or BE (279 cases).

It is worth noticing that, contrary to what has been reported previously (e.g. López et al. 1997), the participants providing more expert-like descriptions

appeared to be more likely to resort to an attribute-matching strategy, as in the two examples below, translated from Bokmaal Norwegian and Castilian Spanish. Such responses were not in sufficient number in order to allow drawing any further conclusions:

Objectively: release of specific types of hormones; Subjectively: a state of consciousness which doesn't show intentionality (or it does at the very least); Culturally: types of reaction patterns and acquired reactions to specific situations and stimuli; Anger fits with all these (NOF52).

Emociones are the product of the *sentimientos* or at least they're tightly related. And also I think they're very close to sensations. What is clear is that the category *emoción* is the result of a construction process in which social meanings are combined with psychological aspects. They are a clear product of the interaction, of meaning-making processes through intersubjectivity. I don't think that my example is the perfect one for explaining what *emoción* is - if there is such an example? But I think that pride combines the features that I mentioned (SPE102).

Since attribute matching was employed only sporadically in accounting for the choice of clearest cases, it was interesting to explore what other criteria were used by respondents when performing this task. The data has been combed again in order to extract new categories for coding alternative criteria (Table 3). As a rule, if a participant would respond with more than one criterion, each criterion would be coded separately; if the same criterion was repeated in the same response, each different formulation was coded separately.

Frequency scores indicate that positive valence is among the most popular criterion invoked by participants in accounting for the choice of best exemplars. Negative valence has been invoked as well, but to a lesser extent. The importance of valence accounting for choice of clearest case varies though across languages and categories (see Table 4).

The preference for valence is not surprising considering that pleasantness emerges as the most salient dimension in the structuring of affective space in studies adopting a dimensional approach. When tested as a predictor of typicality, however, valence was found to be a strong predictor only for speeded membership judgments, but a weak predictor of typicality rating scores. On the other hand, some of the previous studies (e.g. Smith and Smith 1995; Smith and Tkel-Sbal 1995) have reported that their participants showed a very strong positive bias when performing typicality ratings in the affective domain and consistently rated negatively valenced emotions lower than positively valenced one.

Degree of arousal, on the other hand, which is the second most salient dimension found to structure affective space was less often invoked by participants and with great variation across categories, ranging from only 1% for SWK to 15,5% for ITE. It is worth noticing that degree of arousal (operationalized as 'intensity' of an emotion) was found by another study (Zammuner 1998) to predict typicality structure for this Italian superordinate category *emozione* (here ITE).

Table 3 – Overview of exploratory codes

Code name	Acronym	Description
Abstract feature metonymy	AFM	BE is an abstract feature possessed by the GC – irrationality, uniqueness, etc.
Behavioral metonymy	BH	BE is metonymically an instrumental behavioral component / correlate of the GC*
Beautiful-noble-true	BNT	BE is an abstract feature, likely to reflect cultural or personal attitudes towards the given experience
Complexity	CX	BE refers to an experience that is very complex, it might involve many of the other examples given in the list
Causality	CZ	BE as a consistent elicitor of general category*
Degree of Arousal	DA	BE is most intense, thus most salient / clear in manifestations
Duration	DUR	BE for being the longest-lasting
Easy to...	ET	BE is easy to spot or recognize on somebody else
Expressive behavior metonymy	ExM	BE is metonymically an expressive behavioral component / correlate of GC. It is selected for best expressing GC*
FQ	FQ	BE is chosen for occurring often
Negative Valence	NV	BE due to having a highly /highest negative hedonic valence
Other	Othr	Whatever else that does not fit any of the other categories
Physiological metonymy	PhM	BE is metonymically a physiological component / correlate of GC*
Positive-Negative Valence	PNV	BE due to having both a positive and negative hedonic valence
Pops-to-Mind	PtM	BE is first to come to mind when one thinks of GC
Positive Valence	PV	BE due to having a highly / highest positive hedonic valence
Reason-to-Live	RdL	BE due to evolutionary, cultural or personal significance
Relevant object	RObj	BE is chosen for being a relevant object (people, items) to GC*
Strong Impact	SI	BE for having very strong impact on humans
Universal	Uni	BE because is universal

*The codes show a tendency to occur significantly or even exclusively in responses elicited by Romance EMOTIONE(M)-derived superordinate categories (see discussion).

Since hedonic valence and degree of arousal are commonly described as dimensions characterizing affective space, it could be contended that the simple mention of these in the responses obtained in 1.3 is an implicit indication that participants make use of an attribute matching procedure. It is worth noticing however that in all cases in which degree of arousal or hedonic valence were employed for accounting for choice of clearest cases, extreme values on these dimensions were implicitly invoked by respondents (i.e. the best exemplar was presented as *the most* intense or *most* positive) rather than central tendencies or even ideals (for the notion of ideal and a comparison with extreme cases and central tendencies, see Barsalou, 1985).

For ease of comparison, scores for the dimensional criteria (valence and degree of arousal) are presented on the top of Table 4. The scores have been also summed up (the first row highlighted in green) in order to highlight how many participants within each sample resorted to dimensional criteria when accounting for their choice of best exemplars.

The remaining codes have been grouped together as instantiating category-specific ‘theoretical knowledge’, i.e. knowledge that goes beyond perceptually available attributes (e.g. attitudes, beliefs) or knowledge that is thematically or

causally related to a category in focus. Theory- (or knowledge-)based approaches to concepts and categorization argue that category structure and concept coherence is explained by people's theories of the world^{vi}. In a seminal paper, Murphy and Medin (1985) maintained that only by explaining coherence, which in turn can be explained only by taking into account people's theories, one may aspire to reveal the grounds on which category formation takes place and answer why we have the categories we have – in other words, why some groupings appear to make sense and be practically useful, while others are deemed as absurd.

Table 4 – Frequency of exploratory codes – number of cases

	DAF		NOF 0		NOK		SVK		SPE		SPS		ITE		ITS		ROE		ROS	
	%		%		%		%		%		%		%		%		%		%	
PV	11	44	32	32,3	38	41,8	29	29,6	36	32,7	26	21,8	31	27,2	12	6,7	14	14	11	7,1
NV	1	4	20	20,2	13	14,3	13	13,3	6	5,5	6	5	7	6,1	1	0,6	11	11	2	1,3
PNV													9	7,9	2	1,1				
DA	2	8	10	10,1	5	5,5	1	1	7	6,4	11	9,2	12	10,5	27	15,2	9	9	12	7,8
<i>Dim</i>	14		62		56		43		49		43		59		42		34		25	
CZ	1	4	7	7,1	2	2,2	1	1	7	6,4	4	3,4	30	26,3	8	4,5	34	34	4	2,6
RdL	2	8	5	5,1	7	7,7	4	4,1	9	8,2	16	13,4	8	7	28	15,7	14	14	34	22,1
PhM	14		2	2									5	4,4	1	0,6	6	6	2	1,3
OthR			3	3	2	2,2	7	7,1	2	1,8	1	0,8					1	1	2	1,3
BNT	2	8	3	3	8	8,8	9	9,2	10	9,1	10	8,4	7	6,1	21	11,8	6	6	28	18,2
AFM			8	8,1	5	5,5	7	7,1	19	17,3	16	13,4	11	9,6	11	6,2	14	14	10	6,5
Uni	1	4	4	4	10	11	4	4,1	2	1,8	7	5,9	2	1,8	11	6,2	3	3	15	9,7
ExM			2	2					4	3,6	1	0,8	5	4,4	1	0,6	5	5	3	1,9
CX	4	16	10	10,1	4	4,4	3	3,1	6	5,5	13	10,9	14	12,3	24	13,5	7	7	15	9,7
ETS	1	4	4	4			3	3,1	1	0,9			1	0,9	1	0,6			2	1,3
RObj					2	2,2	1	1	1	0,9			2	1,8	3	1,7	4	4		
DUR			2	2	1	1,1	1	1					4	3,5	1	0,6	1	1	1	0,6
SI	1	4	2	2	1	1,1	2	2	4	3,6	6	5	7	6,1	13	7,3	3	3	6	3,9
BM									1	0,9			1	0,9						
PtM			1	1	2	2,2					1	0,8	1	0,9	1	0,6			3	1,9
FQ			2	2	4	4,4	1	1	4	3,6	4	3,4	3	2,6	5	2,8	3	3	4	2,6
<i>Th</i>	26		55		48		43		70		79		101		129		101		129	

To better underline the importance of such theoretical knowledge, the scores reflecting the number of participants within each sample that resorted to such criteria when justifying their choice of best exemplars have been summed up and presented in the row highlighted in green at the bottom of the Table 4.

Due to space limitations, a lengthier discussion of each single criterion, as well as of the variation across categories and languages, will not be possible here. It is worth noticing, however, that some of the criteria accounting for the choice of clearest cases were elicited prevalently or exclusively by *emotione(m)*-derived category in the three Romance languages. More specifically, this was the case for most of the metonymic codes (marked by an asterisk in Table 3). In most of these cases, the choice of best exemplar was also a paronymic one, i.e. elicitors (for instance *exam*) or behavioural or physiological correlates were selected as best exemplars and then the choice was accounted by virtue of these being consistently linked with the eliciting category. This finding was interesting in itself, since, along with other evidence (Sauciuc 2011)^{vii} is indicative of an expert-laymen knowledge asymmetry in how these parallel

superordinate terms are employed and, perhaps, understood. The *emotione(m)* - **sentimentu(m)* duality translates in expert terminology as a dichotomy where primary emotions correspond to *emotione(m)*-derived labels (covering experiences said to be biologically grounded, such as fear, anger, joy) and secondary emotions correspond to **sentimentu(m)*-derived labels (specific to humans only and perhaps more culture-dependent, such as pity, pride, jealousy, etc.). In lexicographic sources, the *emotione(m)*-derived categories are defined as referring to affective reactions of strong intensity and relatively short duration, often accompanied by modification of bodily activities. When used in their plural form however, these refer to a specific, yet diffuse affective state which might be translated as 'to be nervous, to be emotional'. It might be the case that when performing the task, some participants had in mind this second sense, which in turn biased them towards performing this (and other) task thematically rather than resorting to taxonomic and hierarchical knowledge. This interpretation is also supported by the fact that *emotione(m)* derived terms were often produced as example of the **sentimentu(m)* derived category in the free-listing task. This observation may benefit further investigations into the affective domain of Romance languages (or other languages that present similar dichotomies) and encourage a more emic approach when the object of study concerns laymen theories and categories in the affective domain.

4. Concluding Remarks

1093 responses have been collected in 6 languages across 10 superordinate affective categories in a supplemented free-listing task (N=1235) in order to assess whether and, if so, to what extent participants account for their choice of clearest cases in terms of attribute matching as predicted by PT. Attribute matching was found in only 101 cases (9,2% of all recorded cases), while alternative criteria, i.e. extreme values on the pleasantness and arousal dimensions and a number of criteria interpreted as instantiating non-perceptual category-specific knowledge, were found to account for the great majority of data. Based on the results obtained here it can be concluded that an important amount of data points towards a dissociation between choice of clearest cases of a category and attribute matching.

Furthermore, the data bring more support for a previously suggested expert-laymen asymmetry (Sauciuc, 2011) in the way speakers of Romance languages appear to employ and understand *emotione(m)* vs. **sentimentu(m)*-derived superordinate categories.

Previous approaches confronting prototype and dimensional measures (Zammuner 1998; Niedenthal 2004) have already suggested that a hybrid approach (combining classical, dimensional and prototype approaches) might be more suitable in order to account for processes at work in affective categorization. This study extends this observation, suggesting that laymen affective categorization would be better accounted by a multiple strategy approach. Other authors (e.g. Smith and Smith 1995; Smith and Tkeld-Sbal 1995), while pointing out the limited explanatory power of PT in the affective domain have suggested yet other ways to disentangle the issue, stressing the

need for a more in depth assessment of the particularities that specific superordinate categories appear to exhibit across languages.

The evidence presented here is not meant as an attempt to disconfirm PT or family resemblance as a principle of category structure. It might be the case that when making implicit decisions people rely on an attribute matching strategy, but that they have a hard time bringing the details of this process to awareness in order to provide an explanation as the one required by the task outlined above. The data can be nevertheless credited for suggesting a number of alternative criteria that might motivate choice of clearest cases of an affective category, providing material that could fuel a series of relevant hypothesis-driven studies. While affective categorization studies relying on perceptual cues (for instance, facial expression) seem to provide a more consistent cross-cultural picture, cross-linguistic data appear to vary from one language to another. On one hand this legitimates more cross-cultural and cross-linguistic studies before principles and models found in one culture or language can safely be generalized to others. On the other hand, this is also a plea for carefully considering language as a factor of variation and also as a source of insights for explaining category structure, by taking into account the factors and dynamics of language change, including language internal semantic changes, but also intra-linguistic borrowings from expert literature (terms such as *anxiety*, *depression*, but also terms which nowadays appear to be the appendage of laymen, such as *emotion* or *affect*) and inter-linguistic borrowings. Much further research will be needed in order to disentangle affective categorization across languages, with a focus on how affective categories and affective knowledge are employed in a variety of practices and for a variety of purposes. This entails, on one hand, an increase in the number of sampled languages, but also a systematic expansion of tasks, highlighting new factors to be taken into account.

Notes

- i Data collection has been completed on a variety of tasks for Romanian, Italian, Castilian Spanish, Danish, Norwegian and Swedish. Further data collection has been completed in Bulgarian covering, among others, all the tasks reported in this paper, but also new tasks. Arrangements for more data collection were made or are discussed for extending the data collection to Albanese, Greek, Hungarian, Icelandic, Latvian, Lithuanian, Polish, Serbian.
- ii See Machery (2009) for a recent and detailed discussion.
- iii While in the Western Romance languages the term was supposedly derived from the verb 'to feel' and was already in use very early in the period of crystallization of the language, in Romanian this is a more recent borrowing from Italian or French. Even the older term *simțământ* was coined under French influence. An older term for referring to a general affective category was *simțiciune*, not in use anymore.
- iv The two terms sampled in Norwegian would rather have the status of geosynonyms: the Bokmaal Norwegian *foeelse* is corresponded by Nynorsk Norwegian *kjensle*.

The latter term is however included in contemporary Bokmaal dictionaries and native speakers suggested a comparison of the two would be interesting.

- v The informants were not systematically selected; rather the author has gathered information in an informal setting, every time she would encounter native speakers of a given language: exchange students or visiting researchers in Aarhus having an Italian, Spanish or Norwegian background, Danish colleagues, Swedish neighbours.
- vi For further references and experimental evidence on theory- or knowledge-based approaches see, for instance, Komatsu (1992).
- vii The data reported in Sauciuc 2011a indicates that Romance speakers (especially speakers of Romanian and Castilian) almost never produce *emotione(m)* derived labels as a superordinate category when asked to provide general categories for basic-level terms such as love, fear, anger, etc. Instead, they show an overwhelming preference for **sentimentu(m)*-derived labels.

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