On the Concepts of Specificity and Referential Success[1]

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Possibility distributions are one of the usual interpretations of fuzzy sets. According to this interpretation, the fuzzy set represents the available information about the actual (unique) value of a given variable. When fuzzy sets are interpreted this way, it is interesting to measure how difficult it is to determine the mentioned actual value in view of the information provided by the set.

Yager put the focus on this problem, introducing the well-known measures of specificity [1] some time ago. These measures allow to determine to what extent a possibility distribution is a singleton (i.e. the possibility distribution clearly indicates a (unique) actual value). Since then, interesting theoretical results has been derived from this concept (see, for example, [2–6]).

Recently, we have analyzed the close relationship between the mentioned concept of specificity and the concept of referential success handled in data-to-text systems [7], within the field of Natural Language Generation [8]. In this type of systems, one of the usual tasks is to build expressions of the language aimed to refer to a particular object in a given context (set of objects). These expressions are called referring expressions [9] and, usually, have the form of simple noun phrases regarding the fulfillment of a more or less complex property (i.e. *The big red car*). A referring expression is said to have *referential success* if it reachs its objective of distinguishing or identifying the desired object within the set.

Although, in the field of NLG, referential success has been traditionally treated as a crisp concept, some recent studies point out that this concept is not crisp but gradual [10]. This graduality derives, among other reasons, from the fact that the compliance of the property represented by the expression with the referred object and the distractors (other objects in the set) is often not crisp but gradual. In [11] the reader can find a set of properties that a (gradual) measure of referential success must fulfill.

Given the semantic relationship that exists between both concepts, it seems reasonable to analyze them together. As a result of this analysis, some interesting conclusions are drawn:

– Specificity measures can be used to build measures of referential success. A methodology to do this is proposed in [11].

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– Similarly, referential success measures allow to define specificity measures. In this sense, in [12] a method can be found.

This parallelism allows us to take results from each party to increase the results available in the other. For instance, [11] introduces some families of referential success measures derived from well-known families of specificity measures, which allow to increase considerably the range of referential success measures available when solving a specific problem in the NLG field. Similarly, new measures of specificity derived from previously constructed referential success measures have been obtained in [12].

It is worthwhile to continue exploring the relationship between the two concepts, for example: to study the class of specificity measures that can be defined based on measures of referential success, within the framework of the class of all measures of specificity; or to study alternative properties to adjust the semantics of both the concept of specificity and the concept of referential success.

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