THE FUZZY LOGIC OF EXISTENTIAL WISHES AND FEARS

MATTHIAS GERNER
City University of Hong Kong

ABSTRACT. This work is a further development of Gerner (2009, 2010, forthcoming). Attitude ascriptions can be interpreted as declarative speech acts (Heim, 1992) or as expressive speech acts (Gerner, 2010, forthcoming) according to labels used in Searle & Vanderveken (1985)'s typology of illocutionary acts. Heim (1992)'s Graded Possible Worlds Semantics analyzes the English attitude verbs *want*, *hope* and *wish* truth-theoretically as *declarative speech act-indicating devices*. In Gerner (2010), I provide a fuzzy logic analysis of two rare attitude particles in Liangshan Nuosu (Tibeto-Burman: P.R. of China). The Nuosu attitude operators ascribe wishes and fears to the speaker via a hedge and can be interpreted as *expressive speech act-indicating devices*. In this presentation, I am scrutinizing the compositionality of *de dicto/de re* speech acts at two levels, at the level of empirical data and at the level of logical formalization. I demonstrate that the fuzzy model offers the best available match between empirical and formal compositionality, whereas Graded Possible Worlds Semantics manifests a great gap between data- and system-compositionality.

1. English data

The first kind of attitude ascriptions is epitomized by the English expressive verbs *wish*, *want*, *desire*, *fear*, *be afraid of*. These English verbs reflect the attitude of the subject of the sentence, which in general is different from that of the speaker (unless the subject of the clause is the first person). Utterances involving one of the English expressive verbs tend to be naturally interpreted as statements or as declarative speech acts. This is the rationale for why several researchers have modeled the truth rather than the success of wish ascriptions. The most prominent work in this regard is Heim's (1992) *Graded Possible World Semantics*. Heim analyses the truth of wishes in those belief-worlds in which the propositional content is more desirable for the speaker than its opposite content.

In this presentation, I will only consider *de dicto/de re* attitudes (i.e. attitudes to clauses with existential quantification). Consider the following impressionistic example.

(1) (a) Nancy wants to marry *a Norwegian*.
$\varphi(x)$: *x* is a Norwegian
$\psi(x)$: Nancy marries *x*.

(b) Three possible interpretations:
$\text{WISH}(\exists x\,[\varphi(x) \wedge \psi(x)])$: Nancy wants two things: (i) there is a Norwegian, and (ii) she marries that person.
$\exists x\,\text{WISH}(\varphi(x) \wedge \psi(x))$: There is someone specific regarding whom Nancy wants two things: (i) that person is a Norwegian, and (ii) she married that person.
$\exists x\,[\varphi(x) \wedge \text{WISH}(\psi(x))]$: There is someone specific who is Norwegian and Nancy only wants one thing: she marries that person (i.e. Nancy does not necessarily want that person to be a Norwegian).

These interpretations give rise to entailment relationships. For the above example, it is possible to work through s a truth-table.

(2) Truth Table:

$w \vDash \text{WISH}(\exists x\,[\varphi(x) \wedge \psi(x)])$		$w \vDash \exists x\,\text{WISH}(\varphi(x) \wedge \psi(x))$
true	$\Rightarrow$	undecidable
false	$\Rightarrow$	false
true	$\Leftarrow$	true
undecidable	$\Leftarrow$	false

If wishes and fears were assessed in truth-conditional terms, we would face the following situation. The truth of a *de re* wish (or fear) implies the truth of the corresponding *de dicto* wish, whereas the truth of a *de dicto* wish does not necessarily imply the truth of the corresponding *de re* wish. This situation is represented by (3) and I will technically prove that (3) is violated in Graded Possible Worlds Semantics.

(3) Data Property: $w \vDash \exists x\ \text{WISH}(\varphi(x)) \Rightarrow w \vDash \text{WISH}(\exists x\ \varphi(x))$ ("$\vDash$" interpreted as truth relation)

2. Nuosu data

The second kind of IFIDs (*illocutionary force indicating devices*, a term used by Searle) is symbolized by two sentence-end particles which are attested in several Yi languages (Tibeto-Burman: P.R. of China). These fully grammatical sentence-operators ascribe wishes and fears to the speaker by means of an impersonal socialised agent (Gerner, 2010, forthcoming). Their meaning can be tentatively paraphrased by the two English matrix constructions *it is desirable that* and *it is to be feared that*. I focus on the attitude particles of Liangshan Nuosu, one of the Yi languages spoken by 2.7 million natives in Sichuan Province. The two Nuosu sentence-end particles are presented below:

	WISH	FEAR
Liangshan Nuosu	dɯ^{21}lo^{44}	ma^{55}

For *de dicto/de re* attitudes, the voicing of wishes and fears is partially compositional. If a *de dicto* fear or wish is successful to articulate, then it is also successful to express the related *de re* fear/wish. However, the performance failure of a *de dicto* fear/wish does not imply the failure of the corresponding *de re* fear/wish. The following two pairs of examples illustrate these compositional properties. Whenever it is appropriate to fear or to wish the unspecific existence of an entity, it is also appropriate to voice an attitude about the corresponding specific existence, see (4). The converse is not true though. If it is infelicitous to articulate one's fear/wish about the unspecific existence of some entity, nothing definite can be said about its corresponding specific existence. In (5a) it is odd to voice the existence of someone's father as a wish, but it is not strange to wish that a particular individual be the father of another individual, if one is unaware of the exact kinship relation. See (5b).

(4) (a) FEAR($\exists x\ \varphi(x)$) Successful *de dicto* fear

ts^{h}o^{33}	mu^{33}ka^{33}	ts^{h}i^{21}	dʐɯ^{33}mo^{21}	ȵi^{21}ha^{33}	va^{55}	k^{h}u^{33}	su^{33}	dʑo^{33}	**ma^{55}**.
person	person name	3P SG POSS	money	NUM:200	Yuan	steal	NOM	exist	FEAR

'It is to be feared that there is someone who stole Muga 200Y.'

(b) $\exists x$ FEAR($\varphi(x)$) Successful *de re* fear

ʂa^{33}ma^{55}	mu^{33}ka^{33}	ts^{h}i^{21}	dʐɯ^{33}mo^{21}	ȵi^{21}ha^{33}	va^{55}	k^{h}u^{33}	**ma^{55}**.
person name	person name	3P SG POSS	money	NUM:200	Yuan	steal	FEAR

'It is to be feared that Shama stole Muga 200Y.'

(5) (a) WISH($\exists x\ \varphi(x)$) Unsuccessful *de dicto* wish

#mu^{33}ka^{33}	a^{44}ta^{33}	dʑo^{33}	**dɯ^{21}lo^{44}**.
person name	father	exist, have	WISH

'It is desirable that Muga has a father.'

(b) $\exists x$ WISH($\varphi(x)$) Successful *de re* wish

ʂa^{33}ma^{55}	mu^{33}ka^{33}	a^{44}ta^{33}	ŋɯ^{33}	**dɯ^{21}lo^{44}**.
person name	person name	father	COP	WISH

'It is desirable that Shama is Muga's father.'

This pattern can be represented as in the success-table (6) or as in (7). I shall technically prove that this theorem holds in the fuzzy framework if certain additional assumptions are made.

(6) Success Table:

$w \vDash \text{FEAR}(\exists x\, \varphi(x))$		$w \vDash \exists x\, \text{FEAR}(\varphi(x))$
successful	$\Rightarrow$	successful
unsuccessful	$\Rightarrow$	undecidable
undecidable	$\Leftarrow$	successful
unsuccessful	$\Leftarrow$	unsuccessful

(7) Data Property: $w \vDash \text{FEAR}(\exists x\, \varphi(x)) \Rightarrow w \vDash \exists x\, \text{FEAR}(\varphi(x))$ ("$\vDash$" interpreted as success relation)

References

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