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1. Introduction

2. Psychological construction of emotion

3. Fuzzy Logic

4. Conclusions
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1 Introduction

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4 Conclusions
Affective Computing
computational models of emotion

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The phenomena

Central concepts

- **emotion** intense, short lived (folk psychology).
- **mood** longer period of time, less intense (folk psychology).
- **affect**

Arrows connecting 'perceive', 'think', and 'act'.
Commonly used computational models

Approaches

- **Appraisal approaches**
  - Our appraisal of a situation causes an emotional, or affective, response.
  - *identify* emotions with situations or events.

- **Dimensional approaches**
  - Variables are mapped onto a dimensional space.
  - *identify* emotions with regions in dimensional space.

Becker-Asano (2008)
Commonly used computational models

Approaches

- Appraisal approaches
  - Our appraisal of a situation causes an emotional, or affective, response.
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- Dimensional approaches
  - Variables are mapped onto a dimensional space.
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Becker-Asano (2008)
Introduction

2 Psychological construction of emotion

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Two fundamental levels in emotion.

- **cognitive** level.
- **core affect** level.

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**Emotion as a psychological construction.**
Emotion as a psychological construction.

Two fundamental levels in emotion.

- **cognitive** level.
- **core affect** level.

Diagram:

- Core Affect
- Perception of Affective quality
- Attribution to Object
- Appraisal
- Action
- Emotional Meta-Experience
- Emotion Regulation

Prototype of a Specific Emotion
Core affect, Russell (2003)

‘Neurophysiological state that is consciously accessible as a simple non-reflexive feeling that is an integral blend of hedonic (pleasure-displeasure) and arousal (sleepy-activated) values’
Re-defining the affective terms.

- **emotion** cognitively made categorization.
- **mood** un-attributed core affect.
- **affect** a feeling which is a blend of pleasure-displeasure, sleepy-activated.
Introduction

Psychological construction of emotion

Fuzzy Logic

Conclusions
Why fuzzy logic?

Emotion categories

- Emotion is communicated using linguistic terms (angry, sad, happy).
- Folk psychological concepts.
- Unsharp boundaries between the emotion categories.

- Fuzzy logic.
Emotion categories

- Emotion is communicated using linguistic terms (angry, sad, happy).
- Folk psychological concepts.
- Unsharp boundaries between the emotion categories.
- Fuzzy logic.
Russell (2003)

The resemblance among components is a matter of degree. The borders between non-instances, instances, and prototypical instances is very fuzzy.
Introduction Psy-Construct  Fuzzy Logic  Conclusions  Emotion modeling  Semantic gap  Core affect

Quotes from Russell

Russell (1997)

The fuzziness of emotions has now been well established

Russell (1997)

Membership in a category is not either-or but rather a matter of degree. ... The borders of emotion categories are vague.

... That categories admit their members in degrees and have fuzzy boundaries has turned out to be one of the most exciting, practical, and theoretically important ideas in a range of fields.
Bridging gaps
Communication between modules

- Variability in representation levels; semantic gap.
- Granularity of information units (input-cognition, cognition-output)
- Fuzzy relation core-affect - cognition.

Diagram:
- perceive → think → act
- cognition
- core affect

Keywords:
- Introduction
- Psy-Construct
- Fuzzy Logic
- Conclusions
- Emotion modeling
- Semantic gap
- Core affect
Core affect

Core affect space

- Core affect space is fuzzy.

ACTIVATION
- tense jittery
- excited ebullient

DISPLEASURE
- upset distressed
- sad gloomy

PLEASURE
- relate happy
- serene contented

DEACTIVATION
- tired lithargic
- placid calm

S
V
H
Core affect

Kuppens, Oravecz, and Tuerlinckx (2010)
Core affect space

Dynamics modeling, FFSM. (Van der Heide and Trivino (2010))
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Conclusions

- core affect space is fuzzy.
- mapping core affect - emotions is fuzzy.
- emotion is the result of a categorization process.
  - resemblance among components is a matter of degree.
- modeling: linguistically expressed knowledge.
- bridge semantic gaps between modules.

Fuzzy logic!

‘The fuzziness of emotions has now been well established’ (Russell, 1997)
Conclusions

- core affect space is fuzzy.
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- emotion is the result of a categorization process.
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- modeling: linguistically expressed knowledge.
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- Fuzzy logic!

‘The fuzziness of emotions has now been well established’ (Russell, 1997)
Questions

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