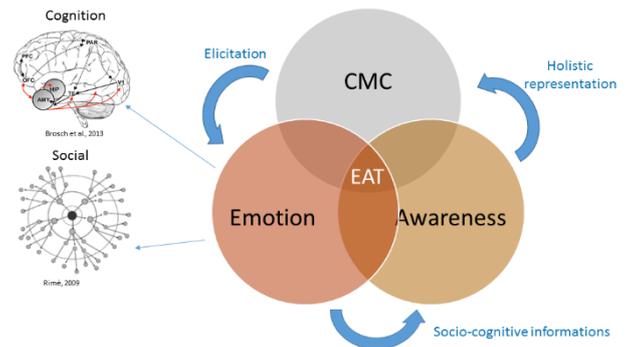


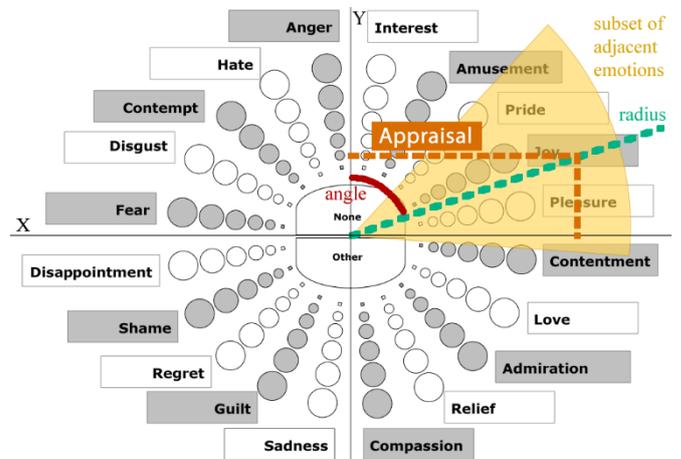
Theoretical Framework

One of the most challenging issues with respect to Computer-Mediated Collaboration (CMC) is the lack of a holistic perception of other people taking part in the same activity. Consequently, shared workspaces accessed through electronic devices integrated tools to counter this phenomenon by displaying information about other people's presence and activities: a process generally referred to as awareness (Dourish & Bellotti, 1992). In this regard, emotions provide meaningful information with respect to cognitive and social aspects. Emotions are in fact known to influence high-level cognitive functions like perception, attention, memory and decision-making (Brosch, Scherer, Grandjean, & Sander, 2013), but they also influence social behaviors (Rime, 2009; Van Kleef, 2009). Therefore, the EATMINT project (e.g. Molinari, Chanel, Bétrancourt, Pun, & Bozelle, 2013) suggests that participants to a CMC task may benefit from emotional awareness via a tool allowing participants to share emotions in real time: an Emotional Awareness Tool (EAT).



The Idea behind the Dynamic Emotion Wheel

The Dynamic Emotion Wheel (DEW) shares the same underlying idea of the Geneva Emotion Wheel (GEW, see Scherer, 2005) – combining the dimensional and discrete emotions approaches to self-report – but adapts it to Emotional Awareness, reducing the size of the tool and providing “emotional history”. More specifically, whereas the GEW uses the dimensions of Valence and Control to define the position of each modal emotion on the circumplex, the DEW asks participants to provide a quantitative evaluation (appraisal) of the situation on both dimensions. A simple algorithm then computes a subset of emotions that are most likely to be associated with the evaluation. In other words, the DEW uses the appraisal component of the Component Process Model (limited to two criteria) as a way to predict the associated subjective feeling, reducing thus the number of discrete emotions displayed on the interface. On the awareness perspective, providing both appraisal and subjective feeling should enhance the mutual understanding of the participants to the collaboration, providing information about the emotional state but also possible cues about causes and consequences on the collaboration. Furthermore, the DEW may be adapted to different sets of emotions arranged on a two-dimensional circumplex.



Contacts

The DEW has been developed as part of the Master thesis project of Mattia A. Fritz for the Master of Science in Learning and Teaching Technologies, Geneva University, under the supervision of Professor M. Bétrancourt. A working example of the tool is available at <http://tecfaetu.unige.ch/perso/malitt/fritz0/memoire/dynamicemotionwheel/>.

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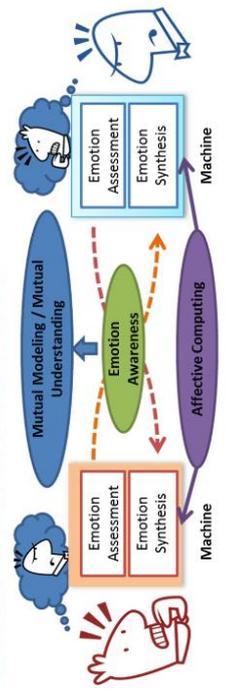
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Dynamic Emotion Wheel: an Emotional Awareness Tool for Computer-Mediated Collaboration

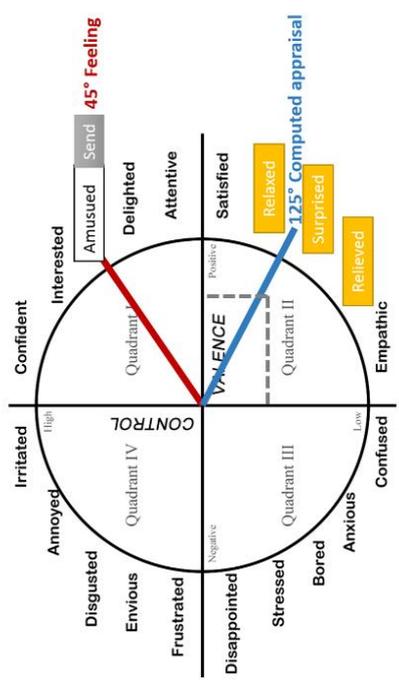
Abstract

The Dynamic Emotion Wheel (DEW) is an Emotion Awareness Tool developed as part of the EATMINT project whose objective is to explore the role of emotion in Computer-Mediated Collaboration (CMC). The DEW is inspired by the Geneva Emotion Wheel (Scherer, 2005), a self-report instrument that arranges a set of modal emotions in a circle with two appraisal dimensions as axes. With the DEW, participants report their perception on the two dimensions and an algorithm dynamically computes a subset of emotions according to two range-input values. A pilot study was conducted to assess the relevance and usability of this self-report instrument combining Appraisal dimensions (Control and Valence) and Subjective feelings (20 discrete emotions from pre-experiment) for real-time emotion sharing.

Emotional Awareness in CMC



Dynamic generation of a subset of emotions



- Quantitative appraisal on Valence and Control (sliders)
- « Appraisal's slope » based on two-dimensional values computation
- « Feeling's slope » based on the circumplex position
- Most likely feelings suggested according to the appraisal
- Possibility to provide another emotion not in the subset

1 VALENCE - Is the situation pleasant?
 Not at all ————— Yes, absolutely

2 CONTROL - Is the situation under your control?
 Not at all ————— Yes, absolutely

3 Which emotion do you feel?
 Surprised Relaxed Relieved
 Autre émotion Envoyeur Aucune

Emotion timeline
 11:19 Delighted
 11:19 Relieved

Your chronology

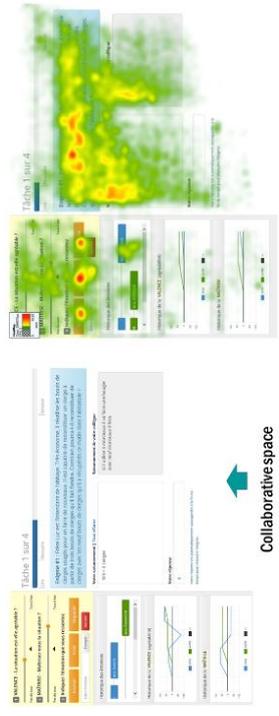


Main features of the tool

- The tool allows members of a dyad to **voluntarily share emotions in real time**
- Appraisal:** Users evaluate on a continuous scale for two dimensions (Control and Valence in the example, but others are also possible if ever).
- Subjective feeling:** Users choose a label among the proposed subset of discrete emotions or enter one.
- Appraisal and subjective feeling serve for monitoring both participants' emotions. The subjective feeling via an **emotion timeline** and the appraisal via **two line charts**

Usability test

- N=16, 8 women (M = 26.9, SD = 6.1)
- 4 problem solving tasks in **simulated collaborative situation**
- Emotion has to be assessed at least 3 times per task



Some results

- Overall **positive evaluation** of the tool usability and utility, but **discrete evaluation and emotion timeline are preferred**.
- Mean number of assessments: **N=17.95** (more than required)
- Cognitive evaluation differed between men and women
 - Valence : $F = 7.6 < H = 25.1$
 - Control : $F = -21.6 < H = 6.2$
- The algorithm works **except** for emotions in the **quadrant negative valence / positive control**.

