

Analyzing Affective Constructs: Emotions ‘n Attitudes

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Abstract. We analyze the relationship between a variety of affective constructs that have been researched, as it is not clear what is the breadth of affective variables to model -- which constructs are equivalent, related, or unrelated.

1 Introduction

Much research has attempted to model and recognize student affect in Interactive Learning Environments, and started exploring mechanisms to repair or cope with negative emotions. However, there are many different theories and constructs for student affect, so many that it is hard to compare these constructs and approaches. This article presents the results of a correlation research study to establish the relationship between three sets of affective constructs, in the hope to eliminate redundant items and make richer constructs, when they are not equivalent. We compare items from the **control-value theory of emotions** [1], which describes several emotions related to achievement in learning situations (in Figure 1, they correspond to variables ending in `_P`, e.g. an item of the `PRIDE_P` construct is “I am proud of my contributions to math class”). The **emotion constructs** by Arroyo et al. [2] were engendered from hundreds of students in real classrooms to classify their frustration, interest, etc. These can be considered *emotions* when asked inside of the tutoring system (e.g. “how frustrated do you feel?”) and *affective predispositions* when asked in a pre/post survey (“how frustrated do you get when solving math problems?”). These are variables ending in `_A`, e.g. an item of the `PRIDE_A` construct is “Do you feel proud when solving math problems?”). Last, the **attitude constructs** by Eccles [3] try to understand students’ concept of themselves as capable to carry out the task, These are variables end in `_E`, e.g. an item of the self-confidence `SC_E` construct is “How good would you be at learning something new in math?”). We present the result of a subset of these correlations, corresponding to the set of *control-oriented* affective constructs, composed of `PRIDE_P`, `PRIDE_A`, `ANGER_P`, `ANXIETY_P`, `ANX_A`, `SHAME_P`, `SHAME_A`, `HOPL_P`, `FRUS_A`, `HOPL_A`, `SC_E`, `CON_A` in the next section.

2 Results

Two hundred and forty middle and high school students (N=240) took a survey before using a mathematics tutoring system. We establish that if the correlation between two

items is $R \geq 0.75$, then the constructs are basically *equivalent*, and one of them can be omitted in any further assessment. We consider two constructs to be *highly related* when $R \geq 0.5$ and $R < 0.75$, and will be combined as they refer to the same construct. We consider two constructs to be *moderately related* when $R \geq 0.25$ and $R < 0.5$. The last possibility is that the constructs are *unrelated* ($R < 0.25$), just different.

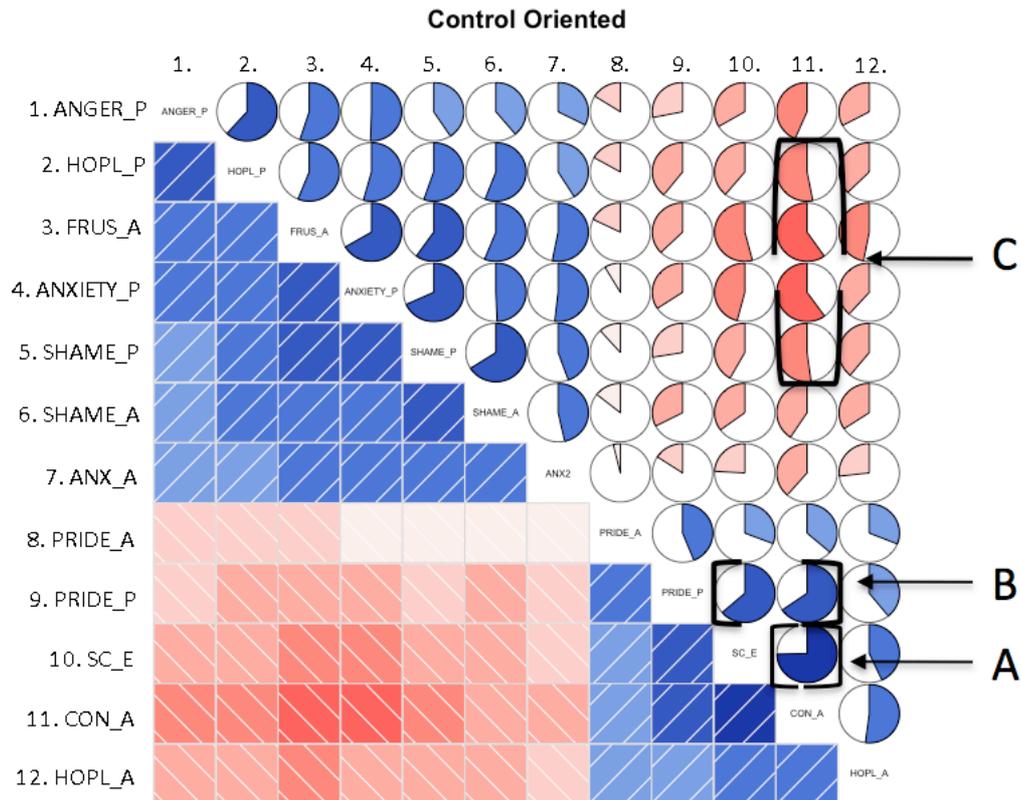


Fig 1. R values for correlations between affective constructs. A → Eccle’s SC_E (Math Self-Concept) and Arroyo’s CON_A (“How confident do you feel...?”) are *equivalent*, redundant; B → PRIDE_P is *highly related* to both SC_E and CON_A, they should be combined; C → CON_A is *highly related* (negatively) to ANXIETY_P, and also FRUS_A, HOPL_P, HOPL_A, SHAME_P. This means that talking with students about their “confidence” we are talking about a complex combination of emotional experiences related to hope, anxiety, frustration, shame and pride.

References

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