

University students' real-life emotions: Applying STARTS models to analyze the experience of emotions and their interaction with perceived academic control

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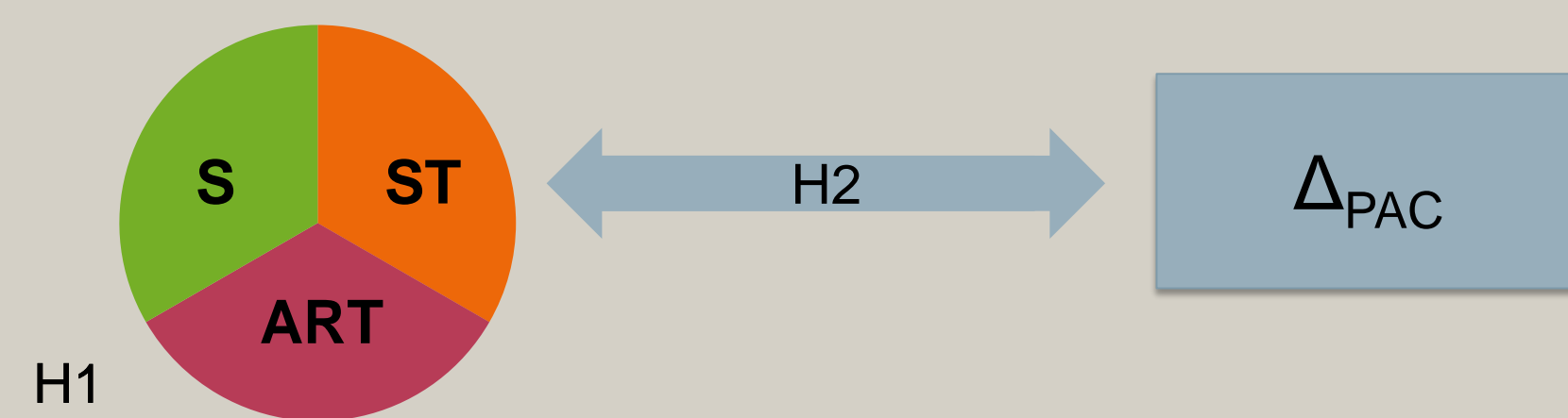
Theoretical Assumptions

- The experience of achievement emotions are important for university students' wellbeing and academic success. The control-value theory postulates the interaction between achievement emotions and control beliefs (Pekrun, 2006).
- Perceived academic control (PAC) is the individuals' control belief that they can influence their own achievement outcomes. It is highly relevant for freshman students' academic success (Perry et al., 2005).
- Although perceived academic control (PAC) is defined to be quite a stable trait, it is assumed to slowly change through achievement experiences and to be influenced by students' achievement emotions. However, achievement emotions are usually variable and situation-specific. Thus, how do achievement emotions relate to the change in perceived academic control (PAC)?

Aims and Hypotheses

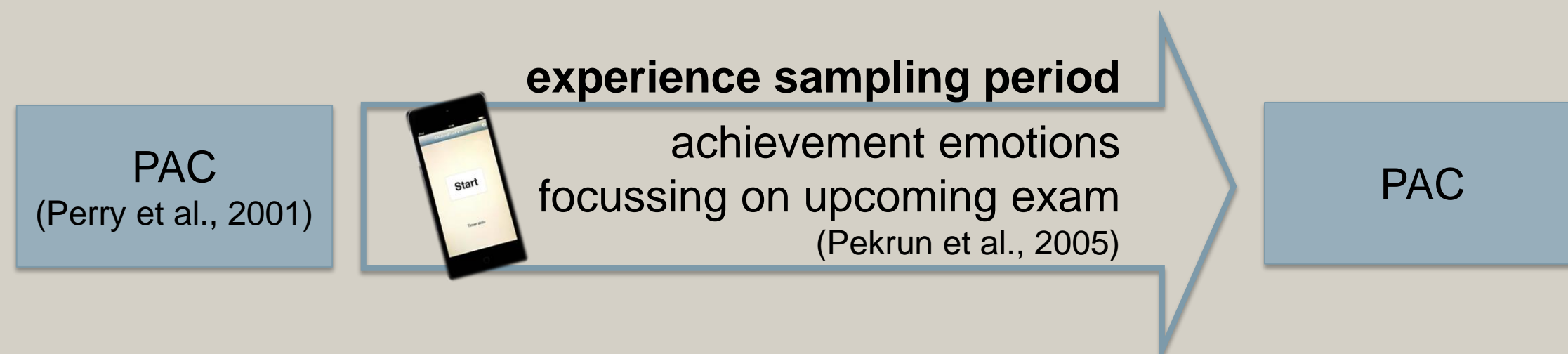
The aim of this study was to, first, disentangle achievement emotions' variances of stable traits (ST), autoregression (ART) and states (S) and, second, to analyse the relation between achievement emotions and perceived academic control (PAC).

achievement emotions



Method

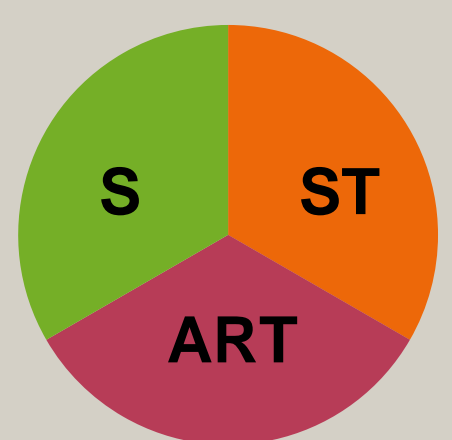
- Sample:** $N = 98$ freshmen; 60.8% female; $M_{age} = 21.1$, $SD_{age} = 2.4$; fields of study: Computer Science, Economics, Physics, Psychology



- Experience Sampling:** 1774 measurements (98 participants x 6 days x 3 alarms per day) prior highly valued exam, compliance 86.1%, random interval sampling, via iPod touch® devices and iDialogPad software (Mutz, 2016)

Rationale of Analyses

achievement emotions



- achievement emotions via STARTS models (Kenny & Zautra, 2001)
- stable trait across all measurements (ST), autoregressive trait depending on previous measurements (ART), actual state random over time (S)
- autoregression assumed to be stationary each within and between days, respectively
- total amount of variance assumed to be changeable between measurements, but proportion stable (quasistationarity model)

Δ_{PAC}

- perceived academic control (PAC) via Latent Change Score model (McArdle, 2009)
- estimate individual difference of the intraindividual change on a latent level

Achievement Emotions (H1)

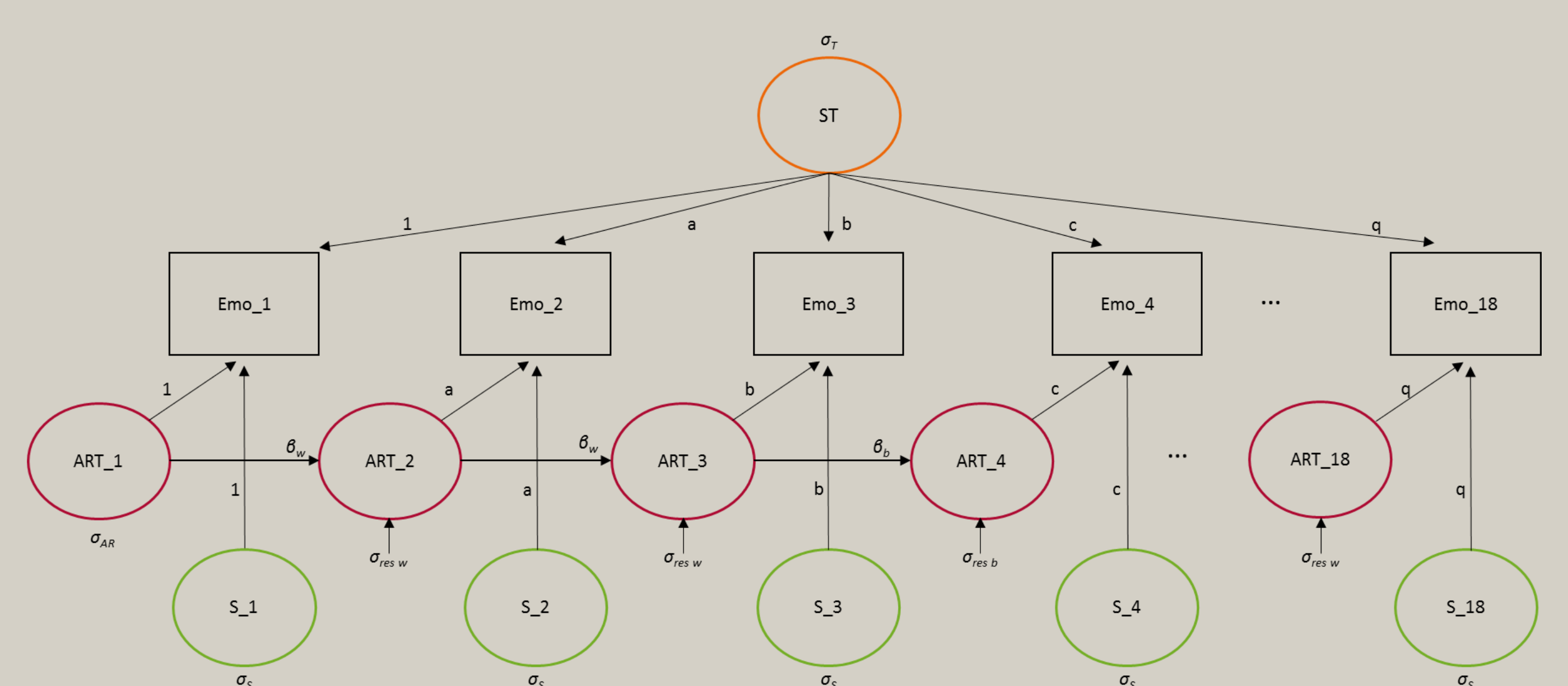
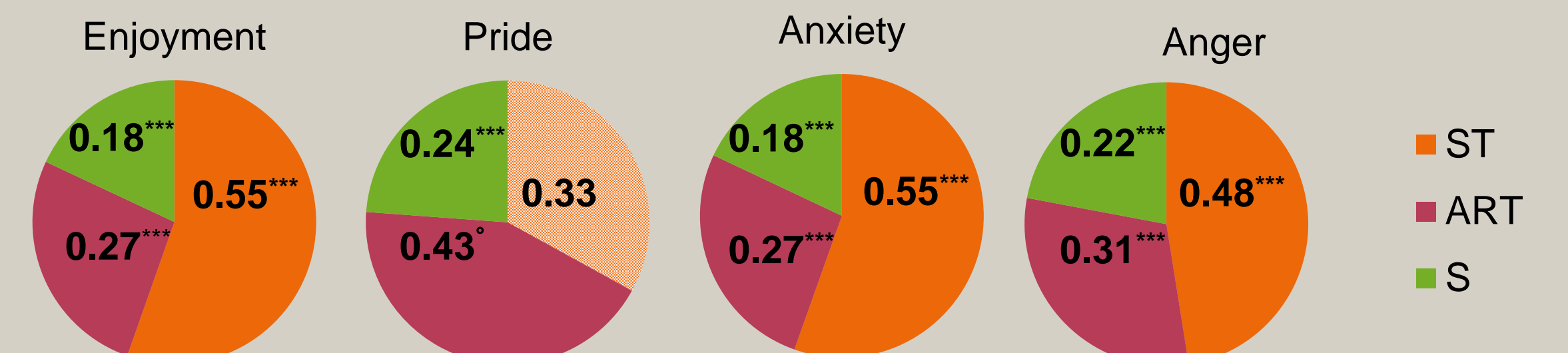


Figure 1. Path diagram of the manifest quasistationarity STARTS model with 18 measurement occasions. ST = stable trait factor; a – q = fixed factor loadings to be equal within one measurement; Emo = single-item measurement of an achievement emotion; ART = autoregressive trait factor; β_w = path coefficients within days; β_b = path coefficients between days; $\sigma_{res,w}$ = ART factor residual variance within days; $\sigma_{res,b}$ = ART factor residual variance between days; S = state factor.

Quasistationarity Model	chi-square	df	RMSEA	CFI	SRMR
Enjoyment	200.366**	149	0.059	0.949	0.070
Pride	204.381**	149	0.062	0.950	0.065
Anxiety	233.583***	149	0.076	0.927	0.066
Anger	177.318*	149	0.044	0.971	0.081

Note. * $p \leq 0.010$, ** $p \leq 0.050$, *** $p \leq 0.001$; $N = 98$

Comparisons with alternative models showed that the quasistationarity STARTS model fitted the observed data best. Thus, we estimated them for all emotions.



The largest variance sources were stable traits (ca. 50%) and autoregressive states (ca. 30%), with the exception of pride.

Relation with Perceived Academic Control (H2)

The difference of perceived academic control (PAC) was not significant over all participants, still, it showed significant variance ($M_{\Delta PAC} = -0.042$, $\sigma_{\Delta PAC} = 0.390^{***}$).

Latent Change	rSTDYX	$\sigma_{\Delta PAC}$
Enjoyment	0.219*	0.390***
Pride	0.557*	0.408***
Anxiety	-0.267**	0.406***
Anger	-0.217*	0.401***

Note. * $p \leq 0.050$, ** $p \leq 0.010$, *** $p \leq 0.001$; $N = 87$

The latent traits of the achievement emotions were related as expected to the change in perceived academic control: positive emotional traits contribute to a rise while negative emotions contribute to a decrease in perceived academic control.

Discussion

Results indicate, that students momentary emotional experience is influenced by their stable trait, earlier emotional experience and the actual situation. Further, their emotional trait contribute significantly to the change of perceived academic control within a high-valued achievement situation like an exam preparation.

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