

Physiological and Experiential Responding During Exposure for Panic Disorder

Natalie C. Tunnell, David Rosenfield, Anke Seidel & Alicia Meuret

Southern Methodist University Dallas, TX

BACKGROUND

The activation of physiological and experiential variables during feared situations has been theorized to play an important role in exposure therapy.

- Studies investigating these responses among fear dimensions are limited in number and have yielded mixed results.
- A study with 73 children with a specific phobia found covariation between cognitive distress (SUDs) and physiological changes, measured by inter-beat interval (Ollendick, Allen, Benoit & Cowart, 2011).
- Systematic increases in cortisol production in relation to exposure day anxiety have been observed during PDA exposure sessions (Meuret et al., 2015), while other studies failed to demonstrate similar response patterns between physiological indices, such as heart rate, blood pressure or cortisol) and anxiety ratings (Alper, Abelson, Wilhelm, & Roth, 2003).
- Other reports found that concordance patterns varied by type of measure or across assessment.
- Alpers et al. (2005) showed concordance between PCO₂, anxiety and breathlessness, but not heart rate and heart racing/pounding or skin conductance and sweat.
- Inconsistency in results may in part be attributed to the variations of assessment schedule.
- Previous research examined *if* physiological and experiential dimensions are related, it remains unclear *how* these two dimensions are related.



Aim: To investigate pathways of change within repeated in-vivo exposure sessions to better understand how physiological and experiential dimensions influence each other.

METHODS

Experimental Design: Participants received 3 weekly in-vivo exposure sessions and a 4th session at 2-month follow-up, yielding 122 total sessions for analysis. Cardio-respiratory physiology (heart rate, PCO₂, respiration rate) and experiential symptoms (cardio-respiratory symptoms, cognitive symptoms, and anxiety) were assessed throughout exposure sessions, in addition to weekly assessments of panic symptomatology.

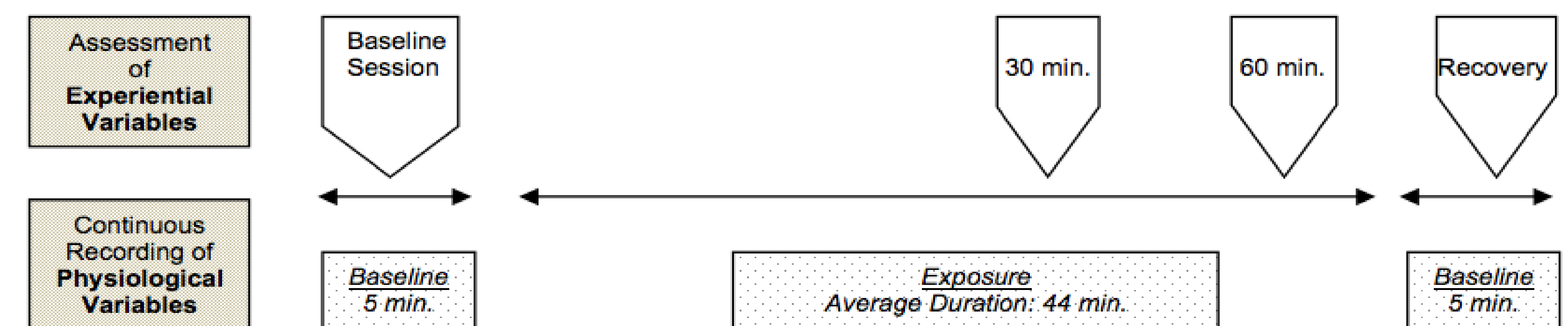
Within-Session Measures

Experiential variables. In order to assess panic symptoms (cardio-respiratory, cognitive) and anxiety (subjective units of distress, or SUDs) during exposure, patients completed a self-report log at multiple times during the exposure comprised of the 13 DSM-IV panic symptoms and anxiety (referred to as SUDS rating).



Physiological variables. A portable, battery-run capnometry device (TIDALWAVE sp®, Respirationics, USA) was used to record end-tidal PCO₂, respiration rate (RR), and heart rate (HR).

Participants: Thirty-four participants (79% female) meeting DSM-IV diagnostic criteria for panic disorder and agoraphobia participated in a two phase intervention for PDA. Mean age of the participants was 33 (SD=9) and the sample was predominantly Caucasian (91%)



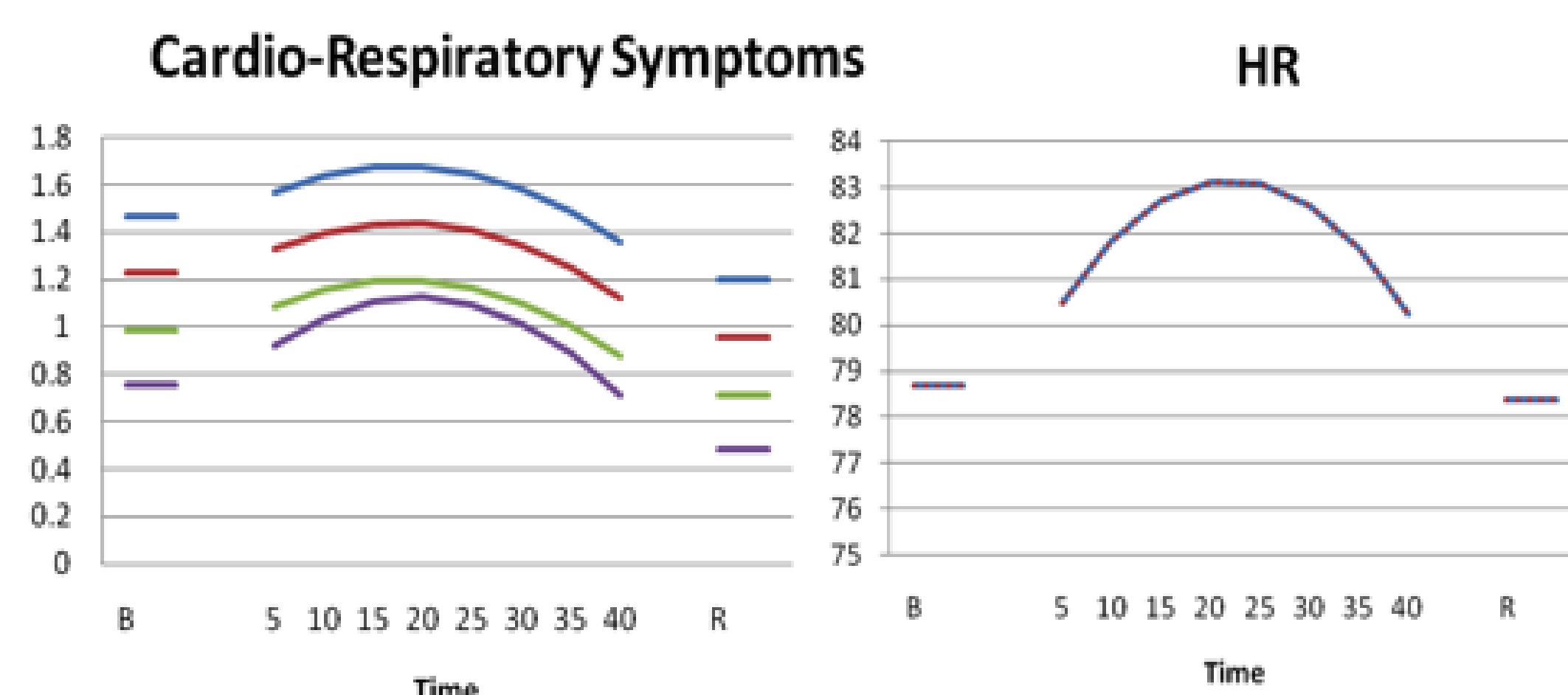
RESULTS

Changes in Outcome over Exposure Sessions

Significant improvement for all measures of panic severity (ASI, BSQ, ACQ, MI-AAL, PDSS), regardless of treatment condition ($p < .05$). The effect sizes were large ($ESs > .08$).

Within Session Changes

The experiential variables (cardio-respiratory symptoms, cognitive symptoms, and SUDs) generally showed curvilinear change *within* sessions (initial increases in symptoms followed by later decreases), with overall decreases beyond baseline levels within sessions for both conditions ($p < .05$). Significant linear and quadratic trends *within* sessions were observed in PCO₂ ($p < .05$). Changes in HR were comparable to the ones seen in PCO₂ in that a significant condition-independent, quadratic change *within* sessions was observed ($p < .05$). However, in contrast to PCO₂, HR initially increased but later recovered to initial levels. Thus, no significant linear trend *within* sessions was observed. RR did not show and change within sessions for either condition.



Within Session Mediation

Changes in PCO₂ mediated changes in the cardio-respiratory symptoms for both the linear and quadratic trends ($p < .05$) but not for changes of the cognitive symptoms nor SUDs. HR mediated quadratic changes in the cardio-respiratory symptoms, cognitive symptoms, and SUDs ($p < .05$). Mediation analyses showed that changes in the cardiac-respiratory symptoms mediated the linear and quadratic changes in PCO₂ and HR ($p < .05$), while changes in the cognitive symptoms and SUDs mediated linear and quadratic changes in HR ($p < .05$) but not in PCO₂ nor RR.

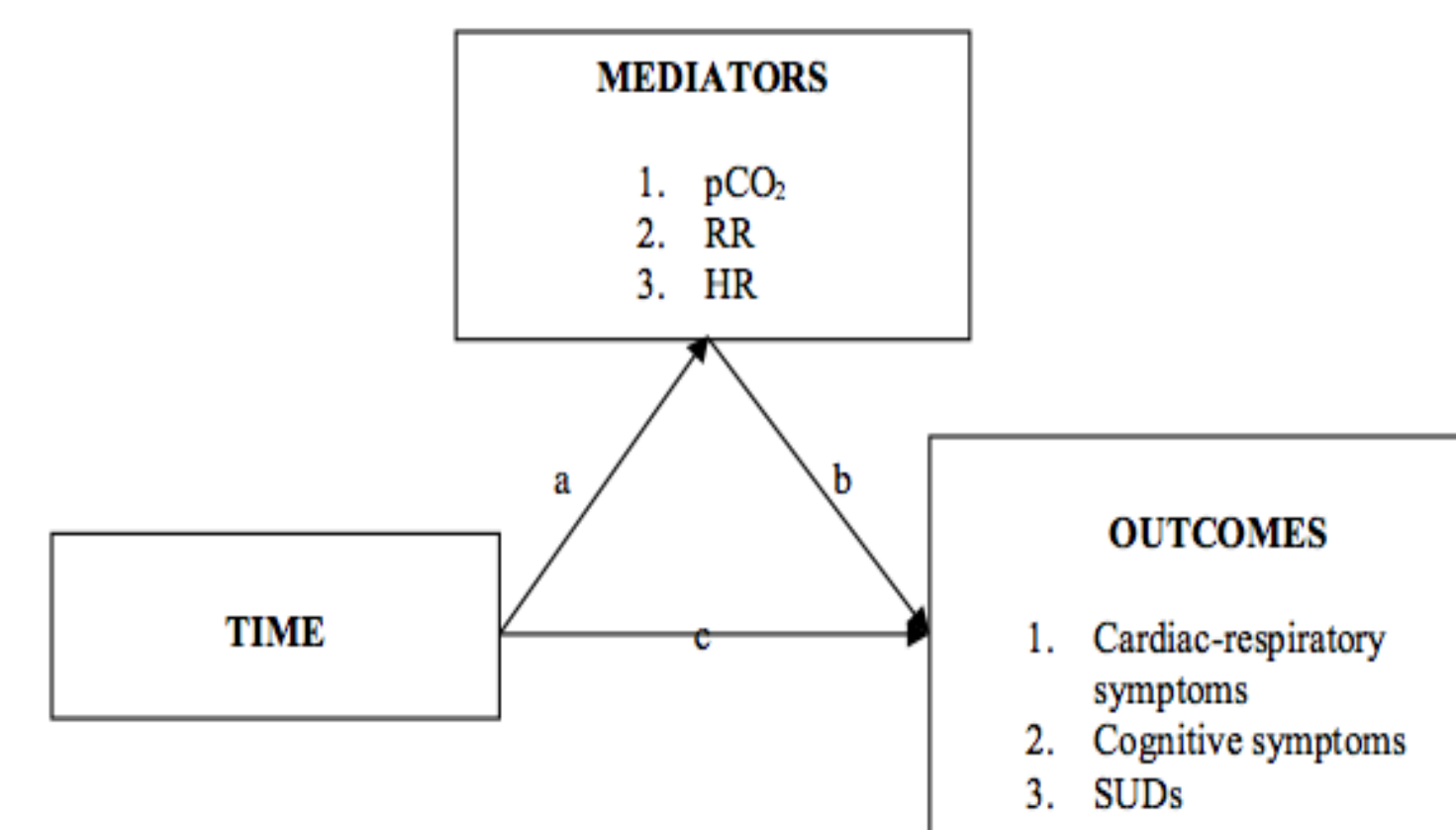


Figure 1. The relation between session (time) and outcome, mediated by physiological dimensions

DISCUSSION

This study enhances the literature by showing how the physiological and experiential dimensions change during exposure sessions, and how these changes are related to one another. Indices of cardio-respiratory physiology bi-directionally mediated cardio-respiratory symptoms, cognitive symptoms, and anxiety during exposure. These bi-directional mediational relationships were stable across sessions and independent of the type of prior coping skills training. Overall, the results suggest physiological and experiential pathways of change interact, thus supporting the important role of the physiological dimension in exposure-based treatments of PD.

Future research is needed to examine if within-session changes of physiological and experiential variables are related to improvements in panic severity.

KEY REFERENCES

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