Rationale. Panting is the optimal way to minimize the phase lag between the plethysmographic volume compression signal (Vplet) and airflow due to the thermal artifact when measuring specific airway resistance (sRaw). A drawback in children is that the end expiratory lung volume may be observed to increase during the measurement. It is not known to what extent sRaw is altered by the breathing strategy. The hypothesis was tested here that increased end expiratory lung volume during panting does not impact significantly on sRaw. Objective. To test whether increased end expiratory lung level within the sRaw acquisition results in a systematic trend with time. Methods. sRaw was measured in 10 children panting in a custom made pressure plethysmograph. Thirty measurements (1-5 per subject) that displayed a steady increase in end expiratory lung level throughout at least 4 breaths were reanalyzed breath by breath. Results. Panting frequency (mean ± SD) was 3.1 ± 0.5 Hz. sRaw was found to increase significantly throughout the acquisition (p = 0.006).

Conclusion: The progressive increase in end-expiratory lung volume during panting in children is associated with parallel increase in sRaw. This may be explained by non linearities in the Vplet - airflow relationship while the end expiratory lung volume increases in relation with imbalance between inspiratory and expiratory efforts. The clinical relevance is not clear and deserves further evaluation.