The Influence Of Angle Of Attack On Passenger Comfort

Summary

The angle of attack (AOA) of an airplane changes the direction of the gravitational force on passengers and this thereby might influence passengers' flying experience. However, the contribution of the AOA regarding comfort/discomfort is not fully explored.

In this paper, we aim to fill this knowledge gap by identifying the relationships between the perceived comfort/discomfort of passengers and the AOA of the plane during the take-off and climbing phases of a flight. An experiment is conducted in a Boeing 737 fuselage where 26 participants were recruited. Each participant experiences 3 setups of seats with different AOAs (3, 14 and 18 degrees) for 20 minutes, respectively. Participants were asked to complete questionnaires during each session, and their heart rate and the pressure on the seat and the backrest were recorded as well.

Experiment results indicated that participants experienced 14 degrees as the most comfortable angle with the lowest discomfort, which might be useful for airlines in setting up the take-off and climbing procedure. It would be good to check the findings in real flights.
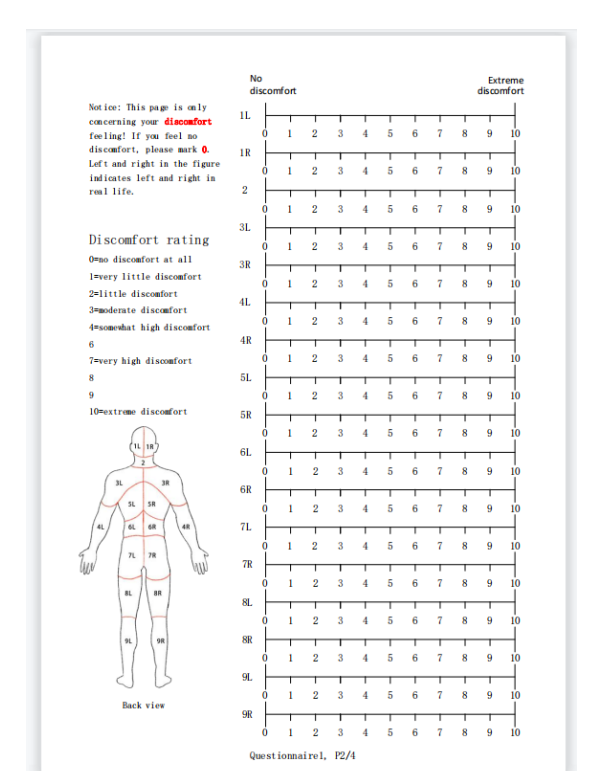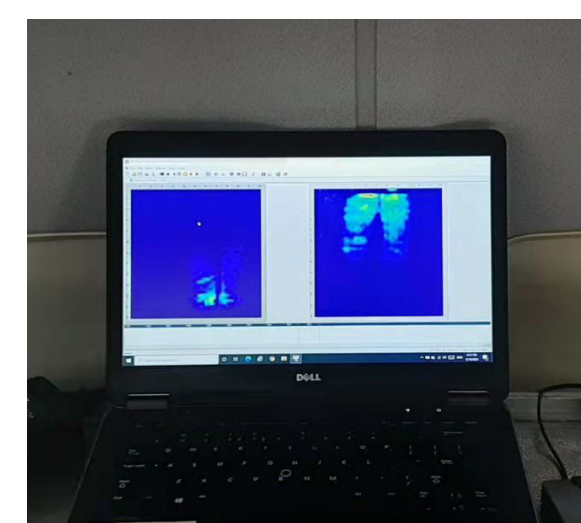
Setup

Two rows of seat mounted to a platform that could adjust to different angles. Pressure mats were put on the seat and backrest.
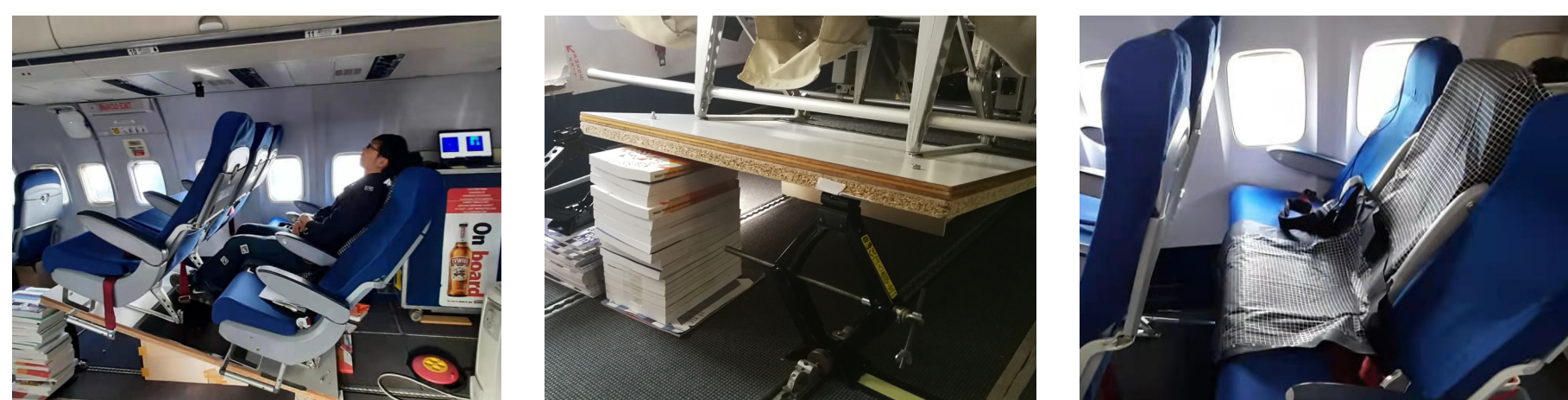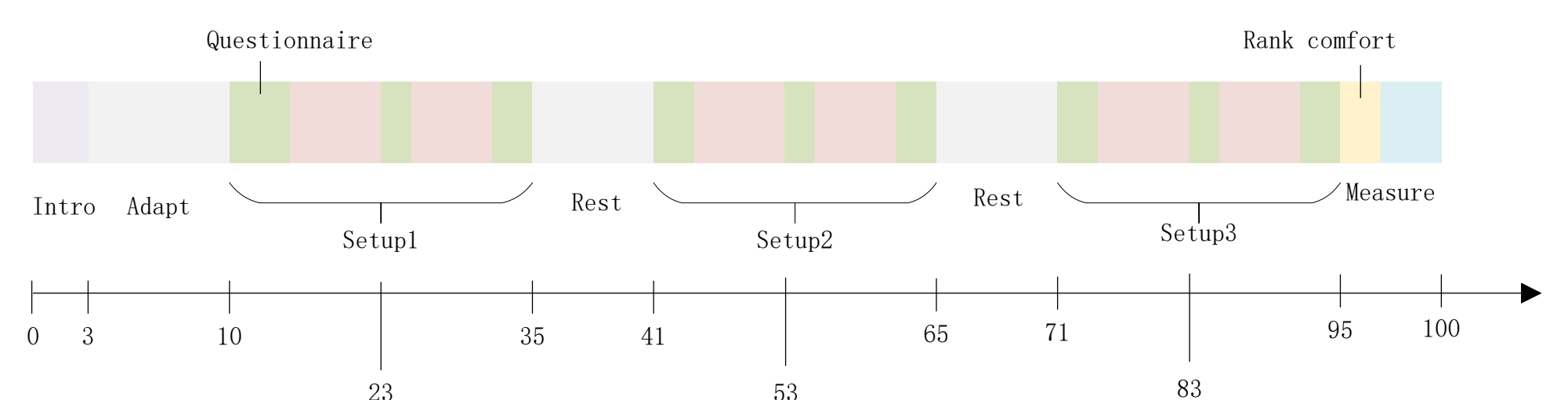

Data collection

Subjective data (questionnaires) and objective data (HRV, pressure) are collected.

Experiment procedure

Result and conclusion

After analysis of multiple parameters, it can be concluded that a certain degree of inclination might improve the feeling of comfort, or at least will not increase the feelings of discomfort. It was found that 14-degree AOA is experienced as more comfortable than 18 degrees

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