

THE EFFECTS OF GENDER, AGE, AND TIREDNESS ON THE IMPACT OF DRAFTS

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Draft-induced responses are determined by great variations which are related to numerous not yet sufficiently studied personal and situational influences. The present study investigates the rôle of gender, age, and tiredness on the evaluation of drafts by pooling the data from eight experiments which were performed with similar designs and procedures. Altogether 179 persons (70 women, 109 men, 18 - 68 yrs) participated in overall almost 1,000 sessions, where several individual and situational factors were documented and first analyzed for this paper. After 20 minutes in a reference climate (t_a : 22°C, \bar{V}_a : < 0.05 m/s, RH: 40 - 60%), the participants moved into a climatic chamber where they were exposed to drafts for at least one hour and where air velocity (0.1 - 0.4 m/s), turbulence intensity (< 20 to > 70%), draft direction (horizontal, diagonal, vertical), frequencies (0.05, 0.4 Hz), air temperature (11 to 23°C), and metabolic rate (< 70 to 156 W/m²) were varied. Physical activity varied between sitting in a chair, standing before a monitor while completing a tracking test, or operating an arm-ergometer at workloads corresponding to measured metabolic rates of 104, 128, and 156 W/m². Clothing insulation was calculated for thermal neutrality. The most sensitive arms and the neck were not covered. Initially, the participants assessed their actual health state, well-being, and tiredness. Identical questionnaires were then completed every 5 minutes concerning general thermal sensation and thermal preference, as well as perception of air movements and draft-induced annoyance separately for various body parts presented in a list. Statistical analyses based on questionnaires completed during the steady state and concerned the percentages of persons who stated draft-induced annoyance, who felt 'rather cool', and preferred a higher temperature. Generalized linear models were calculated to determine the significance of individual and situational factors. Generally, perception of air movements was independent from gender, age, and tiredness. Women were significantly more often annoyed by drafts (50 vs 30%, $p = 0.001$) and felt more often 'rather cool' in general (67 vs 50%, $p = 0.006$). So, employers who provide their employees with special clothing for moderate cold workplaces shall take this in account. Five groups defined by the decades from 20 to 70 years (30 women, 28 men) revealed no effect of age on draft-induced general annoyance, or on a 'rather cool' sensation and this was confirmed by 2 further studies, where age varied sufficiently for statistical analysis. Despite this, it must be taken in account that the elderly are physically less active in the usual situation, they then produce less metabolic heat and they are certainly more often annoyed by drafts. The percentage of persons who stated draft-induced annoyance and a 'rather cool' sensation in general was significantly higher in rather tired than in alert persons. So, tired persons must adjust their clothing accordingly if they have not the opportunity to adjust the temperature at their workplace.

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