

# Exploring the Influence of Impeding Exercise on Eating Behaviour

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# Exploring the Influence of Impending Exercise on Eating Behaviour

## Abstract

- **Compensatory Health Belief (CBH) model**<sup>1</sup>: one may unknowingly increase their calorie intake in the face of an upcoming exercise session.
- Preliminary correlational results show that participants who consumed more snacks in the **impending exercise (IE)** condition also had a higher energy balance.
- In other words, those participants may not have expended enough energy during the exercise session to account for their increased energy intake.
- Hence, health professionals should take into account this contradictory relationship between impending exercise and increased food intake when developing solutions to combat obesity.

## Background & Hypothesis

- **Impending exercise** may make one **more susceptible to snack on high-calorie food**.<sup>2</sup> This is because **anticipated effectiveness of future exercise is more prone to overly optimistic expectations** than past exercise.<sup>3</sup>
- Meaning that individuals may snack more as a reward for an IE session or because they believe their exercise session can offset the extra calories consumed. Hence, these inaccurate evaluations may lead to **behaviours consistent with overeating**.
- Surprisingly, in that same study that reported a difference between participants' effectiveness expectations, the authors **did not find any difference in calorie intake** between the *eating before exercise* condition as compared to the *exercising before eating* and *no exercise* condition.<sup>3</sup>
- This could be **due to the limitations** associated with their study design: ① between-subjects design, ② only female participants, ③ BMI of 18.5 – 25, ④ no meal standardization, ⑤ pre-determined exercise duration and intensity.
- As such, the purpose of the present repeated measures study aims to re-examine the effects of impending exercise on eating behaviours while addressing the limitations of previous research.

**H<sub>1</sub>: Participants will consume more calories in the impending exercise condition as compared to the no exercise condition.**

**H<sub>2</sub>: Participants will overestimate the effectiveness of their upcoming exercise leading them to consume more calories than they expend.**

## Methodology

### Participants

- 9 healthy inactive overweight male participants (age: 24.11 ± 1.69 years; body mass index (BMI): 26.48 ± 1.53 kg/m<sup>2</sup>, VO<sub>2max</sub>: 30.08 ± 3.49 mL/kg/min) were recruited from the National University of Singapore (NUS).

### Procedures

- Following a **screening, baseline and familiarization (SBF)** session, participants underwent two randomly counterbalanced experimental sessions: **meal before exercise (ME)** and **meal only (MO)** conditions.

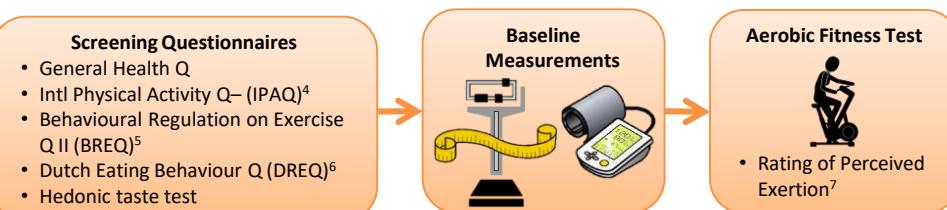


Figure 1. Procedures associated with the SBF session.

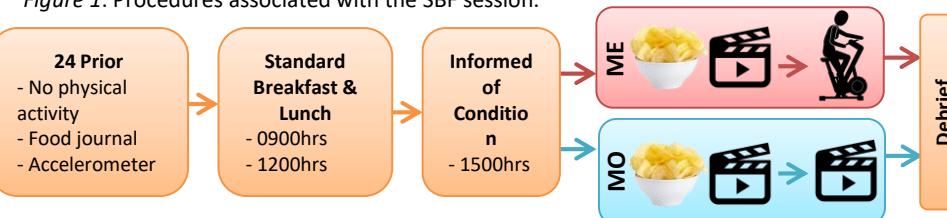


Figure 2. Procedures associated with the MO and ME session.

- Appetite and blood pressure were measured during the ME and MO sessions at 3 time points (red and blue coloured arrows).
- A physical activity enjoyment scale was also given after the ME workout session.<sup>8</sup>

## Preliminary Results

### Hypothesis 1

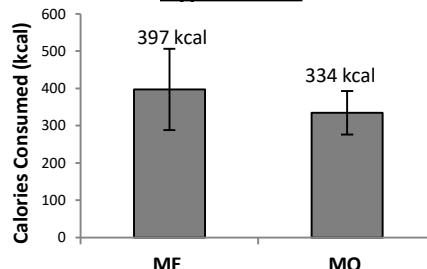


Figure 3. Mean calories consumed in the ME and MO experimental conditions.

- In line with H<sub>1</sub>, the average **calories consumed** in the ME session is **higher** than the MO session.
- However, a paired t-test showed that the difference did not reach significance,  $t(8) = .68, p = .513$ .
- The **difference in caloric consumption** between ME and MO session was **significantly correlated** with the **energy balance** in the ME session (calories consumed – calories expended),  $r(7) = .809, p = .008$ .

### Hypothesis 2

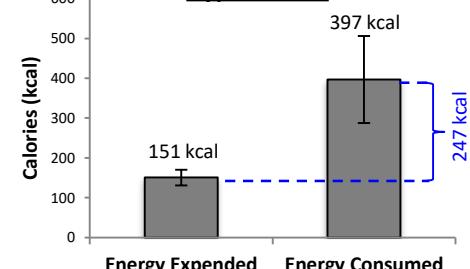


Figure 4. Mean calories expended and consumed in the ME experimental condition.

- Consistent with H<sub>2</sub>, **more calories were consumed than expended** thus leading to a positive energy balance.
- However, a paired t-test was marginally significant,  $t(8) = 2.21, p = .058$ .

### Other Findings

- **External eating behaviour** was marginally significantly positively correlated with the **difference in caloric consumption** between the ME and MO session,  $r(7) = .654, p = .056$ .
- The **enjoyment** associated with physical activity was also highly correlated with **energy expended** during the exercise session,  $r(7) = .886, p = .001$ .

## Discussion & Conclusion

- As the **study is still on-going**, the **small sample size** may result in **low statistical power** and contributed to the non-significant t-test.
- Although the **difference between the energy consumed and expended (247 kcal)** is non-significant, this difference is **clinically meaningful** as it has been reported that an increase of 100 kcal/day re-establishes one's energy balance at the new, slightly higher, body weight.<sup>9</sup> Hence, with a constant positive energy balance of approx. 247 kcal, one's body weight will increase over time.
- The correlation between the differences in energy consumption and energy balance shows that participants compensated for the impending exercise by snacking more and also overestimated the effectiveness of their impending exercise session.
- The influence of IE on food intake may be a **mediator for rising obesity levels** in Singapore despite programs to promote physical activity (e.g. National Physical Fitness Award [NAPFA], Holistic Health Framework [HHF]).<sup>10</sup>
- **Future initiatives** to promote physical activity for weight loss should **take the CHB model into account** and **ensure the activity is enjoyable** as it seems to be important for increasing energy expended during physical activity.

### References:

1. Rabaia, M., Knäuper, B., & Miquelon, P. (2006). The eternal quest for optimal balance between maximizing pleasure and minimizing harm: The compensatory health beliefs model. *British journal of health psychology*, 11(1), 139-153.
2. Fishbach, A., & Dhar, R. (2005). Goals as excuses or guides: The liberating effect of perceived goal progress on choice. *Journal of Consumer Research*, 32(3), 370-377.
3. Coelho, J., Roefs, A., Havermans, R., Salvy, S. J., & Jansen, A. (2011). Effects of exercising before versus after eating on dieting and exercise evaluations: A preliminary investigation. *Canadian Journal of Behavioral Science*, 43(1), 63-67. doi: 10.1037/a0021736
4. Craig, C. L., Marshall, A. L., Sjöström, M., Bauman, A. E., Booth, M. L., Ainsworth, B. E., Pratt, M., Ekelund, U., Yngve, A., Sallis, J. F., & Oja, P. (2003). International Physical Activity Questionnaire: 12-Country Reliability And Validity. *Medicine & Science in Sports & Exercise*, 35(8), 1381-1395.
5. Markland, D., & Tobin, V. J. (2010). Need support and behavioural regulations for exercise among exercise referral scheme clients: The mediating role of psychological need satisfaction. *Psychology of Sport and Exercise*, 11(2), 91-99.
6. Van Strien, T., Frijters, J. E., Bergers, G., & Defares, P. B. (1986). The Dutch Eating Behaviour Questionnaire (DEBQ) for assessment of restrained, emotional, and external eating behaviour. *International Journal of Eating Disorders*, 5(2), 295-315.
7. Borg, G. A. (1982). Psychophysical bases of perceived exertion. *Medicine & Science in Sports & Exercise*, 14(5), 377-381.
8. Kendzierski, D., & DeCarlo, K. J. (1991). Physical Activity Enjoyment Scale: Two validation studies. *Journal of Sport & Exercise Psychology*, 13, 50-64.
9. Hill, J. O., Peters, J. C., & Wyatt, H. R. (2009). Using the energy gap to address obesity: a commentary. *Journal of the American Dietetic Association*, 109(11), 1848-1853.
10. Gupta, N., Chin, M. K., Yang, J., Balasekaran, G., Chia, M., Girandola, Edgindon, C. R., & Mok, M. M. C. (2010). Obesity prevention in Singapore: Collaborative efforts among government, health professionals and the community. *Asian Journal of Exercise and Sports Science*, 7(1), 61-70.