

# The Role of Acculturation on Energy Intake and Expenditure among Exchange Students in Singapore

Ng, Xue Qi

2017

Ng, X. Q. (2017, March). The Role of Acculturation on Energy Intake and Expenditure among Exchange Students in Singapore. Presented at Discover URECA @ NTU poster exhibition and competition, Nanyang Technological University, Singapore.

<https://hdl.handle.net/10356/83723>

---

© 2017 The Author(s).

*Downloaded on 10 Dec 2023 01:19:47 SGT*

# The Role of Acculturation on Energy Intake and Expenditure among Exchange Students in Singapore

## Abstract

- Acculturation presents challenges and changes that may influence health outcomes through energy intake<sup>1</sup> and expenditure<sup>2</sup>.
- Exchange students completed measures on physical activity, acculturation styles and food portion size selection.
- Correlation analysis showed that greater levels of integration style predicted higher physical activity.
- Hence, this highlights the importance of integration on the health related behaviours of exchange students.

## Background & Research Questions

- Acculturation, the process of psychological and cultural changes as a result of contact between cultural groups, may cultivate acculturative stress which is a significant concern for international students<sup>3</sup>. Maladaptive eating patterns and gain in body weight have been associated with people under acculturative stresses<sup>4</sup>.
- As such, it is imperative to examine the relationship between different types of acculturation styles and energy balance in the form of intake and expenditure.
- More successful acculturation (e.g. length of stay) was found to be positively associated with higher physical activity in 57% of cases in a review on immigrants<sup>5</sup>. It was also significantly associated with increased energy density of the diet and less dietary restraint with regards to factors (e.g. cholesterol) associated with chronic disease development<sup>1</sup>. Generally, integration may predict higher physical activity and greater food portion size selection.
- To the author's knowledge, there have been no studies on the effect of different acculturation styles and behaviours (exercise, food portion selection) related to energy balance of exchange students to date.
- Also, the lack of an agreement on the definition of acculturation might have limited findings of previous acculturation and physical activity studies<sup>6</sup>.
- As such, the purpose of this study is (1) to utilise a conceptual framework of acculturation styles— Integration, Assimilation, Separation to examine its effect on energy balance, (2) to explore relationships between both energy intake and expenditure, (3) to expand upon the literature to Western sojourners in Asia.

## Research Question: Do different acculturation styles influence exchange students' energy regulation?

H<sub>1</sub>: Greater levels of integration will predict greater energy expenditure behaviour in the form of physical activity (PA).

H<sub>2</sub>: Greater levels of integration will predict higher energy intake in the form of ideal portion size (IPS).

## Methodology

### Participants

- 23 exchange students from Germany, Netherlands and Sweden were recruited from Nanyang Technological University (11 males, 12 females, M<sub>age</sub>=22.8, SD=1.52, range 20-26).

### Procedure (for each time point)

Time Point 1 (TP1) & Time Point 2 (TP2)

### Online Survey

- East Asian Acculturation Measure (EAAM)<sup>7</sup>  
Integration: e.g. 'I tell jokes both in English or Singlish and in my native language'  
Assimilation: e.g. 'I write better in English than in my native language'  
Separation: e.g. 'Most of the music I listen to is from my home country'
- Intl Physical Activity Q- (IPAQ)<sup>8</sup>  
E.g. 'During the last 7 days, on how many days did you do vigorous physical activities'
- Behavioural Regulation in Exercise III (BREQ-3)<sup>9,10</sup>  
E.g. 'It's important to me to exercise regularly'

### Lab Visit & Baseline Measurements

- Online Ideal Portion Size Choice Task (IPS); 30 different food images.  
E.g. 'Please select the amount of food that you like to eat for lunch'

Laksa

Penne Pasta with Mushroom Sauce



sample items from portion selection task

## Results

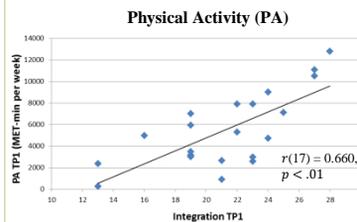


Figure 1. Scatterplot of integration on PA at time point 1 (TP1).

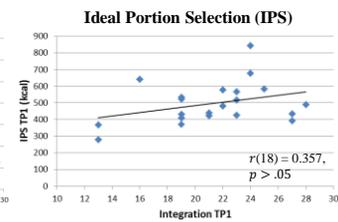


Figure 2. Scatterplot of integration on IPS at time point 1 (TP1).

- At TP1, integration was significantly associated with PA after controlling for assimilation and separation (fig. 1).
- At TP2, there was a marginal effect of integration and assimilation on physical activity,  $r(11) = -0.485, p = .093$  and  $r(11) = 0.478, p = .099$  respectively, after controlling for PA at TP1.

- At TP1, integration was not significantly associated with IPS (fig. 2).
- At TP2, integration had a marginal effect on IPS,  $r(10) = 0.560, p = .058$  while assimilation was significant,  $r(10) = -0.624, p < .05$  after controlling for IPS at TP 1.

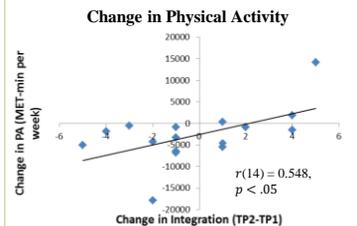


Figure 3. Correlation between change in integration and change in PA from TP1 to TP2.

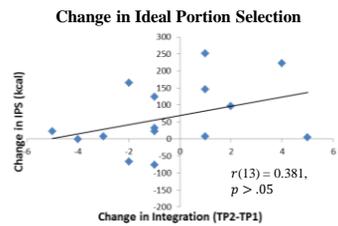


Figure 4. Correlation between change in integration and change in IPS from TP1 to TP2.

- The change in integration was significantly correlated with the change in physical activity (fig. 3).

- The change in integration was not significantly correlated with the change in IPS (fig. 4).

## Motivation to Exercise (BREQ Scores)

- Integration was significantly correlated with all aspects of internal motivation - identified, integrated and intrinsic motivation at TP1 after controlling for assimilation and separation ( $r(18) = 0.585, p < .01, r(18) = 0.470, p < .05, r(18) = 0.459, p < .05$  respectively).

## Discussion & Conclusion

- Among exchange students, greater level of integration predicted higher PA but not IPS, although there was a trend towards positive IPS.
- Data from two separate time points reflected changes in integration patterns which predicted changes in specific health behaviours of exchange students.
- One limitation of the current study is the small sample size and attrition between the two time points.
- As integration was positively correlated with intrinsic and integrated motivation, which in turn was positively correlated with physical activity, future research can investigate the association between integration and physical activity which may be mediated by exercise motivation.
- Future initiatives catered to exchange students should focus on integration as it may influence the students' physical health.

### References:

1. Tseng et al. (2014). *Journal of Immigrant and Minority Health*, 17(2), 400-407.
2. Wolin et al. (2006). *Preventive Medicine*, 42(4), 266-272.
3. Schofield et al. (2013). *Adolescent Psychiatry*, 3(1), 52-60.
4. Furukawa, T. (1994). *International Journal of Eating Disorders*, 15(1), 71-79.
5. Gerber et al. (2011). *Journal of Public Health*, 20(3), 313-341.
6. Koca, C., & Lapa, T. Y. (2014). *Perceptual and Motor Skills*, 119(3), 698-716.
7. Barry, D. T. (2001). *Encyclopedia of Multicultural Psychology*, 3(4), 193-7.
8. Craig et al. (2003). *Medicine & Science in Sports & Exercise*, 35(8), 1381-1395.
9. Markland, D., & Tobin, V. (2004). *Journal of Sport and Exercise Psychology*, 26, 191-196.
10. Wilson et al. (2006). *Journal of Biobehavioral Research*, 11, 79-104.

Co-Supervisor/Collaborator: Dr. Aaron Sim Yueren