

Predicting Chinese Adolescents' intention to engage in healthy eating

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Introduction & Literature Review

Introduction

- According to WHO (2012), worldwide obesity has nearly **doubled** since 1980
- Overweight and obesity are major causes of chronic illness, such as high blood pressure
- China has the **second-largest** number of obese individuals in the world (Ng et al., 2014)

Introduction

- The overweight and obesity rate among mainland children under the age of 20 increased from 5.7% in 1980 to 18.8% in 2013 (Ng et al., 2014).
- With the one-child policy, single children, who are called “little emperors”, receive whatever foods they want. The Little Emperors are exposed to tempting images of unhealthy foods in the media (Bankman and Alivisatos, 2013; Jing, 2000).



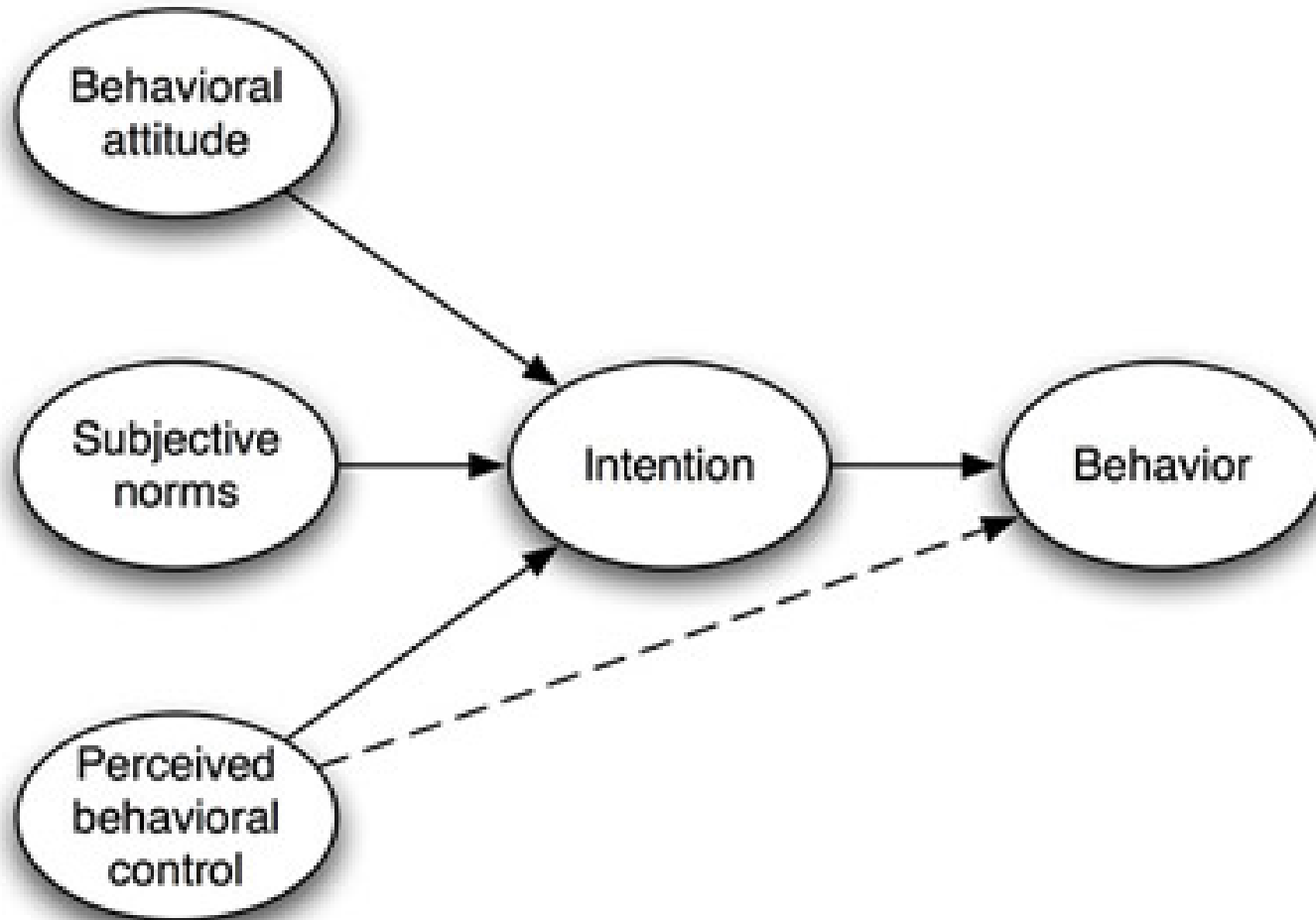
Research Objectivities

- predict the intention to adopt healthy eating among adolescents in Mainland China
- Using the theory of planned behavior + additional variables

Social implications

- help parents, health educators, and public policy makers to more effectively develop and deliver healthy eating messages

Theory of Planned Behavior; (Ajzen, 1988, 1991)



- The measurement of social norm **failed** to include the social influence from impersonal sources, such as the **influence of the mass media, the internet, and the government.**
- In addition to variables of TPB, there is no study include additional variables such as self-efficacy, perceived barriers, past behavior, and behavioral knowledge

- Added variables: **self-efficacy** and **barriers** to extend the original model for predicting **healthy eating**¹
- Self-efficacy: individual's own ability and internal resources → behavior
- Differently, perceive control → external factors

Literature Review

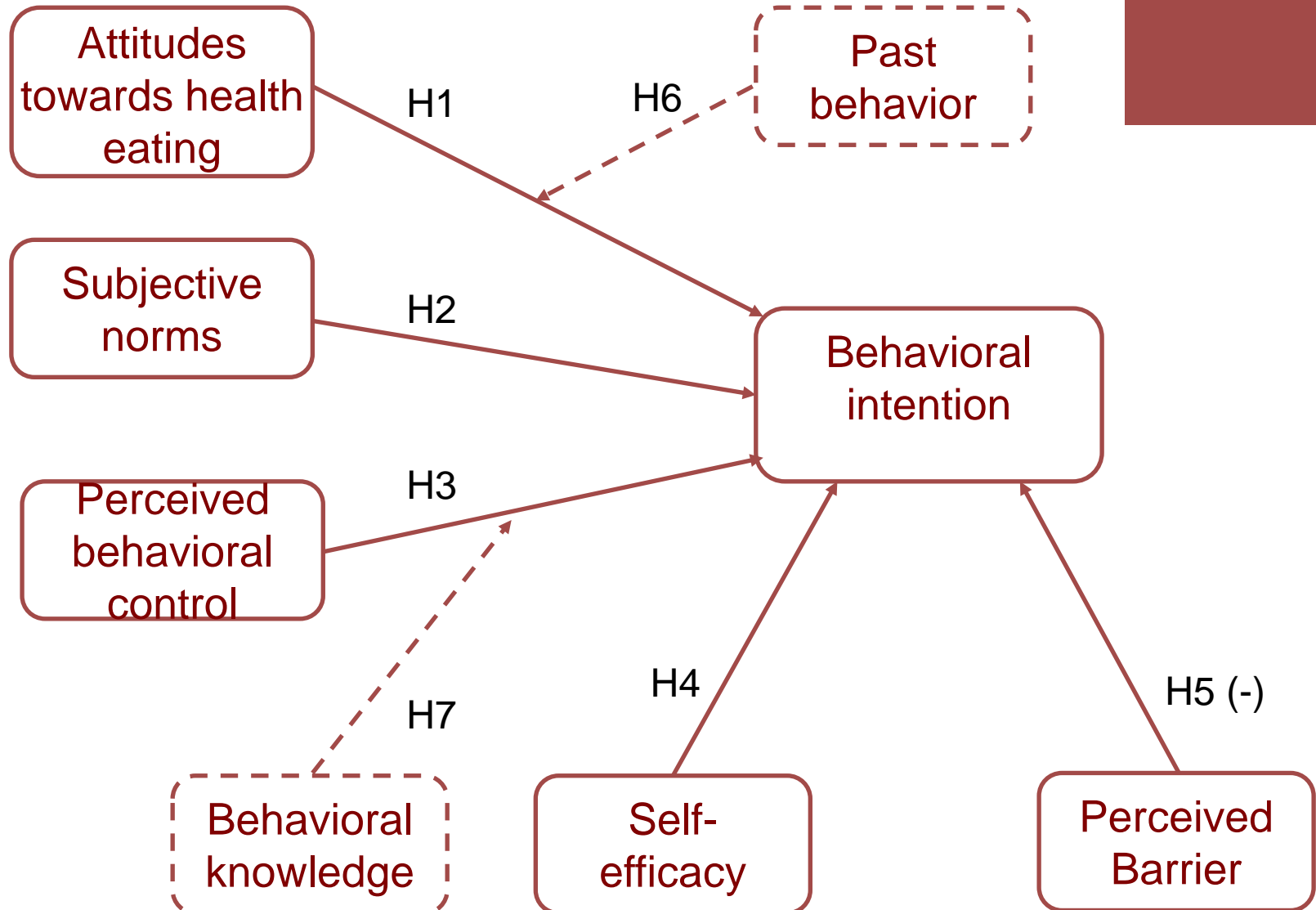
Perceived barriers to healthy eating

- one's own opinion of visible costs of behavior
- poor availability of healthy foods
- teachers and peers not being informative or supportive
- higher preferences for unhealthy foods because of taste
- healthy foods being more expensive generally

Literature Review (gender difference)

- inconsistent findings
- American boys' healthy eating attitude mostly influenced healthy eating intention and girls' intention was most likely affected by perceived behavioral control. ²

Figure 1. Model of Healthy Eating



Hypothesis

- **H1. Subjective norms** supporting healthy eating are positively related with adolescents' **intention** to engage in healthy eating.
- **H2. Attitudes** toward healthy eating are positively related with adolescents to engage in healthy eating.
- **H3. Perceived behavioral control** is positively related with adolescents' **intention** to engage in healthy eating.
- **H4. Self-efficacy** is positively related with adolescents' **intention** to engage in healthy eating.
- **H5. Perceived barriers** are negatively related with adolescents' **intention** to engage in healthy eating.

Hypothesis

- **H6.** The relationship between **attitudes** towards healthy eating and adolescents' **intention** to engage in healthy eating is **weaker** when adolescents have **higher levels of past behavior** of engaging in healthy eating than **lower levels of past behavior** engaging in healthy eating.
- **H7.** The relationship between **perceived behavioral control** and adolescents' **intention** to engage in healthy eating is **stronger** when adolescents have **lower knowledge** of healthy eating than **higher knowledge** of healthy eating.

Methods

Methods

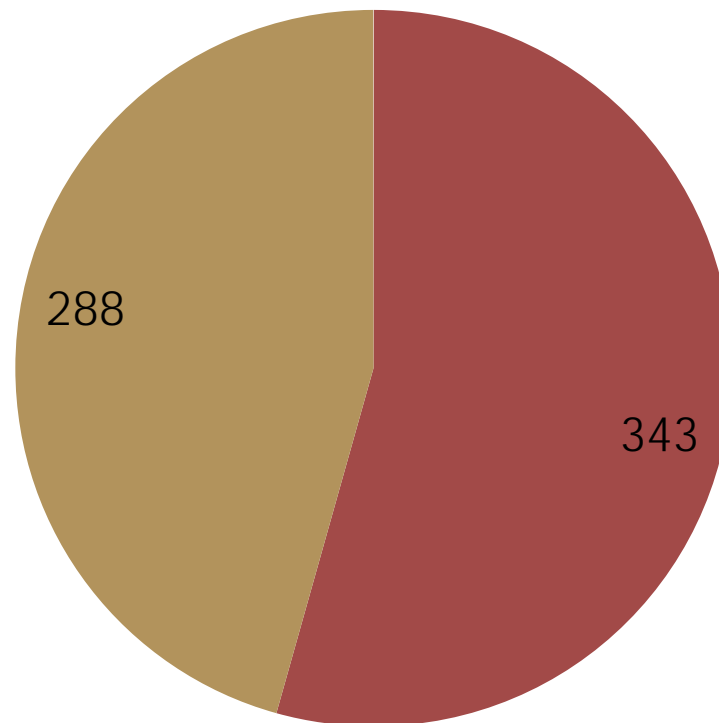
Purposive sampling

- type of school, then schools, then classes
- **Five middle/high schools in Shanghai and seven in Jilin, Changchun**
- For each selected school, **one to two classes** in the target grades were selected.

Methods

Participants (N=635, 4 not report sex)
mean age=15.6 (sd=1.6)

by sex

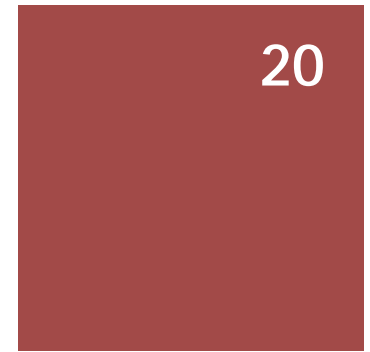


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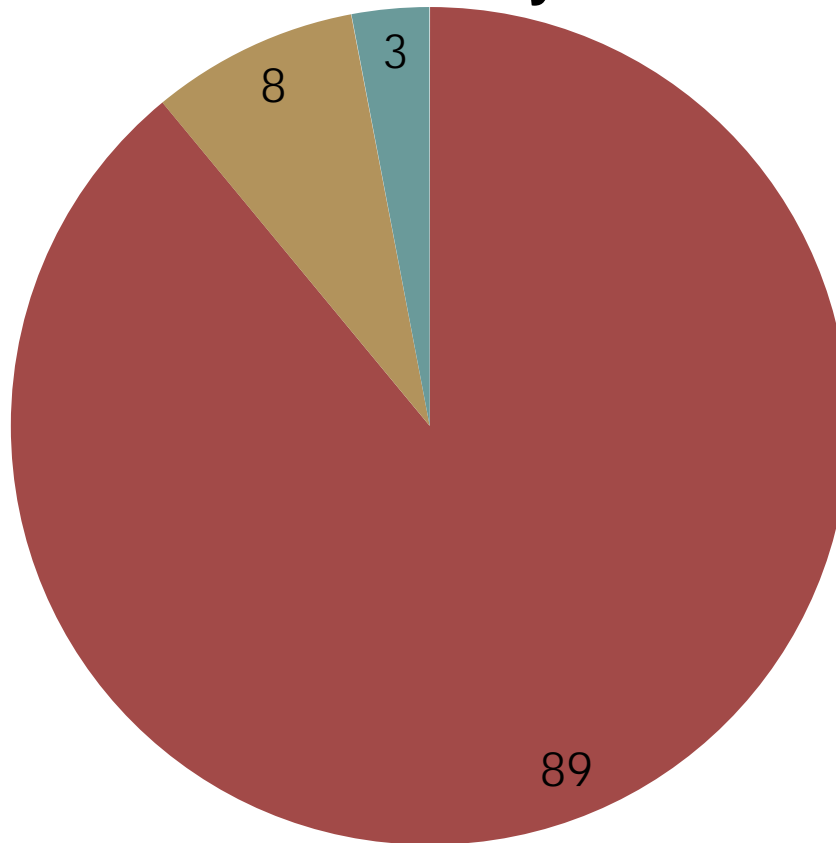
■ M
■ F

Methods

mean BMI=20.5



by BMI



- normal
- overwt 25+
- obese 30+

Methods

Procedure

- participation was voluntary
- Respondents filled out the questionnaires during a normal class session
- conducted in December 2013 to February 2014

Methods

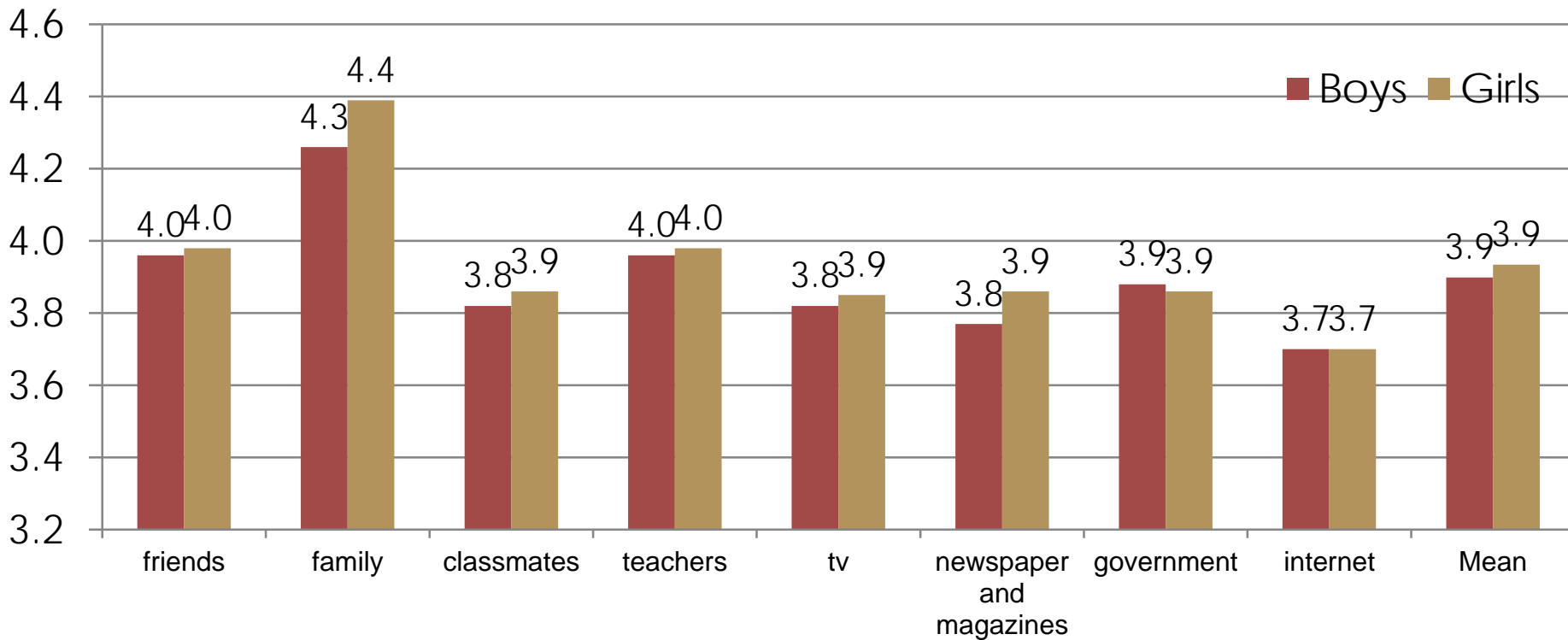
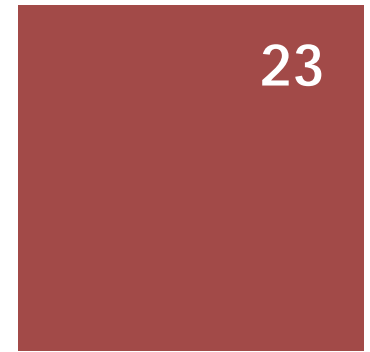
Questionnaire

- healthy eating was defined as consuming three balanced meals daily that consisted of sufficient fruits as well as vegetables, and consuming fast foods, chips, candies, and desserts sparingly (Baker, Little, & Brownell, 2003).

Subjective norm

(...thinks I should engage in healthy eating)

($\alpha = 0.92$ for boys; $\alpha = 0.92$ for girls)

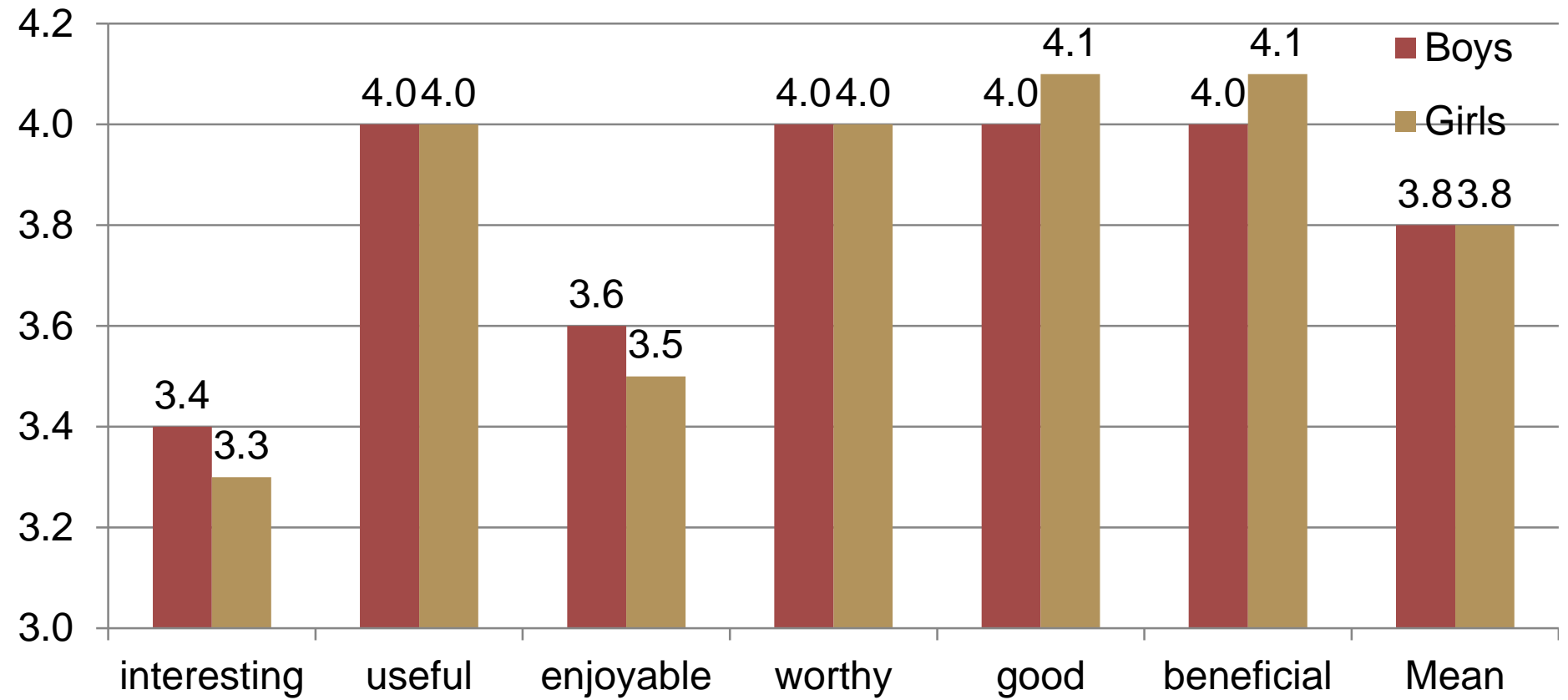


Attitude

(...boring-interesting, worthy-unworthy)

($\alpha = 0.84$ for boys; $\alpha = 0.76$ for girls)

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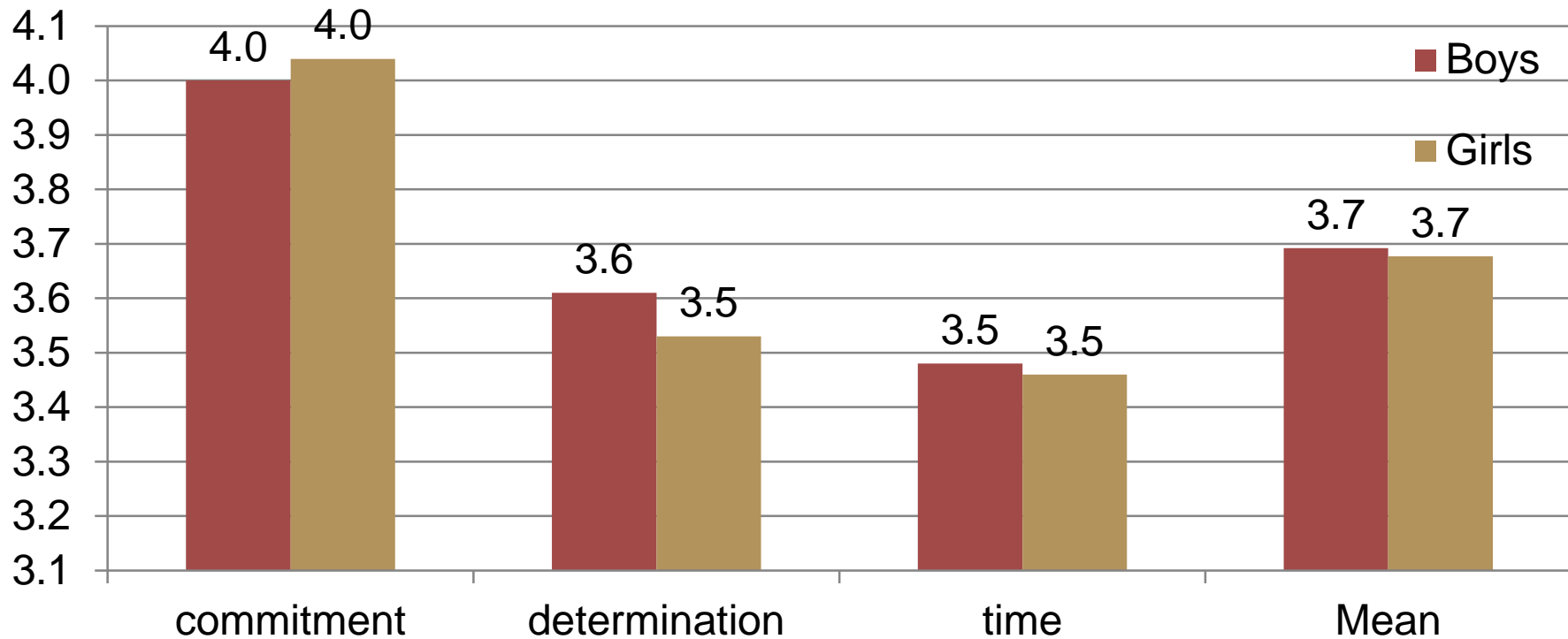


Perceived behavior control

(e.g., Do you have enough discipline to eat healthily)

($\alpha = 0.75$ for boys; $\alpha = 0.81$ for girls)

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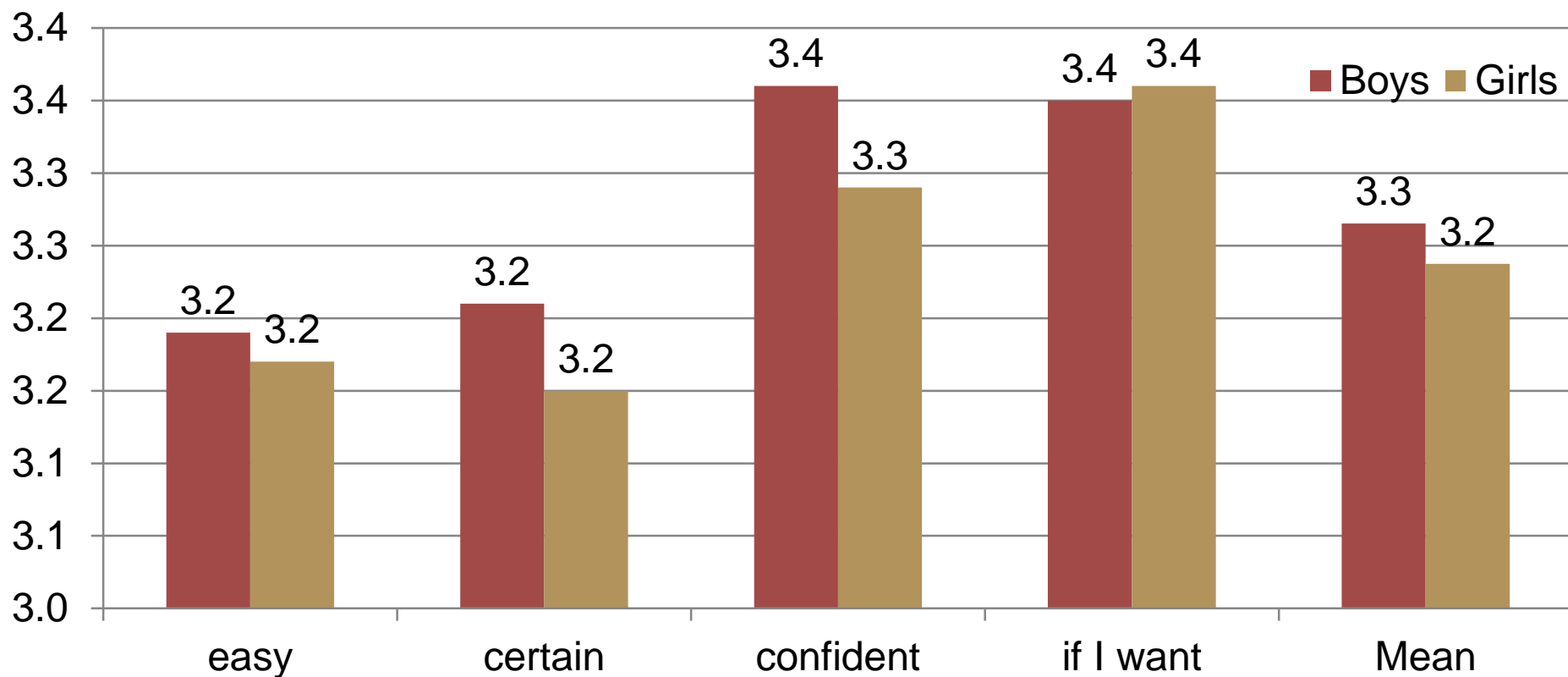


Self efficacy

(e.g., how certain/confident are you that you could engage in healthy eating over the next two weeks)

($\alpha = 0.84$ for boys; $\alpha = 0.79$ for girls)

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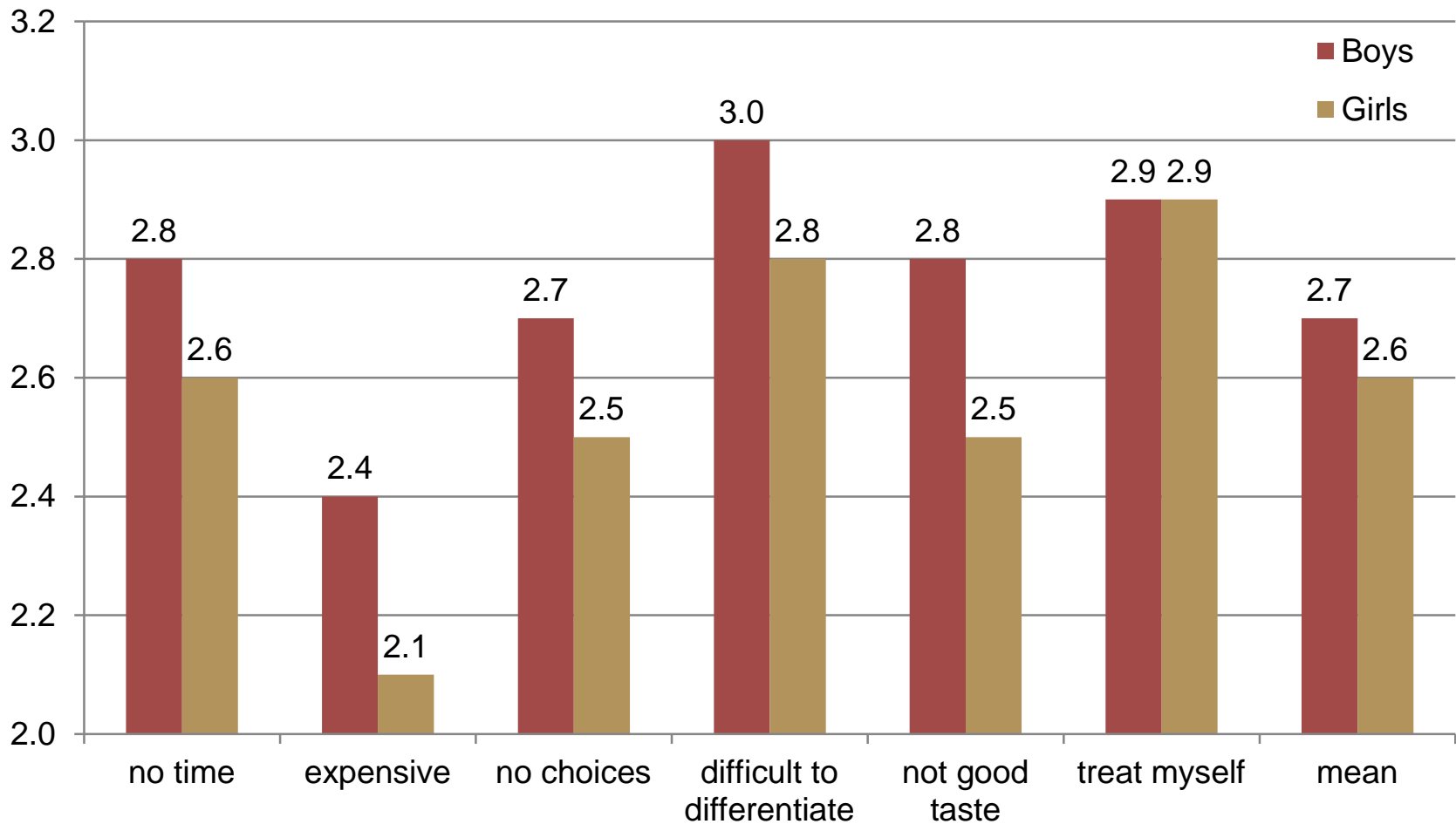


Perceived barriers

(e.g., I don't always eat healthily because not enough healthy options available)

($\alpha = 0.84$ for boys; $\alpha = 0.79$ for girls)

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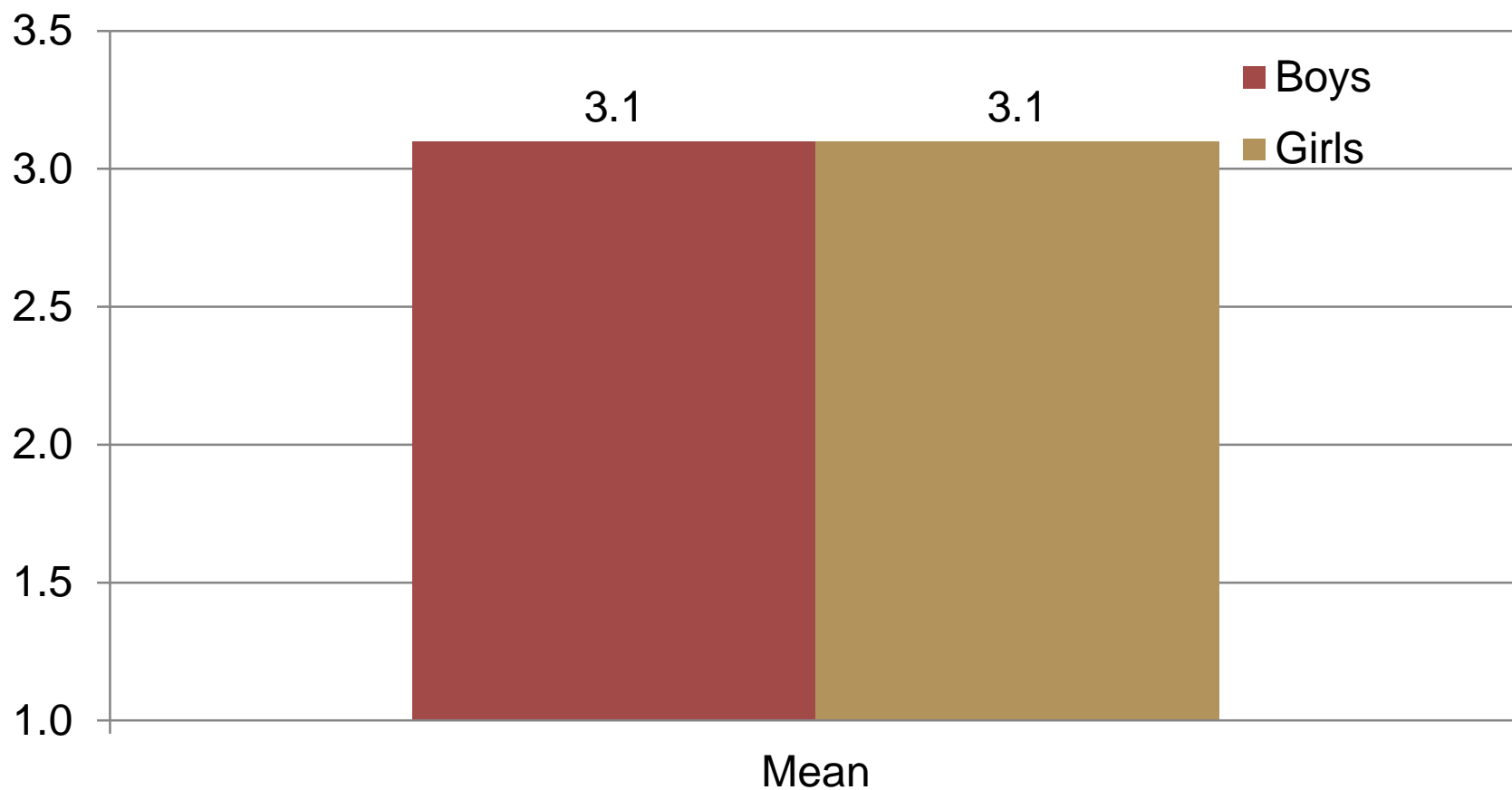


Knowledge.

(e.g., compared to average persons, rate your knowledge of how much you know about healthy eating)

($\alpha = 0.84$ for boys; $\alpha = 0.79$ for girls)

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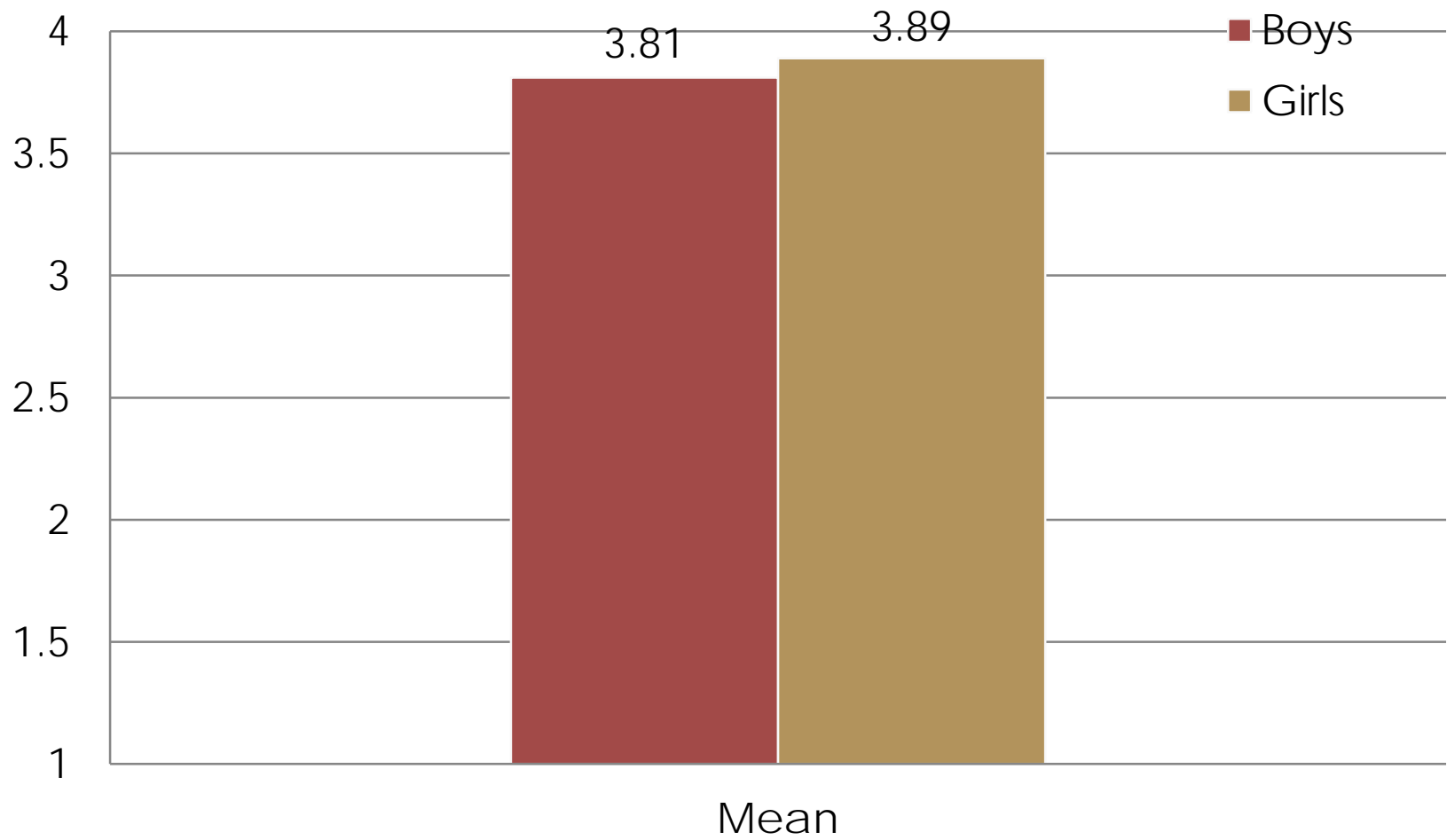


Intention

(e.g. “Do you intend to engage in healthy eating over the next week?” “How likely is it that you will engage in healthy eating over the next week?”)

($\alpha = .87$ for boys and $.85$ for girls)

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Findings

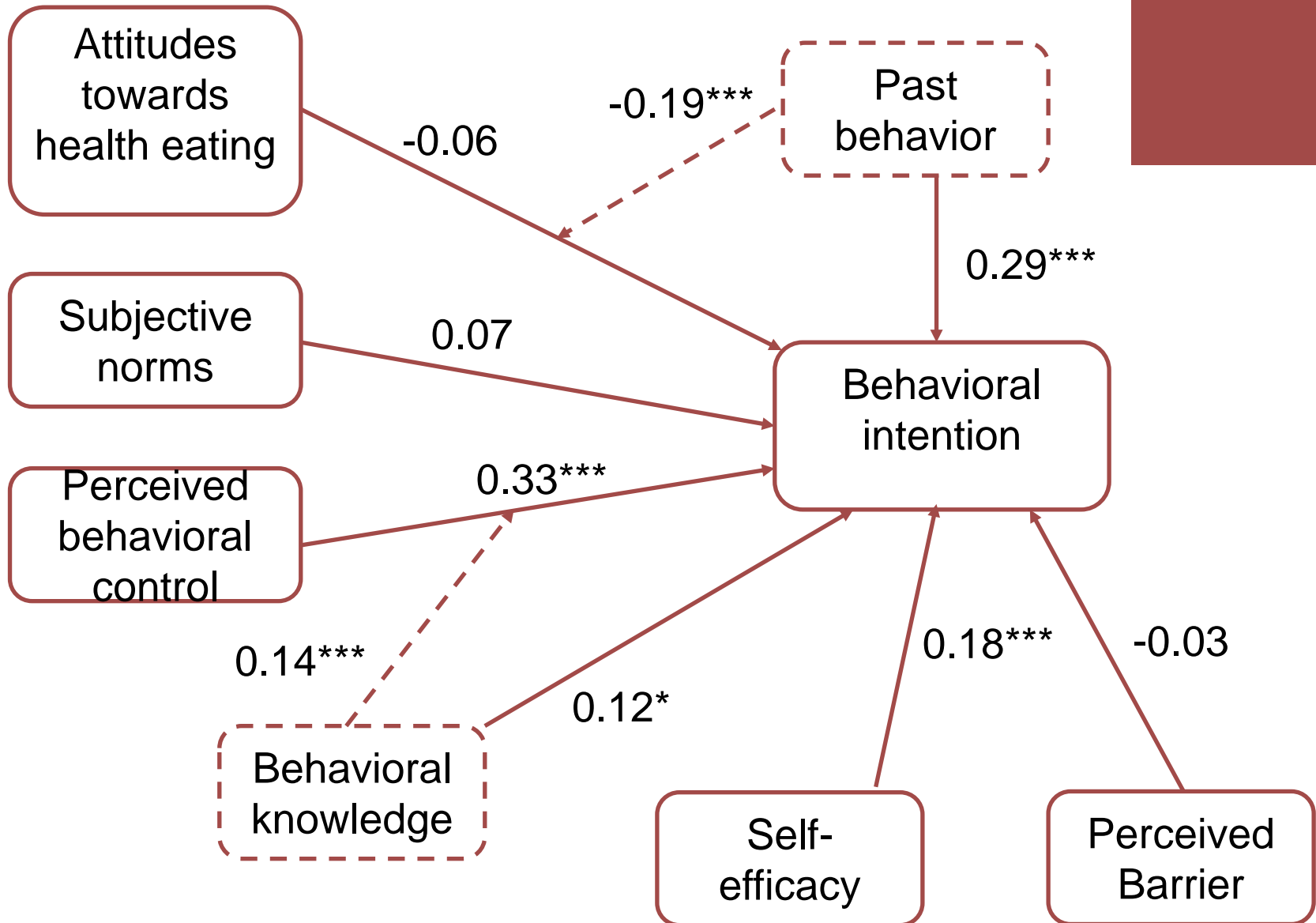
Research Results

Table 1. Age, BMI, and BMI Classification for Boys and Girls

| Variable | Boys | Girls | |
|------------------------------|-------|-------|----------|
| Age (Years) | | | <i>t</i> |
| M | 15.46 | 15.74 | -2.18* |
| SD | 1.52 | 1.60 | |
| BMI (kg/m ²) | | | <i>t</i> |
| M | 21.06 | 19.90 | 3.54*** |
| SD | 3.91 | 3.85 | |
| Obesity classification (%) † | | | χ^2 |
| Thinness | 31.2 | 43.3 | 19.51*** |
| Normal | 52.5 | 48.3 | |
| Overweight | 13.3 | 4.2 | |
| Obese | 3.0 | 4.2 | |

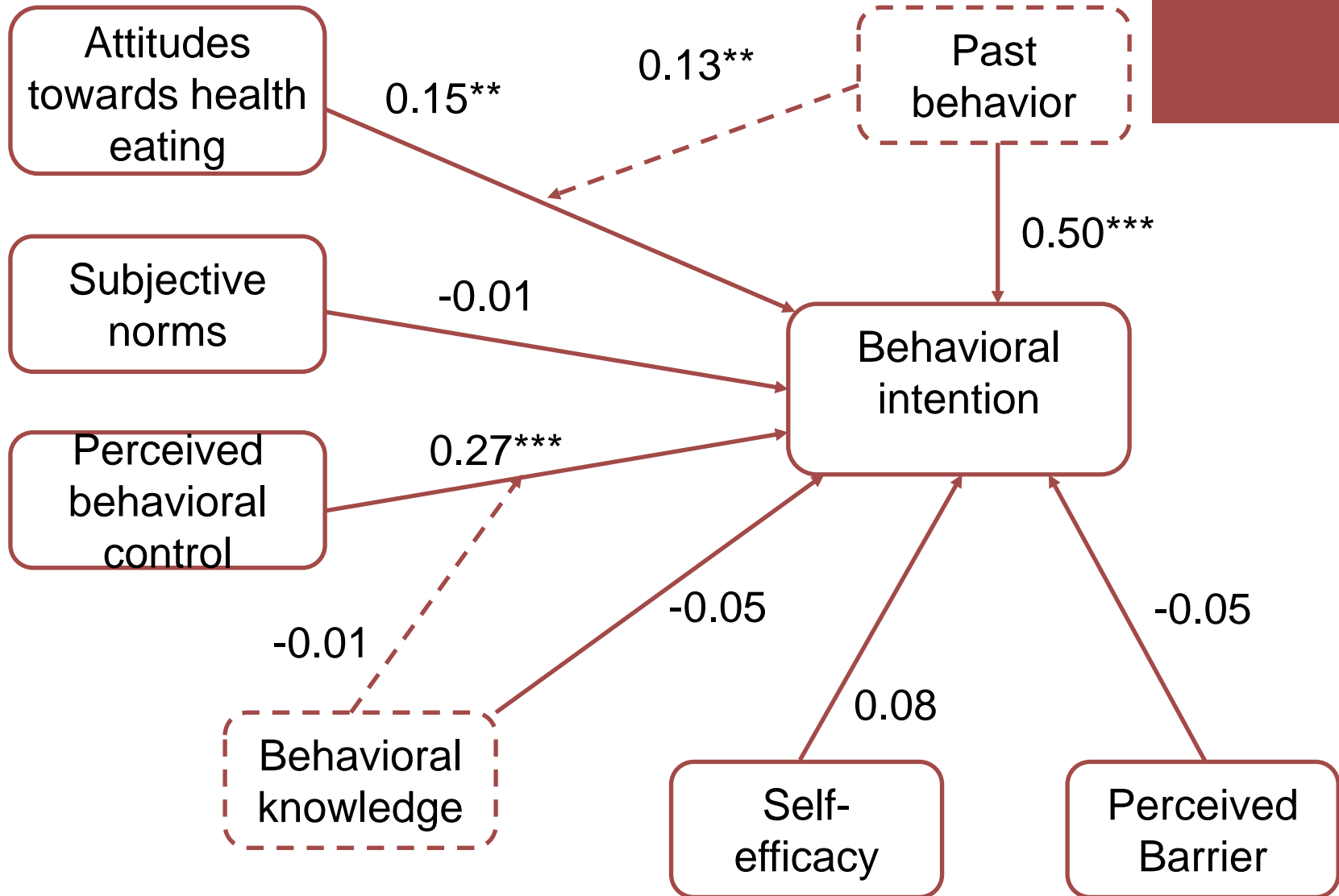
Note. †Based on the BMI classification of the World Health Organization (2014).

Figure 2. Model of Healthy Eating for Boys



Note. ** $p < .01$; *** $p < .001$.

Figure 3. Model of Healthy Eating for Girls



Note. ** $p < .01$; *** $p < .001$.

Figure 4.

Relationship between Attitude and Healthy Eating Intention as a Function of Past Behavior for Boys

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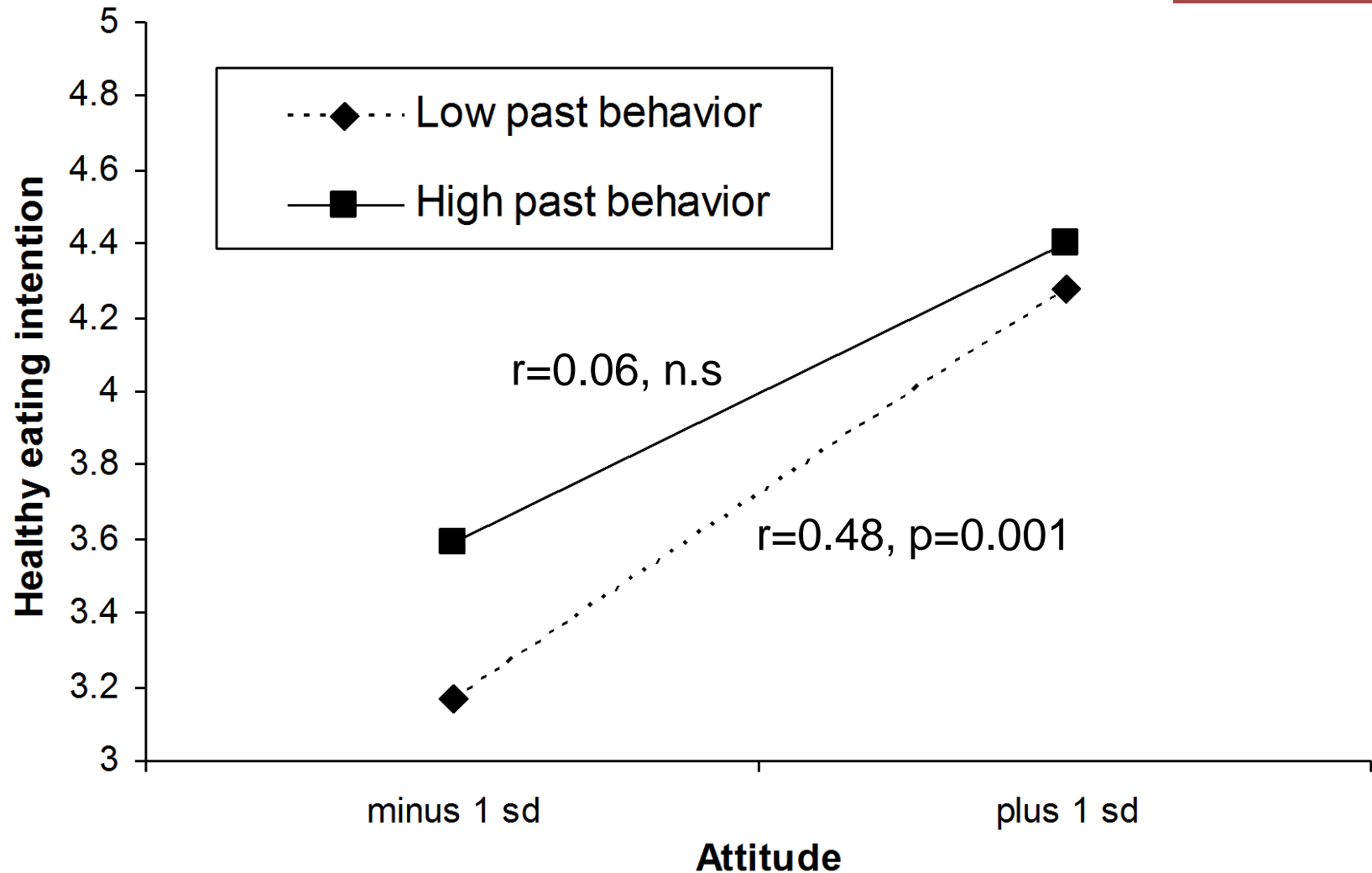


Figure 5. Relationship between Perceived Behavioral Control and Healthy Eating Intention as a Function of Healthy Eating Knowledge for Boys.

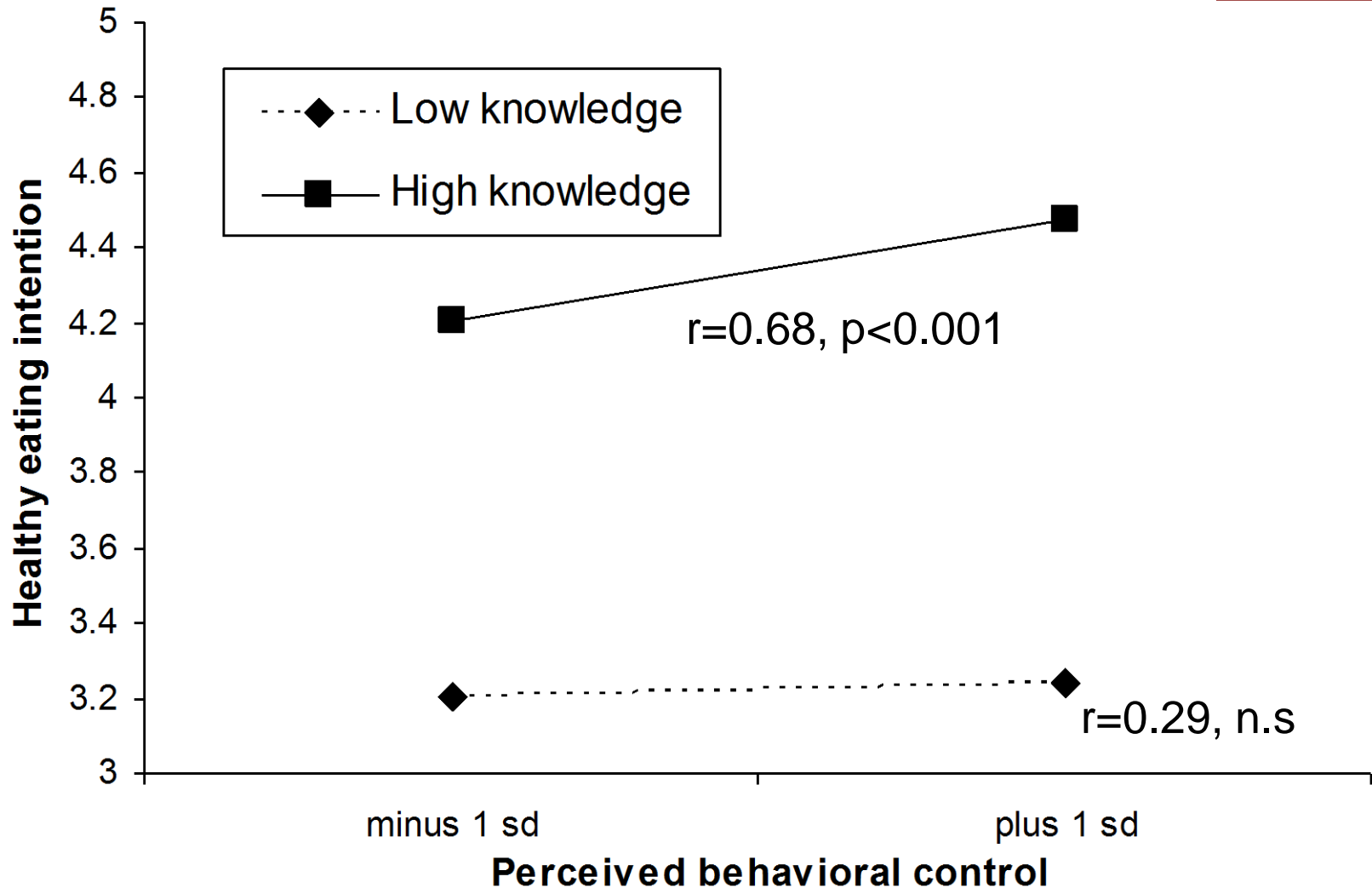


Figure 6. Relationship between Attitude and Healthy Eating Intention as a Function of Past Behavior for Girls

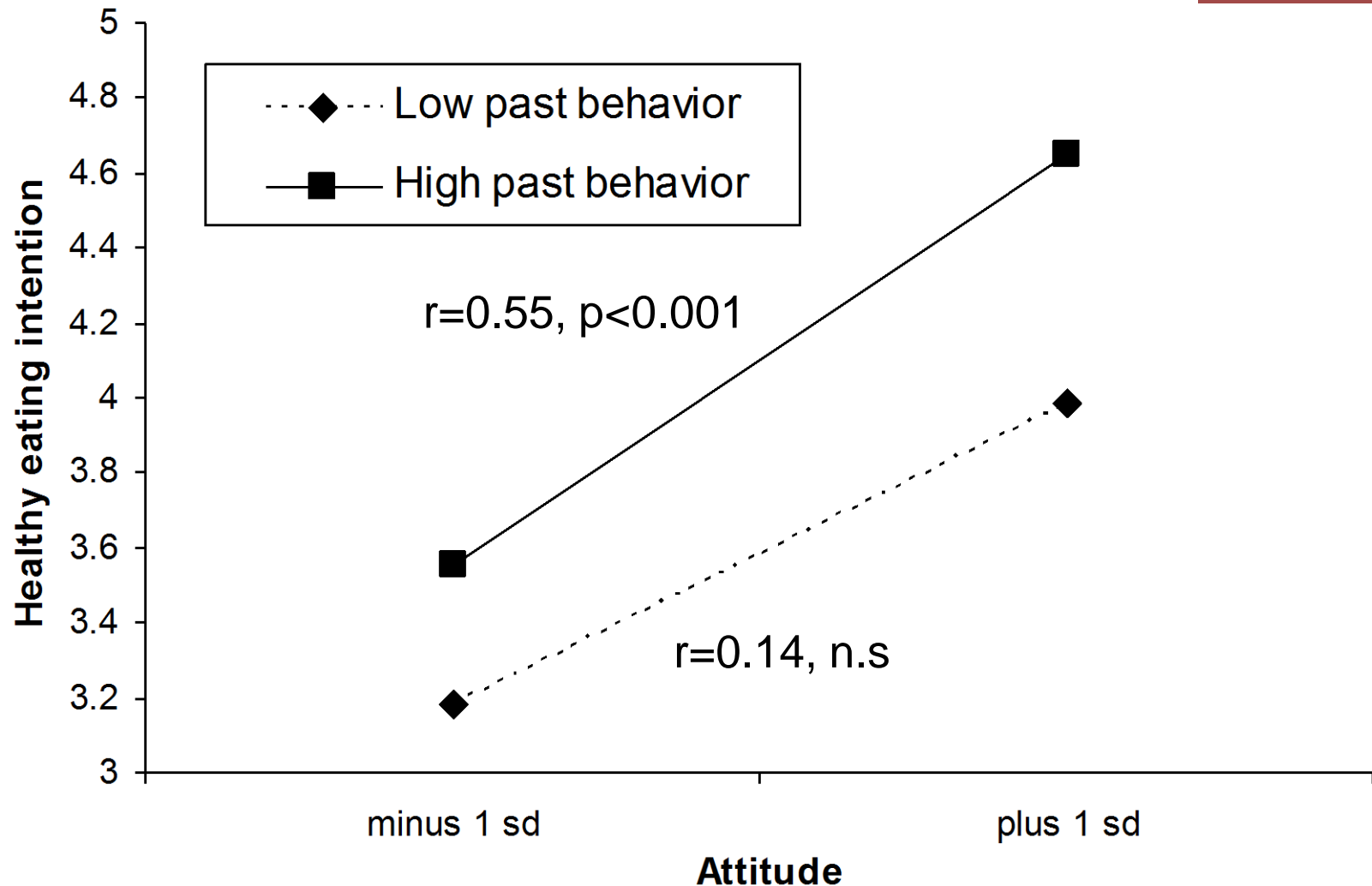


Table 4

Summary of hypotheses testing

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| | | | | | Boys | Girls |
|----|---------------------------|---|-----------|---|-----------------|-----------------|
| H1 | Subjective norms | ↑ | Intention | ↑ | No | No |
| H2 | Attitudes | ↑ | Intention | ↑ | No | Yes |
| H3 | PBC | ↑ | Intention | ↑ | Yes | Yes |
| H4 | Self-efficacy | ↑ | Intention | ↑ | Yes | No |
| H5 | Barriers | ↑ | Intention | ↓ | No | No |
| H6 | Attitudes X Past behavior | ↑ | Intention | ↓ | yes | opposite |
| H7 | PBC X Knowledge | ↑ | Intention | ↓ | Opposite | No |

Discussion

Discussion

- **Perceived behavioral control** and **self-efficacy** emerged as significant predictors for **boys**, while **attitude** and **perceived behavioral control** were significant predictors for **girls**
- **Past behavior and knowledge** were able to explain additional variance in healthy eating intention for **boys**. For **girls**, only **past behavior** was found to predict intention

Implication

- For both boys and girls, it is necessary to facilitate ease of behavioral control and self-efficacy through fostering an environment where adolescents can make healthy food choices.
- Parents and public policy makers should encourage a more positive attitude towards healthy eating, particularly for girls
- Peers would be a productive channel through which is communicate the healthy eating message to boys

Conclusion

- The study has uncovered those factors, and in doing so has provided a platform for marketers, parents, and Government bodies to develop strategies that will foster healthy eating decisions among them

Future research

- Construct public services advertisements with different appeals (e.g. changing attitudes; changing behavioral controls or changing perceived norms) and measure its effectiveness

Thank you!



Table 2a.

Mean, Standard Deviation, and Pearson Correlations among Various Measures for Boys

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| | 2 | 3 | 4 | 5 | 6 | 7 | 8 | 9 | 10 |
|---------------------------------|------|------|--------|--------|---------|--------|---------|--------|---------|
| Boys | | | | | | | | | |
| 1. Age | .13* | -.07 | -.13* | -.05 | .20*** | -.12* | -.01 | .00 | -.09 |
| 2. BMI | | .02 | -.07 | -.00 | .07 | -.03 | .03 | -.00 | -.05 |
| 3. Attitude | | | .43*** | .24*** | -.39*** | .32*** | .32*** | .32*** | .35*** |
| 4. Perceived behavioral control | | | | .31*** | -.43*** | .46*** | .60*** | .37*** | .66*** |
| 5. Subjective norms | | | | | -.12* | .17** | .24*** | .21*** | .31*** |
| 6. Perceived barriers | | | | | | -.16** | -.34*** | -.11* | -.31*** |
| 7. Self-efficacy | | | | | | | .37*** | .30*** | .47*** |
| 8. Past behavior | | | | | | | | .25*** | .61*** |
| 9. Healthy eating knowledge | | | | | | | | | .32*** |
| 10. Healthy eating intention | | | | | | | | | |
| <i>M</i> | | 3.80 | 3.69 | 3.90 | 2.75** | 3.27 | 3.69 | 3.14 | 3.81 |
| <i>SD</i> | | 0.67 | 0.83 | 0.81 | 0.90 | 1.02 | 1.06 | 0.73 | 0.87 |

Notes. * $p < .05$; ** $p < .01$; *** $p < .001$. Means of boys and girls differ at * $p < .01$.

Table 2b.
Mean, Standard Deviation, and Pearson
Correlations among Various Measures for Boys

| | 2 | 3 | 4 | 5 | 6 | 7 | 8 | 9 | 10 |
|--|------|------|--------|--------|---------|---------|---------|---------|---------|
| Girls | | | | | | | | | |
| 1. Age | .16* | .04 | -.16** | .04 | .19** | -.01 | -.01 | -.16** | -.08 |
| 2. BMI | | -.12 | -.03 | -.11 | .10 | -.08 | -.07 | -.08 | -.06 |
| 3. Attitude | | | .44*** | .37*** | -.34*** | .28*** | .25*** | .27*** | .45*** |
| 4. Perceived behavioral control | | | | .31*** | -.56*** | .48*** | .44*** | .37*** | .64*** |
| 5. Subjective norms | | | | | -.14* | .17** | .10 | .24*** | .21*** |
| 6. Perceived barriers | | | | | | -.23*** | -.35*** | -.31*** | -.43*** |
| 7. Self-efficacy | | | | | | | .37*** | .22*** | .43*** |
| 8. Past behavior | | | | | | | | .27*** | .65*** |
| 9. Healthy eating knowledge | | | | | | | | | .27*** |
| 10. Healthy eating intention | | | | | | | | | |
| <i>M</i> | | 3.83 | 3.68 | 3.93 | 2.56** | 3.24 | 3.76 | 3.10 | 3.89 |
| <i>SD</i> | | 0.55 | 0.83 | 0.73 | 0.81 | 1.01 | 1.02 | 0.65 | 0.79 |

Notes. * $p < .05$; ** $p < .01$; *** $p < .001$. Means of boys and girls differ at * $p < .01$.

Table 3a.

Multiple Regression Analyses: Predicting Healthy Eating Intention for Boys

| Predictor | Step 1 | | Step 2 | | Step 3 | | Step 4 | |
|------------------------------|---------|-------|---------|---------|---------|---------|---------|----------|
| | β | t | β | t | β | t | β | t |
| Boys | | | | | | | | |
| Age | -.08 | -1.20 | .01 | .18 | -.02 | -.34 | -.03 | -.66 |
| BMI | -.04 | -.65 | -.00 | -.02 | -.02 | -.39 | -.01 | -.14 |
| Attitude | | | -.04 | -.66 | -.05 | -.99 | -.06 | -1.12 |
| Perceived behavioral control | | | .50 | 8.27*** | .33 | 5.22*** | .33 | 5.35*** |
| Subjective norms | | | .12 | 2.45* | .09 | 1.89 | .07 | 1.61 |
| Perceived barriers | | | -.05 | -.95 | -.02 | -.33 | -.03 | -.55 |
| Self-efficacy | | | .25 | 4.63*** | .19 | 3.68*** | .18 | 3.61*** |
| Past behavior | | | | | .33 | 5.97*** | .29 | 5.49*** |
| Healthy eating knowledge | | | | | .09 | 1.87 | .12 | 2.60* |
| Attitude X Past behavior | | | | | | | -.19 | -4.12*** |
| PBC X Knowledge | | | | | | | .14 | 3.06** |
| R^2 | .00 | | .47 | | .54 | | .57 | |
| $R^2\Delta$ | .01 | | .48 | | .07 | | .03 | |

Notes. * $p < .05$; ** $p < .01$; *** $p < .001$.

Table 3b.

Multiple Regression Analyses: Predicting Healthy Eating Intention for Girls

| Predictor | Step 1 | | Step 2 | | Step 3 | | Step 4 | |
|------------------------------|---------|-------|---------|---------|---------|----------|---------|----------|
| | β | t | β | t | β | t | β | t |
| Girls | | | | | | | | |
| Age | -.11 | -1.58 | -.04 | -.85 | -.06 | -1.44 | -.05 | -1.25 |
| BMI | -.05 | -.69 | -.01 | -.16 | .03 | .69 | .04 | .96 |
| Attitude | | | .19 | 3.15** | .17 | 3.48** | .15 | 3.12** |
| Perceived behavioral control | | | .42 | 5.99*** | .29 | 4.96*** | .27 | 4.53*** |
| Subjective norms | | | -.02 | -.44 | -.01 | -.30 | -.01 | -.21 |
| Perceived barriers | | | -.08 | -1.30 | -.02 | -.48 | -.05 | -.91 |
| Self-efficacy | | | .19 | 3.22** | .06 | 1.32 | .08 | 1.70 |
| Past behavior | | | | | .51 | 10.70*** | .50 | 10.60*** |
| Healthy eating knowledge | | | | | -.04 | -.98 | -.05 | -1.03 |
| Attitude X Past behavior | | | | | | | .13 | 2.92** |
| PBC X Knowledge | | | | | | | -.01 | -.29 |
| R^2 | .01 | | .45 | | .64 | | .65 | |
| $R^2\Delta$ | .02 | | .45 | | .19 | | .01 | |

Notes. * $p < .05$; ** $p < .01$; *** $p < .001$.