

The Impact of School-based Health Centers on Children's Health Outcomes

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School-Based Health Centers (SBHCs)

- Located within schools or on school grounds
- Address K-12 students' physical and mental health needs through comprehensive range of services:
 - Primary care
 - Preventive care
 - Early intervention
- Staffed with multidisciplinary teams:
 - Nurse practitioners
 - Physicians assistants
 - Social workers



SBHCs and Health Care Access

- Increase access and utilization of primary care services among:
 - low-income,
 - urban,
 - rural,
 - female, and
 - African American students
- Highest utilization rates among children with public or no insurance
- Serve as a healthcare safety net for disadvantaged and medically underserved youth



SBHCs and Health Outcomes

- Health outcomes improve for children with chronic diseases
- For children with asthma, SBHC use is associated with:
 - fewer hospitalizations,
 - fewer visits to emergency rooms, and
 - better school attendance.



SBHCs and Health Outcomes

- RWJF's School-based Adolescent Health Care Program:
 - *Design:* Compared students with SBHCs and without SBHCs
 - *Results:* No significant effect on students' health outcomes
- HFGC's Health Outcomes of Students Using SBHCs:
 - *Design:* Compared randomly selected students in elementary schools with SBHCs to students in elementary schools without SBHCs
 - *Results:* Users reported improvement in health related quality of life compared to students in non-SBHC schools



Limitations of Prior Research

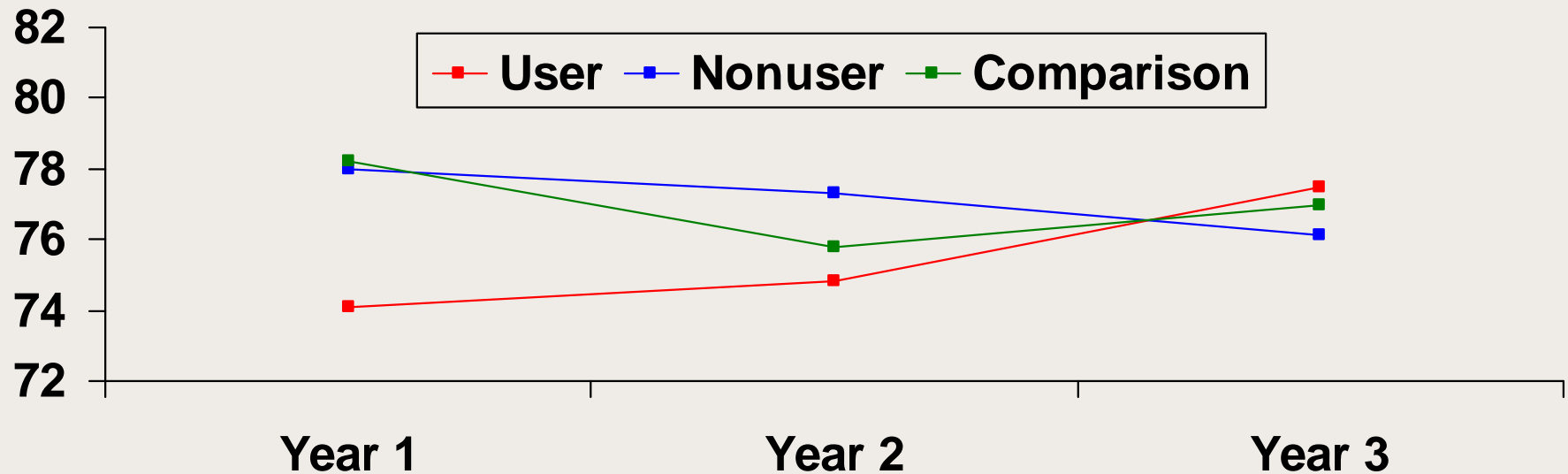
- Lack of a comprehensive measure of health
- Failure to account for cluster effects at school level
- Mixing school-level effects with individual-level effects



Limitations of Prior Research

- Regression to the mean?

Total HRQOL



Addressing Limitations of Prior Research

- Using a multidimensional measure of health
- Employing multilevel modeling to:
 - Account for cluster effects at the school level
 - Separately model school- and individual-level predictors
- Including year one health as a covariate to:
 - Account for pre-existing group differences and regression-to-the-mean
- Maintaining a high retention rate



Study Design

- Non-equivalent comparison group design
 - Recruited students from schools with and without SBHCs
- Selected schools with SBHCs
- Matched SBHC schools to non-SBHC schools based on:
 - SES (i.e., free/reduced price lunch rate)
 - race/ethnicity
 - school size



Study Sites

	Imp		Est		Com		Total		
	MS	HS	MS	HS	MS	HS	MS	HS	All
Urban	1	1	2	3	2	3	5	7	12
Rural	2	2	0	0	0	0	2	2	4
Total	3	3	2	3	2	3	7	9	16

Imp: Implementation sites

Est: Established sites

Com: Comparison sites



Sample Recruitment and Participation Rates

- Consent Rates:
 - Sought consent from cohorts of 6th graders and 9th graders
 - Recruited both SBHC users and non-users
 - Parental consent obtained for 1,134 students
- Participation Rates:

Year	MS		HS		Total	
	n	% ‡	n	%	n	%
2006-2007	349	92	609	93	958	92
2007-2008	317	83	516	79	833	80
2008-2009	241	63	422	64	663	64
Total*	381	37	657	63	1,038	

‡Percentage of those who completed a survey in any year

*Participated at least once



Sample Characteristics (Year 3)

	MS	HS
Age	12-15 (<i>M</i> =13.6)	15-19 (<i>M</i> =16.6)
Gender	Male: 44% Female: 56%	Male: 46% Female: 54%
Free & Reduced Price Lunches	45%	53%



Sample Characteristics (Year 3)

Race/Ethnicity

	MS	HS	Total
White	44%	46%	45%
African American	22%	29%	27%
Latino	13%	14%	13%
“other”	23%	12%	15%



Sample Characteristics

Users

	MS	HS	Total
User	77%	81%	79%
Non-user	23%	19%	21%

Site Type

	MS	HS	Total
Comparison	33%	29%	30%
Implementation	32%	40%	37%
Established	36%	31%	33%



Measurement

- Child Health and Illness Profile—Adolescent Edition (CHIP-AE™)
 - 107 items, 6 domains and 20 subdomains
 - Physical, mental, and social aspects of health
 - Valid and reliable with:
 - racially and economically diverse samples, in urban/rural and clinical/community settings
- Administration procedures
 - Self-administered, completed annually during school hours



Health Outcomes

- Satisfaction with Health:
 - Overall perceptions of and beliefs about one's health
- Physical Discomfort:
 - Positive and negative somatic feelings and symptoms
- Emotional Discomfort:
 - Positive and negative emotional feelings and symptoms



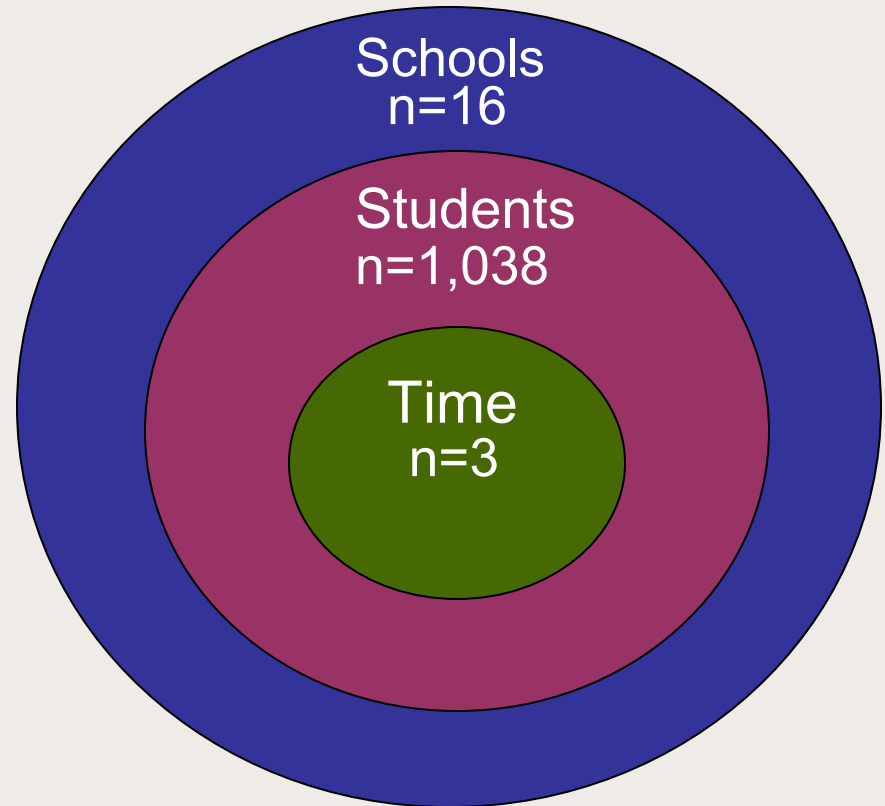
Health Outcomes

- Physical Activity:
 - Participation in activities that promote physical fitness
- Nutrition:
 - Two scales: Healthy eating and unhealthy eating



Analyses Overview

- 3-level Hierarchical Linear Modeling
 - Time is nested within students who are nested within different schools
 - Level 1: Differences over time within each student
 - Level 2: Differences among students within the same school
 - Level 3: Differences across schools



Analyses Overview

- Outcome at Time 3
 - Differences in the level of the outcome at the final year of the study
- Outcome over Time
 - Differences in the average change for each year of the study



Analyses Overview

- Proportion of Variance Explained by Each Level
 - L1: What proportion of the variance in the outcome is accounted for by students varying over time?
 - L2: What proportion of the variance in the outcome is accounted for by differences between students in the same school?
 - L3: What proportion of the variance in the outcome is accounted for by differences between students across schools?
 - For each model, estimated proportion of variance in outcome accounted for by each level of analysis



Analyses Overview

- Proportion of Variance Explained by Each Level
 - L1: 33% to 48% of the outcome variability was explained by differences within students over time
 - L2: 49% to 65% of the outcome variability was explained by differences across students within the same school
 - L3: 2% to 5% of the outcome variability was explained by differences across schools



Analyses Overview

- Predictors of Interest:
 - Level 3: Presence/absence of an SBHC on site
 - Level 2: Health center use
 - Level 2: Use*Gender



Analyses Overview

- Control Variables:
 - Level 3: Grade level
 - Level 2: Age
 - Level 2: Race
 - Level 2: Gender
 - Level 2: Socioeconomic Status (SES)
 - Level 2: Outcome at time 1



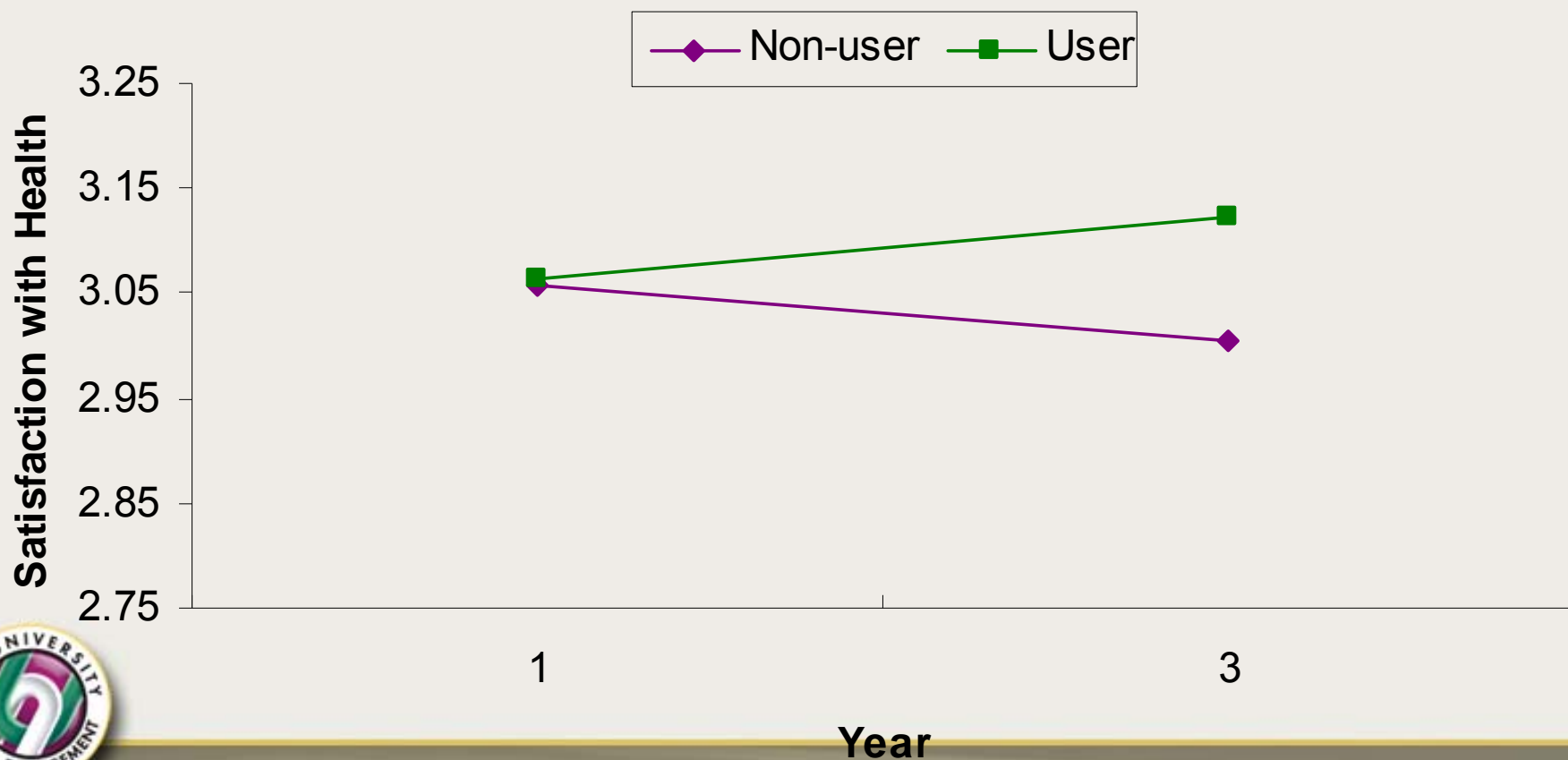
SBHC Presence

- Emotional Discomfort at T3:
 - Students at implementation sites reported less emotional discomfort than students at comparison sites ($\gamma = -.06$, $p < .05$)
 - No significant difference between established and comparison sites



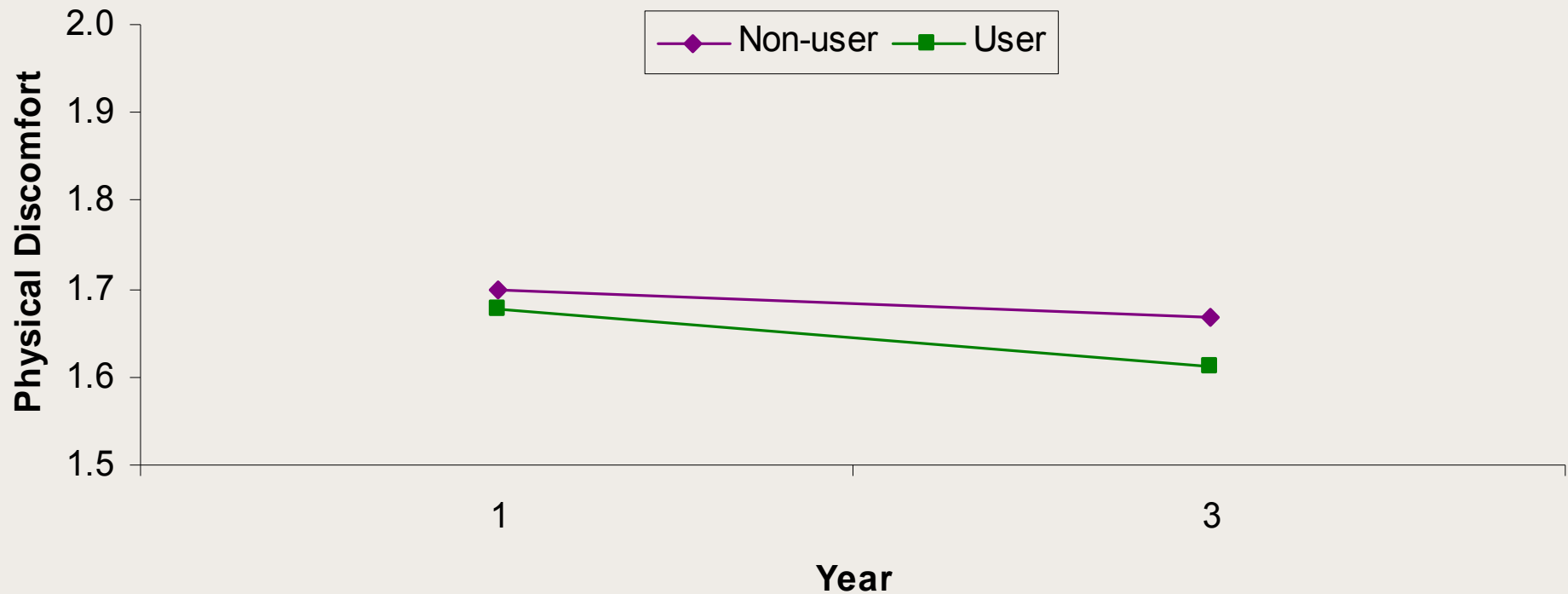
Satisfaction with Health

- SBHC use at T3: Sig ($\gamma = .12$, $p < .05$)
- SBHC use over Time: Sig ($\gamma = .05$, $p < .05$)



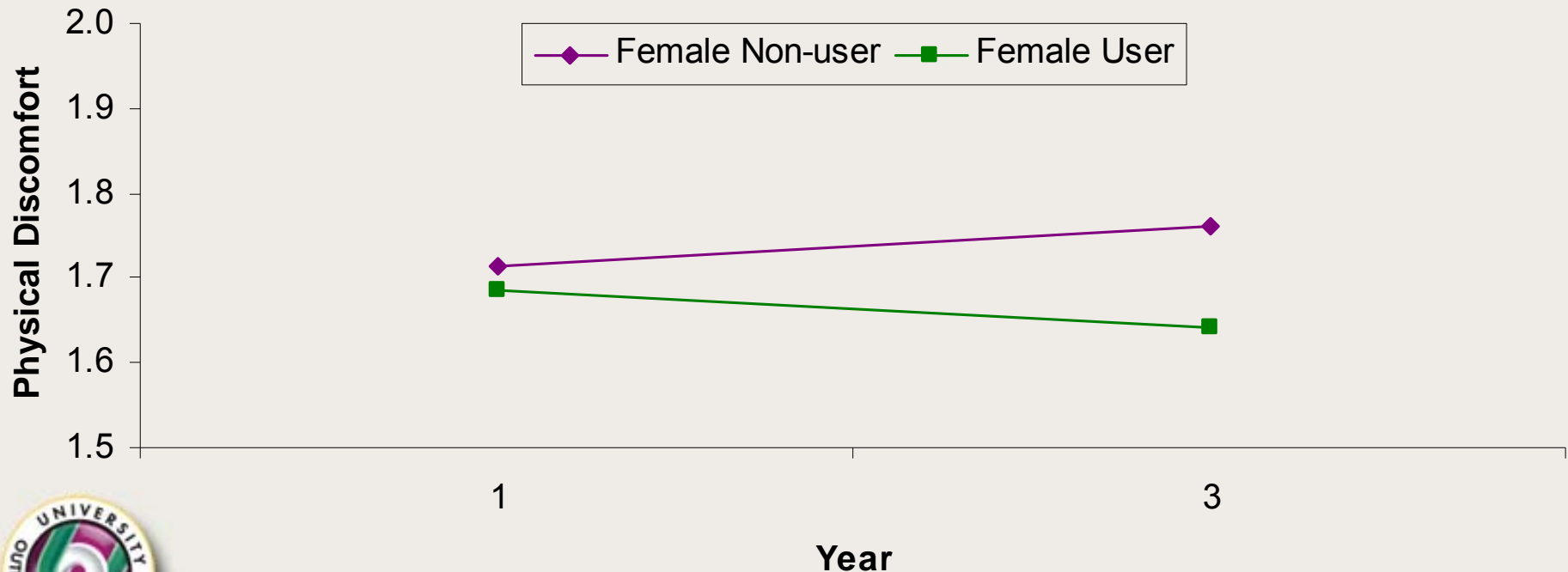
Physical Discomfort

- SBHC use at T3: Significant ($\gamma = -.06$, $p < .05$)



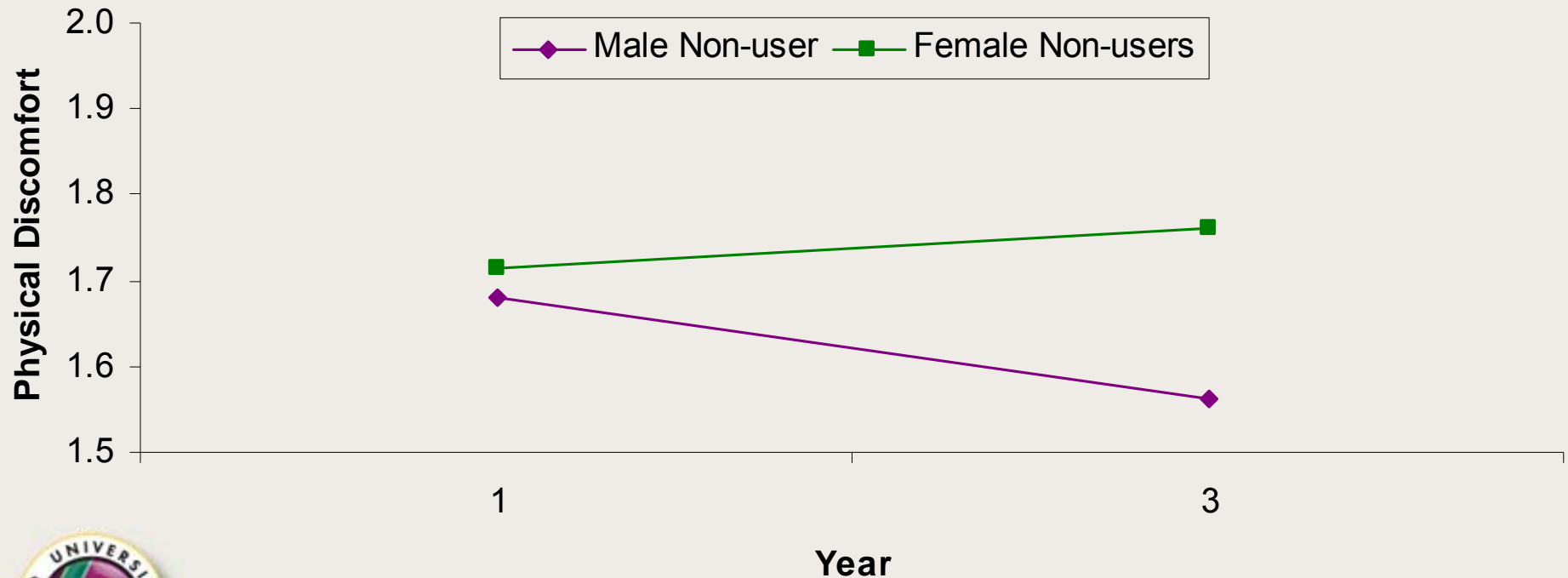
Physical Discomfort

- Use*Gender: Sig at T3 ($\gamma = -.13, p < .05$)
 - Females: users vs. non-users
 - Female users were lower at T3 ($\gamma = -.12, p < .05$) and decreased .04 units more than female non-users each year ($\gamma = -.04, p < .05$)



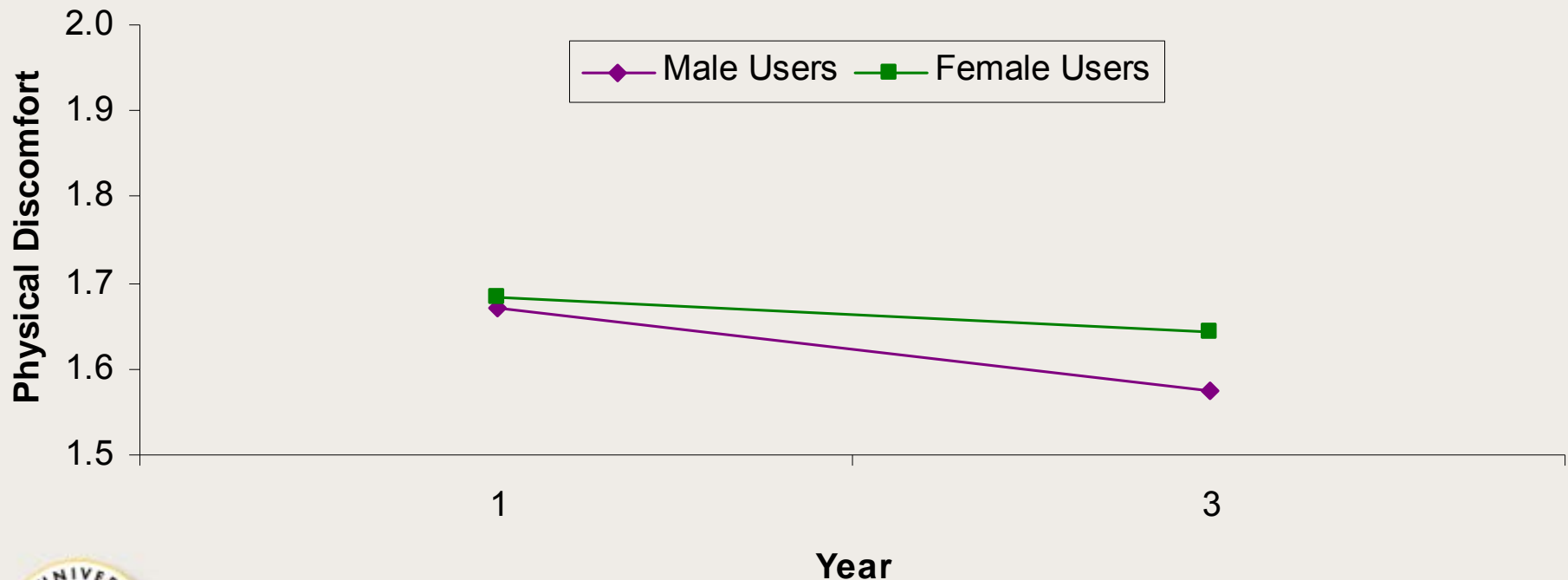
Physical Discomfort

- Use*Gender (cont'd):
 - Non-users: female vs. male
 - Female non-users were higher at T3 ($\gamma = .20, p < .05$) and increased .08 units more than male non-users each year ($\gamma = .08, p < .05$)



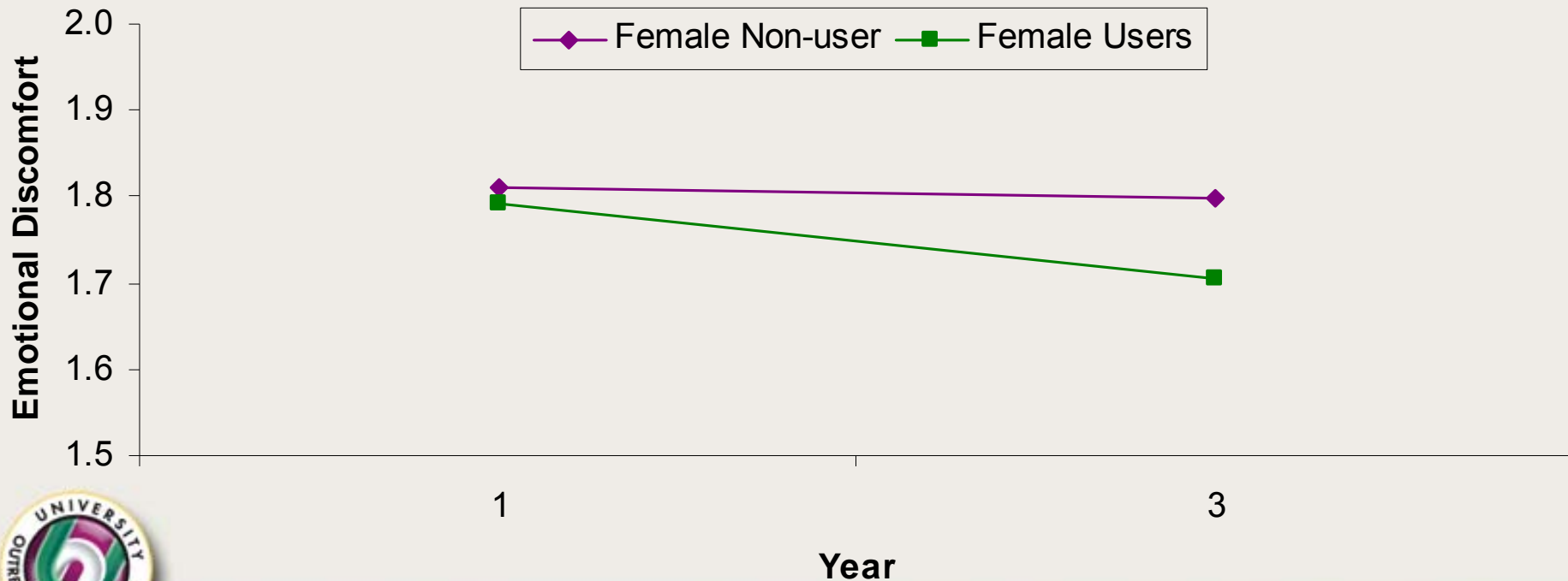
Physical Discomfort

- Use*Gender (cont'd):
 - Users: female vs. male
 - Female users were higher at T3 ($\gamma = .07, p < .05$) and declined .03 units less than male users each year ($\gamma = .03, p < .05$)



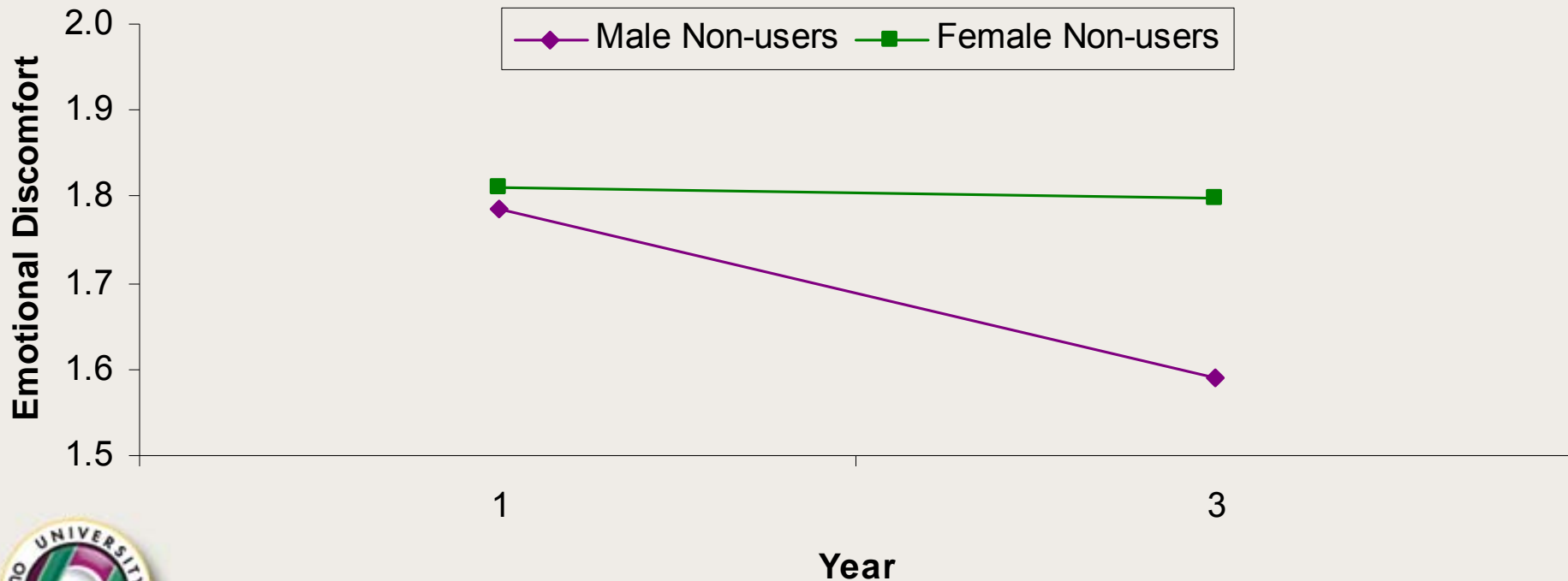
Emotional Discomfort

- Use*Gender at T3: Significant ($\gamma = -.12, p < .05$)
 - Females: users vs. non-users ($\gamma = -.09, p < .05$)
 - Female users were sig lower on ED compared to female non-users



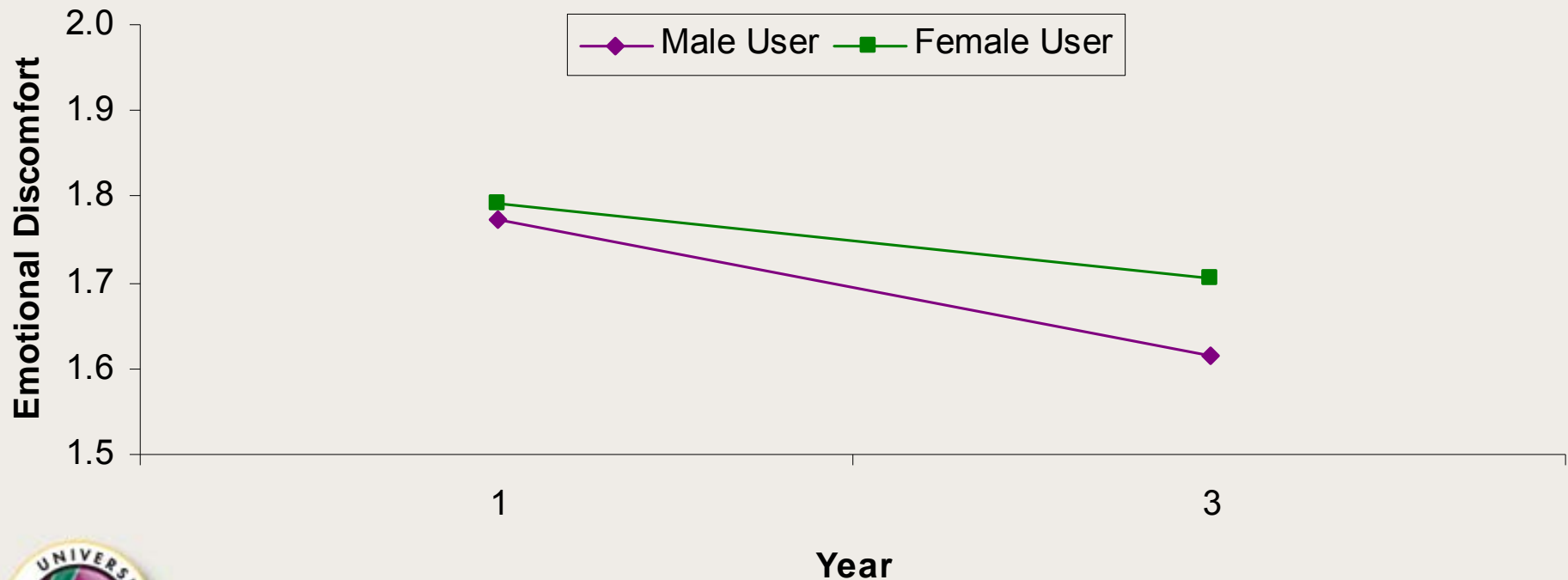
Emotional Discomfort

- Use*Gender at T3 (cont'd):
 - Non-users: females vs. males ($\gamma = .21, p < .05$)
 - Female non-users were sig higher on ED than male non-users



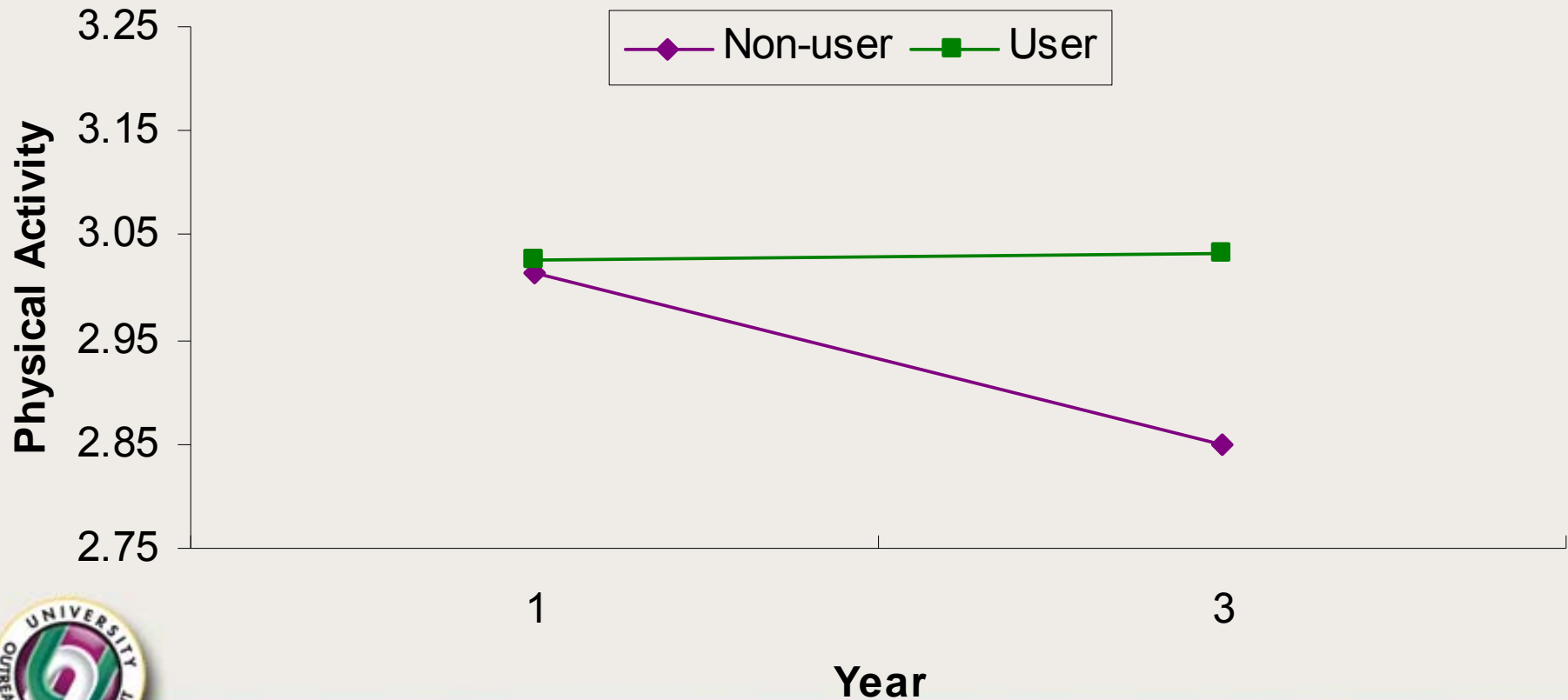
Emotional Discomfort

- Use*Gender at T3 (cont'd):
 - Users: females vs. males ($\gamma = .09, p < .05$)
 - Female users were sig higher on ED than male users



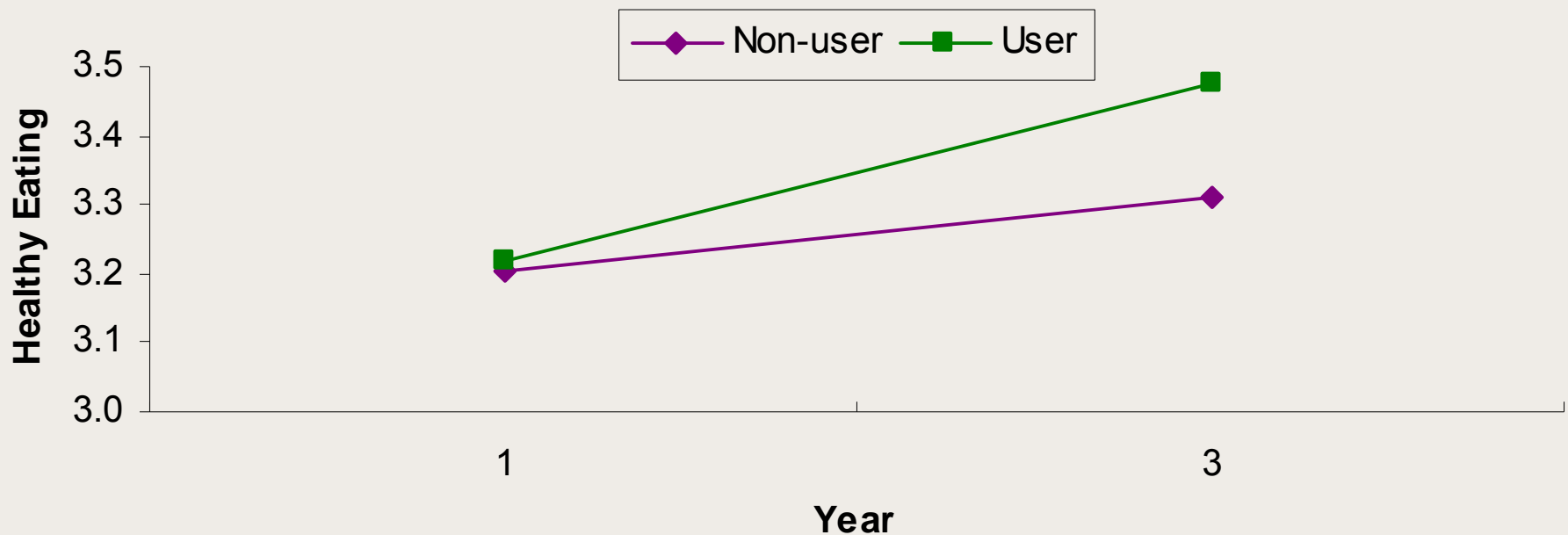
Physical Activity

- SBHC use sig at T3 ($\gamma = .18, p < .05$)
- SBHC use sig over time ($\gamma = .08, p < .05$)



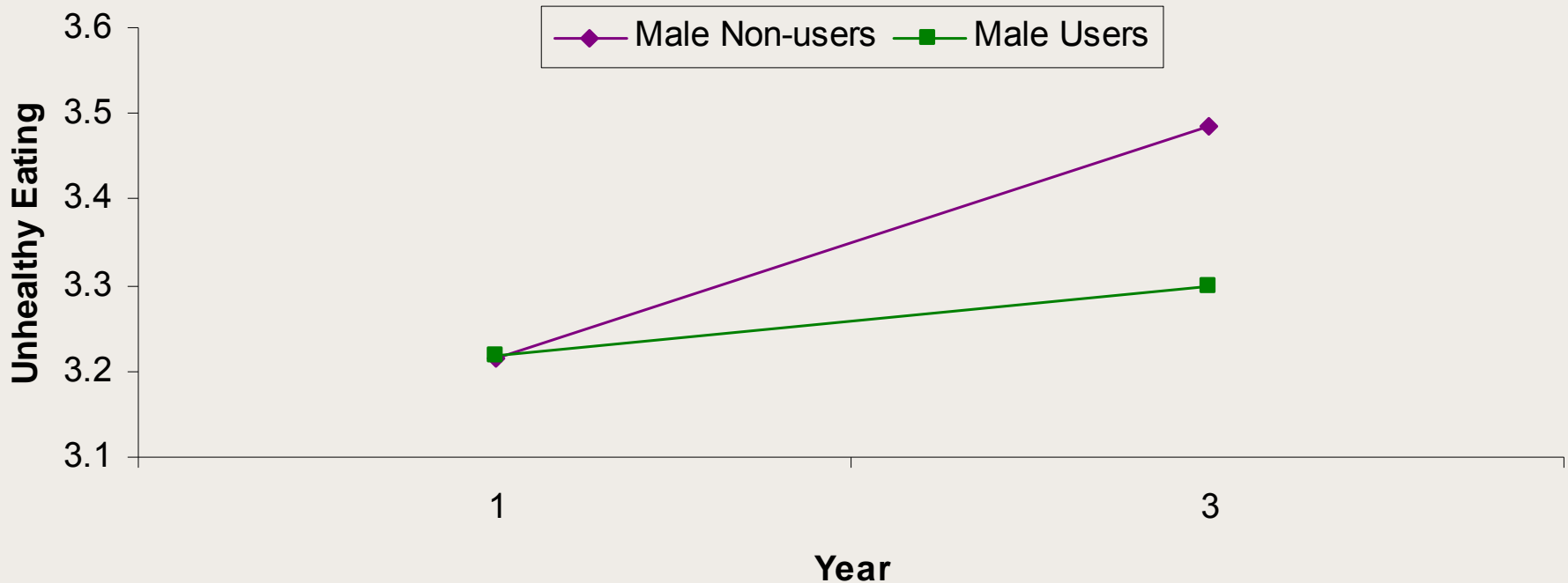
Nutrition: Healthy Eating

- SBHC use sig at T3 ($\gamma = .16, p < .05$)
- SBHC use sig over time ($\gamma = .07, p < .05$)



Nutrition: Unhealthy Eating

- Use*Gender at T3: Significant ($\gamma = .22, p < .05$)
 - Males: users vs. non-users ($\gamma = -.19, p < .05$).
 - Male users reported eating more unhealthy food than male non-users

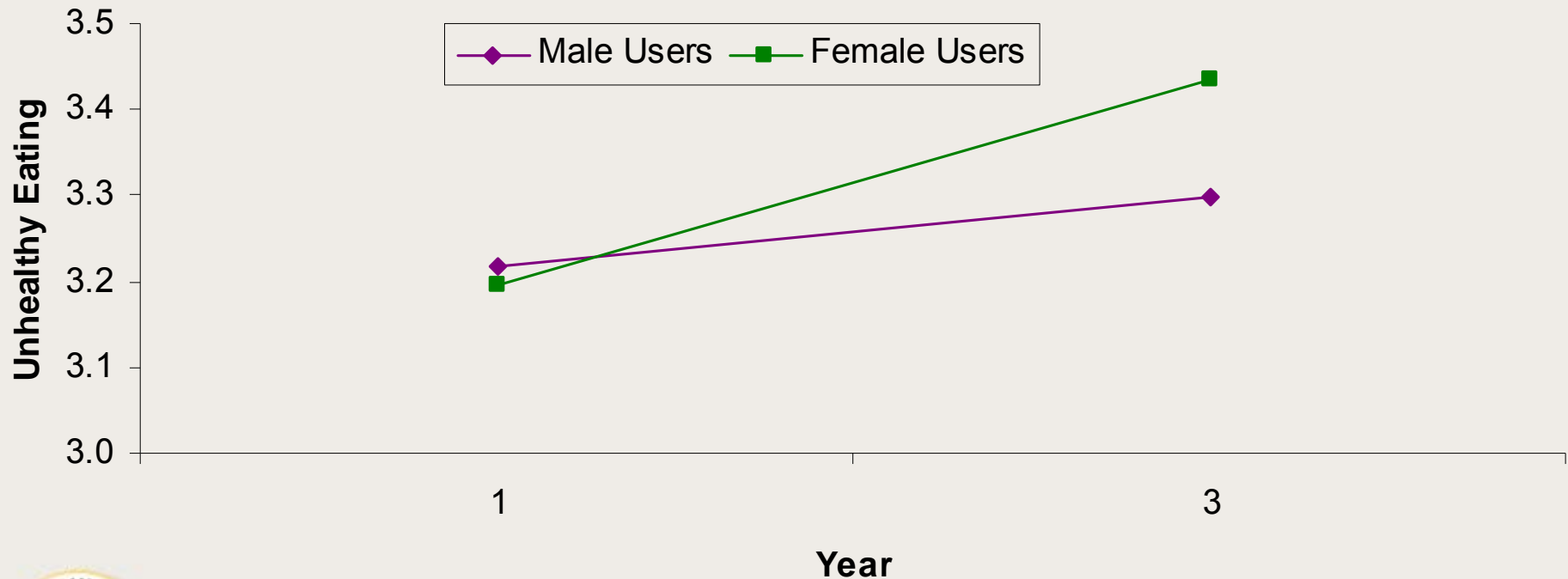


Note: Unhealthy eating is reverse scored. Higher scores indicate *less* unhealthy eating



Nutrition: Unhealthy Eating

- Use*Gender at T3 (cont'd):
 - Users: females vs. males ($\gamma = .14, p < .05$).
 - Female users report eating less unhealthy food than male users



Note: Unhealthy eating is reverse scored. Higher scores indicate *less* unhealthy eating



Summary

- School-level impact of SBHCs appears to be minimal
- SBHC users compared to non-users reported:
 - Greater overall satisfaction with health at T3 and increased satisfaction with health over time
 - Less physical discomfort at T3
 - More physical activity at T3 and over time
 - More healthy eating at T3 and over time
- Found significant user by gender Interactions for:
 - Physical discomfort
 - Emotional discomfort
 - Unhealthy eating



Limitations of Our Study

- Nonrandom selection of school and individuals
- Inadequate sample size at level 3 (schools)
- Measure of user status (ever used)
- Small differences between users and non-users



Implications and Future Directions

- SBHCs have the potential to positively impact student health
- Provide health care services to medically underserved children
- Funding for SBHCs under threat
- Additional evaluation research to identify what aspects of SBHC care influence health outcomes
 - Types of services utilized



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