



# Delay Discounting in Linguistically Diverse College Students

Yiyi Wang, Jonathan Tarbox  
March 2020



**USC** University of  
Southern California

# Introduction

**Psychological  
Flexibility**

**Stress**

**Grit**

**Delay  
Discounting**

# ▶ Psychological Flexibility



- ▶ Behavior is...
- ▶ **LESS** under the control of negative reinforcement (escaping discomfort)
- ▶ **MORE** under the control of long-term positive reinforcers (values)
- ▶ **LESS** rule-governed and rigid
- ▶ **MORE** variable and more under the control of direct-acting contingencies

## Acceptance and Action Questionnaire-II

Higher score  
↓  
Higher  
psychological  
inflexibility

Below you will find a list of statements. Please rate how true each statement is for you by using the scale below to fill in your choice.

1	2	3	4	5	6	7
never true	very seldom true	seldom true	sometimes true	frequently true	almost always true	always true

1. My painful experiences and memories make it difficult for me to live a life that I would value.

2. I'm afraid of my feelings.

3. I worry about not being able to control my worries and feelings.

4. My painful memories prevent me from having a fulfilling life.

5. Emotions cause problems in my life.

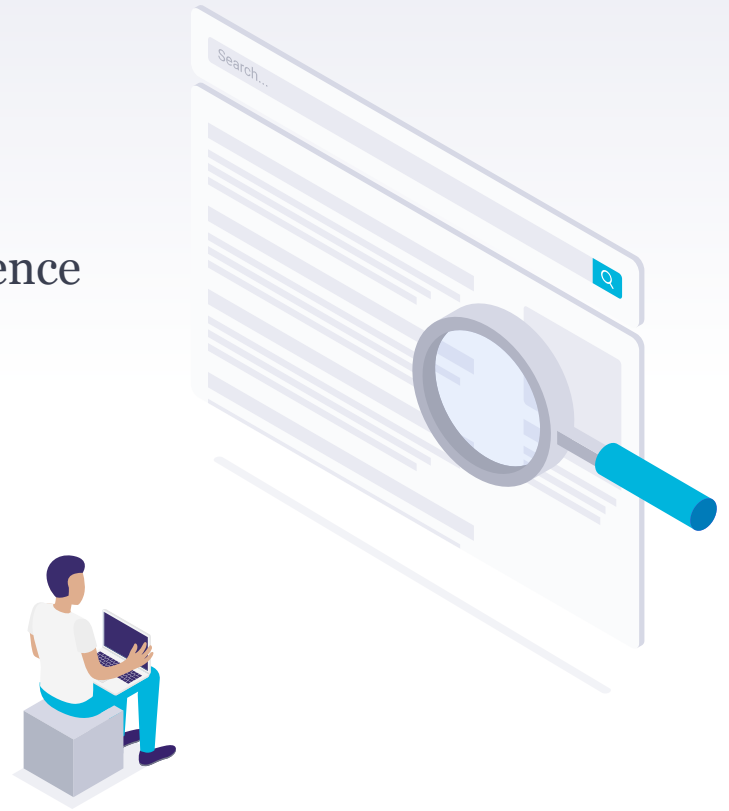
6. It seems like most people are handling their lives better than I am.

7. Worries get in the way of my success.

TOTAL

# Grit

- ▶ High response persistence, even in the presence of lean reinforcement and/or punishment
- ▶ Verbal descriptions of future goals that help support persistent behavior (rules)



*Directions for taking the Grit Scale: Here are a number of statements that may or may not apply to you. For the most accurate score, when responding, think of how you compare to most people -- not just the people you know well, but most people in the world. There are no right or wrong answers, so just answer honestly!*

1. I have overcome setbacks to conquer an important challenge.

Very much like me

Mostly like me

Somewhat like me

Not much like me

Not like me at all

2. New ideas and projects sometimes distract me from previous ones.\*

Very much like me

Mostly like me

Somewhat like me

Not much like me

Not like me at all

3. My interests change from year to year.\*

Very much like me

Mostly like me

Somewhat like me

Not much like me

Not like me at all

# Stress

## PERCEIVED STRESS SCALE

The questions in this scale ask you about your feelings and thoughts during the last month.  
In each case, you will be asked to indicate by circling *how often* you felt or thought a certain way.

Name \_\_\_\_\_ Date \_\_\_\_\_

Age \_\_\_\_\_ Gender (Circle): **M** **F** Other \_\_\_\_\_

**0 = Never    1 = Almost Never    2 = Sometimes    3 = Fairly Often    4 = Very Often**

- |  |   |   |   |   |   |
|--|---|---|---|---|---|
| 1. In the last month, how often have you been upset because of something that happened unexpectedly?                 | 0 | 1 | 2 | 3 | 4 |
| 2. In the last month, how often have you felt that you were unable to control the important things in your life?     | 0 | 1 | 2 | 3 | 4 |
| 3. In the last month, how often have you felt nervous and "stressed"?  | 0 | 1 | 2 | 3 | 4 |
| 4. In the last month, how often have you felt confident about your ability to handle your personal problems?         | 0 | 1 | 2 | 3 | 4 |
| 5. In the last month, how often have you felt that things were going your way?                                       | 0 | 1 | 2 | 3 | 4 |
| 6. In the last month, how often have you found that you could not cope with all the things that you had to do?       | 0 | 1 | 2 | 3 | 4 |
| 7. In the last month, how often have you been able to control irritations in your life?                              | 0 | 1 | 2 | 3 | 4 |
| 8. In the last month, how often have you felt that you were on top of things?  | 0 | 1 | 2 | 3 | 4 |
| 9. In the last month, how often have you been angered because of things that were outside of your control?           | 0 | 1 | 2 | 3 | 4 |
| 10. In the last month, how often have you felt difficulties were piling up so high that you could not overcome them? | 0 | 1 | 2 | 3 | 4 |



# A Hunch...





“

Study  
Abroad

Language  
Barriers

Loneliness

Financial  
Challenge

Cultural  
Differences

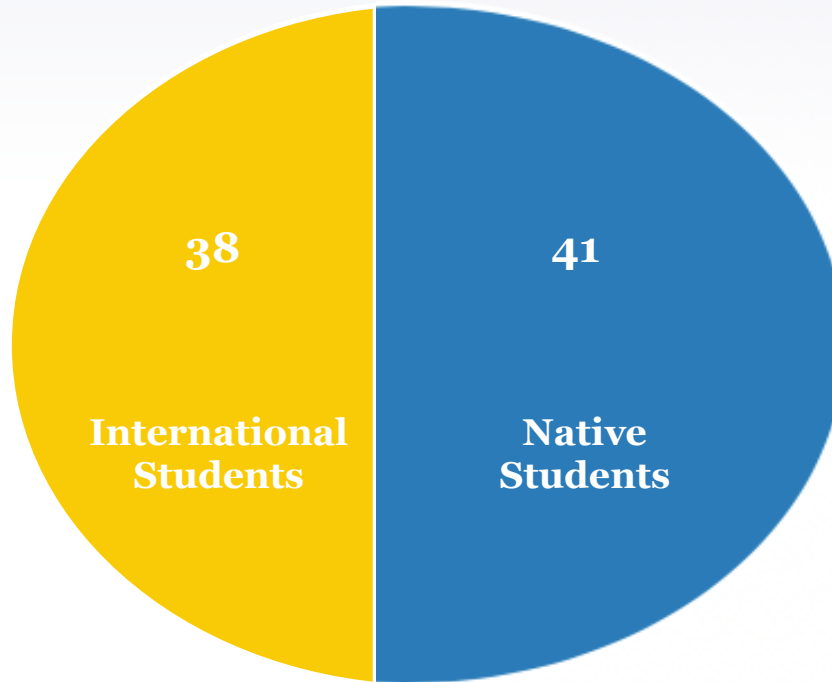


# Hypotheses

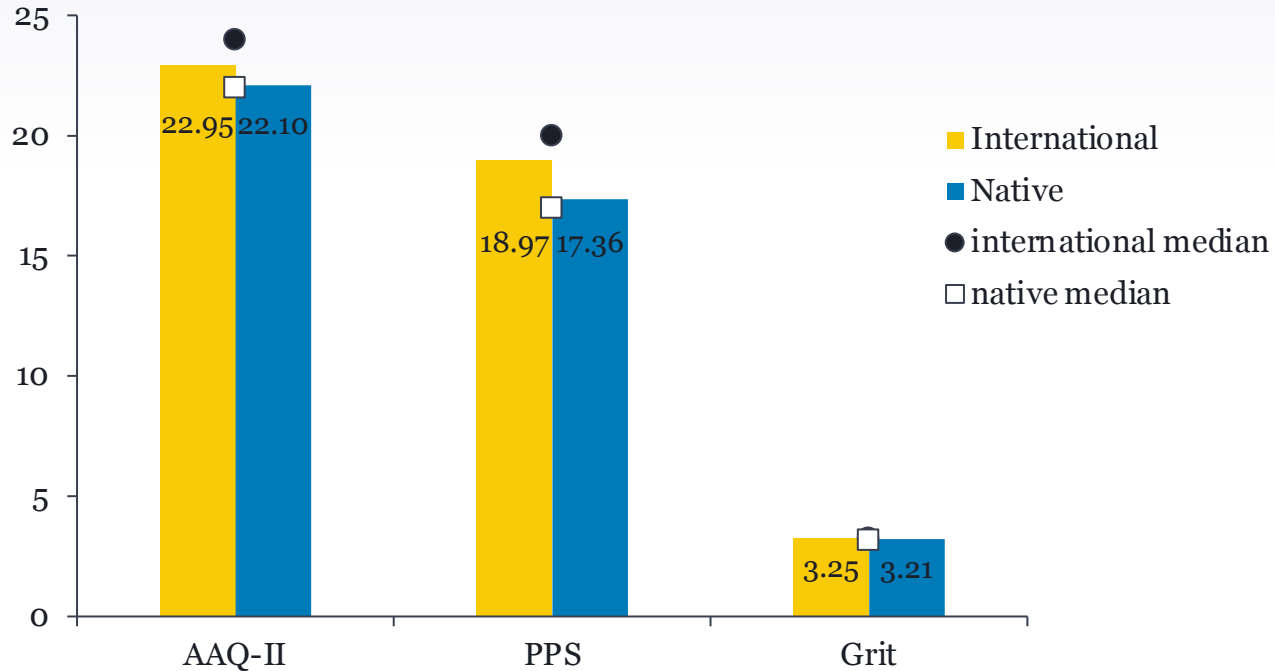
	International Students	US-born Students
<b>Stress</b>	↑	↓
<b>Psychological Inflexibility</b>	↑	↓
<b>Grit</b>	↑	↓

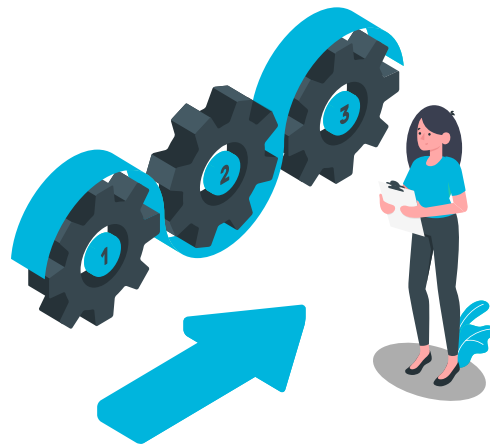
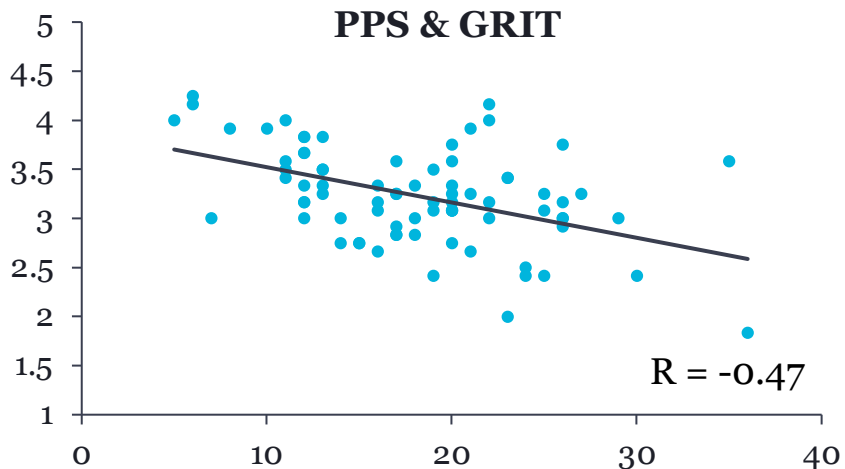
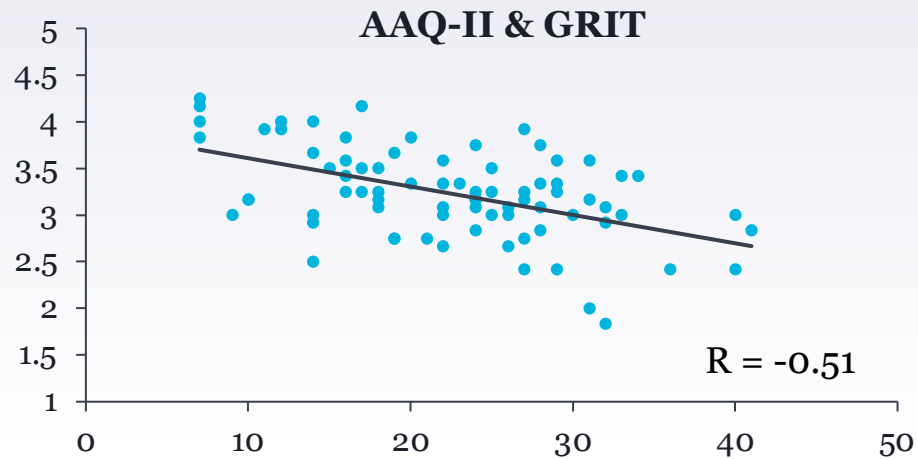
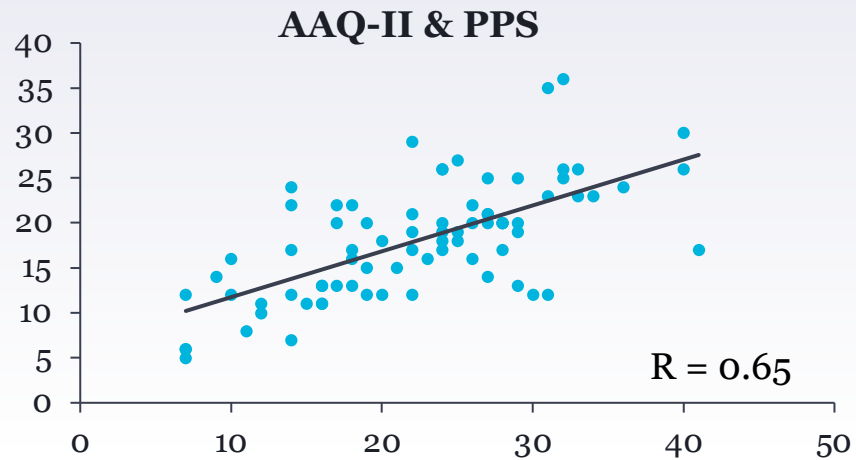


▶ However, it turns out our hunch is wrong...



However, it turns out our hunch is wrong...





# Take Away...

- Science is not about proving what we already believe
- Science is about investigating



# Delay Discounting

Utah State University



Journal of Visualized Experiments

www.jove.com

## Video Article

### Measuring Delay Discounting in Humans Using an Adjusting Amount Task

Charles C.J. Frye<sup>1</sup>, Ann Galizio<sup>1</sup>, Jonathan E. Friedel<sup>1</sup>, W. Brady DeHart<sup>1</sup>, Amy L. Odum<sup>1</sup>

<sup>1</sup>Department of Psychology, Utah State University

Correspondence to: Amy L. Odum at [amy.odum@usu.edu](mailto:amy.odum@usu.edu)

URL: <http://www.jove.com/video/53584>

DOI: [doi:10.3791/53584](https://doi.org/10.3791/53584)

Keywords: Behavior, Issue 107, Delay discounting, impulsivity, commodity, trait, reward devaluation, adjusting amount, impulsive choice

Date Published: 1/9/2016

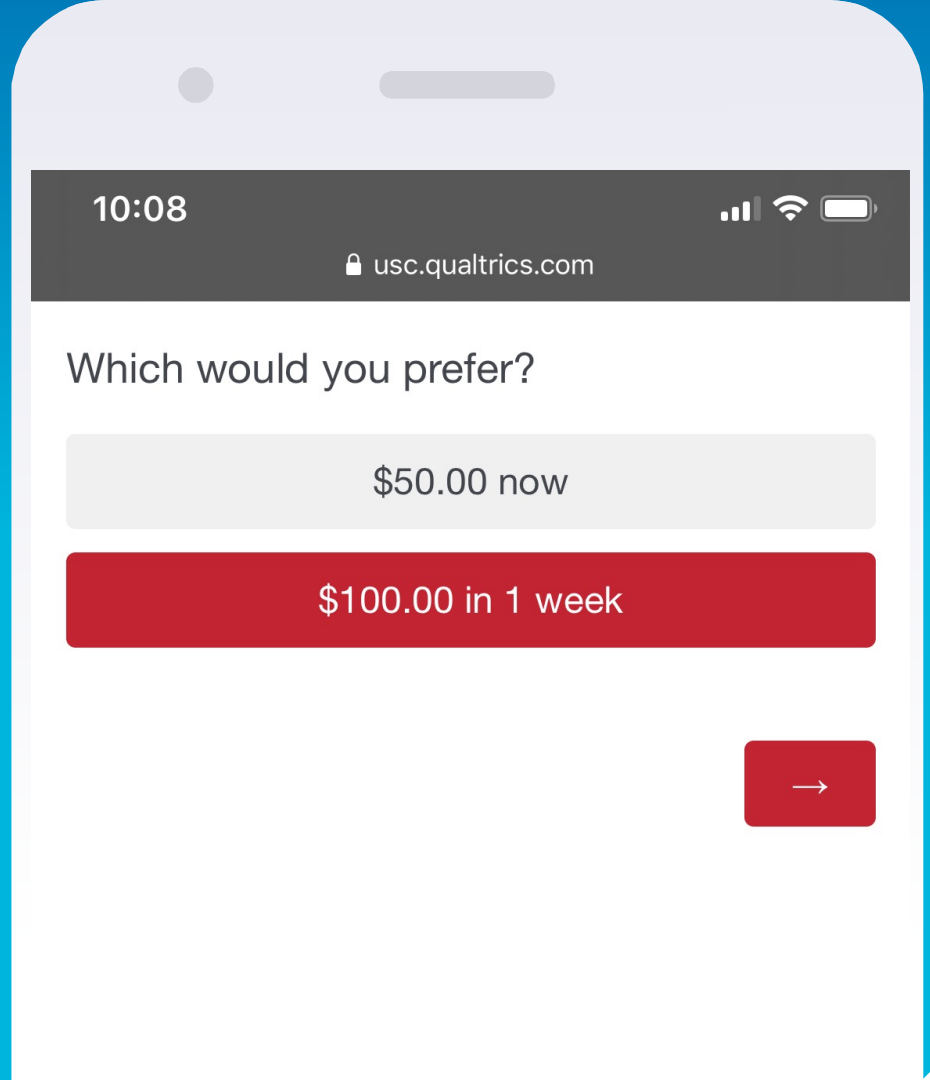
Citation: Frye, C.C., Galizio, A., Friedel, J.E., DeHart, W.B., Odum, A.L. Measuring Delay Discounting in Humans Using an Adjusting Amount Task. *J. Vis. Exp.* (107), e53584, doi:10.3791/53584 (2016).

## Abstract

Delay discounting refers to a decline in the value of a reward when it is delayed relative to when it is immediately available. Delay discounting tasks are used to identify indifference points, which reflect equal preference for two dichotomous reward alternatives differing in both delay and magnitude. Indifference points are key to assessing the shape of a delay-discounting gradient because they allow us to isolate the effect of delay on value. For example, if at a 1 week delay and a maximum of \$1,000, the indifference point is at \$700 we know that, for that participant, a 1-week delay corresponds to a 30% reduction in value. This video outlines an adjusting amount delay-discounting task that identifies indifference points relatively quickly and is inexpensive and easy to administer. Once data have been collected, non-linear regression techniques are typically used to generate discounting curves. The steepness of the discounting curve reflects the degree of impulsive choice of a group or individual. These techniques have been used with a wide range of commodities and have identified populations that are relatively impulsive. For example, people with substance abuse problems discount delayed rewards more steeply than control participants. Although degree of discounting varies as a function of the commodity examined, discounting of one commodity correlates with discounting of other commodities, which suggests that discounting may be a persistent pattern of behavior<sup>1</sup>.

# Delay Discounting

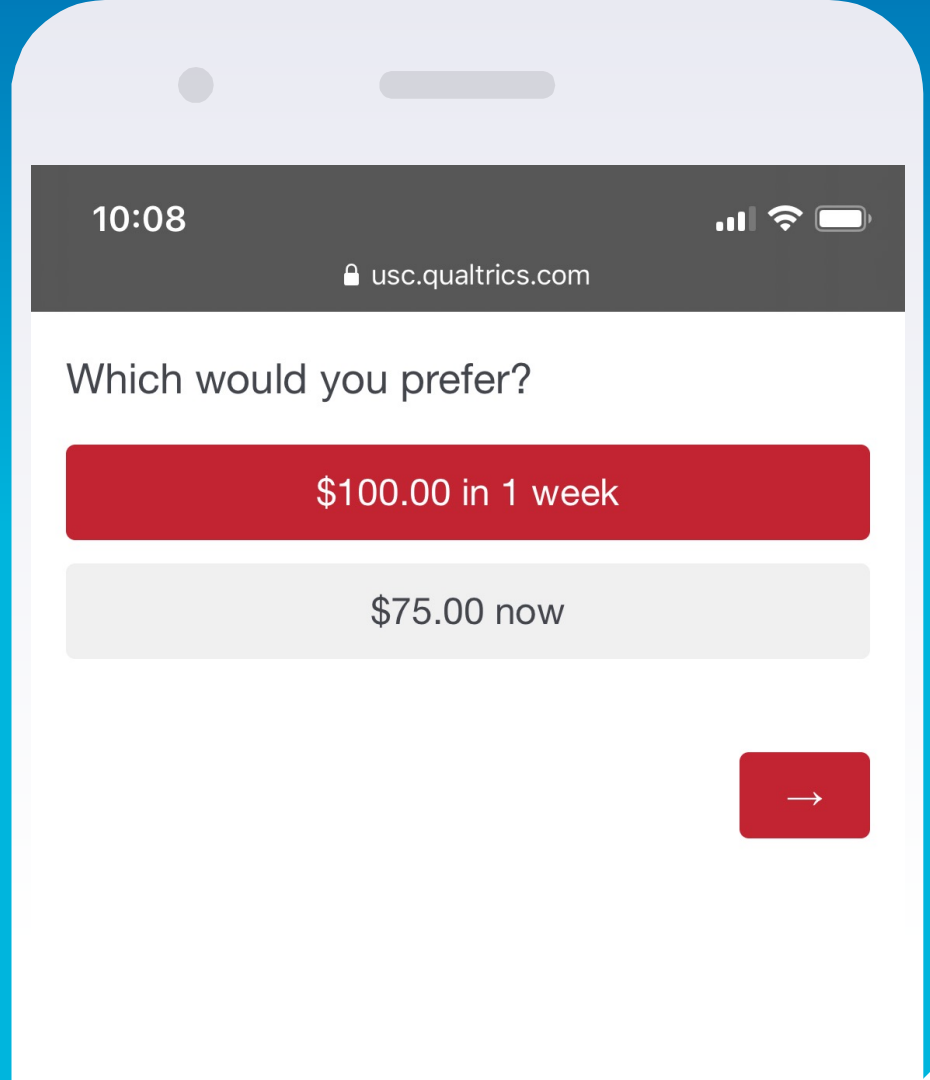
- Pick \$100 in 1 week



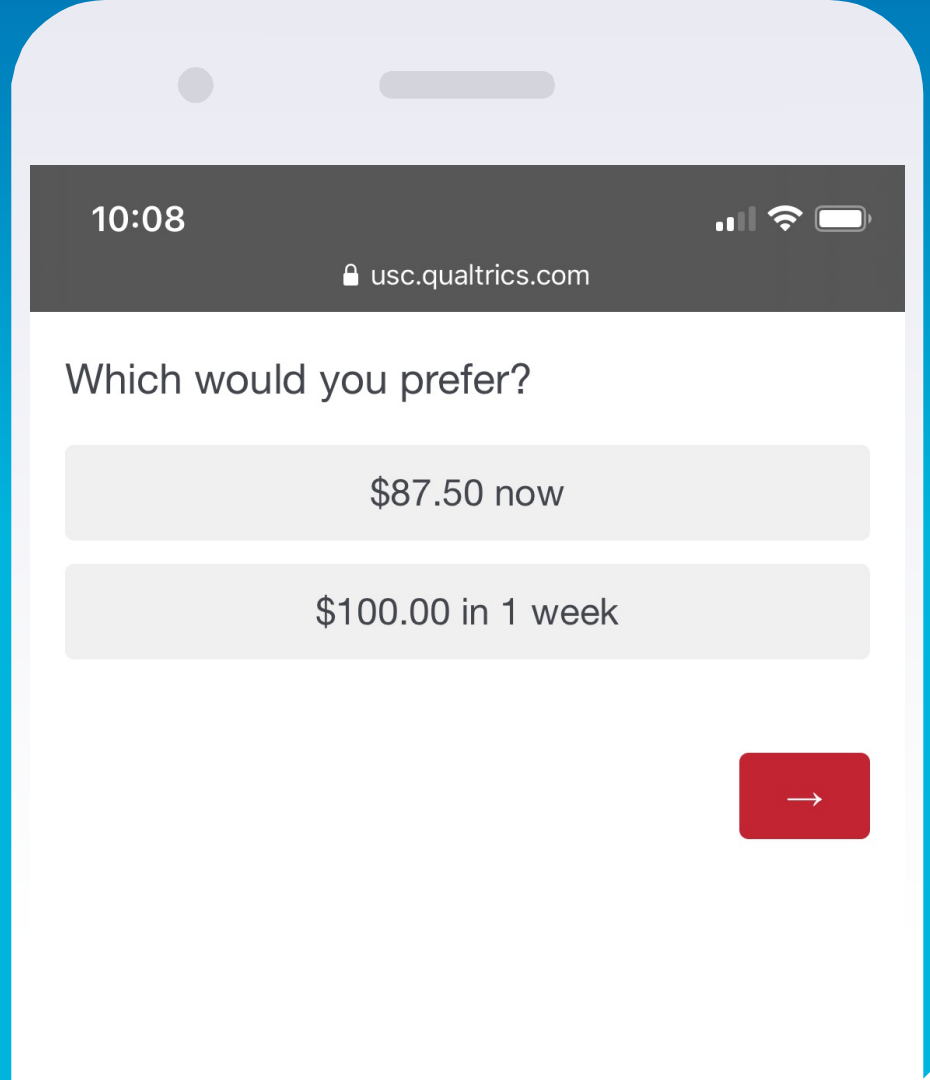


# Delay Discounting

- Pick \$100 in 1 week

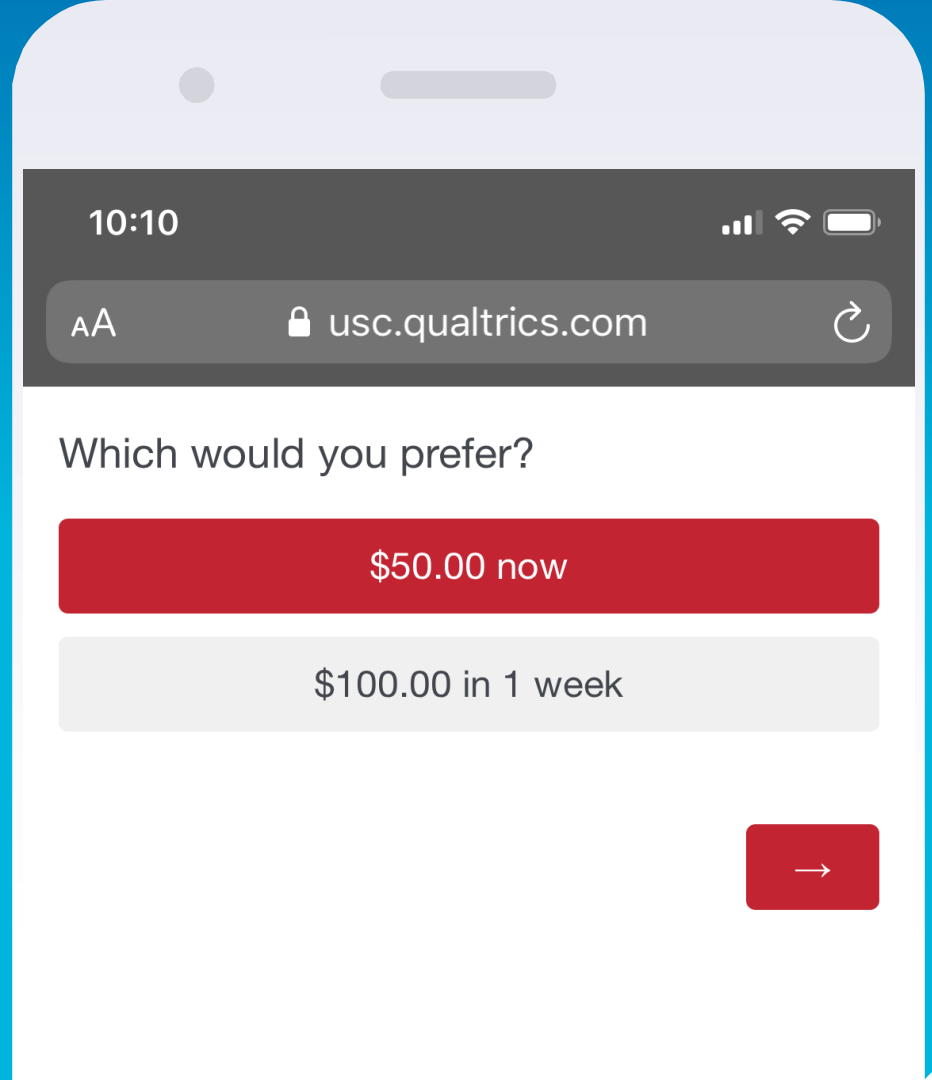


# Delay Discounting



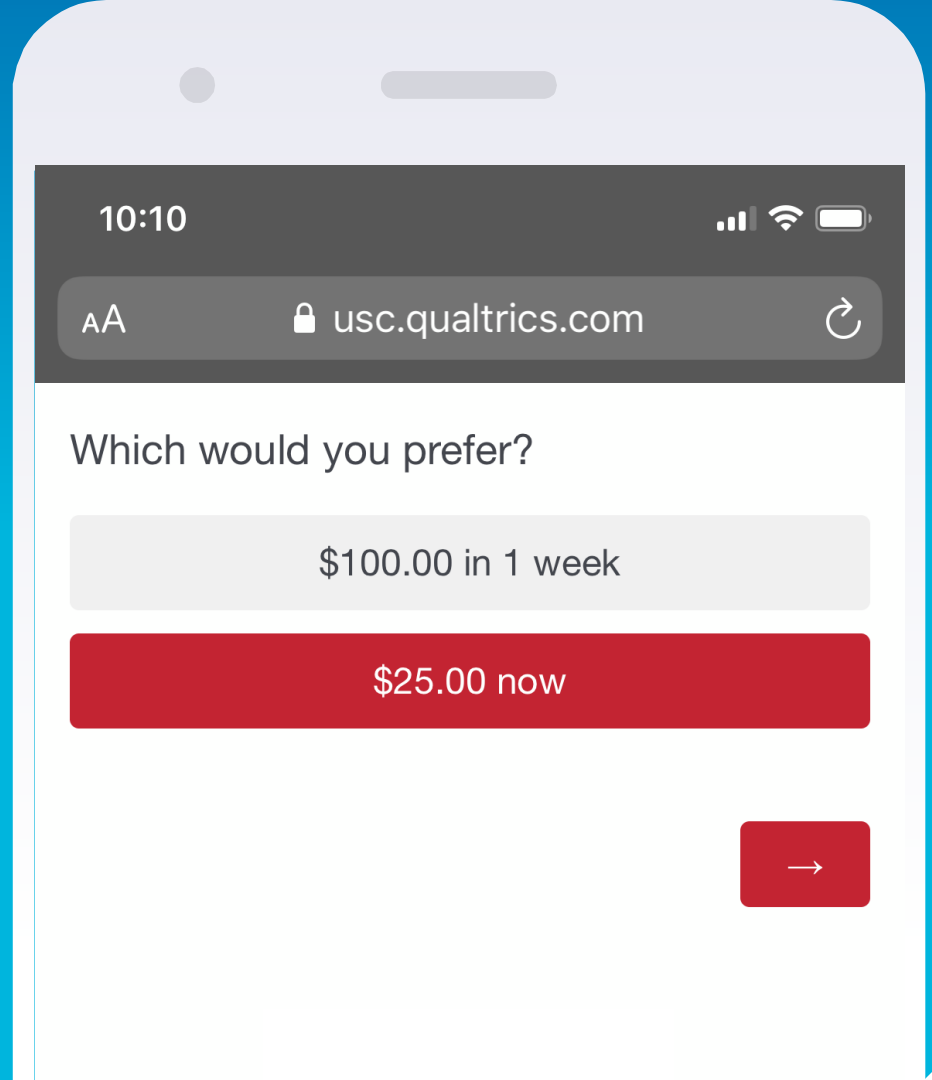
# Delay Discounting

- Pick \$50 now

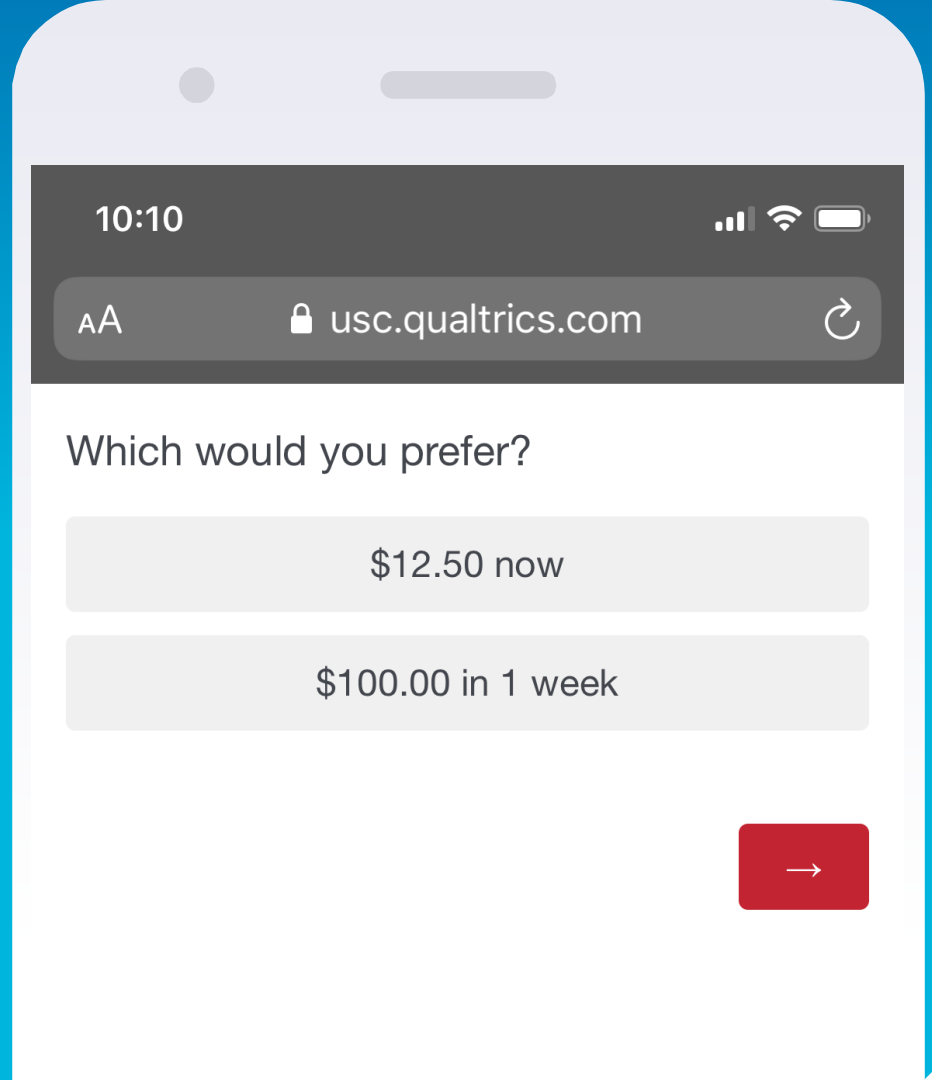


# Delay Discounting

- Pick \$25 now



# Delay Discounting



# Delay Discounting

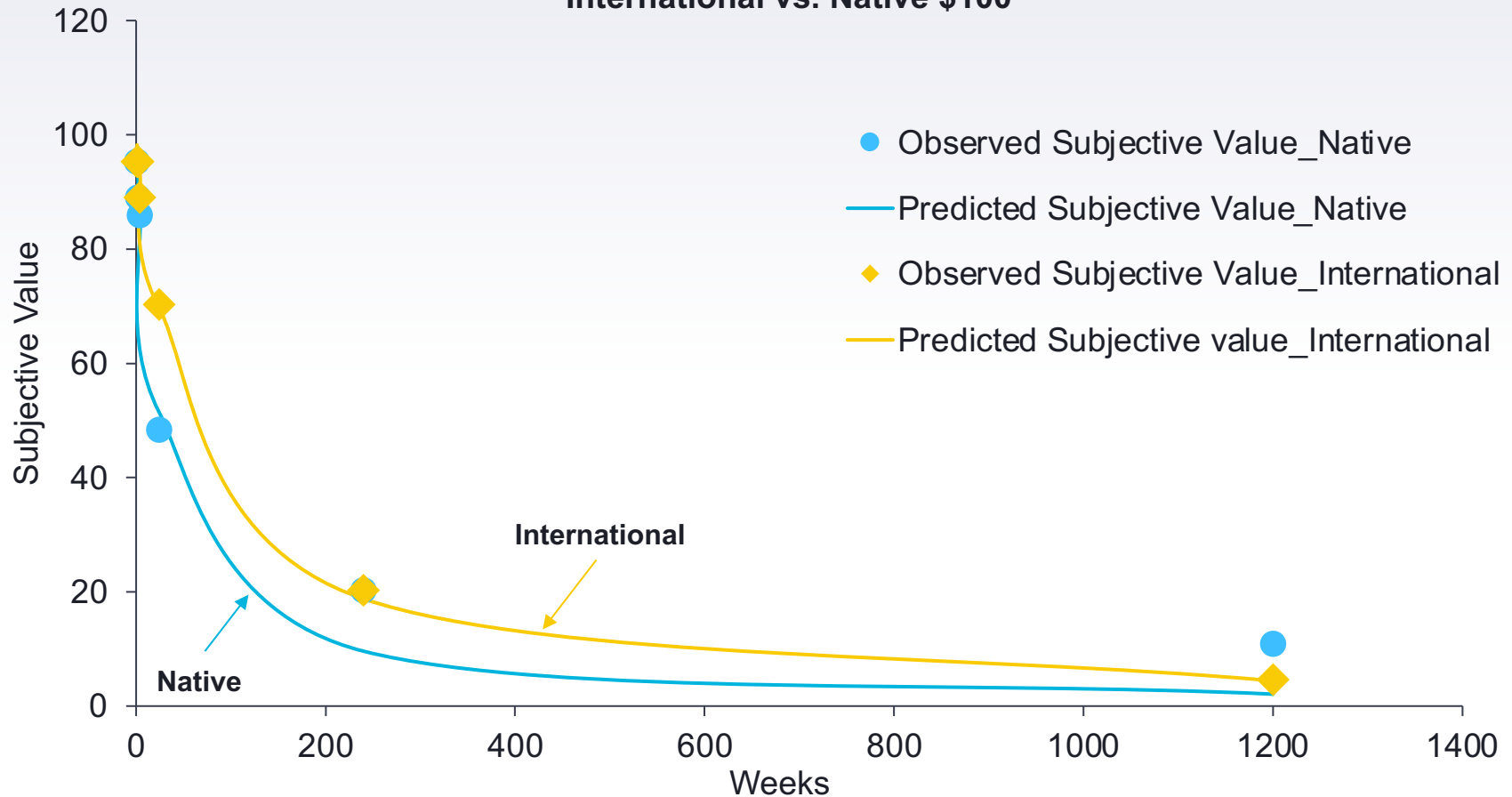
	International Students	US-born Students
\$100	↓	↑
\$1000	↓	↑





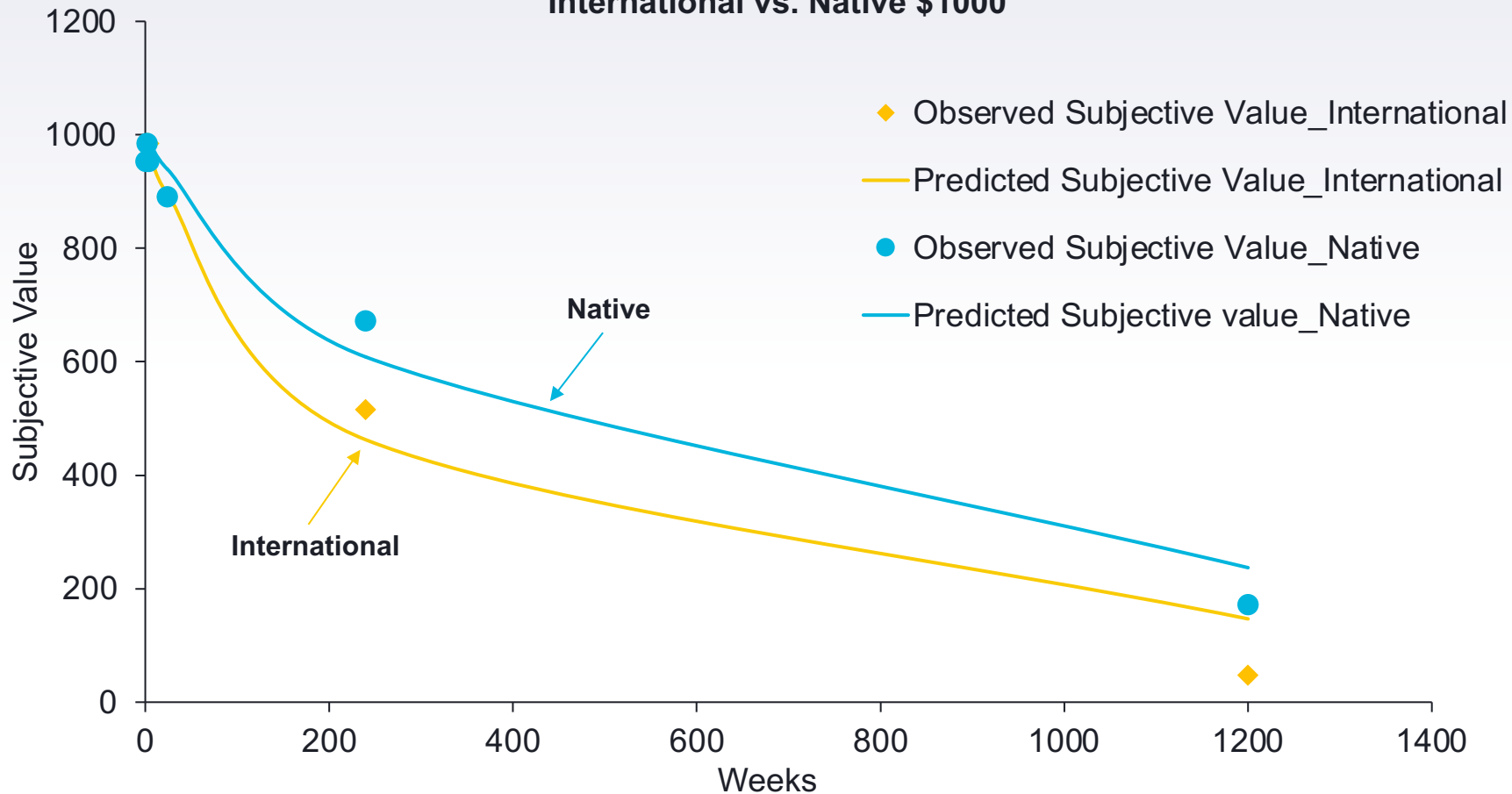
Well, it turns out only  
half of our hypotheses  
is right...

## International vs. Native \$100





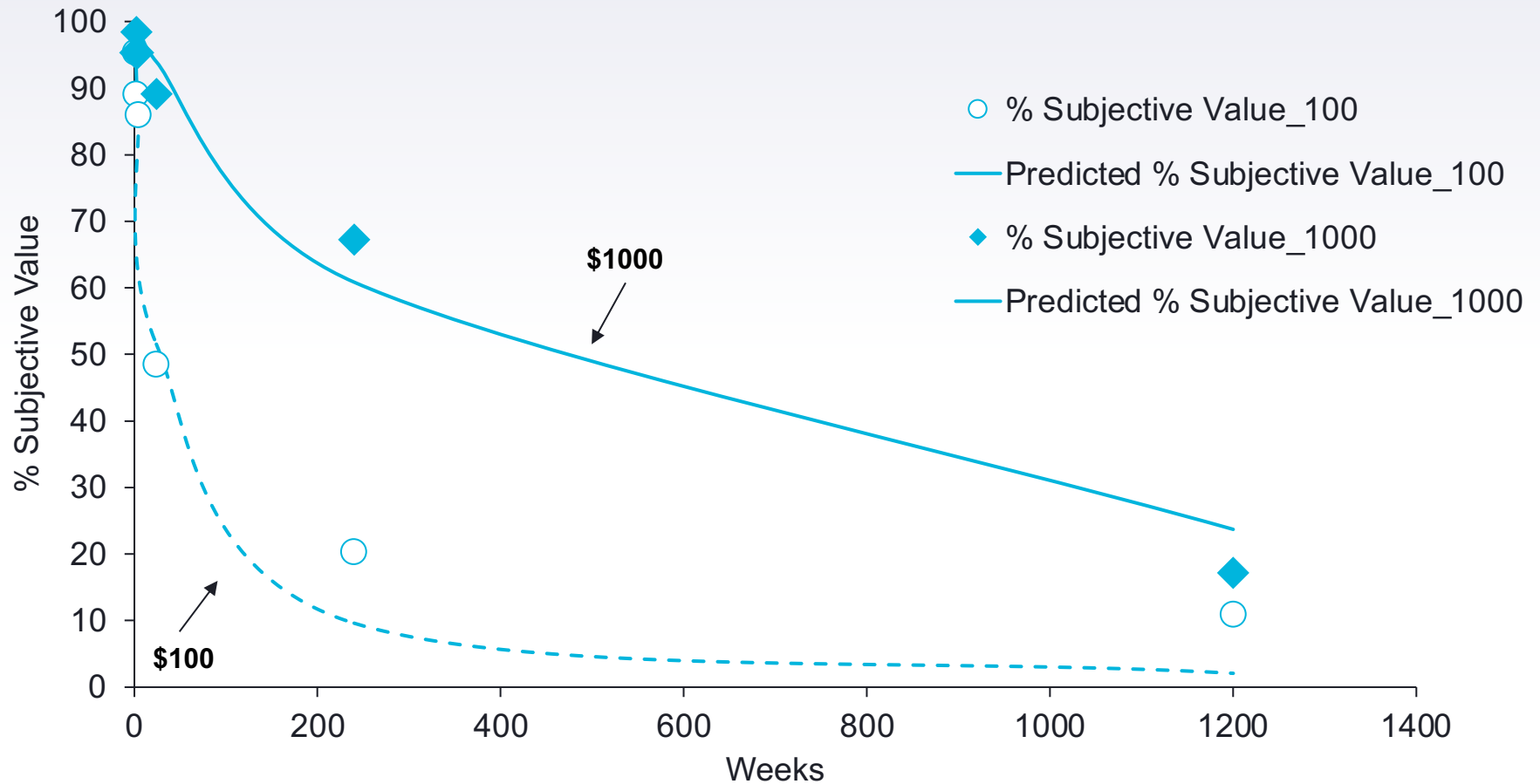
## International vs. Native \$1000

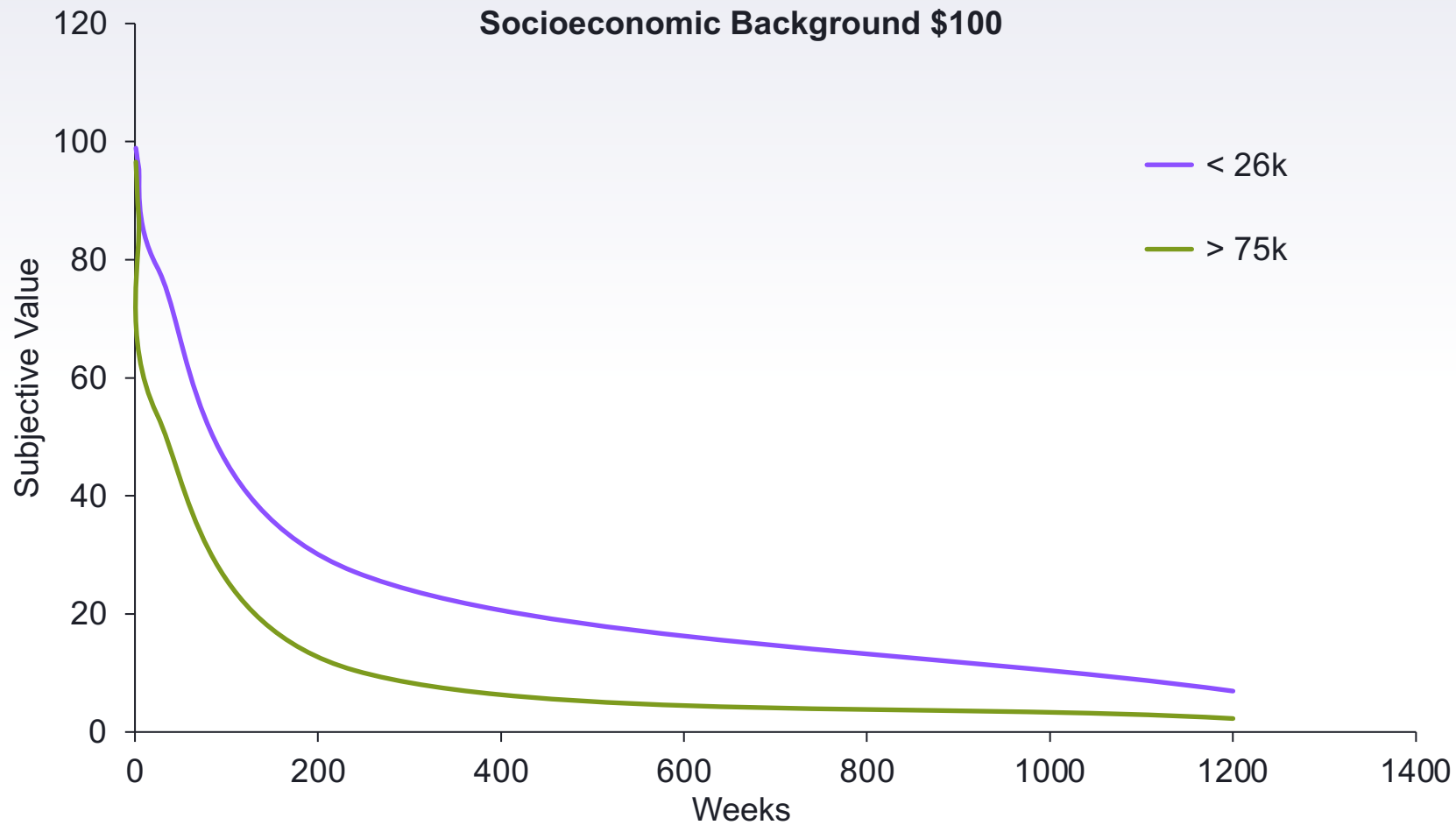


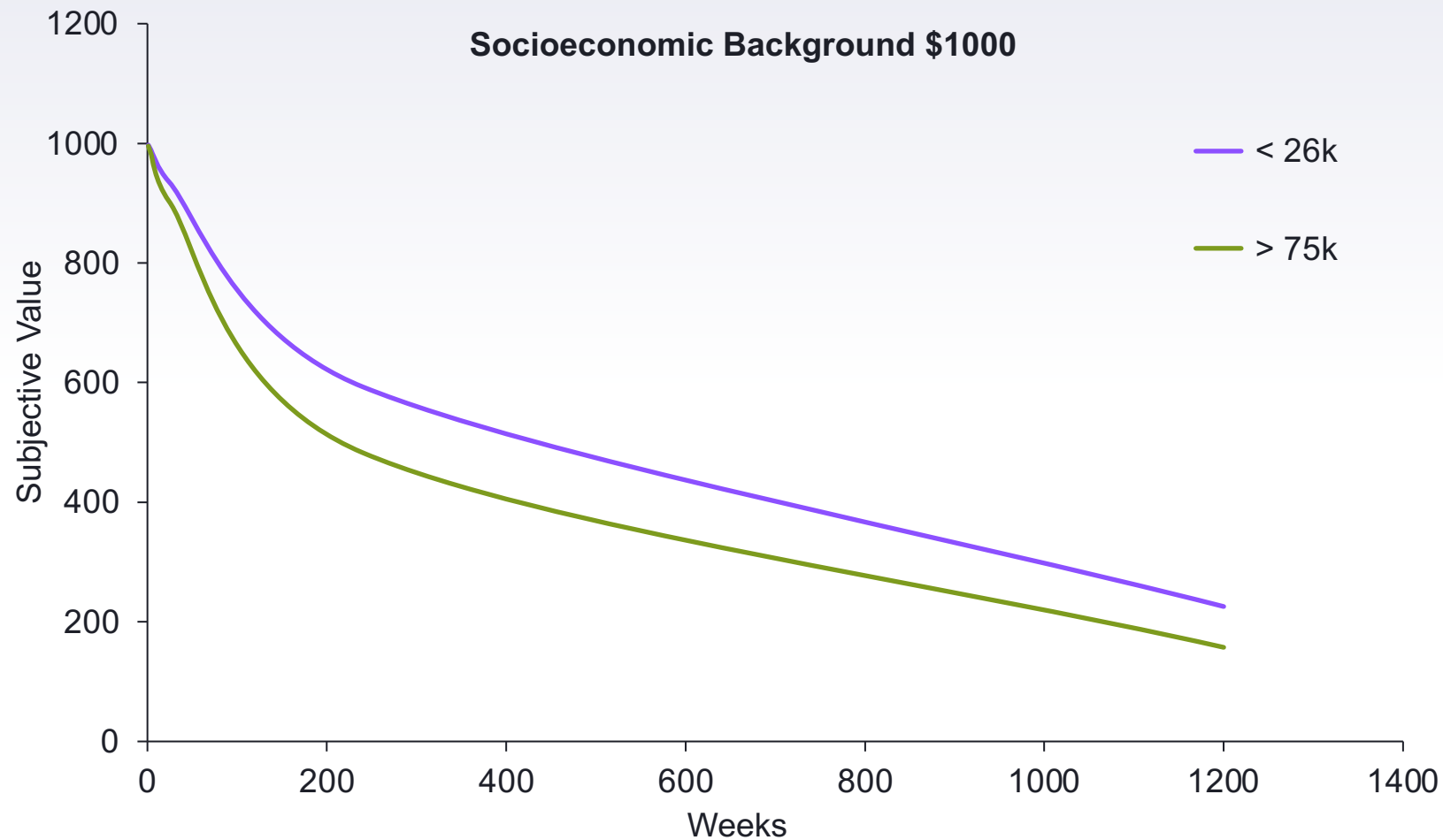
## International \$100 vs \$1000



## Native \$100 vs \$1000







	International Students	US-born Students
\$100	↓	↑
\$1000	↑	↓

	\$100	\$1000
International Students	↑	↓
US-born Students	↑	↓

	< 26k	> 75k
\$100	↓	↑
\$1000	↓	↑

# Contributions



**Similarity**

**Diverse  
Populations**

**Between  
Group  
Research**

# Limitations



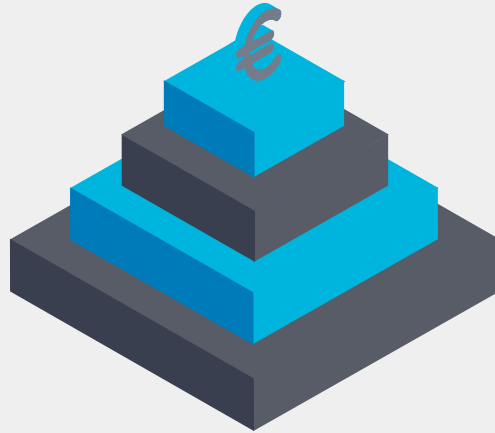
**Various  
Academic  
Background**

**Diverse  
Cultures**

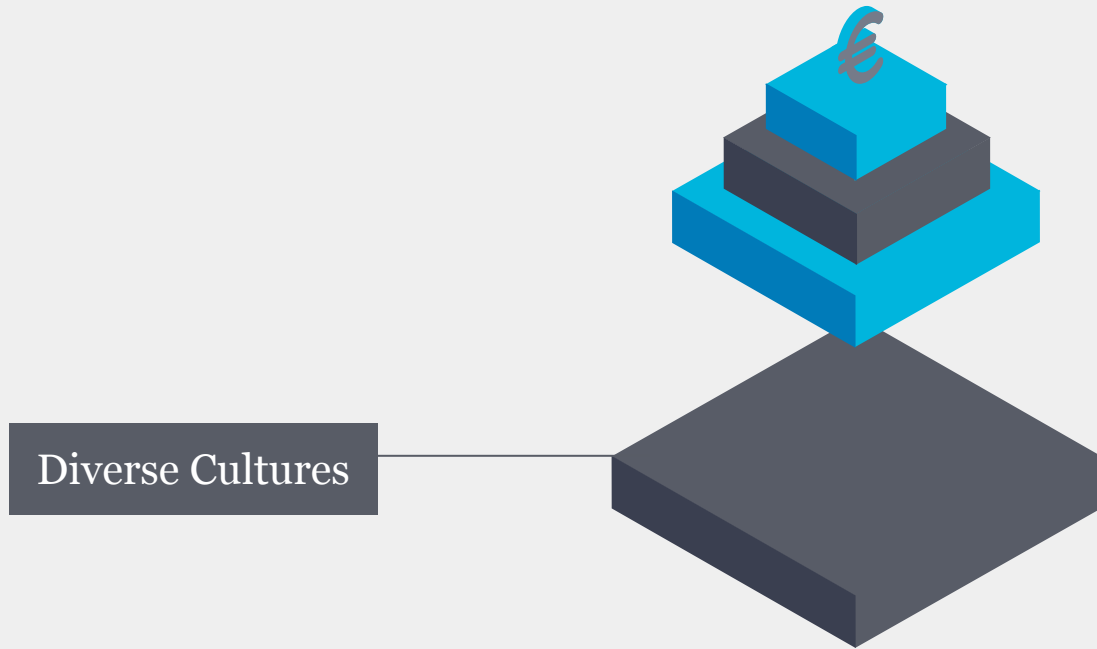
**Small  
Sample  
Size**



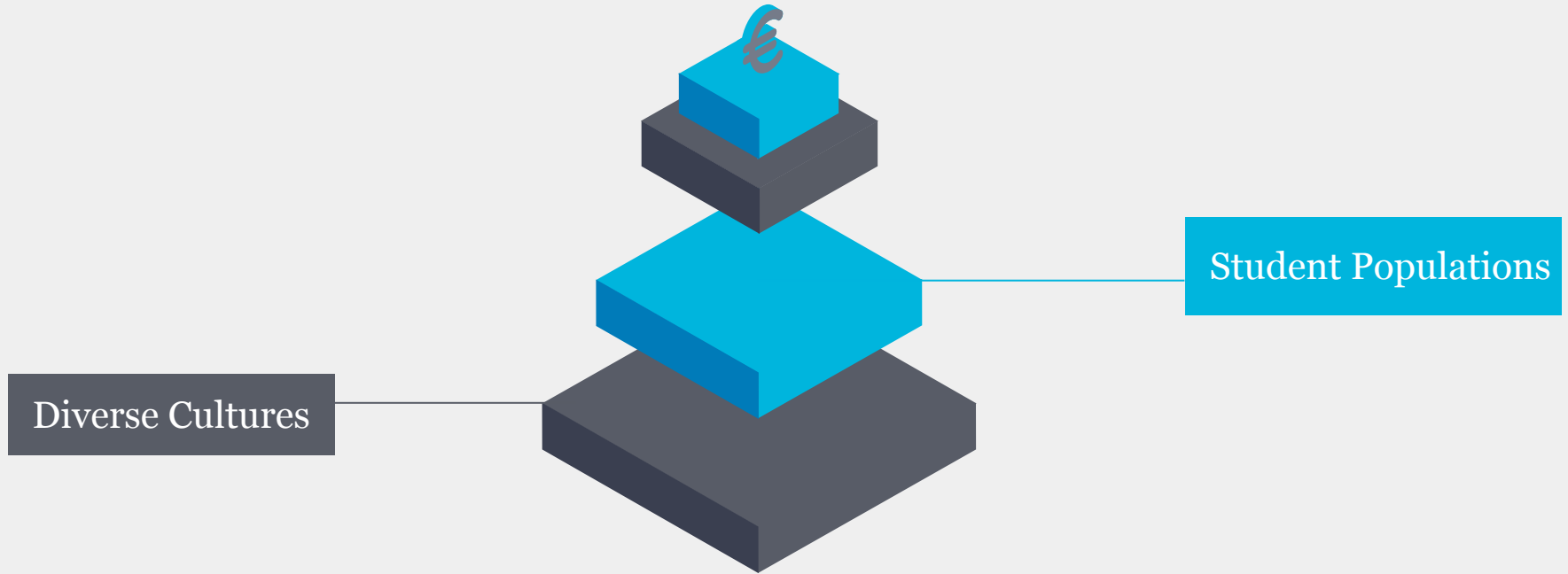
# Future Direction



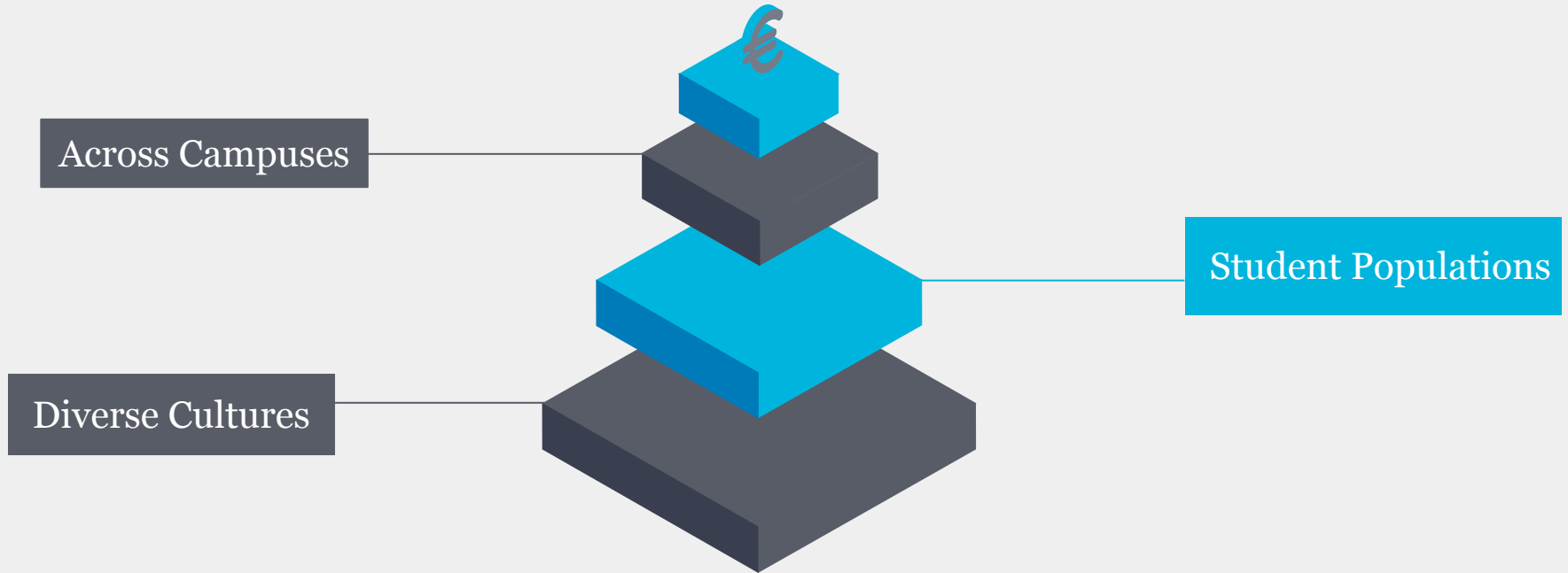
# Future Direction



# Future Direction



# Future Direction



# Future Direction

