

# Campus Ecological Networks

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To access the slides, works cited, a copy of the instructional worksheet, and methodological resources, please visit [michaelbrown.work](http://michaelbrown.work).

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# Agenda

- Overview of my scholarship
- Teaching theories of context
- Campus ecological networks
- Next steps



# Connecting through the curriculum



# Socio-structural sources of inequality

- Relational perspective on educational debts (antonio, 2012; Ladson Billings, 2006)
- Equity-minded practices require attention to structural dimensions of learning and development processes (Johnson, 2022)
- Boundary location and permeability matter for achieving equity (Posselt et al., 2017)

# Focal Areas of Interest



Curriculum making and policy



Curriculum navigation and student networks



Enactment of curriculum through teaching technologies

# College Student Learning and Development Course

- Unit 1: Theories of Cognition, Learning Theories, Motivation & Engagement
- Unit 2: Theories of Identity Development
- Unit 3: Theories of Context
- Throughout: Frameworks focused on power and inequality in learning

## Example Unit: Theories of Context

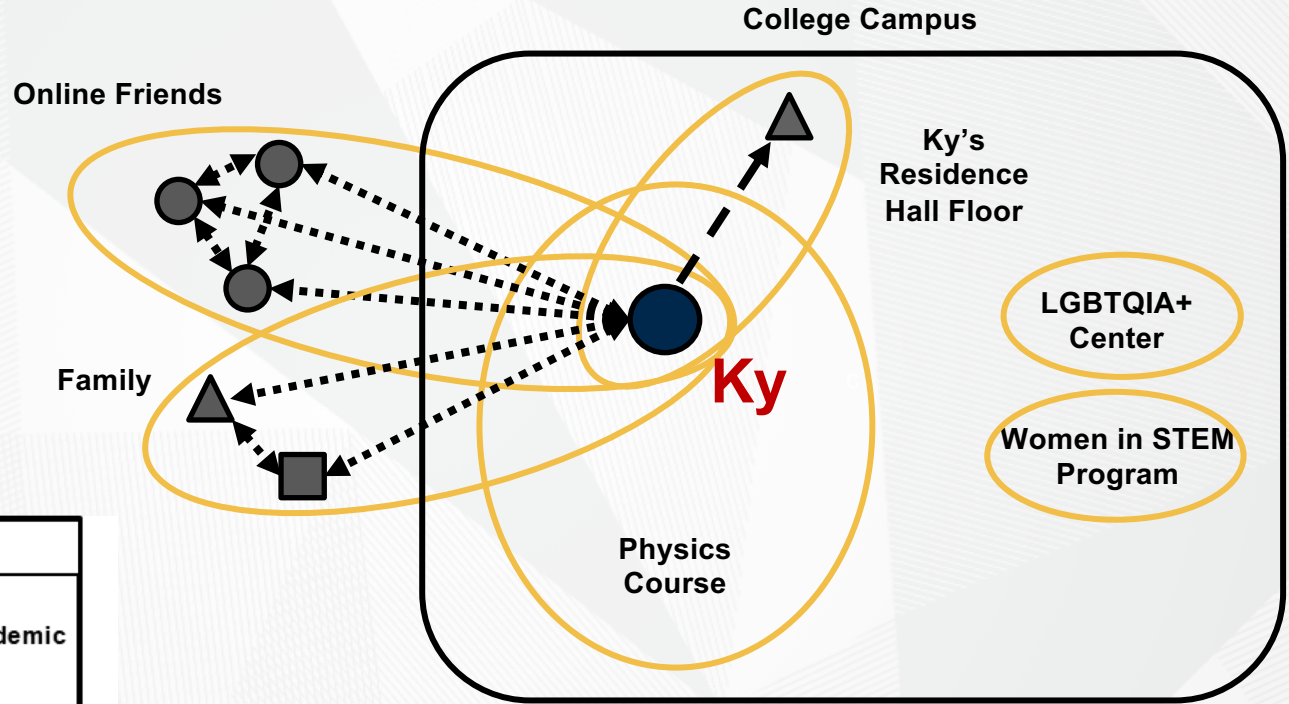
- Developmental Ecology
- Sense of Belonging & Validation Theory
- Intersectionality, Systems of Power, and Human Development
- Applying Theories of Context to Practice



## Core Discussion Network (CDN)

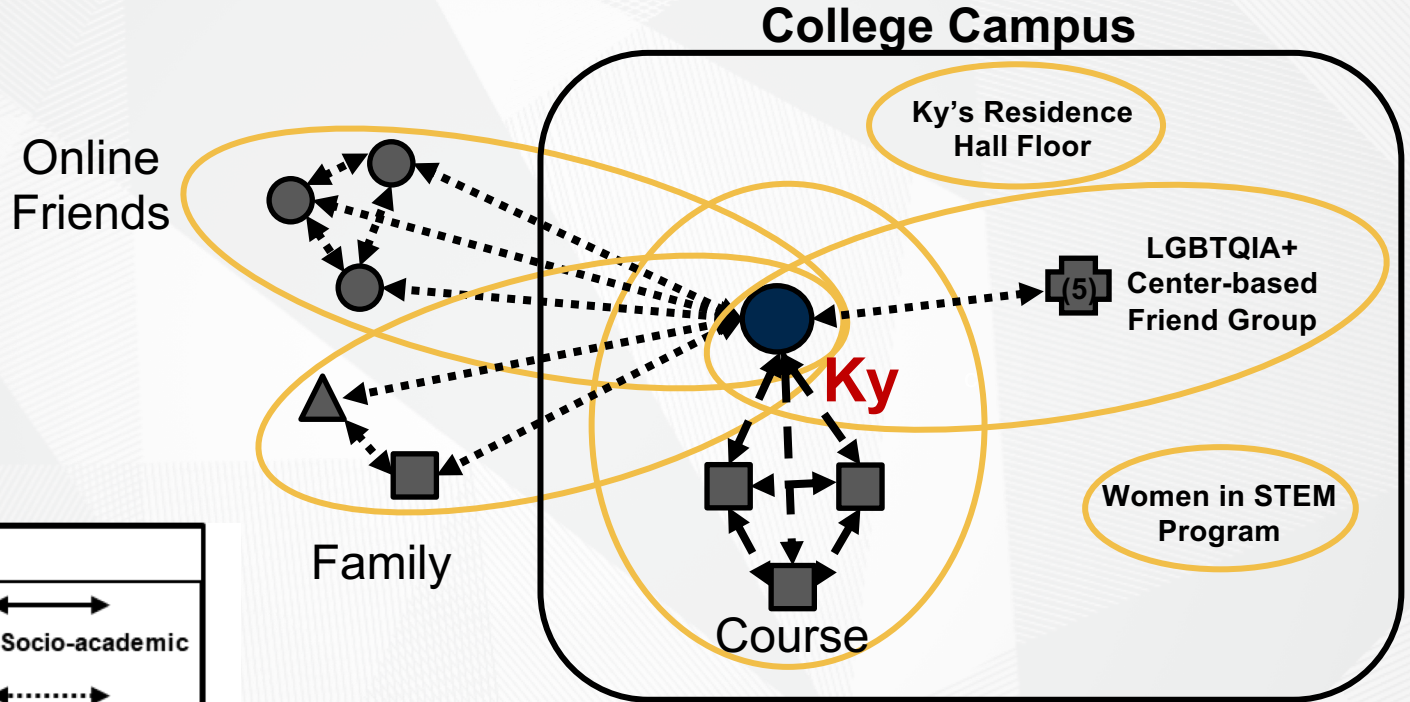
- People an individual regularly turns to with important matters to discuss (Marsden, 1987)
- Changes in response to shifts in context (Small, 2013)
- Undergraduate ed disrupts CDN (Small, 2017)

# Ky's Microsystems (Fall)



Key	
● Focal student	↔
● Non-binary	↔
▲ Cisgender Man	⋯↔
■ Cisgender Woman	⋯↔
■ Gender not specified	⋯↔
	Socio-academic
	Social only
	Academic only

# Ky's Microsystems (Spring)

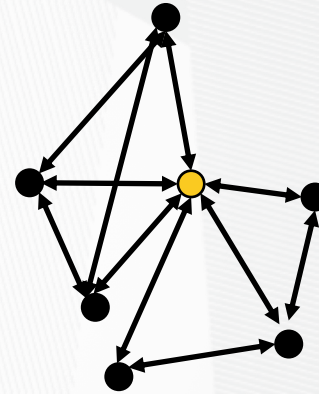


Key	
● Focal student	↔ Socio-academic
● Non-binary	⋯ Social only
▲ Cisgender Man	⋯ Social only
■ Cisgender Woman	⋯ Academic only
■ Gender not specified	⋯ Academic only

# Help-seeking strategies

## Core Discussion Network

- Targeted Mobilization
- Opportune Mobilization



“From time to time, most people discuss important matters with other people. Looking back over the last six months—who are the people with whom you discussed matters important to you?”

Small, M. L. (2013). Weak ties and the core discussion network: Why people regularly discuss important matters with unimportant alters. *Social networks*, 35(3), 470-483.

# Your Core Discussion Network

1. Place yourself in the center and your connections around you
2. Draw connections to yourself and to other individuals in your network who know each other

## Take a second

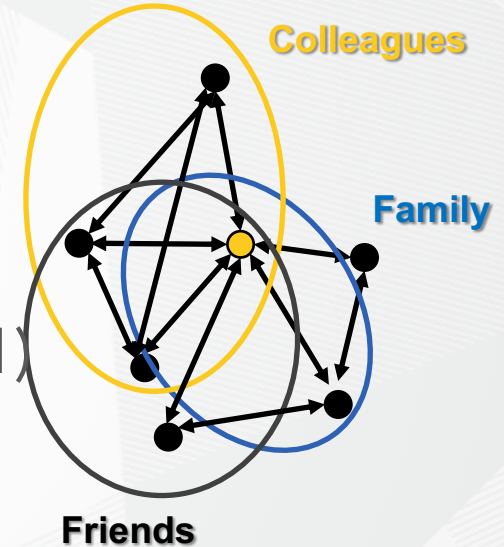
- Who is present in your network?
- How might you activate relationships to address emergent concerns?
- What other relationships, not present in your network, might you engage if you had a problem?

# Your help-seeking strategies

Core Discussion Network

- Targeted Mobilization
- Opportune Mobilization

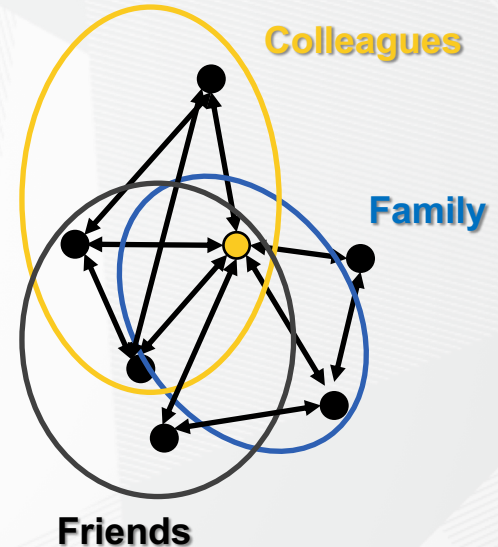
Unequal Networks (Bidart et al., 2021)





# Your help-seeking strategies

- How might we employ what we know about students and their relationships in educational design?
- What could you do to cultivate healthy learning and development ecologies in your role on campus?



# Q&A



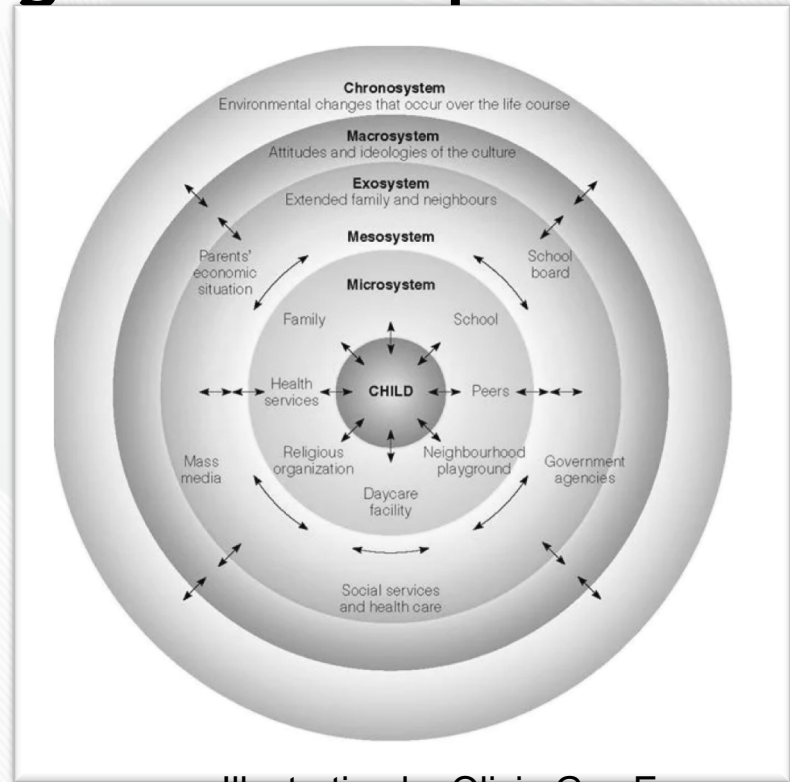


# **Campus Ecological Networks**

Understanding Patterns of Relationships in Learning, Identity, and Equity in College

# PPCT Model of Ecological Development

- Microsystem
- **Mesosystem**
- Exosystem
- Macrosystem
- Chronosystem



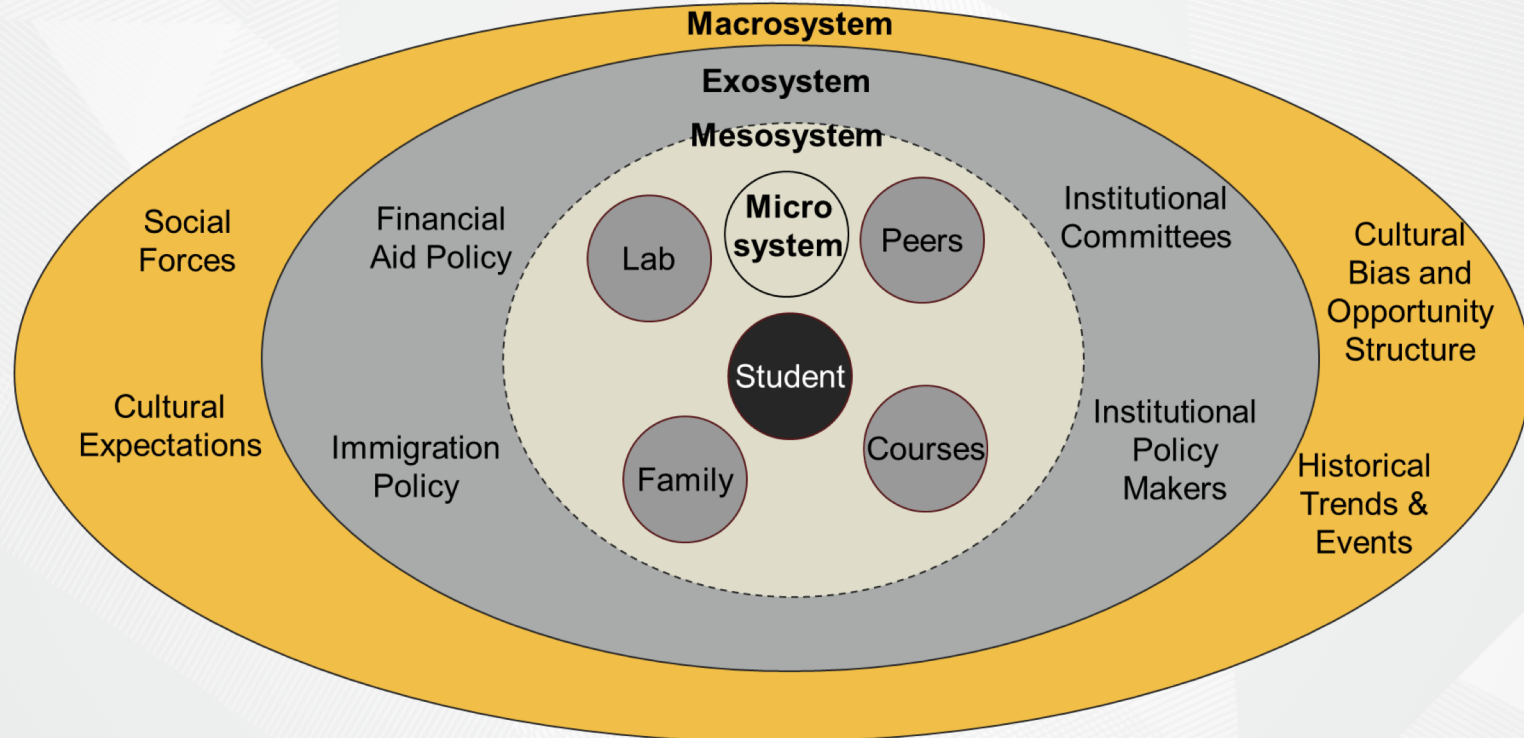
-Illustration by Olivia Guy Evans

# Neo-Ecological Theory

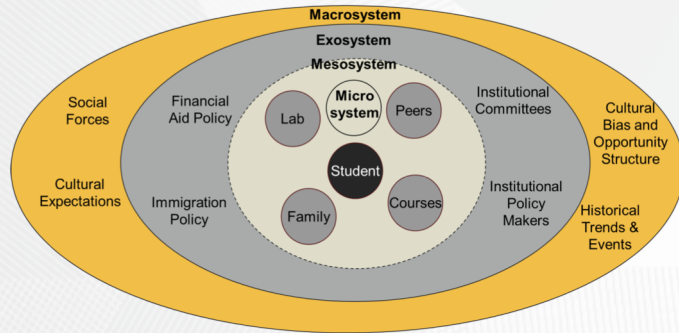
Developmental interactions across microsystems are defined by:

- (A)synchronicity of engagement
  - Availability and publicness of interactions
  - Permanence of interaction
  - Presence or absence of cues in an environment
- Navarro & Tudge (2022)

# Campus Ecologies (Renn & Arnold, 2003)

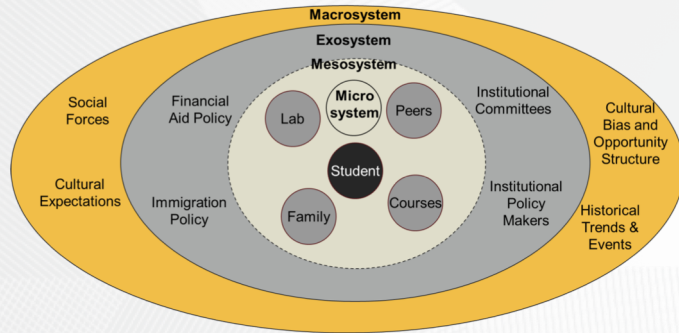


# Context



# Context

+

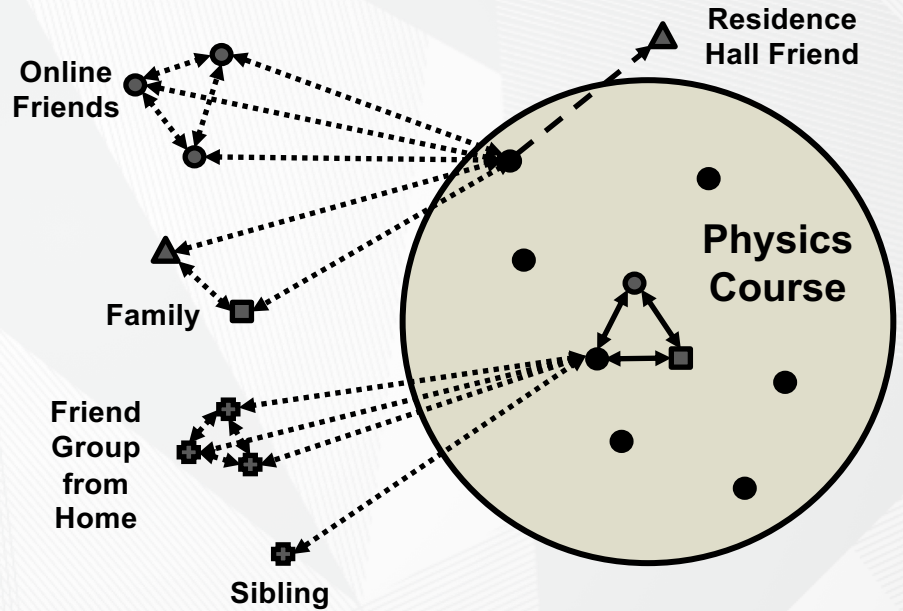
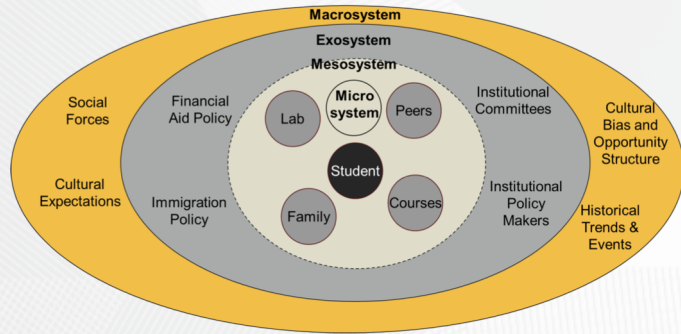




# Context

+

# Structure

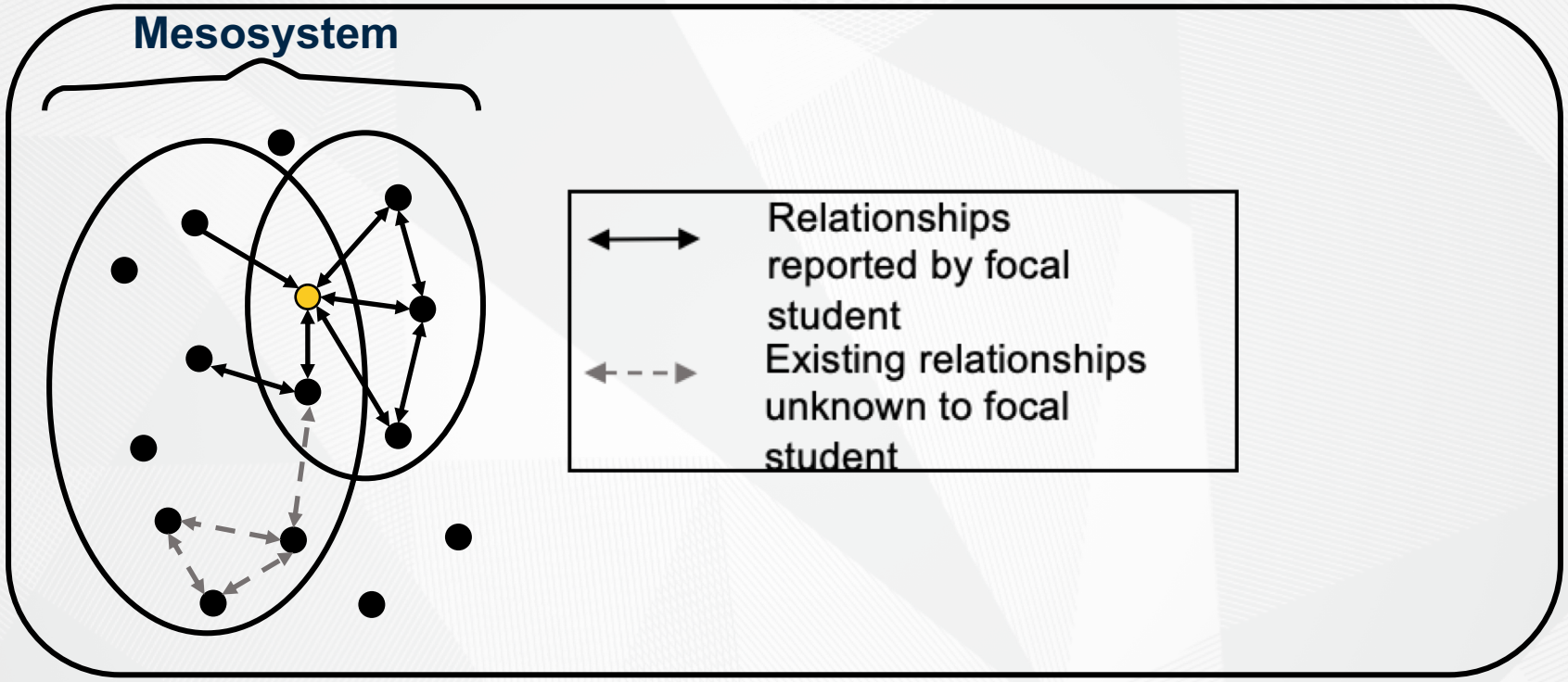


# Conceptual Framework

- Logic of Collaboration (Nespor, 1994)
- Institutional agents (Stanton-Salazar, YEAR)
- Socio-Academic Integrative Moments (Deil-Amen, 2011)
- Campus Ecological Networks (Brown & Smith, 2024)

→ Chronosystem →

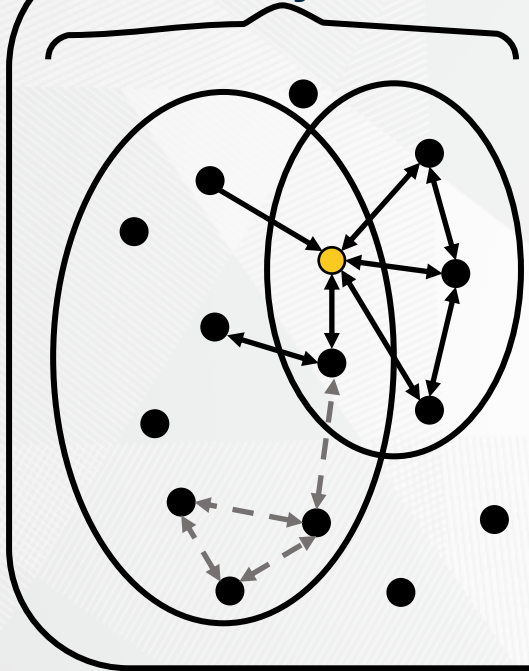
Mesosystem



↔ Relationships reported by focal student  
↔ Existing relationships unknown to focal student

→ Chronosystem →

Mesosystem



Relational Processes  
(Learning & Identity  
Negotiation)

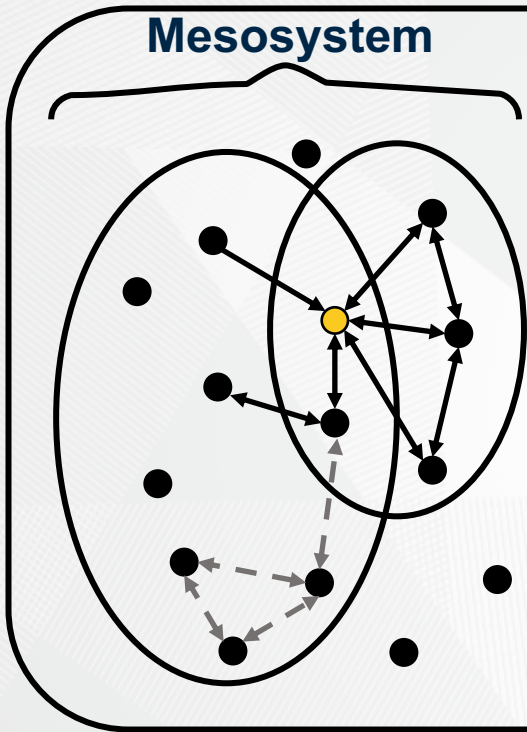
Structural (In)Equality  
Processes

Network Mechanisms



→ Chronosystem →

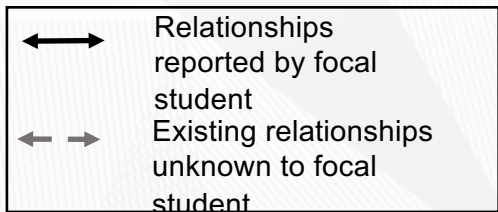
Mesosystem



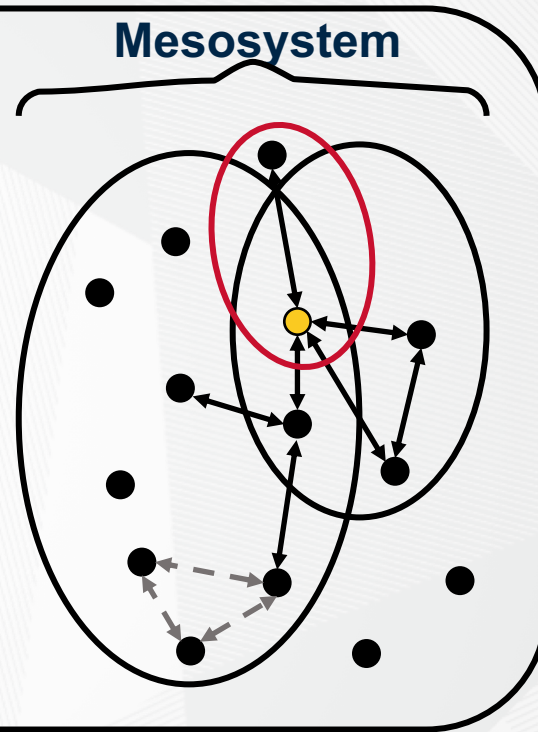
Relational Processes (Learning & Identity Negotiation)

Structural (In)Equality Processes

Network Mechanisms



Mesosystem



## Dyadic Features

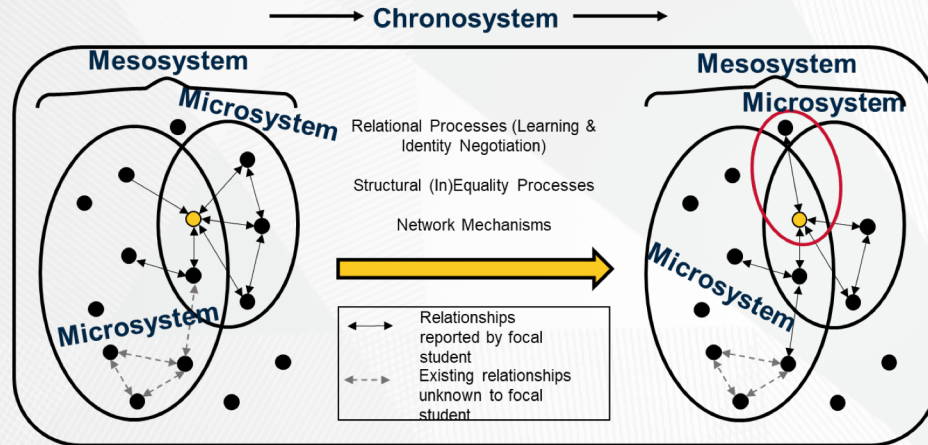
Tie existence,  
directionality, mutuality,  
content, frequency

## Network Features

Density, centrality,  
structural holes, cognitive  
networks

## Modality

Physical (built and natural  
environment) and/or Virtual  
(technological constraints &  
affordances; synchronicity)



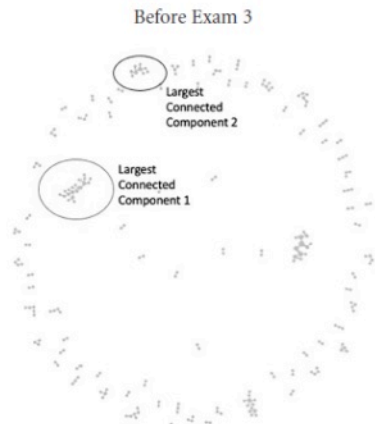
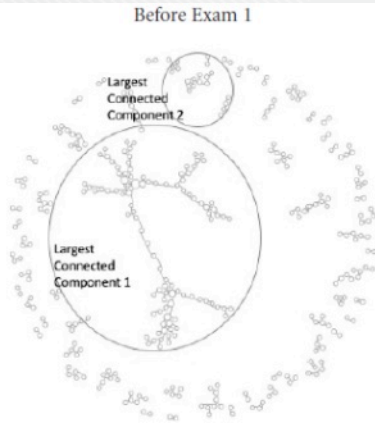
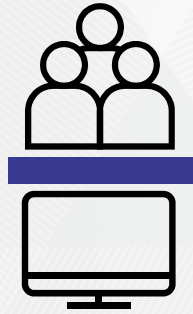


Figure 1. Course Network over the semester: Largest connected component before and after first exam; sized by betweenness centrality

# Law of Large Enrollments

60% decrease in course network density (Brown, 2019)



# **Guided Pathways and Knowledge Mobilization**

A Campus Ecological Network  
Perspective on Unequal Outcomes



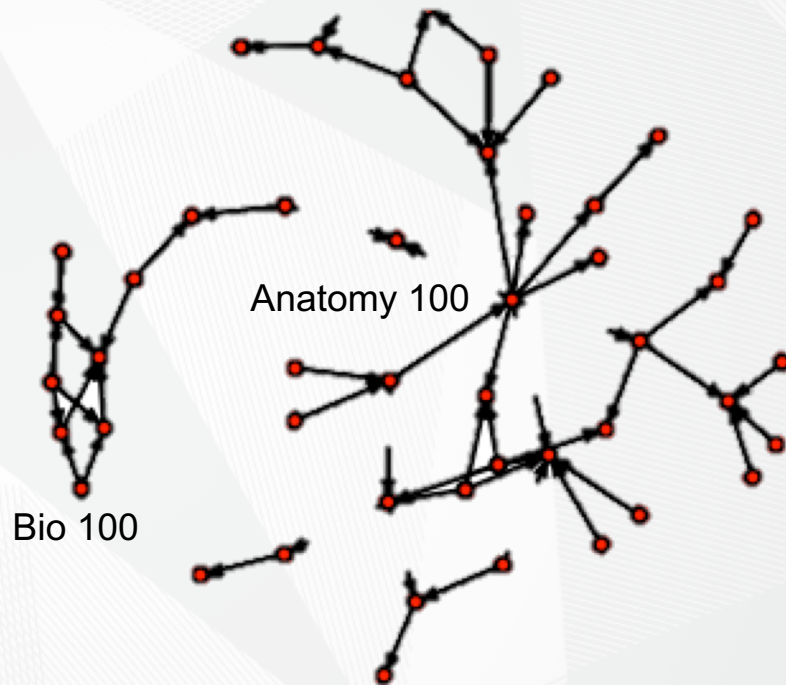
# Student Success Transfer Dyads

Kalamazoo**VALLEY**<sup>™</sup>  
community college



Dyad 8 Year Bachelor's Completion Rate: 8%  
*-Department of Education, 11/9/23*

Life Science  
Guided Pathways  
Course Network  
at Suburban CC



Sequential Enrollment Course-Taking  
Graph

# Methodology

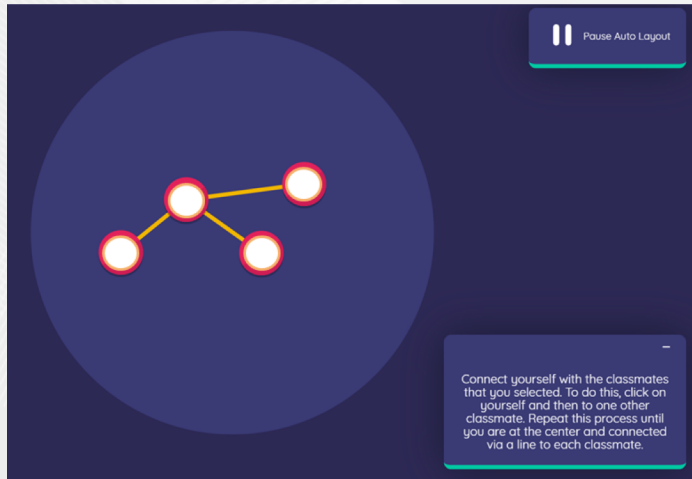
- Longitudinal network study of Life Science student cohorts
- Pre- and post- test surveys each semester
- Annual retrospective interview

## *Network Instruments:*

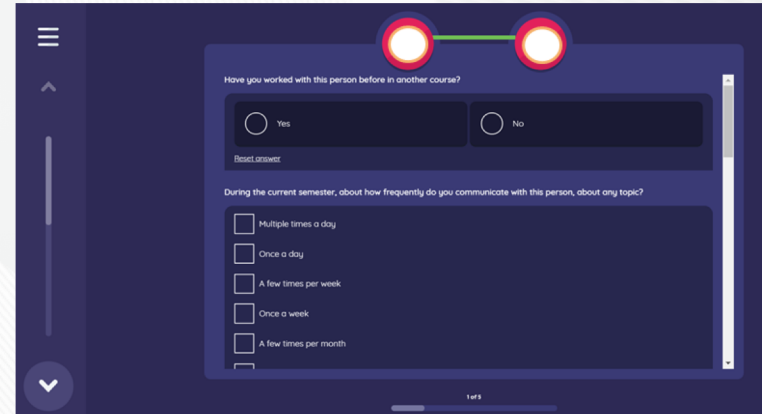
- Core Discussion Network (Small, 2019 adapted from General Social Survey)
- Unequal Networks (Bidart et al., 2021)

# Network Canvas Interviewer

## Network Prompts



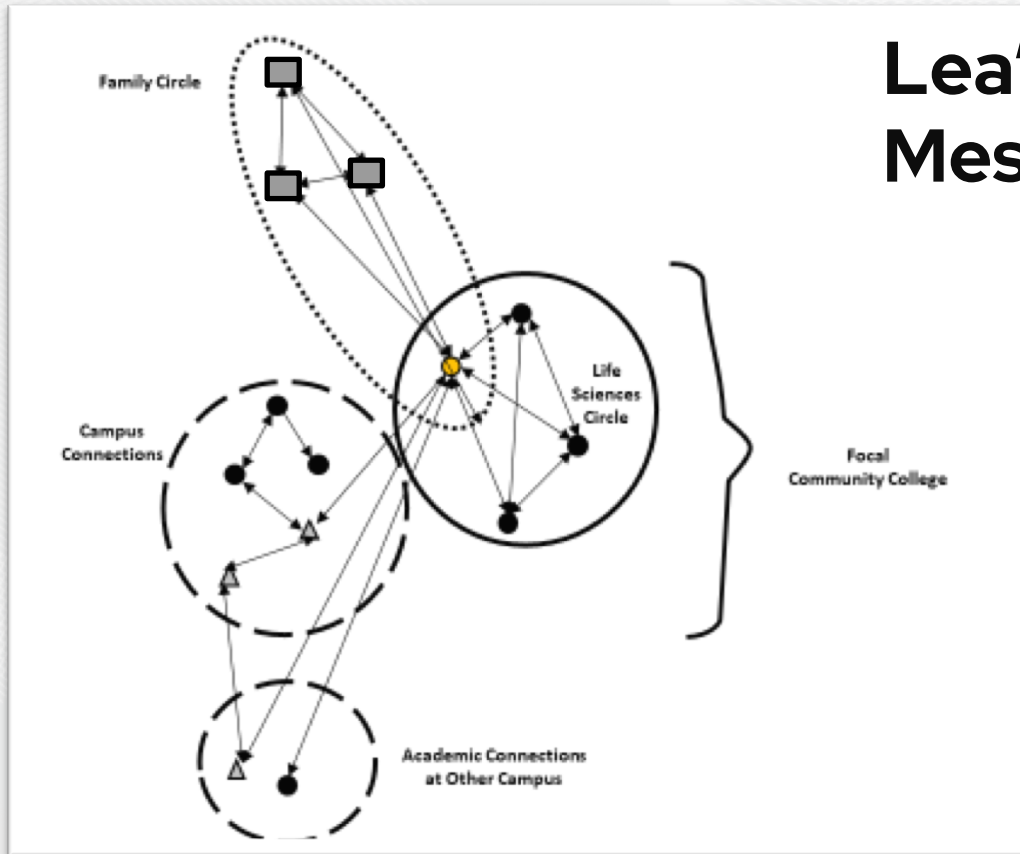
## Tie Based Prompts



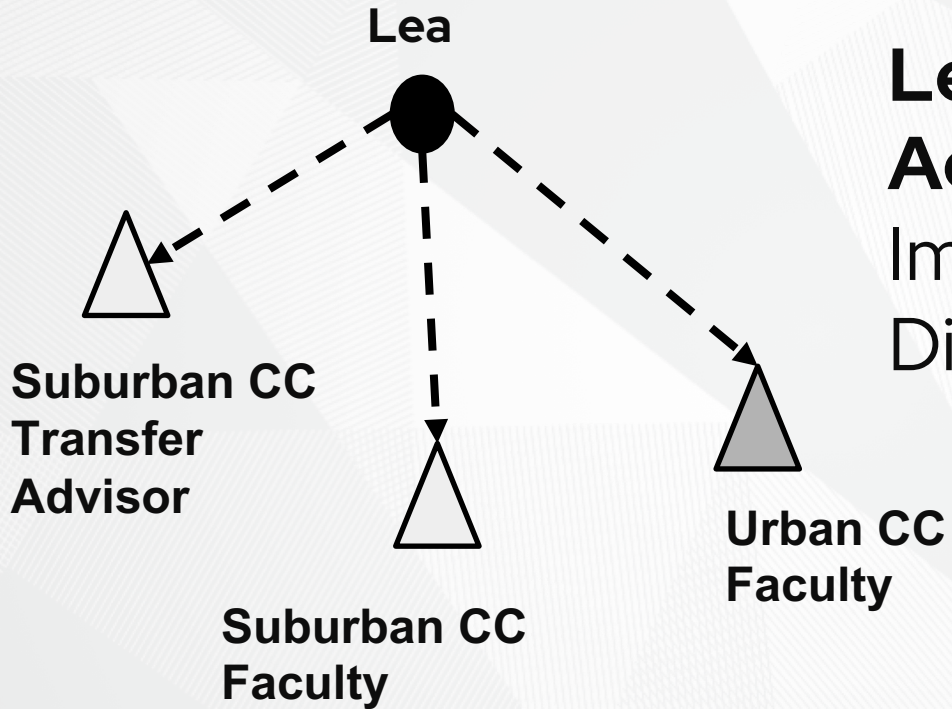
# Lea: 3<sup>rd</sup> Semester Student

- Life Science Pathway
- Chose to start at Suburban CC to wait out 'social distancing' policy
- Member of campus Life Science student organization
- Aspires to a PhD in Bio-Chemistry
- Lives in easy walking distance from Suburban CC

# Lea's Mesosystems



Key	
● Focal student	↔ Socio-academic
● Student	⋯↔ Social only
△ Instructor	↔ Academic only
□ Parent/Sibling	↔ Academic only



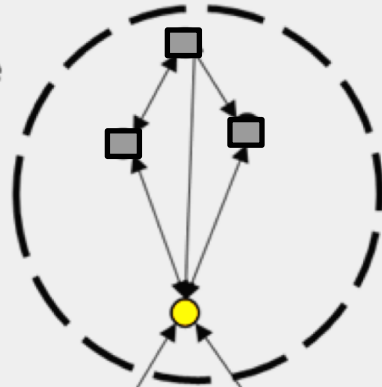
## Lea's Transfer Advice Network: Imbalance & Dissonance

# Dave: 2<sup>nd</sup> Semester Student

- Splits course taking equally between Suburban CC and Urban CC
- Works full time as a home health aide
- Takes courses across the Life Science and Health Science pathway
- Aspires to be a Nurse Practitioner
- Uses public bus systems for commute



Family and  
Friends  
Social Circle



Exam Prep  
Mobile App

Transfer  
Advisor

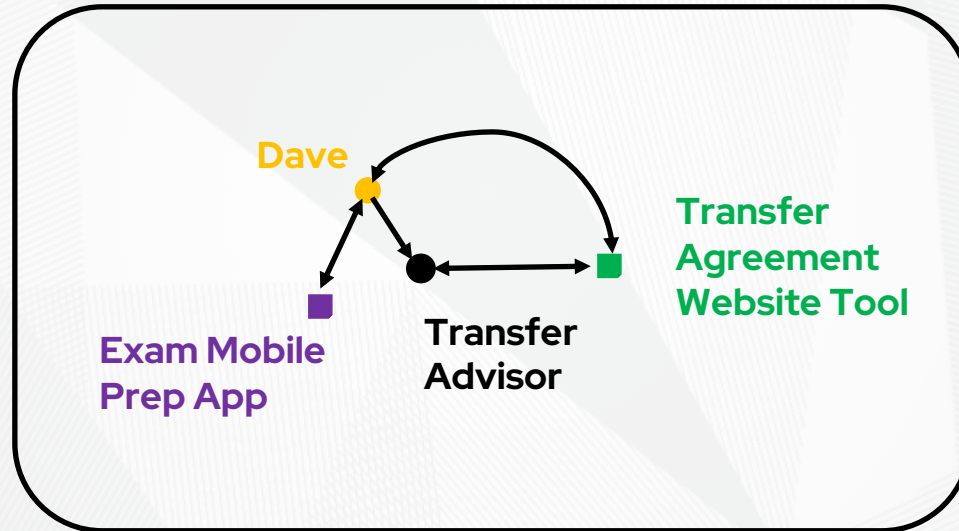
## Dave's Mesosystem

Key	
● Focal student	↔ Socio-academic
● Student	⋯ Social only
△ Instructor	↔ Academic only
□ Parent Sibling	



**Dave and the  
absence of a  
network**

# Enactment of curriculum through teaching technologies



Dave's Transfer Advice Network

# Non-human actors, tools, and curricular navigation

Transfer  
Agreement  
Website Tool



Exam Mobile  
Prep  
Application



- Not institutional actors
- Anti-Black Box (Benjamin, 2017)
- Opens students up to extraction, isolation, and potential harm depending on the tool

	<b>Lea</b>	<b>Dave</b>
<b>Microsystems</b>	Capacity	Digital Tools
<b>Mesosystems</b>	Split Campus Environments	Network Erasure
<b>Network Mechanisms</b>	Balance; Lack of closure	Isolation and Structural Holes
<b>Learning Process</b>	Dissonance and maintenance of aspirations	Coursework strategy development
<b>Implications for Inequality</b>	Delayed academic momentum	Minimal socio-academic integrative capacity

# Curriculum, Teaching Technologies, and Communities of Learners

- Open curricular policy and relational sources of support
- Personalization and communities of learners
- Ecologies of learning and development and non-human actors
- Who gets technology and who gets human centered interaction?

# Future Directions



Ongoing longitudinal research on student networks and curricular navigation

- S-STEM 2022-2029
- Department of Education and Transfer Dyad Measures
- College and Beyond II Data

# Future Directions



Non-human agents in  
undergraduate teaching  
and learning

- NSF Human Technology Frontier
- UM Academic Innovation
- ACLS Data Justice Grants



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**Thank You!**