

# **“Technology Transfer and Academic Entrepreneurship: Lessons Learned and New Directions”**

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# ASU's Global Center for Technology Transfer (GCTT): -The “Traveling Wilburys” of Technology Transfer

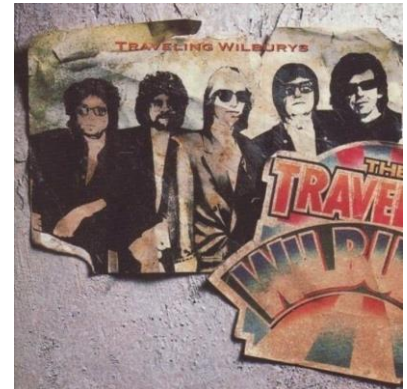
## ❑ Co-Executive Directors

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- [Maribel Guerrero](#) (Associate Professor -- SPA)

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# How is GCTT *Unique*?

- 1. Interdisciplinary (multi-level research)**
  - organizational behavior/human resource management/leadership
  - economics/strategy/productivity/performance
  - public policy
  - entrepreneurship
  - geography/economic development
- 2. Multi-sectoral**
  - universities
  - federal/national labs and public research organizations
  - multinational firms and startups
- 3. Global**
  - partners in multiple countries and regions
- 4. Innovative educational programs**
  - a focus on topics not typically covered in technology transfer/entrepreneurial training (e.g., organizational and management issues)
  - non-degree programs/certificates/lifelong learning
    - ❖ an emphasis on first-generation, Hispanic, African-American, Indigenous individuals

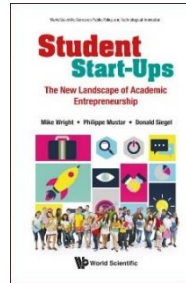
# Key Stylized Facts from the Academic Literature on University Technology Transfer/Academic Entrepreneurship



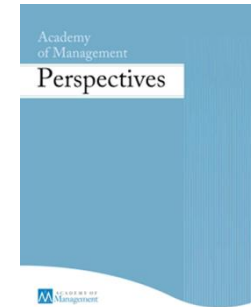
Siegel (2006)



Link, Siegel, &  
Wright (2015)



Wright, Mustar, and  
Siegel (2019)



Balven, Fenters, Siegel,  
and Waldman (2018)

- ❑ Universities increasingly focusing on entrepreneurship, rather than simply patenting and licensing, including property-based institutions (i.e., incubators/accelerators and science/technology parks)
- ❑ Rapid growth in student entrepreneurship
- ❑ Most major research universities have developed a complete innovation/entrepreneurial ecosystem
- ❑ Some faculty members are not disclosing inventions to TTO (tension between faculty and administration)

# **Key Stylized Facts from the Literature on University Technology Transfer/Academic Entrepreneurship (cont.)**

- ❑ Critical factors in university technology transfer “performance”:**
    - incentives (e.g., royalty distribution formulas)
    - social networks, especially networks of “star scientists”
    - institutional policies
    - organizational/department culture
    - TTOs can play an important educational role in promoting commercialization and entrepreneurship (best when business schools are connected to TTOs)
  - ❑ The literature on university technology transfer is mainly focused on the “macro” (institutional) level (dominated by economists and sociologists)**
- ⇒ We need more “micro”/OB/HR research on this topic**

# **New Directions: Organizational/Psychological Issues in Technology Transfer and Academic Entrepreneurship**

**(Balven, Fenters, Siegel, and Waldman, 2018-AMP; Waldman, Valount, Siegel, Rupp, 2021-JAP ); Choi, Siegel, Waldman, and Mitchell, 2022, RP); Siegel and Guerrero, 2021, JMS)**

- ❑ More Focus on Federal/National Labs/PRIs (not just univs)**
- ❑ More Focus on Post-Docs, not just Faculty**
- ❑ Role of Organizational Justice**
- ❑ Entrepreneurial Identity**
- ❑ Motivation and Role Conflict**
- ❑ Lab managers (faculty PIs) as Leaders/Champions**
- ❑ Work-Life Balance**
- ❑ Diversity, Equity, and Inclusion**
- ❑ Cultural Assimilation of Foreign-Born Scientists**
- ❑ The Impact of the Government's Response to the Pandemic on TT and AE (and all the variables mentioned above)**

## OB Paper Example-

### “The Role of Justice Perceptions in Formal and Informal University Technology Transfer” (Waldman, Vaulont, Balven, Siegel, Rupp-*Journal of Applied Psychology*, 2022)

- ❑ **Key Impediment to Technology Transfer-Tension between faculty and the university administration (e.g., TTO)**
- ❑ **Formal Technology Transfer**
  - Patents
  - Licensing activity
  - Startup creation/incubation
- ❑ **Informal technology transfer (“bypassing” the university TTO)**
  - Via consulting Link, Siegel, and Bozeman (2007)
  - Other types of bypassing activities, with or without invention disclosure Siegel, Waldman, Link, Atwater (2004)  
Markman, Gianiodis, & Phan (2006, 2008)

# Organizational Justice

(Perceptions of equity and fairness in the workplace)

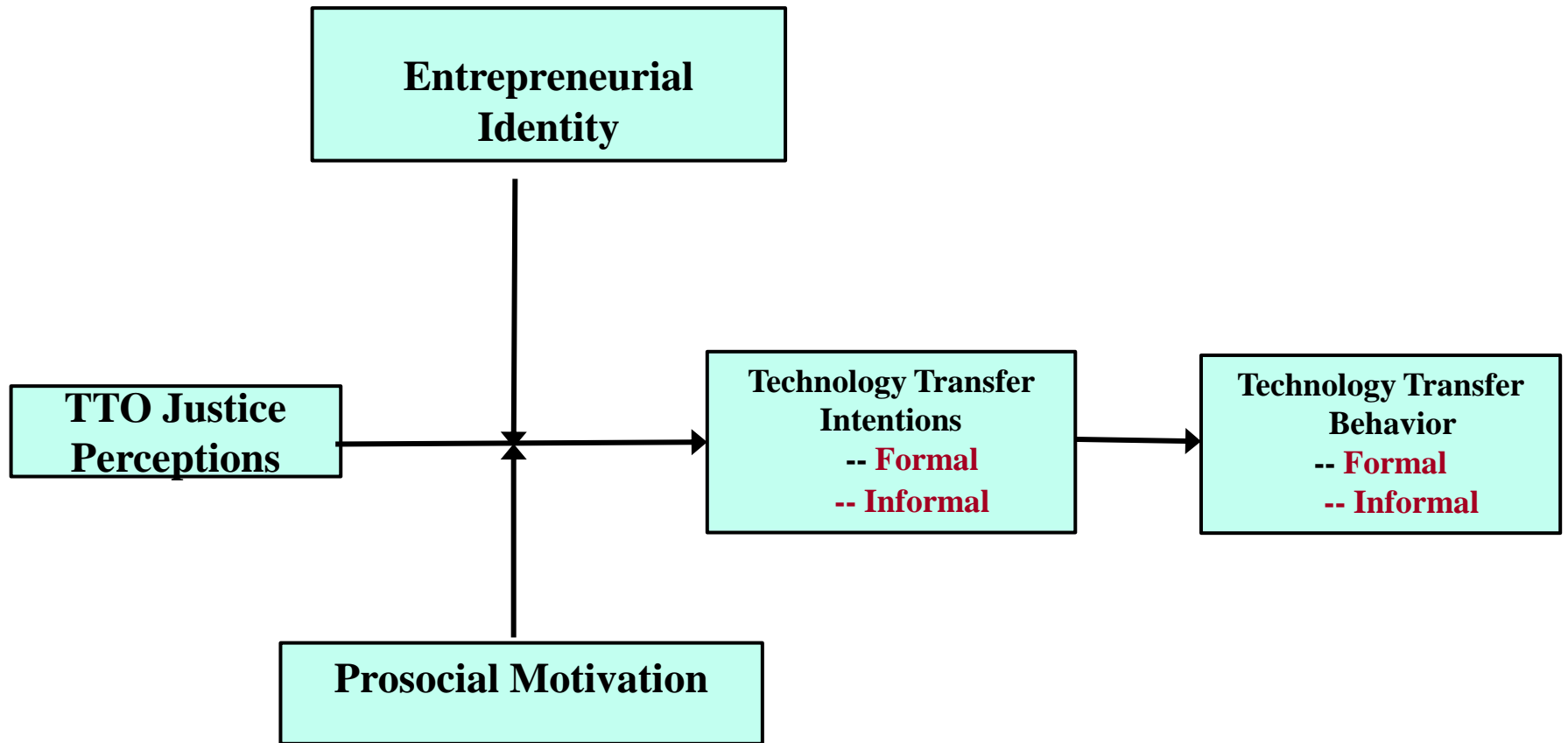
## *Dimensions:*

- ☐ Distributive justice
- ☐ Procedural justice
- ☐ Interactional justice
  - interpersonal
  - informational

## *Theoretical Framework:*

- ☐ Faculty justice perceptions of TTO
  - How these justice perceptions affect formal and informal technology transfer intentions and outcomes
- ☐ Justice sensitivity (which variables affect this?)





# Mixed Methods

## ❑ *First stage – Semi-structured Interviews*

- ❑ 5 major research universities

- ❑ 55 scientists and engineers, department chairs, and/or TTO personnel

## ❑ *Key Take Aways From Qualitative Analysis*

- ❑ Organizational justice and identity are likely to be important in explaining ITT (“bypassing”) and lack of technology transfer effort on the part of faculty

## ❑ *Second Stage – Surveys*

- ❑ 30 major research universities

- ❑ Faculty, post docs, department chairs, center directors, and TTO personnel

## ❑ *Three Waves of the Survey July 2016, April 2017, April 2020)*

- ❑ Final sample—18,446 faculty, 830 department chairs and center directors, and 581 technology transfer office personnel

- Response rates: 2,000 (11%) faculty, 102 (12%) department chairs and center directors, and 176 (30%) technology transfer office personnel

# Empirical Results, Conclusions, Extensions

## 1. Justice Matters

- Organizational justice (OJ) perceptions with regard to a university's TTO predict both formal and informal technology transfer intentions and outcomes of academic entrepreneurs

## 2. Effects of moderators (based on justice sensitivity)

- High Entrepreneurial Identity strengthens the Justice → TT relationship
- High Prosocial Motivation weakens the justice → TT relationship

## 3. Extensions (current research)

- Impact of the Pandemic on TT and the relationship between OJ and TT, and other “micro” factors (e.g., DEI, Identity, Championing/Leadership, WLB)
- The Roles of Ambivalence and Organizational Support in TT