Measuring a multidisciplinary science center with citations

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Evaluation of Institutionalized Research

Georgia Tech Enterprise Innovation Institute

- Science policy has commonly used citations in assessing science (Glanzel et. al. 2006)
- There are several issues with this (e.g., Bornmann and Daniel 2008)
  - Incentives for self-citation
  - Field effects
  - Time lags
  - Journal visibility
- These issues are intensified when applied to multidisciplinary science centers
  - Citations are biased toward single discipline research (Rafols et al. 2012)

Citations and centers

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- Does the center serve as a knowledge diffusion mechanism?
- Does it diffuse knowledge more quickly?
  - The center's research attracts outside attention
  - The center amasses excellent researchers who become aware of and cite the work

Bibliographic Coupling

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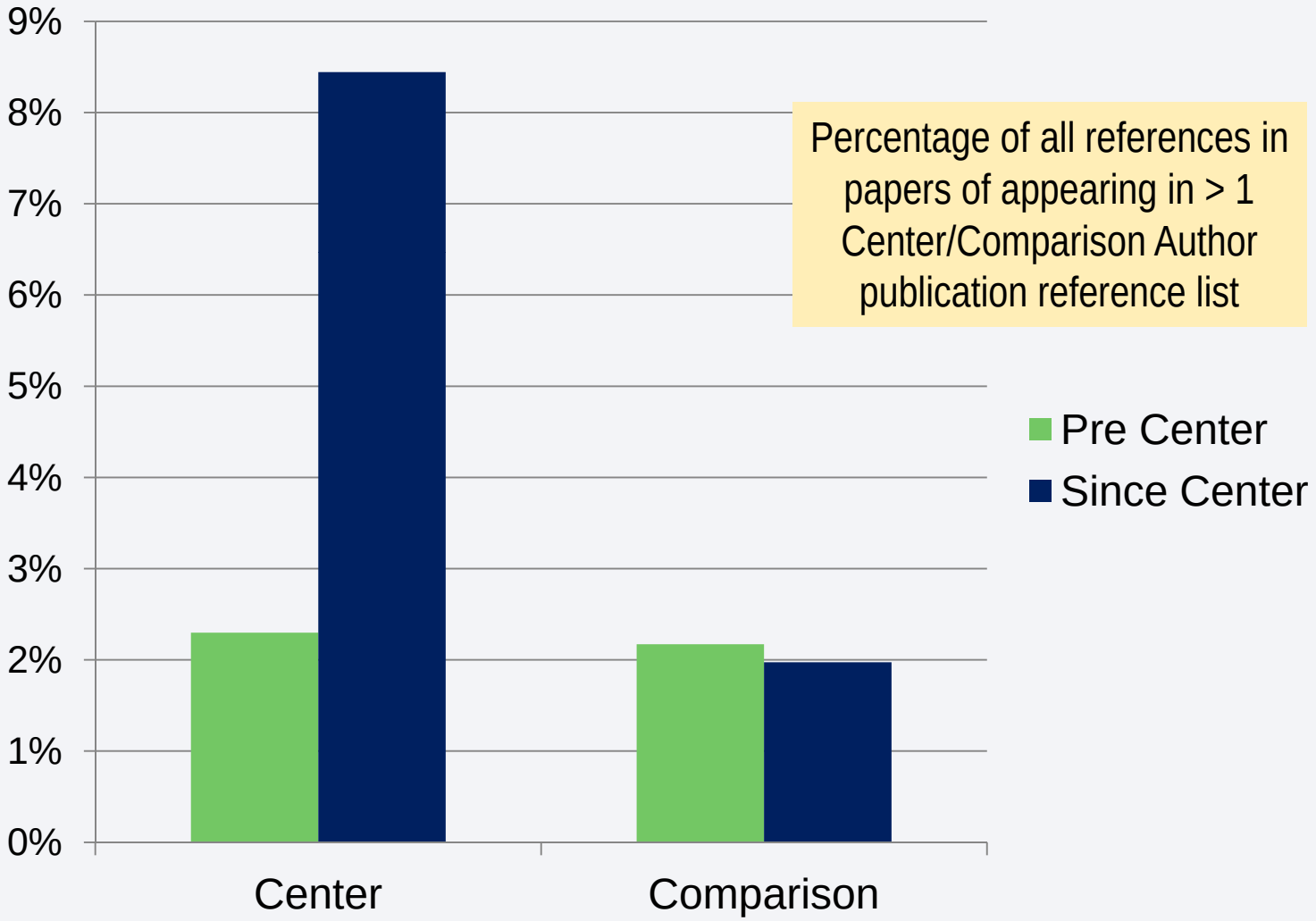
Shared References Among Center Leads Nearly Quadrupled Since Center Creation

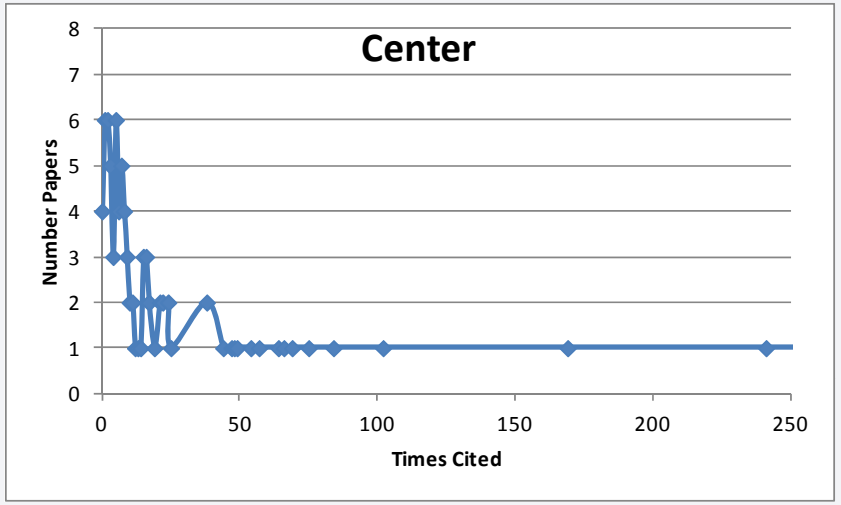


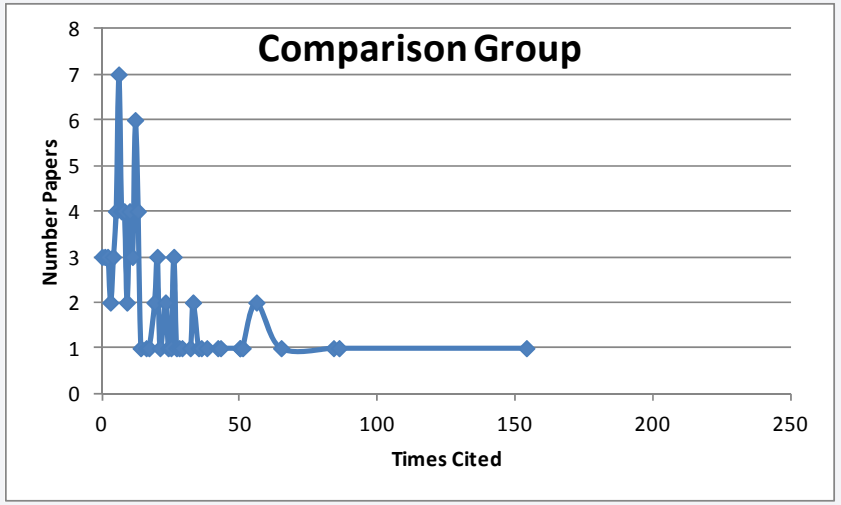
Measuring citation timing

- Prestigious articles are more likely to be cited quickly (Bornmann and Daniel 2010)
  - v. Rogers (2010): highly cited nanotechnology articles received both quick and lagged citations
- In looking at timing, self-citation is an issue
  - More prominent at meso and micro levels (Glanzel et al. 2006)
  - Significant in the earliest years, declining over time (Rousseau 1999)
  - Positively related to number of authors (Aksnes 2003, Schubert et al 2006)

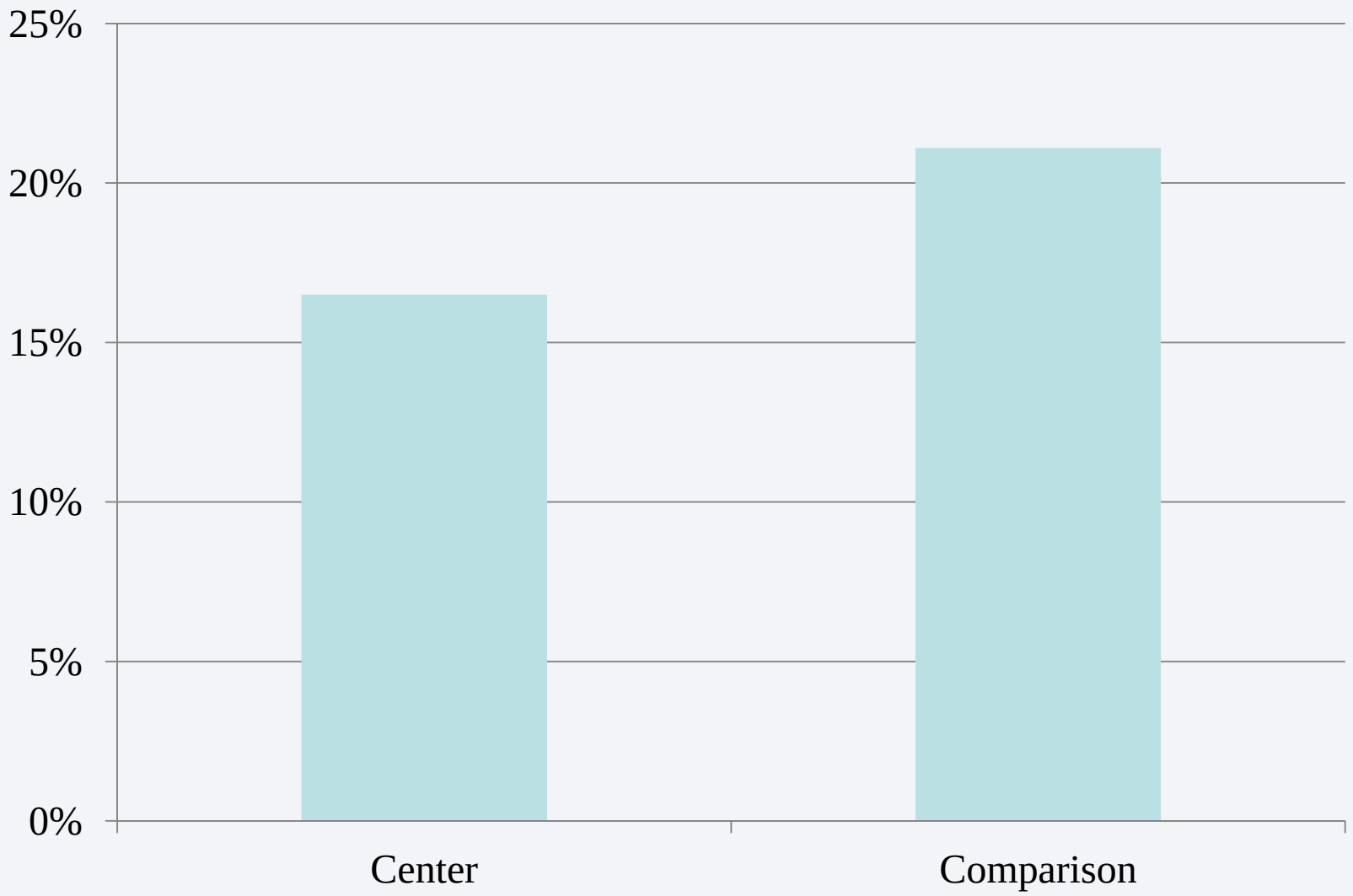
Data sources

- Two Datasets
  - Publications of Center from 2005-2009 in Web of Science
  - Comparison Group: Random sample of articles in same journals in the top Center-related journal subject categories for same time period
- Citation distribution similar
  - Mann Whitney U, $p > .10$
  - Center: more highly cited papers (mean=9.6, median=2)
  - Comparison: fewer low cited papers (mean=8.3, median=3)

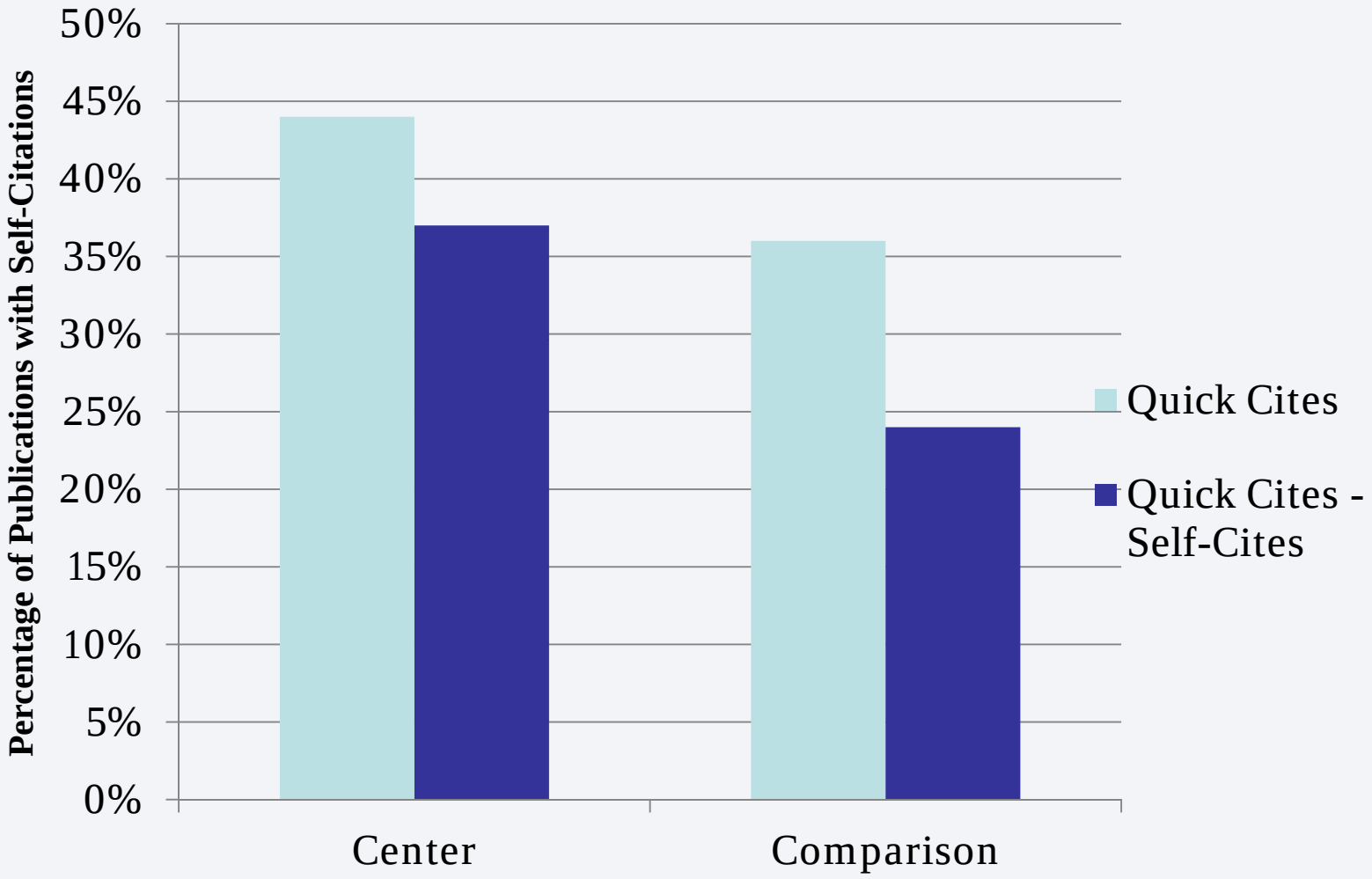




Self-Citations



Early Citations



Model

Quick cites = *f* (center, number of authors, pubyear, field)

where,

Center is 1=center, 0=comparison

Number of authors is total number of authors

Pubyear is year of publication

Field dummies:

- psychology=1
- neuroscience=1
- education (reference category)

For self-citations

- Quick no self=Quick cites – Self-cites

Descriptives

Variable	Mean	Std. Dev.	Min	Max
quickyear	0.4	0.5	0	1
center	0.5	0.5	0	1
numberofauthors	3.7	2.1	1	16
psychology	0.3	0.5	0	1
neuroscience	0.4	0.5	0	1
education	0.2	0.4	0	1
publicationyear	2007	1.4	2004	2009
quicknocites	0.3	0.5	0	1

Number of observations = 175

Model

Variables	quickyear	quicknocites
center	+	+
number of authors	+	(+)
psychology	+	+
neuroscience	+	+
publication year	+	+
Constant	-	-
Pseudo R2	.13	.09
Log Likelihood	102.5***	107.6**
Observations	175	175

Standard errors in parentheses
64% correctly classified (quickyear); 68% correctly classified (quicknocites)

The probability of a quick citation is 18% higher for centers, 25% higher without self-citations (based on marginal effects)

Implications

- Centers not just to perform research but also as a diffusion tool
- Centers are not citing their own research
  - Only 3 of the center's quick cites came from other center members
- Centers also accelerates signals of important publications