



# Using Doctoral Dissertations for A New Understanding of Disciplinarity and Interdisciplinarity

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## ABSTRACT

This paper displays a preliminary result of studying disciplinarity and interdisciplinarity based on a new source of data: doctoral dissertations. Using doctoral dissertations across more than a century, this paper aims to report the overall development of disciplines and the interaction among disciplines. Preliminary results demonstrate significant increases in the number of disciplines across the 20<sup>th</sup> century and the level of interaction among disciplines. This poster focuses on the 30 highest producing disciplines and examines the dependency of these disciplines on other disciplines (where dependency is measured by the proportion of dissertations within that discipline that are also labeled with another discipline).

## Acknowledgement

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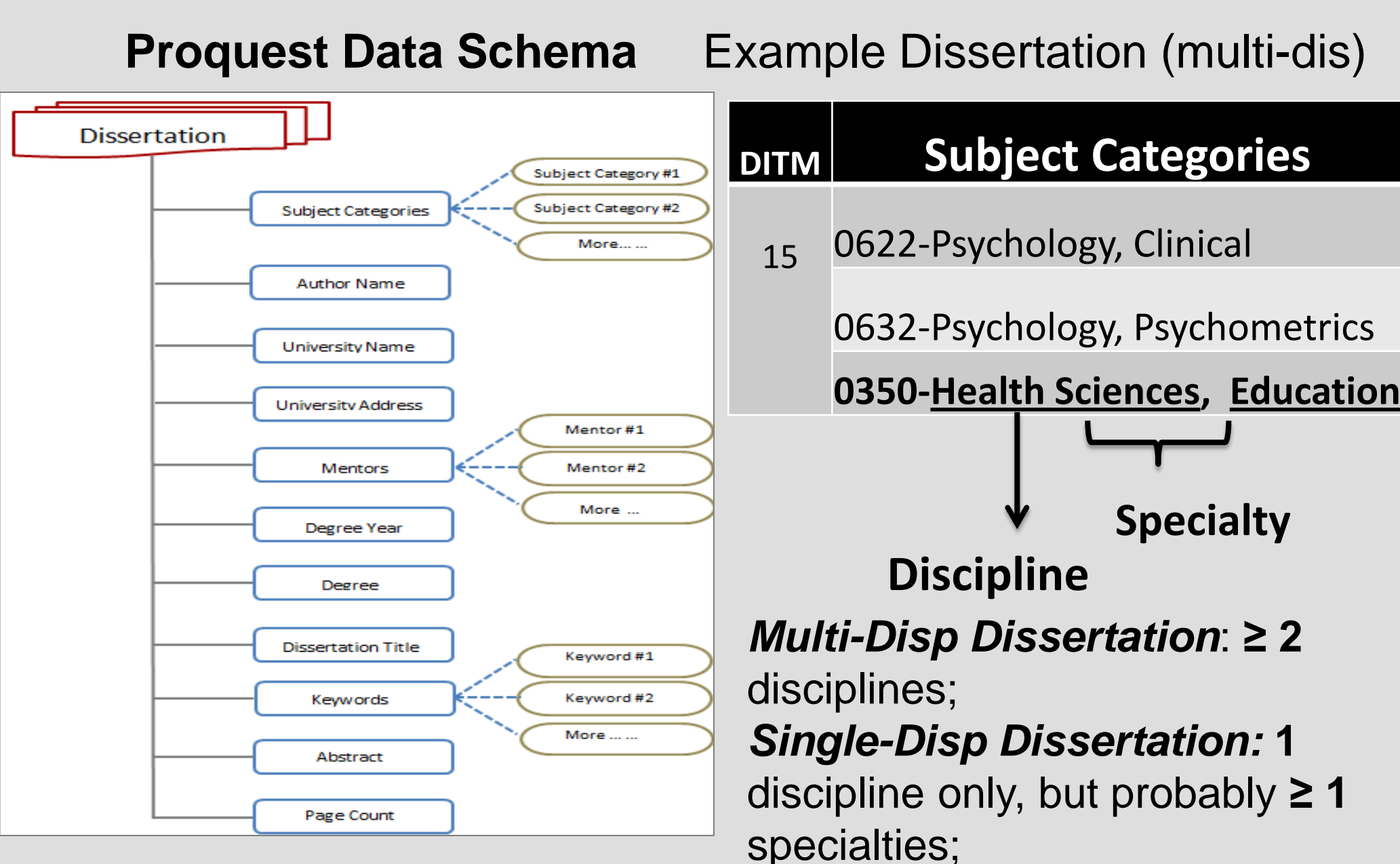
## INTRODUCTION & MOTIVATION

**Journal articles** have provided the primary data source for describing the scientific landscape, but produced biased knowledge map. When working with Web of Knowledge data, disciplines which produce high rates of journal articles become grossly overrepresented and disciplines with different types of output are omitted or marginalized.

**Doctoral dissertations** can enhance our current understanding of the landscape of science for several reasons. **Firstly**, all research disciplines produce dissertations. Therefore, this genre does not favor certain disciplines over others. **Secondly**, each individual produces only a single dissertation in each discipline. Therefore, dissertations are not skewed in the direction of subdomains or authors who might be inordinately prolific. **Lastly**, dissertations are heralded as a student's original and independent contribution to the research landscape. We should, therefore, expect dissertations to provide indicators of innovation and novelty for a discipline.

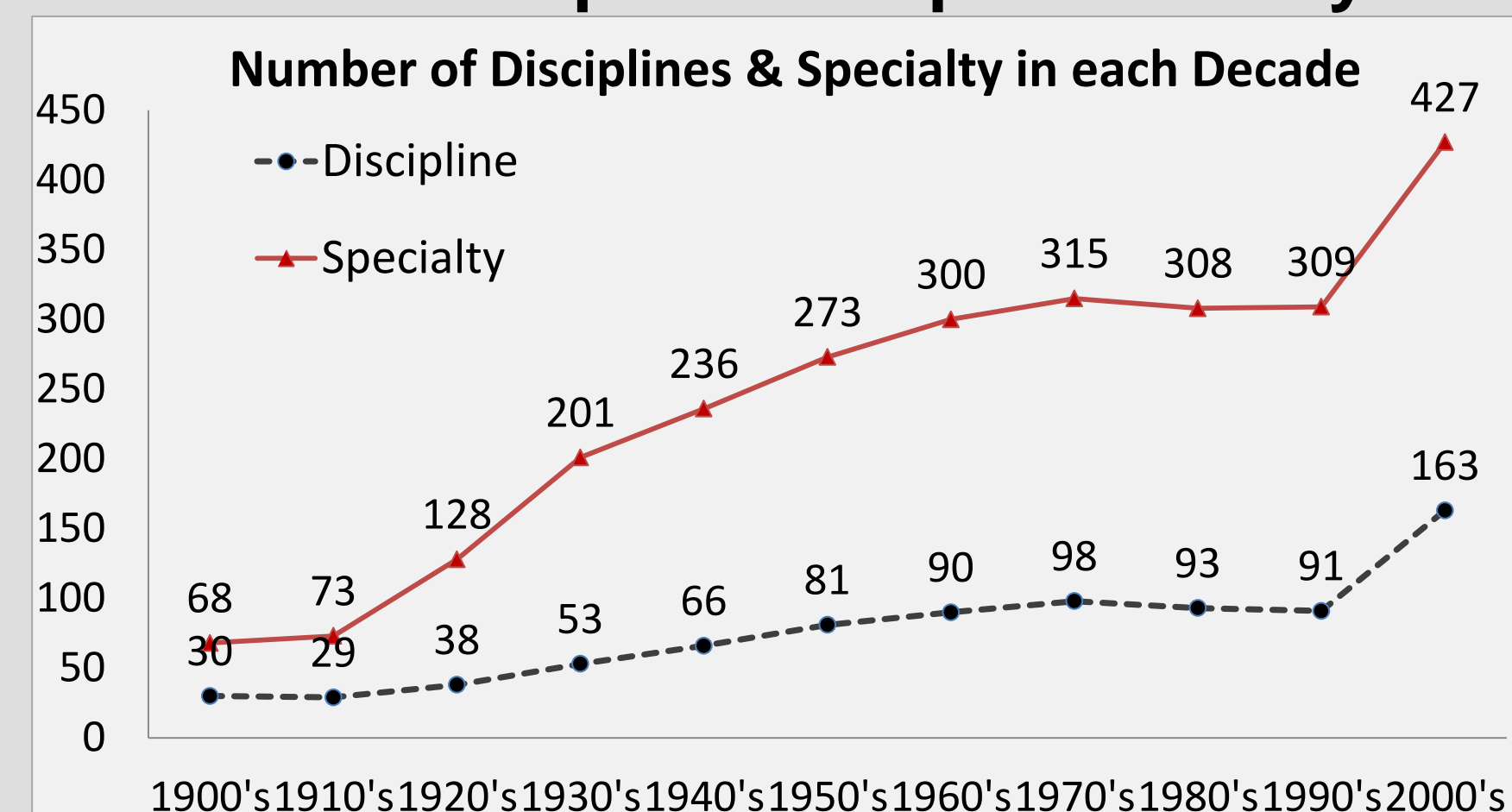
## DATA

- Over **2.3 million** dissertations provided by ProQuest;
- From **1,490** institutions across **66** countries;
- **1848-2009** Year (1900-2009 used here)
- **94** Degrees
- **166** Disciplines;
- **432** Specialties;
- **1,850,846** Research Doctorate Dissertations (80%)



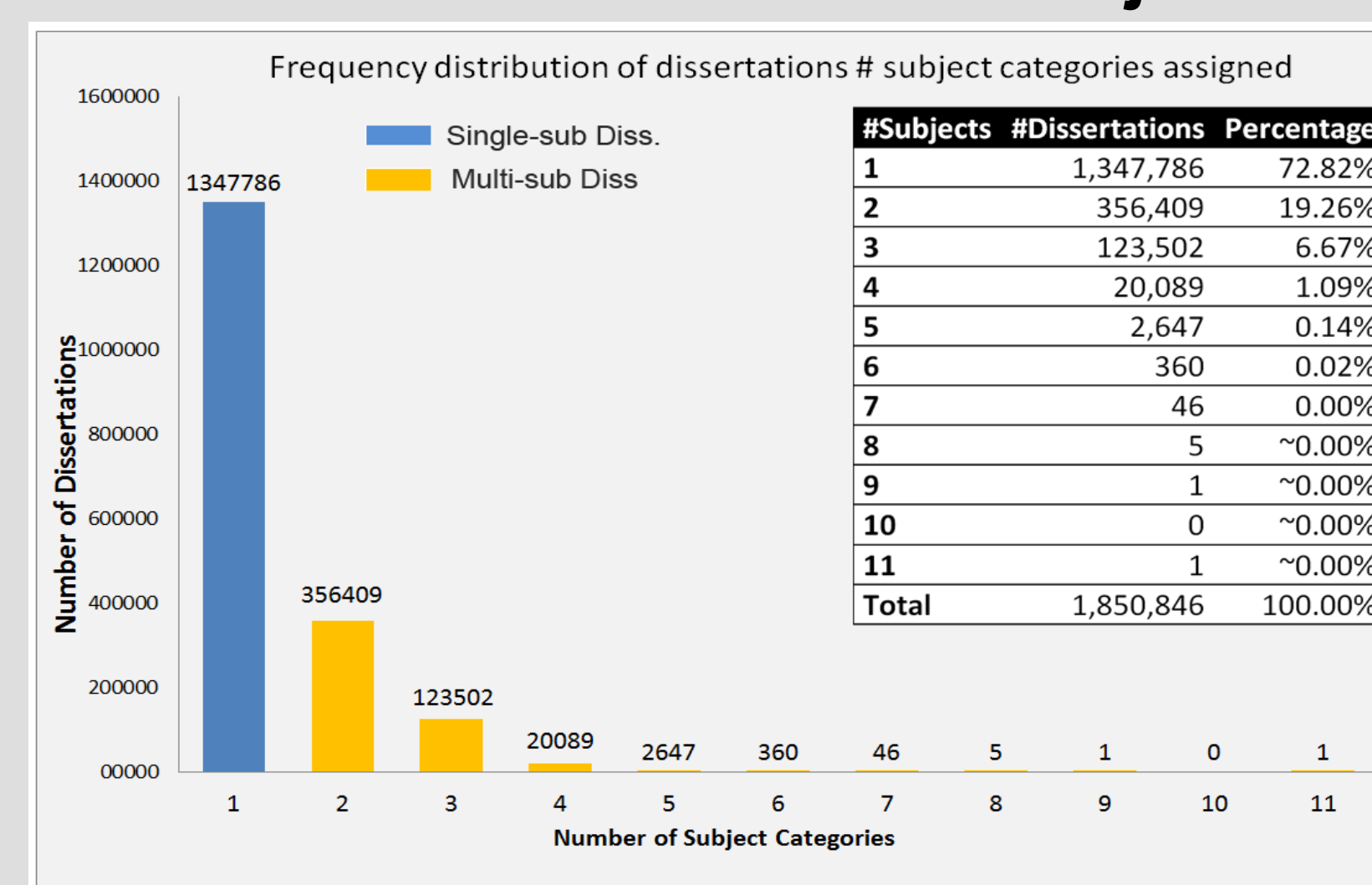
## RESULTS

### Number of Disciplines & Specialties by Decade

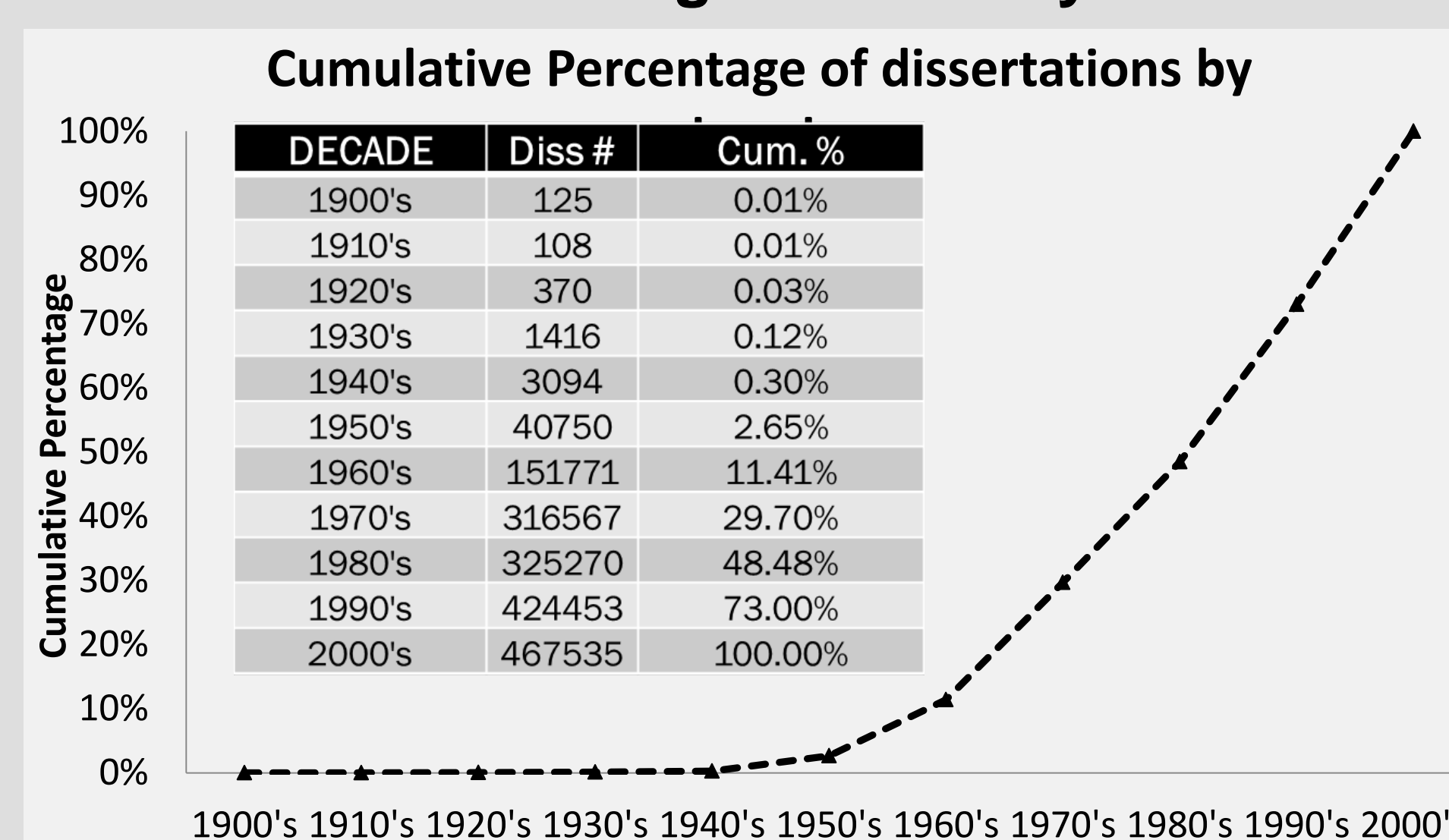


## RESULTS CONT'D

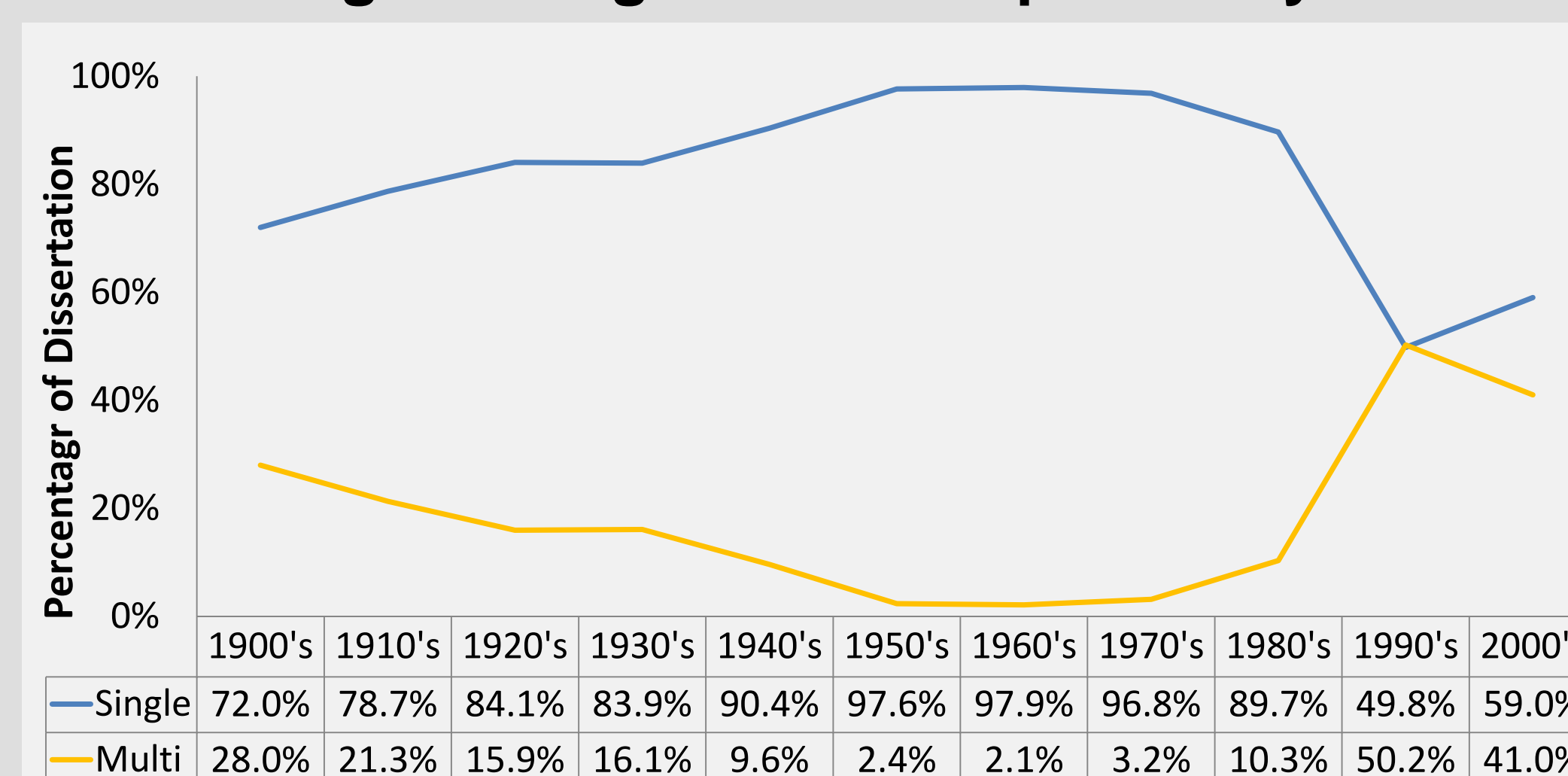
### Number of Dissertations Over Subject Categories



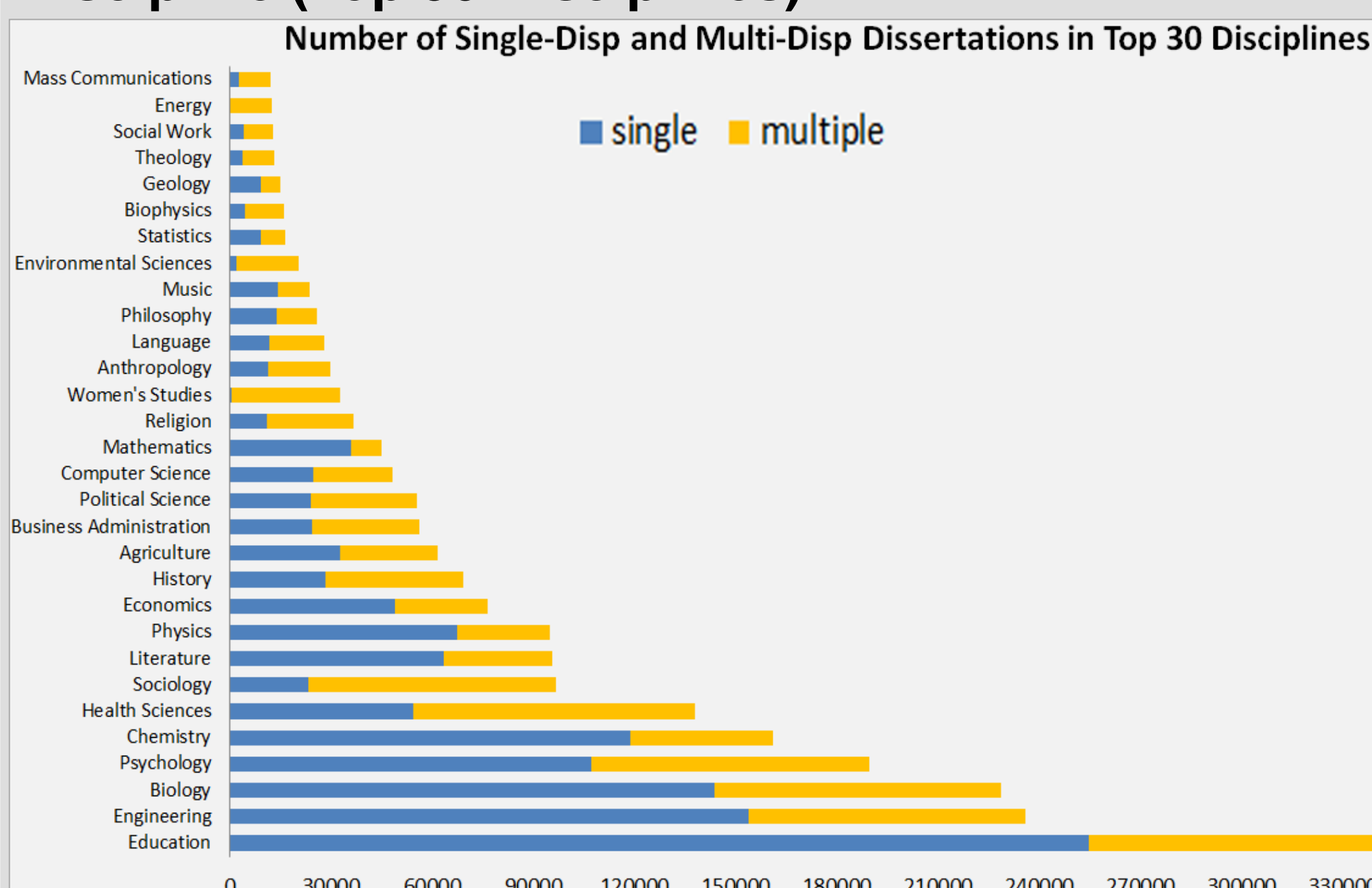
### Cumulative Percentage of Diss. by Decade



### Percentage of Single & Multi Disp Diss. by Decade



### Number of Single & Multi-Disp. Diss. in each Discipline (Top 30 Disciplines)



## RESULTS CONT'D

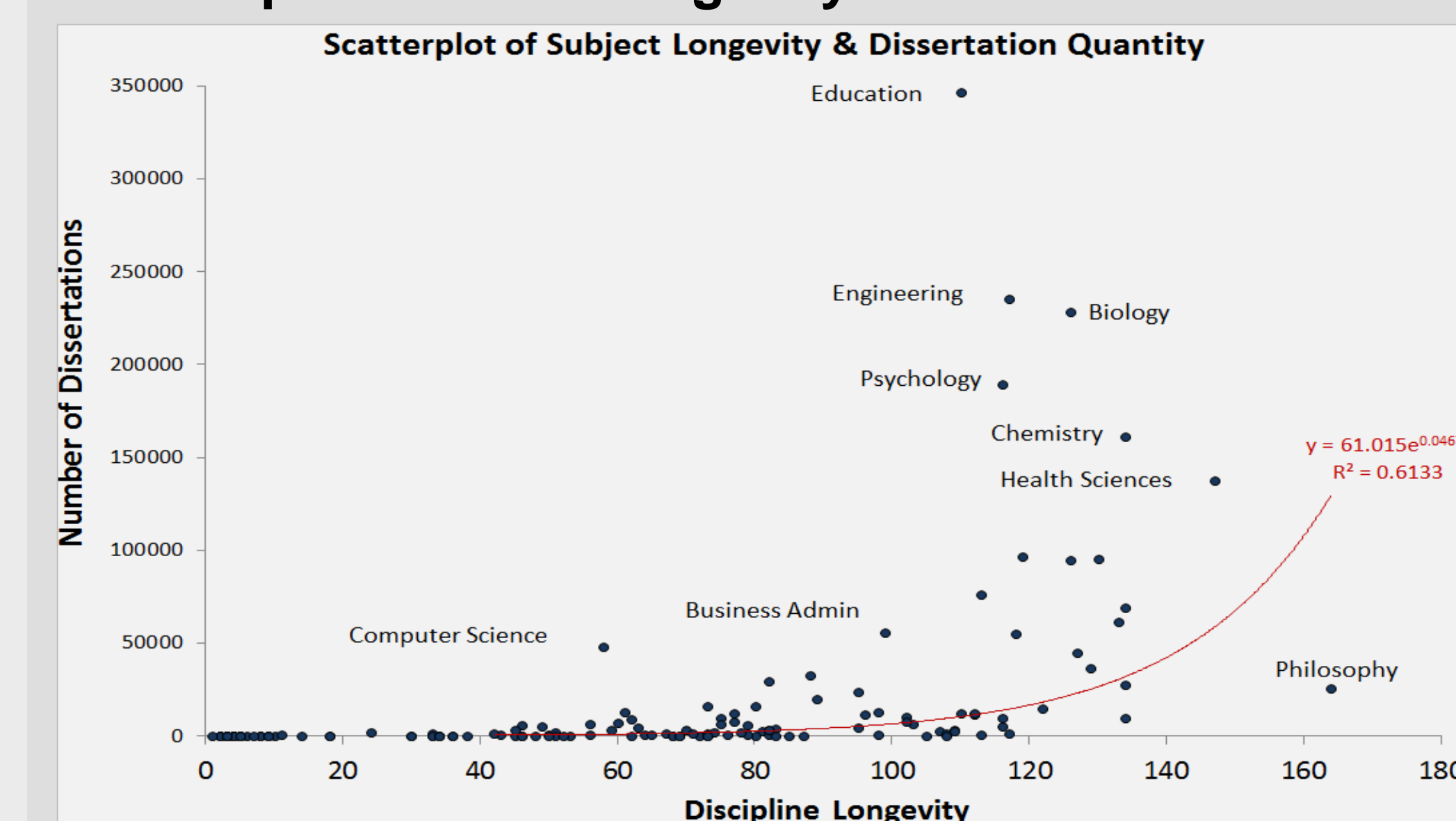
### Very Independent Disciplines (%Single Disp>60%)

Discipline	First_appear	#Diss	%Single Disp
Horticulture	1940	33	97.0%
Mathematics	1885	44,895	80.7%
Chemistry	1879	161,120	74.8%
Education	1902	346,815	74.3%
Physics	1886	94,640	71.8%
Literature	1882	95,479	67.5%
Musical Performances	1958	281	66.7%
Engineering	1895	235,819	65.7%
Economics	1899	76,319	65.1%
Biology	1887	228,783	63.8%
Geology	1890	14,833	62.2%
Music	1917	23,699	61.6%

### Completely Dependent Disciplines (%Multi Disp=100%)

Discipline	First_appear	#Diss.
Web Studies	2003	114
Latin American Studies	2002	57
Environmental Studies	2008	47
Geomorphology	2008	38
Peace Studies	2008	33
Chemical Oceanography	2008	32
Planetology	2007	26
Paleoclimate Science	2007	24
Caribbean Studies	2004	24
African Studies	2008	21
Classical Studies	2009	20
East European Studies	2007	18
European Studies	2008	15
Intellectual Property	2005	15
Near Eastern Studies	2009	12
Holocaust Studies	2008	12
South African Studies	2008	11

### Discipline Size & Longevity



## Discussion & CONCLUSIONS

- **Significant** increases in the number of disciplines across the 20<sup>th</sup> century and the level of interaction among disciplines;
- **Science** disciplines (e.g., mathematics, chemistry, and physics) bare fewer interdisciplinary features than social science and humanities disciplines
- **Many** contemporary social science and humanities disciplines (e.g., black studies and women's studies) are highly dependent.