A Preliminary Analysis of Correlates of Engineering Persistence

Results from a Longitudinal Study

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Context

- Persistence in Engineering (PIE) survey
- component of Academic Pathways Study (APS) of the CAEE
- broaden understanding of development of engineering skills and identities
- quantitative and qualitative approaches
- longitudinal research base on engineering student learning

Core APS Research Questions

- Skills
- Education
- Identity
- Workplace

Full details of research questions:

Eris, Chen *et al.*

Proc of ASEE, Portland OR, 2005

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PIE Survey

- intended to identify correlates of persistence in engineering
- administered to cohort of 160 students at four institutions
- longitudinally from first to senior year
- serves as basis for national survey (APPLES)
- preliminary data analysis from first 6 (of 7) administrations presented here

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Survey constructs

- 26 survey constructs
- items constant, constructs evolving
- track item-total correlations and internal consistencies (alphas)

Full details of development process:

Eris, Chen *et al.*
Proc of ASEE, Portland OR, 2005

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Some examples of constructs and items

1a. Academic Persistence

Do you intend to complete a major in engineering?

3a. Confidence in Math and Science Skills

Science ability

Math ability

Ability to apply math and science principles in solving real world problems

11a. Academic Disengagement (Liberal Arts Courses)

Skipped non-engineering related class

Turned in non-engineering related assignments late

Came late to non-engineering related class

Turned in non-engineering related assignments that did not reflect your best work

Please see Paper AC2007-2392 for full details and references.

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Persisters and nonpersisters

- persister: continuing to major in engineering
- overall persistence rate of 76%
- females: 80%; males: 73%
- persistence rate at institutions 68-84%

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Correlates of persistence

- compared construct scores for persisters and nonpersisters
- exploratory statistics (t-tests; $p<0.05$)
- normalized scale of 0-1 for constructs

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Persistence and motivation

- Persisters report greater academic, professional persistence
- Persisters, nonpersisters are similar in motivation due to financial reason or social benefit
- Persisters more likely to be motivated by an academic mentor

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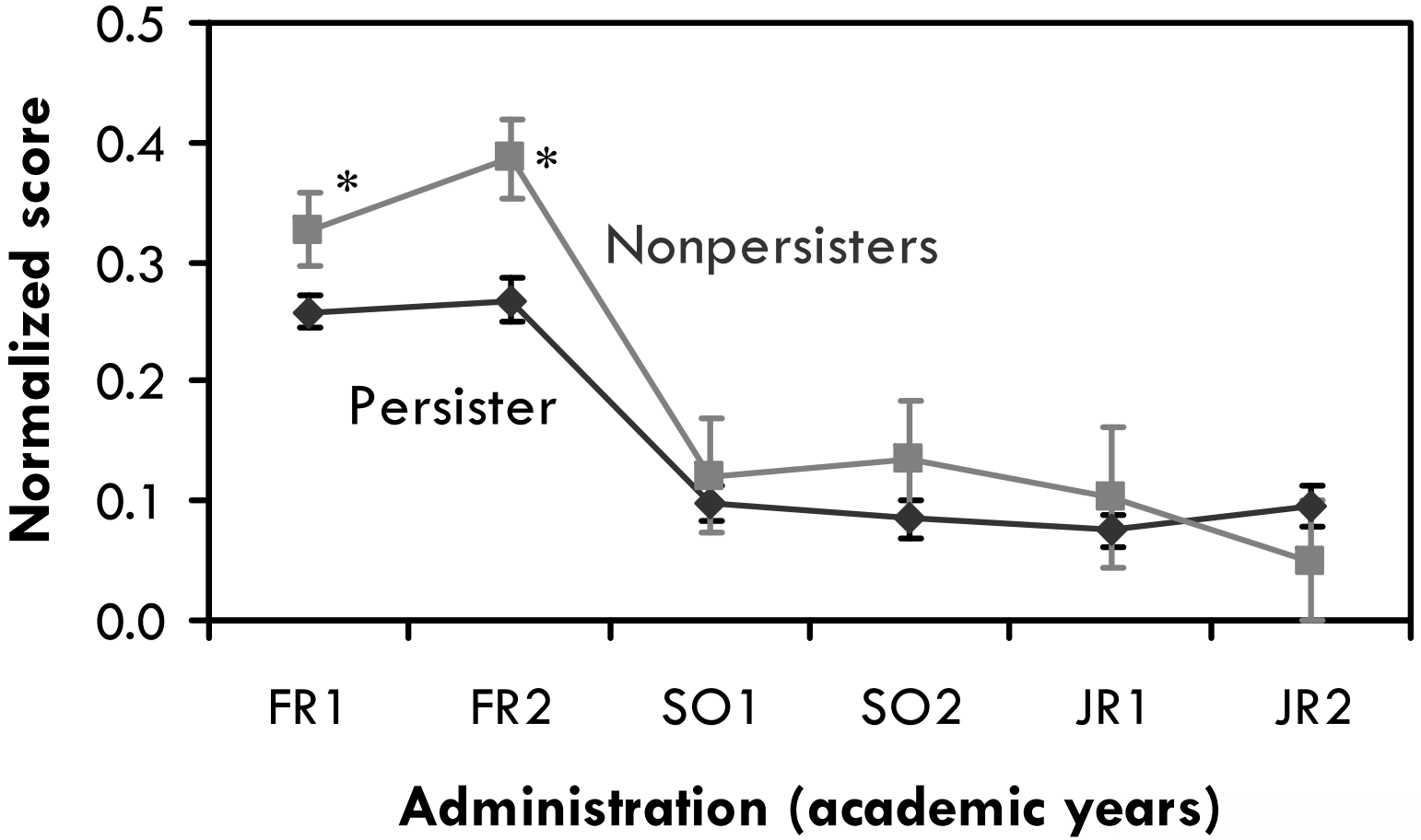
Motivation (Family Influence)



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Importance of, and confidence in, skills

- Nonpersisters and persisters rate the importance of math and science skills similarly
- Persisters rate the importance of interpersonal skills higher than nonpersisters
- Persisters and nonpersisters are similarly confident in their interpersonal skills

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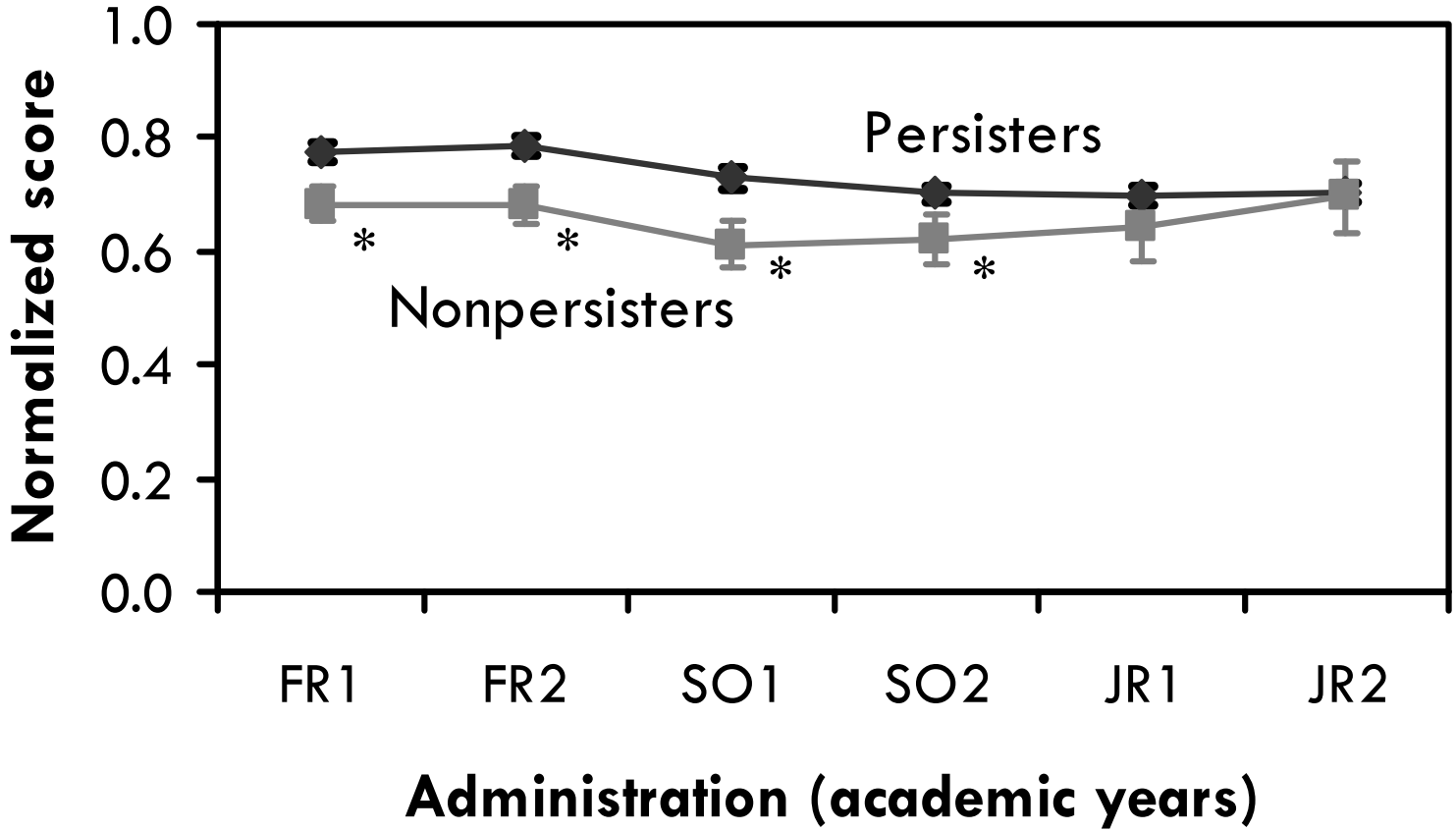
Confidence in Math and Science Skills



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Academic engagement and experiences

- Nonpersisters report higher disengagement in both engineering and liberal arts courses
- Similar degrees of interaction and satisfaction with instructors
- Persisters report a higher degree of satisfaction with their overall academic experience

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Some emerging ideas, and future work

- senior year dataset now available
- do full ANOVAs for time/subgroup effects
- break out gender, ethnicity, immigration status, institution
- incorporate information from transcripts
- early vs late persisters?

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