

# Nontraditional Measures of Talent to Address Underrepresentation: New Evidence from Old Data

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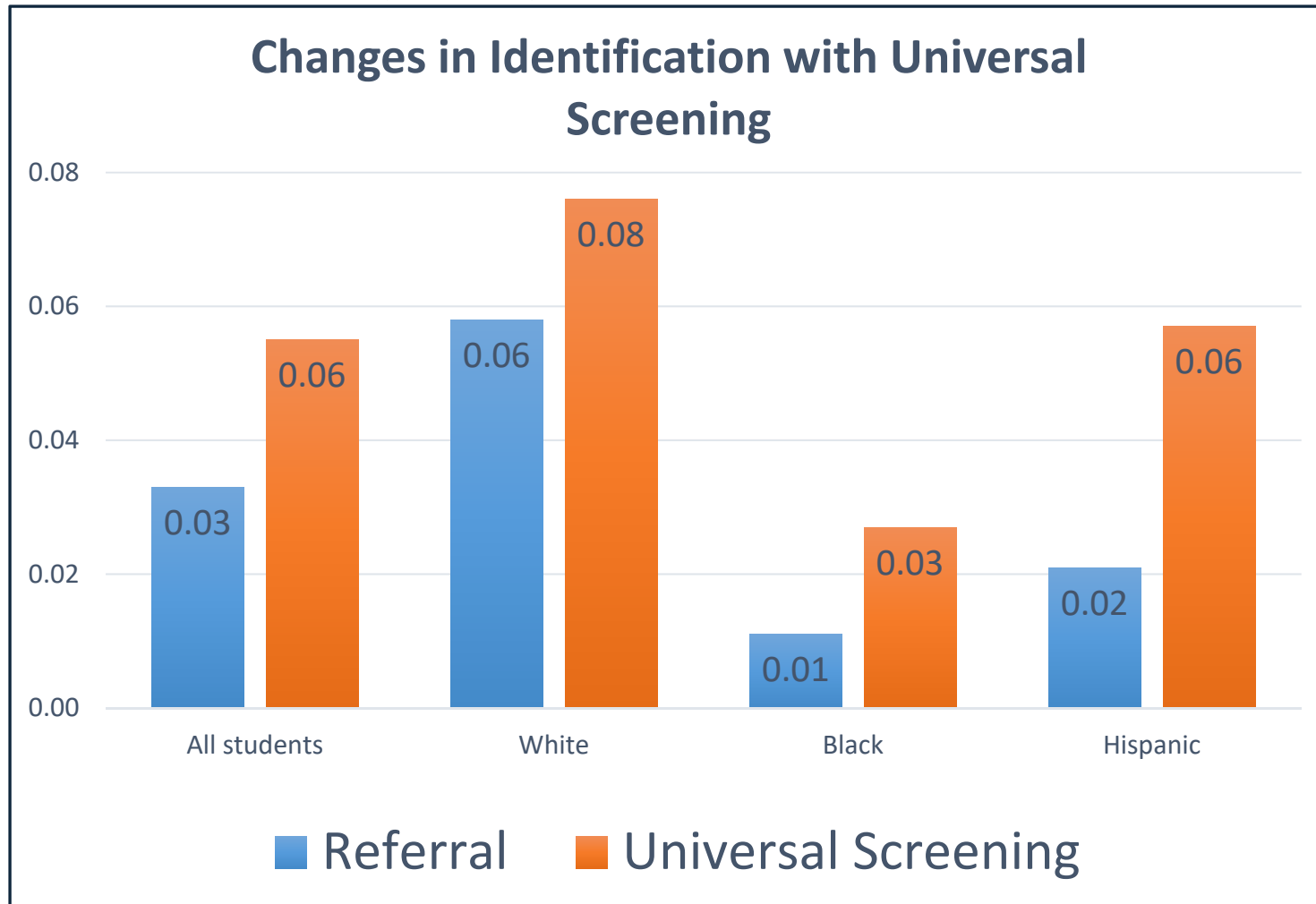
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# Background

- Universal screening is known to increase representation
  - Card & Giuliano (2015) compared **diversity of identified students** in a large Florida school district that **moved from a referral-led process to a universal screening program**.
- Assessment used for the screening are also critical for influencing the diversity of students identified
  - Lakin (2018, *GCCQ*) found that methods of combining tests affected diversity

# Impact on diversity:

Card & Giuliano (2015)

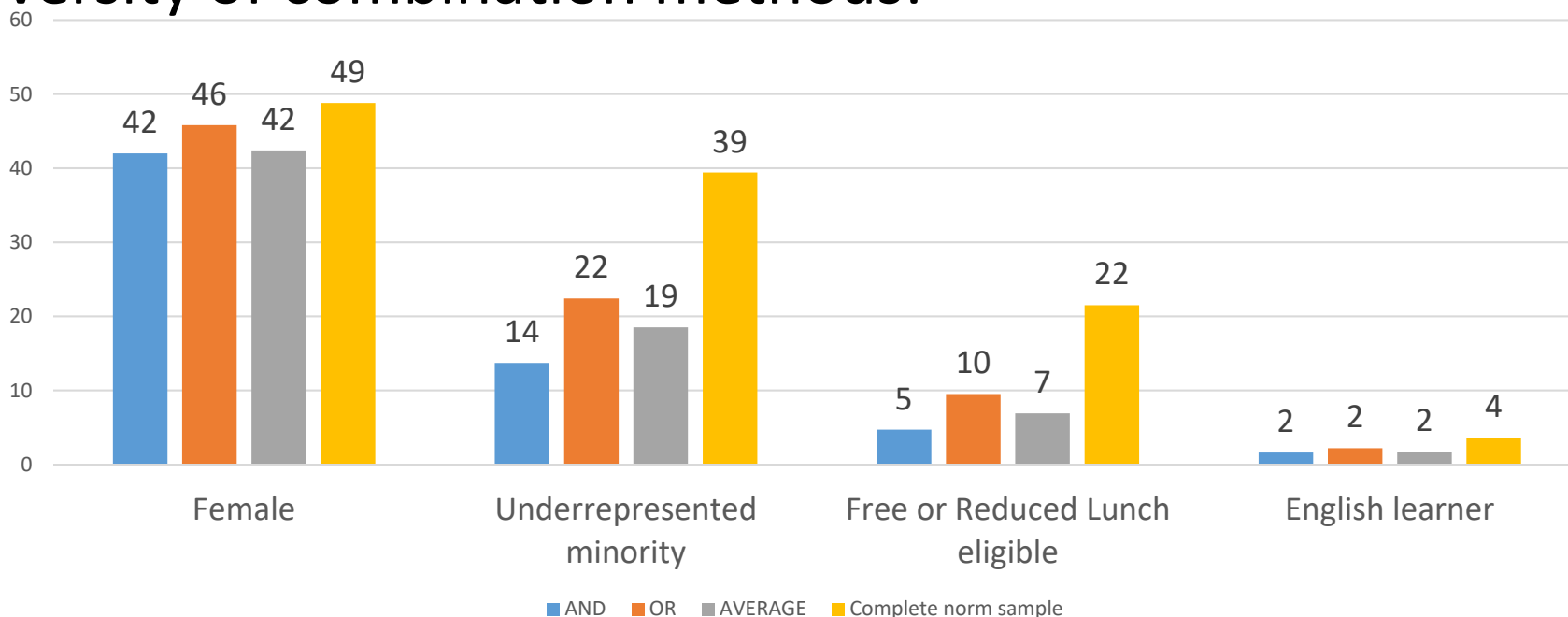


# Combining multiple scores (Lakin, 2018, GCQ)

Total identified by combination method (out of 36K)

AND	OR	AVERAGE
619	5,602	2,646

Diversity of combination methods:



# Expanding measures in “universal screening”

- Perhaps there are different—and potentially better—predictors of success in some groups not currently being measured.
- Perhaps some skills are less likely to be fully realized in some groups, hence the importance of expanding measures on which they show greater development.

# Research Questions

## **Which non-traditional measures might increase the diversity of students identified?**

- Could spatial reasoning play a role in identifying more historically underrepresented groups?
  - Is having a relative spatial strength common? Is it more common in some groups?
  - What are the curricular implications of spatial giftedness?
- Do non-cognitive attributes increase representation?

# Who is historically underrepresented or underserved in gifted and talented programs?

- Race and ethnicity: African American, Latinx
- Lower socio-economic status
- English language proficiency
- Rurality
- Gender

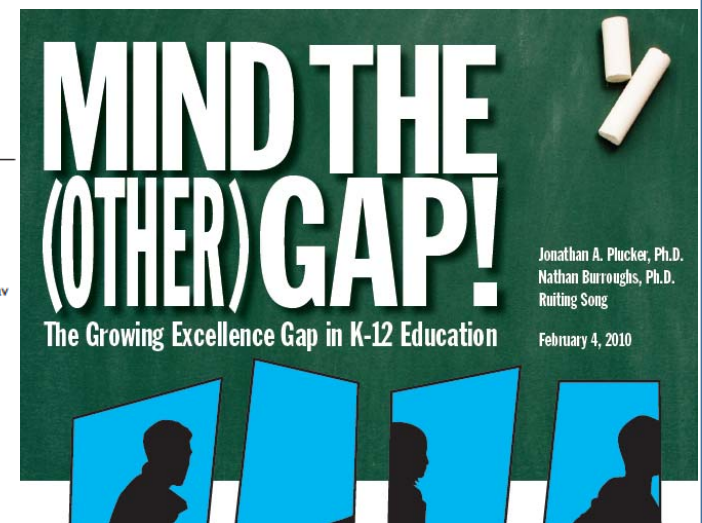
## Rethinking Giftedness and Gifted Education: A Proposed Direction Forward Based on Psychological Science

Rena F. Subotnik<sup>1</sup>, Paula Olszewski-Kubilius<sup>2</sup>, and  
Frank C. Worrell<sup>3</sup>

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Public Interest  
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SAGE



# Project Talent data

- Stratified random sample of the U.S. high school student population, grades 9, 10, 11, and 12, first identified in the 1960s. Total sample of roughly 440,000 students from over 1300 schools.
- This study examines just the publicly available baseline testing data which combined information from the 5 year follow up that asked for demographic information.
- The sample for this study was 101,306.



# Project Talent data

Variable from Project Talent		Subtests	Number of items
Academic achievement	English Composite	Spelling	16
		Capitalization	33
		Punctuation	27
		English Usage	25
		Effective Expression	12
			(113 total)
	Mathematics Composite	Math I	16
		Math II	24
		Math III	14
			(54 total)
	Reading comprehension		48
Reasoning abilities	Mechanical reasoning		20
	Visualization in 2D		24
	Visualization in 3D		16
	Abstract reasoning (figure matrices)		15
Non-cognitive traits	Creativity (word fluency task)		20
	Leadership	Student Activities Inventory	5 rating scale items
	Artistic	Student Interests Inventory	7 rating scale items

*Note.* Details provided in Flanagan et al. (1972).

# Examples of items

## CREATIVITY

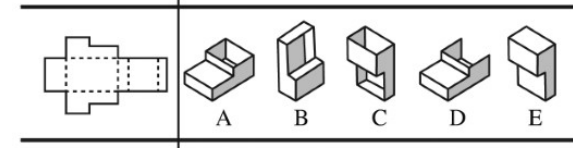
**Directions:** This is a test of your ability to think of clever and ingenious ways of doing things. In each item, you are to read the paragraph that describes the problem and think up a solution to the problem. Then you are to look at the choices and see whether one of them has the same first and last letters as your answer, and whether the number of spaces for missing letters is right. If none of the 5 choices fits your solution, try to think of another solution. When you find the answer, blacken the answer space on your answer sheet which corresponds to your choice for that item. Look at the sample problem below.

S1. A man's wife accidentally dropped her ring and it rolled under the seat of the car. The space was too narrow for the man to reach the ring with his hand. He recovered the ring by using a piece of wire to make a

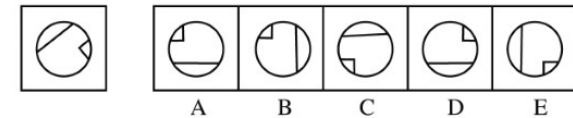
- A. b - - l
- B. s - - p
- C. h - - k
- D. s - - w
- E. v - - l

The word you should have thought of is hook, since the man could easily make a hook in the end of the wire and use it to pull out the ring. Since choice C has h and k as its first and last letters and two spaces in between for the two o's, choice C would be selected.

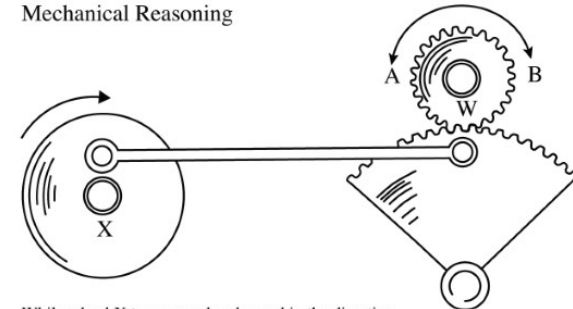
## Three Dimensional Spatial Visualization



## Two Dimensional Spatial Visualization



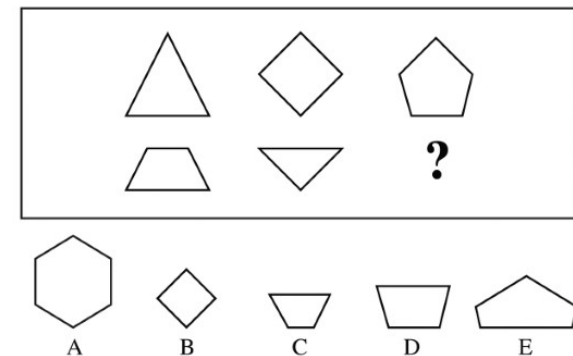
## Mechanical Reasoning



While wheel X turns round and round in the direction shown, wheel W turns

- A. in direction A.
- B. in direction B.
- C. first in one direction and then in the other.

## Abstract Reasoning



# Examples of items

Regarding the things I do and the way I do them, this statement describes me

- A. extremely well.
- B. quite well.
- C. fairly well.
- D. slightly.
- E. not very well.

1. I am the leader in my group.

## INTEREST INVENTORY

This section contains items for you to answer about occupations you would like and things you would like to do. For each item assume that you would have any necessary training or education that would be required. *Disregard salary, social standing, permanence, etc., in fact anything except how well you would like to do the work or the activity.* Your answer does *not* mean that you plan to go into an occupation if you say you would like it—only that it involves the kind of activity you think you would enjoy.

Begin now.

## Part 1: OCCUPATIONS

**Directions:** For each occupation listed below you are to consider whether or not you would like that kind of work. *Work quickly. Your first impression is the most valuable. Be sure to answer all of the items. Mark your answers as follows:*

- A. I would *like* this *very much*
  - B. I would *like* this *fairly well*
  - C. *Indifferent* or *don't know much about it*
  - D. I would *dislike* this *a little*
  - E. I would *dislike* this *very much*
-

# Score Gaps (Cohen's d)

Green < .15 SD  
 Yellow < .50 SD  
 Red > .50 SD  
 NS = Non Significant

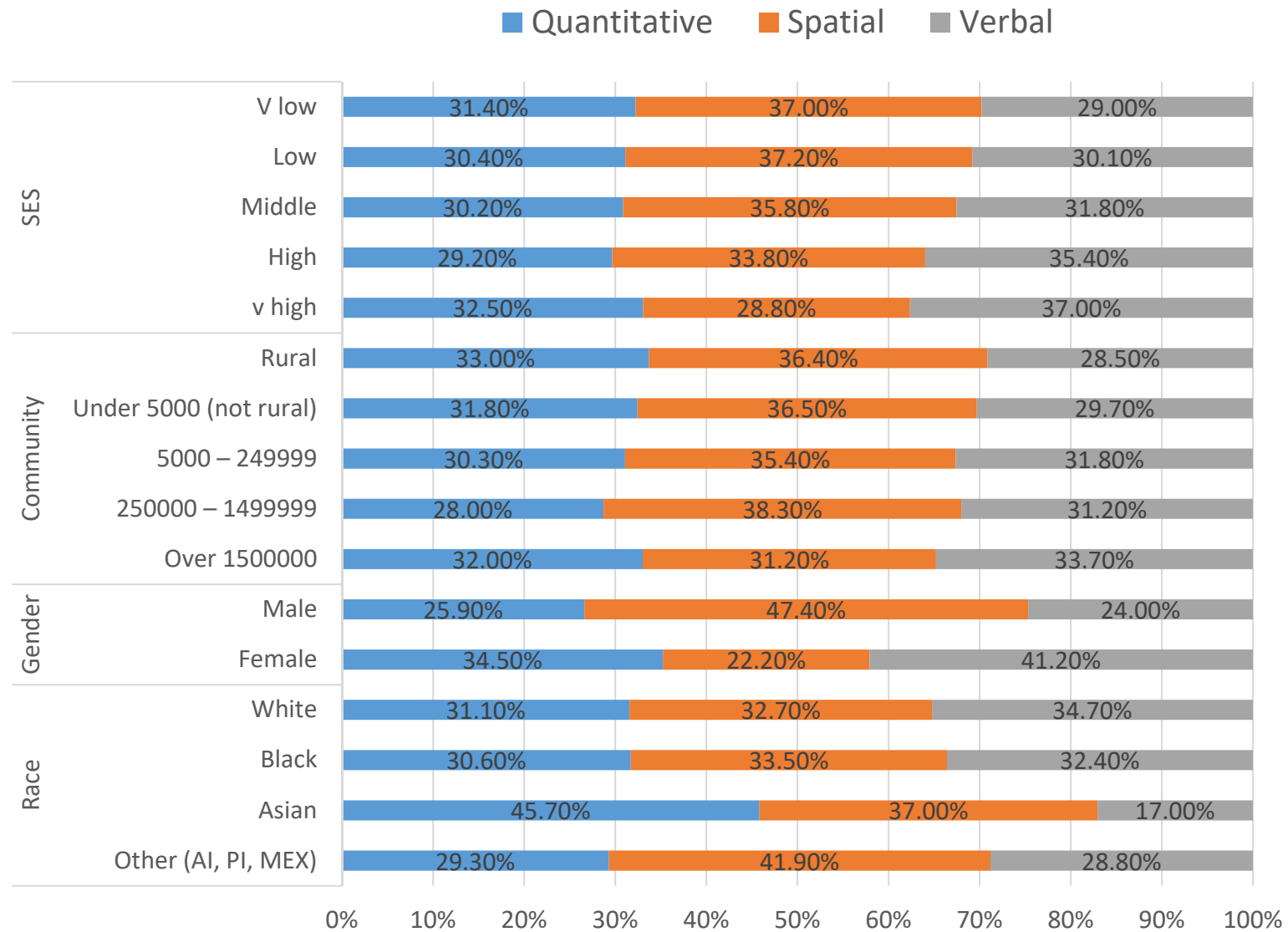
		SES	Rurality		Race	Gender
		V. High – V. low	mid-sized city – Rural	mid-sized city – Urban	White – African American	Female – Male
Achievement	English	1.16	0.30	NS	1.17	0.52
	Math	1.31	0.29	NS	1.36	-0.08
	Reading Comp.	1.39	0.38	0.04	1.31	0.15
Specific Abilities	Abstract Reas.	1.15	0.33	NS	1.21	NS
	Mechanical Reas.	0.93	0.20	0.31	1.32	-0.95
	2D Visualization	0.62	0.16	0.11	0.79	-0.31
	3D Visualization	0.82	0.20	0.16	0.93	-0.24
Non-cog.	Creativity	1.10	0.29	0.13	1.18	-0.10
	Leadership	0.43	0.02	NS	NS	0.09
	Artistic	0.33	0.13	NS	NS	0.52

# Percent of proportional representation

Green = Within 1 S.E.  
Yellow = "Closer" to proportional  
Red = Not proportional

		SES	Rurality		Race	Gender
	Focal groups: Hist. Underrep.	Very low	Rural	Urban	African American	Female
Achievement	English	19%	65%	77%	10%	<b>142%</b>
	Math	15%	63%	<b>111%</b>	6%	84%
	Reading Comp.	17%	57%	<b>106%</b>	8%	<b>103%</b>
Specific abilities	Mechanical Rs.	29%	<b>79%</b>	57%	7%	18%
	2D Viz.	<b>59%</b>	<b>83%</b>	<b>107%</b>	<b>36%</b>	68%
	3D Viz.	32%	<b>72%</b>	79%	11%	60%
	Abstract Reas.	29%	67%	<b>102%</b>	15%	<b>94%</b>
Non-cognitive traits	Creativity	21%	<b>71%</b>	80%	5%	79%
	Leadership	<b>59%</b>	<b>93%</b>	<b>131%</b>	<b>153%</b>	111%
	Artistic	<b>67%</b>	<b>74%</b>	<b>100%</b>	<b>124%</b>	153%

# Relative Strength (AKA Tilt)



# Relationship to Educational Outcomes

	Verbal achiev't	Math achiev't	Scientific- Technical achiev't	Amount of Education (5yr)
Mechanical Reasoning	0.39	0.54	0.71	.30
Viz in 2D	0.31	0.38	0.38	.20
Viz in 3D	0.39	0.50	0.48	.27
<b>Abstract reasoning</b>	<b>0.54</b>	<b>0.57</b>	<b>0.43</b>	<b>.36</b>
Creativity	0.56	0.57	0.55	.34
Leadership	0.08	0.11	0.03	.18
Artistic	0.06	0.12	0.17	.14

# Implications for curriculum

- Under achievement
  - Identifying gifts that aren't developed by typical K-12 curriculum
- Behavior issues?
  - Needs more study
- Alignment of services to those identified
  - Can't change identification without changing services
  - Today 1:15 PM - 1:45 PM: With Gail Ryser, Service-Driven Identification: Does Your Identification Process Serve Your Program Goals? Location: M100 IJ



# Conclusion

- Using the two-dimensional visualization (and perhaps spatial reasoning broadly) as well as non-cognitive measures of leadership and artistic skills may be helpful to select a broader range of students.
  - Correlation with
- Screening for these skills and providing aligned educational curricula could help improve educational performance of disadvantaged students in the pipeline.