Magnitude & Contextualization

Sebastian Tello-Trillo[1]

[1]University of Virginia

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  - Statistical Significance
  - Economic Significance
  - What is the difference?

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- This is what we'll learn how to do, but first some key concepts about sizing up estimates.

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  - Example: is a 2.4 dollar per hour raise a lot?

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  - Similar to measurement, we won't dive into, for each field or policy "What's the right comparison?", we'll answer that question in broad terms.
- Once we understand some common reference points, we'll learn tools that can help express size in a more tangible way.
  - A goal of ours is to organize the nuance on economic significance and at the same time make it something that a layperson could understand.

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  - The other important component of "sizing" an effect is number translation. This is the skill of taking a number from a scientific paper and provide new interpretations that others can understand.

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  - Let's say a paper states that a policy that occurred in 2014 has increased high school graduation rates by ***10 percentage points.***
  - How do we think about the size of this effect? Is that big or small?

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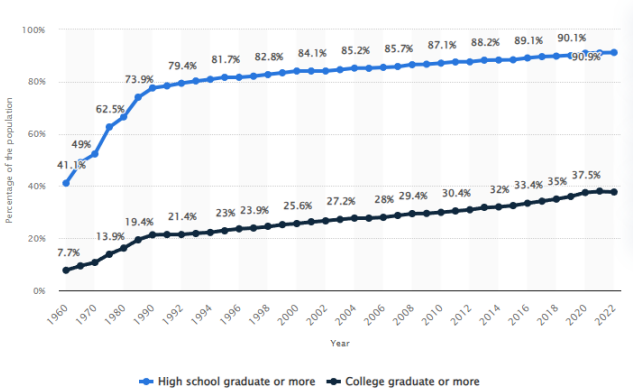

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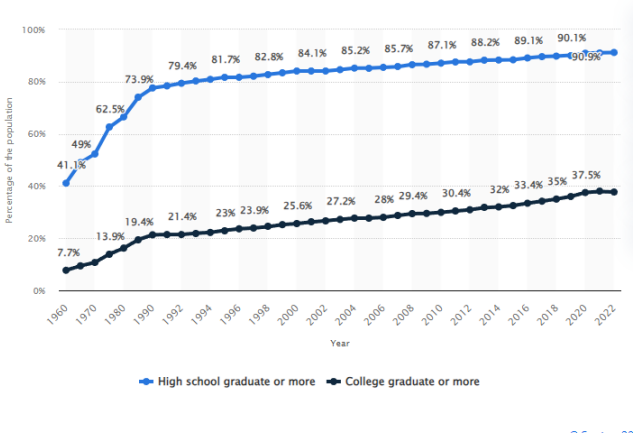

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- Could you express 10pp as a percentage change using the information above?

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3. Comparing the effect to other policies' effects

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    - ⋆ "This program increase employment by 0.01 percent."

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What would be the rate express as # of arrest per 100,000 residents?

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$$\text{Arrests per 100,000 residents} = \left(\frac{\text{Total arrests}}{\text{Population}}\right) \times 100,000$$

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$$\text{Arrests per 100,000 residents} = 350$$

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- If that's all the information we have, we stop there.

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- If we had more years of data, we could then get a better sense if that 12% was a "fluke" (too high or too low) and make better comparisons.

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What's your assessment of size for the DC policy now?

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- What is the size of the effect in percentage terms?

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- For example, let's say a policy has an effect of 0.001 in (standardized units)
- However the mean is 0.001
- What is the size of the effect in percentage terms?
- This implies 100% change, which seems very large! But in fact, maybe even a 100% change could be very small, let's say this is about measuring some toxin in the water, but the only relevant threshold is if it passes a threshold of 10, so this a 100% change may actually not be that meaningful.

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  - A large effect (e.g., 1 SD or more) indicates a substantial shift, equivalent to moving the average participant's outcome by the amount of typical variation in the dataset.

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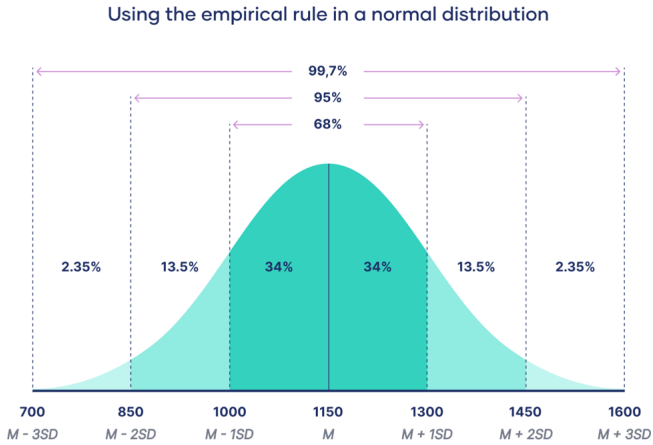

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- This means the average score rises from 70 to 75.
- Percentile Shift: In a normal distribution, a 0.5 SD change moves an individual from the 50th percentile (mean) to approximately the 69th percentile (or vice versa).

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- This only talks about "effectiveness", adding cost adds concepts of "cost-effectiveness".