Assessing measurement error in sex and gender identity measures in an NCES survey

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This presentation is intended to promote ideas. The views expressed are part of ongoing research and do not necessarily reflect the position of the U.S. Department of Education.

Introduction

High School Longitudinal Study of 2009 (HSLS:09)

- Nationally representative study of 9th-graders in 2009, followed throughout high school and into postsecondary education and early careers with a STEM focus

- 23,000+ students in U.S. public and private high schools

- Base year: Fall 2009 (9th grade)
- First follow-up: Spring 2012 (most were 11th-graders)
- 2013 Update: summer-fall 2013 (most had just completed high school)
- High school transcripts collected in 2013
- Second follow-up: 2016 (most were 3 years post-high school)

- 2016 collection modes: Web survey, CATI, and CAPI for nonrespondents and high priority cases
  - Responsive design with monetary incentives; cases such as previous-round nonrespondents and dropouts were prioritized

Gender identity (GI) questions in NCES surveys

- Initial focus group and expert recommendations suggested that gender identity measure should be “two-step”
  - Sex at birth asked first, then current gender (with more than two options)
- Reviewed extant measures – not many federal surveys asked GI at time of development
- Needed to balance ability for sample members to report identities with minimization of measurement error and burden
- Given concerns about declining response rates, the GI questions were added at the end of the survey with the demographics questions

Sex question in HSLS:09 Base year and First follow-up

Student

- What is your sex?
  - Male
  - Female

Parent

- What is [your 9th grader]'s sex?
  - Male
  - Female

GI questions in HSLS:09 Second follow-up

Gender Identity

- What sex were you assigned at birth (what the doctor put on your birth certificate)? (**select one**)
  - 1=Male, 2=Female

- What is your gender? Your gender is how you feel inside and can be the same or different than your biological or birth sex. (**check all that apply**)
  - Male
  - Female
  - Transgender, male-to-female
  - Transgender, female-to-male
  - Genderqueer or gender nonconforming, or some other gender
  - You are not sure

Initial testing of GI questions HSLS:09 Second follow-up

- Field-tested items
  - April – July 2015, Sample size=800
  - Number missing, possibly from skips or refusals, was less than 5 cases
  - Number of breakoffs on these questions was 0 cases
  - Several individuals indicated a transgender gender identity
  - Apparent issues with these items: **None**

- Cognitive testing with gender identity items
  - June – July 2015, number= 40 (12 LGBTQ)
  - Participants liked having more options
  - Participants Googled unfamiliar terms, but help text definitions were helpful
  - Simpler question stems worked better
  - Option for “something else” or “different identity” was appreciated
  - Two-step measure was confirmed to be least confusing
  - Apparent issues with items: **None**

Evaluation methods

GI questions in HSLS:09: Evaluation methods

- On the data file, variables are provided individually for each response option
  - Data users can create their own composite variables from the sex and gender information
- Responses on Second follow-up (2016) GI items were re-coded
  - Sex item response was compared to gender identity item
  - Responses on the gender identity item were evaluated and cases placed in different gender identity categories
- Sex and gender variables from Base year (2009) and First follow-up (2012) compared to variables collected in Second follow-up (2016)
  - Derived versions of variables indicating student sex that incorporated information collected from parents and schools (e.g., school roster information) were compared to student-reported data
  - Imputation information considered

GI questions in HSLS:09: Coding of response data

- Patterns of reported sex and gender information across base year, first follow-up, and second-follow-up variables were compared
  - Used to make decisions about recoding into a new gender identity composite variable

- High school variables (2009 and 2012)
  - Variables using student survey data compared to derived versions of those variables with inputs from parent surveys and school roster information used for sampling
  - Imputation flags (i.e., variables developed to help analysts identify when changes were made to an original variable) were noted

- Second follow-up (2016) sample member survey variables
  - Sex at birth (Male or Female)
  - Gender identity (check all that apply)
    - Many respondents checked more than one option and each response option was included as a separate variable on the data file

GI questions in HSLS:09: Coding of response data

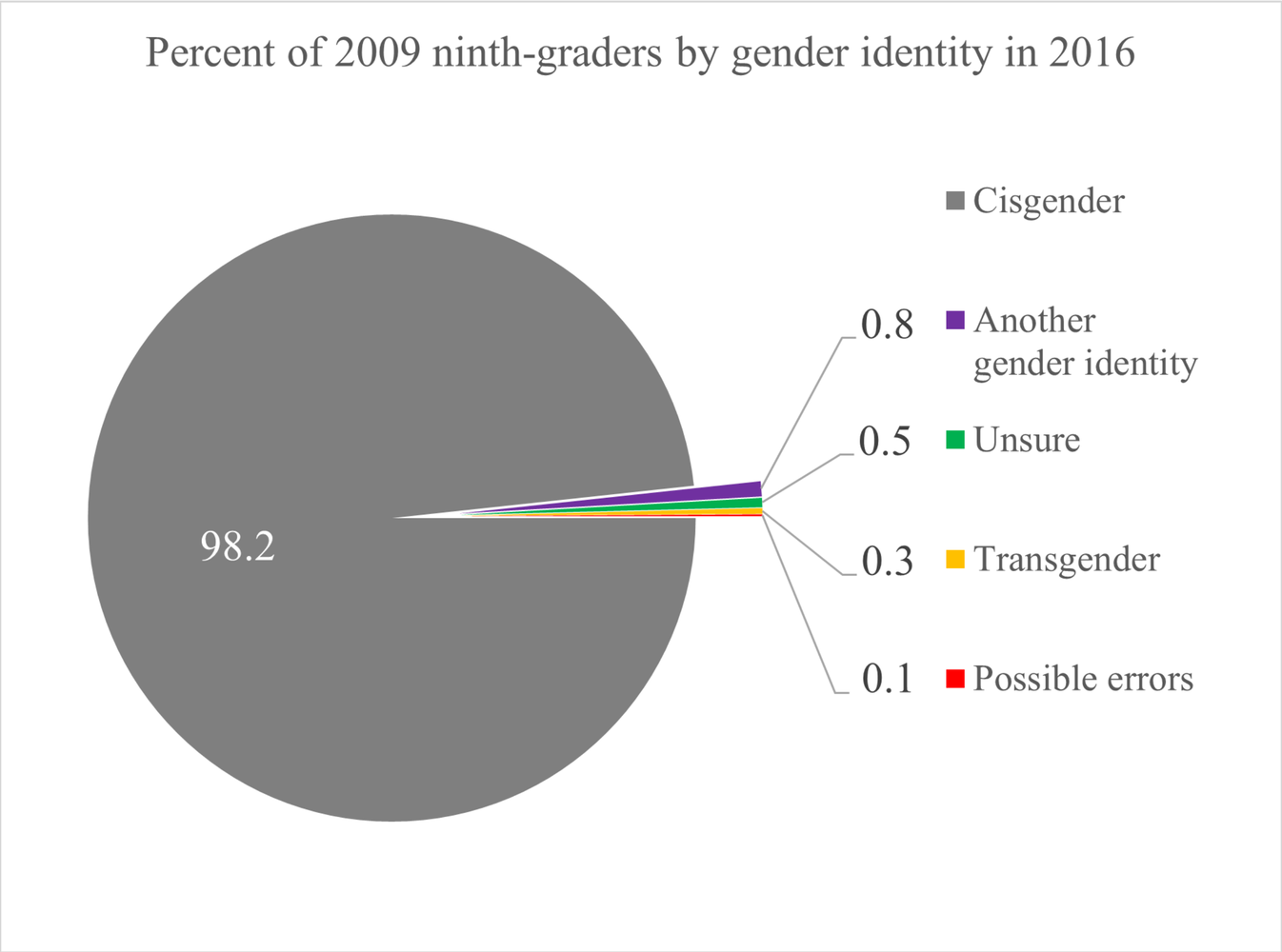
- Cases for which reported sex in high school did not match BOTH sex and gender identity reported in 2016 were investigated further
  - "**Investigation group**"
  - Disagreements between any of the below coding rules were flagged for further follow-up

Investigation group coding rules:

- Transgender = "Transgender, male-to-female" and "Transgender, female-to-male"
  - OR cases whose birth sex and gender identity were different (e.g., female on Sex and male on Gender), even if Transgender options were not selected
- Another gender = "Genderqueer or gender nonconforming, or some other gender" was selected, even with any other selected options
- Unsure = "You are not sure" was selected, even with any other selected options

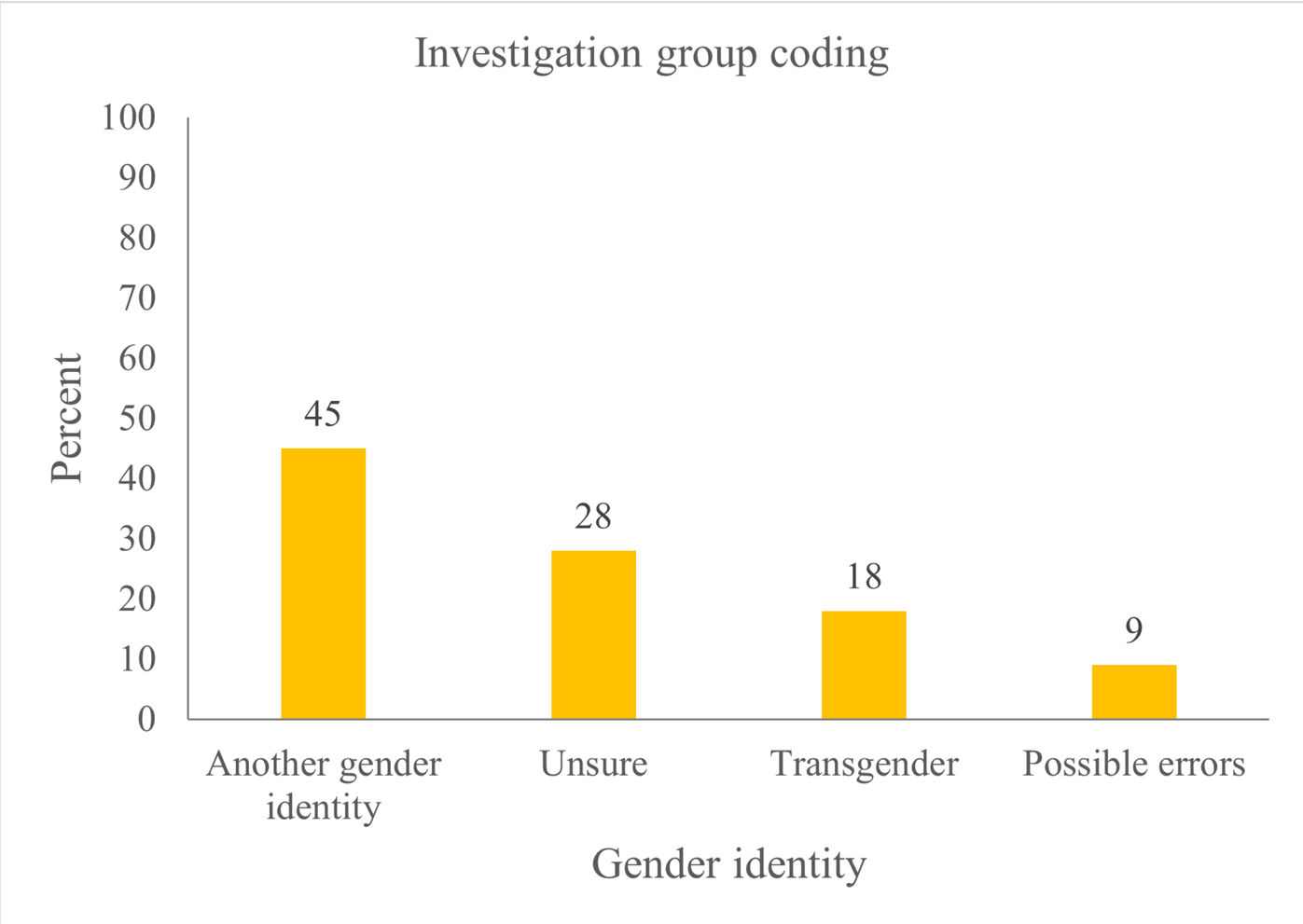
Results

Gender identity status of 2009 ninth-graders in 2016



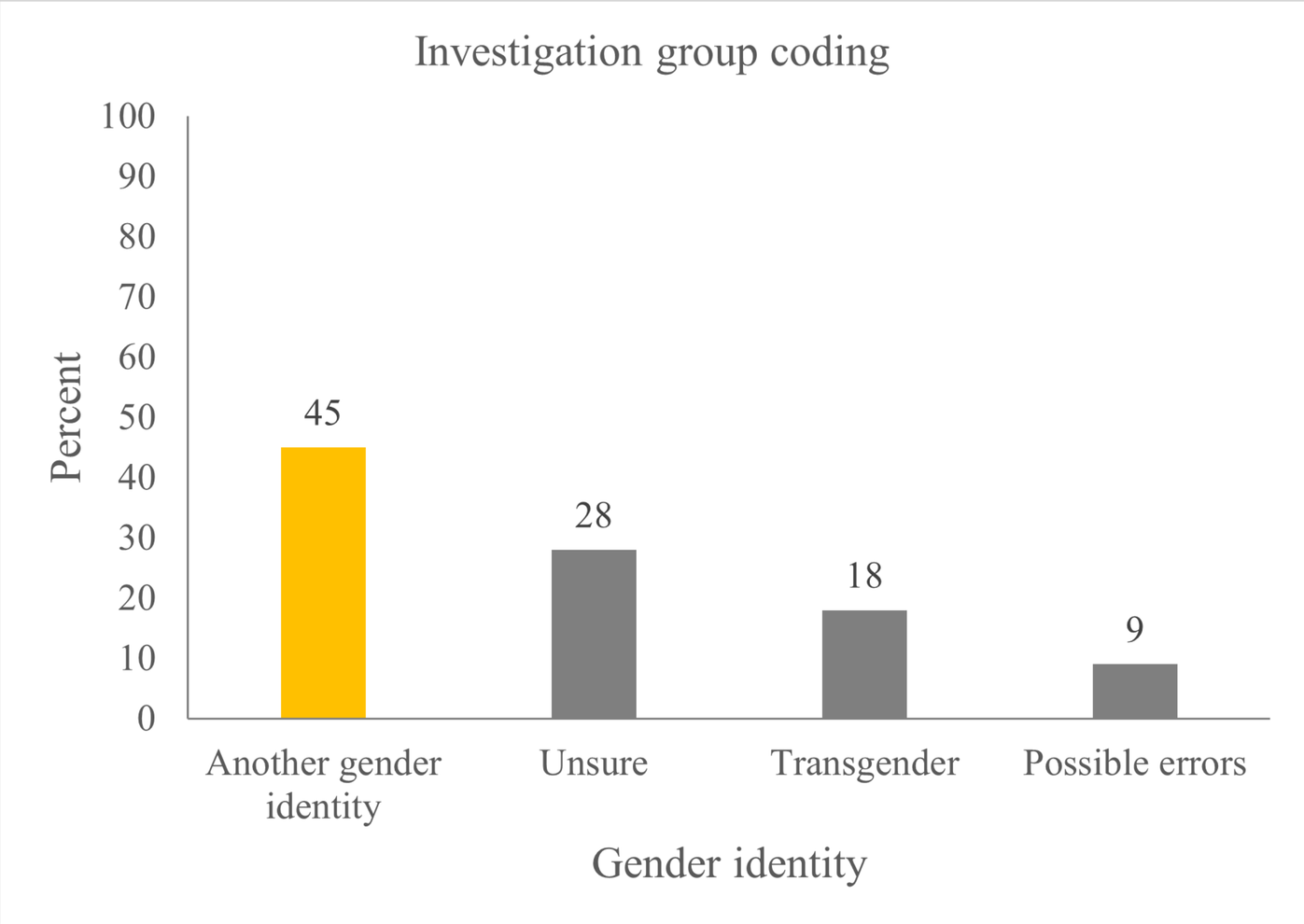
- A very small percentage (**0.3 percent**) identified as Transgender
  - In line with other population estimates (Meerwijk & Sevelius, 2017)
- A very small percentage (**0.8 percent**) identified as Another Gender identity
  - The size of this group in the population is less well understood
- Overall, **~2 percent** reported a gender identity in 2016 that did not match 2009 or 2012 reports
  - This group was investigated further for possible measurement error ("**investigation group**")

Gender identity status in 2016 – Investigation group



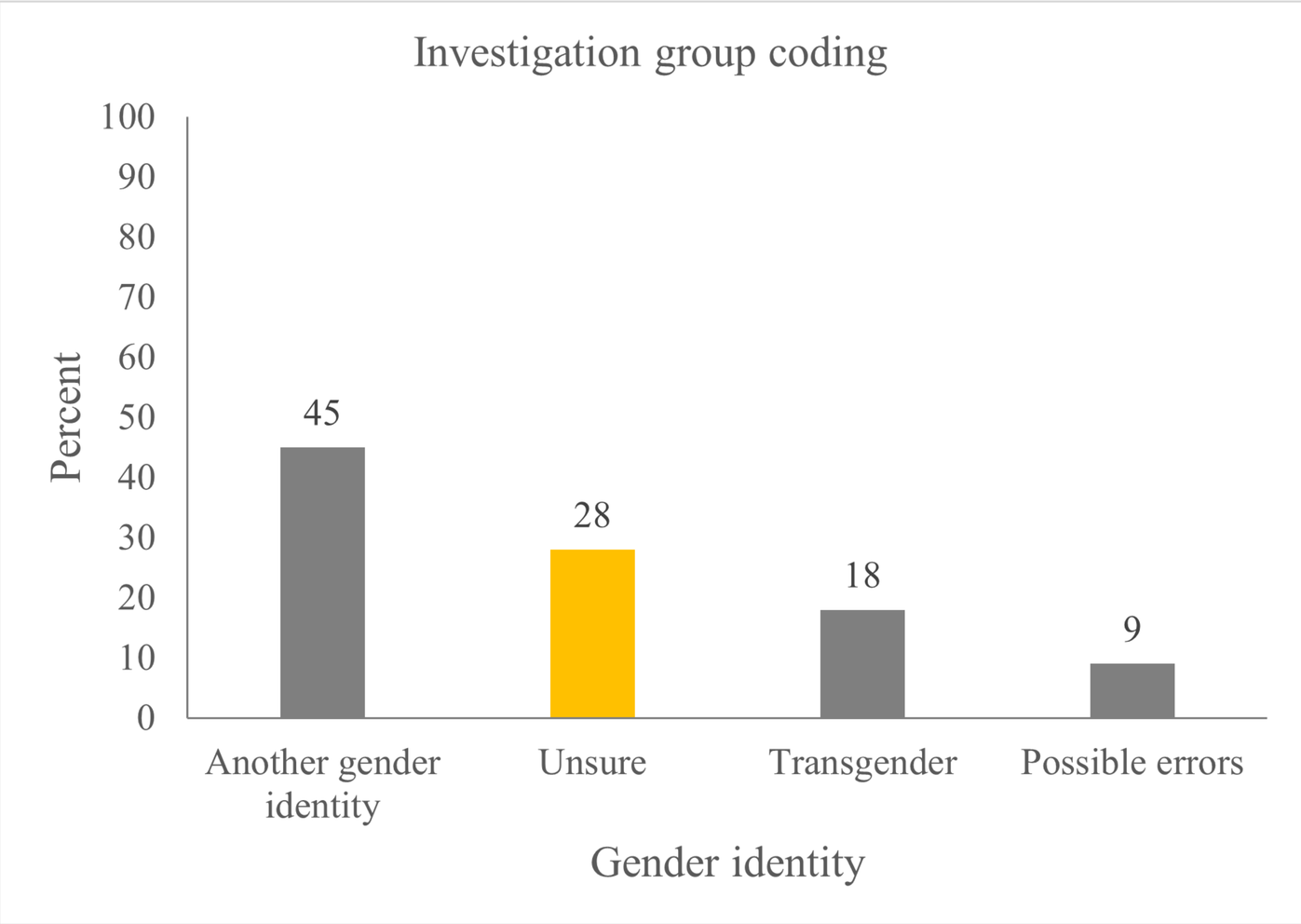
- Of investigation group:
- 45 percent coded as Another gender identity
- 28 percent coded as Unsure
- 18 percent coded as Transgender
- 9 percent coded as Possible Errors
- Next, each group will be described further….

Gender identity status in 2016 – Investigation group



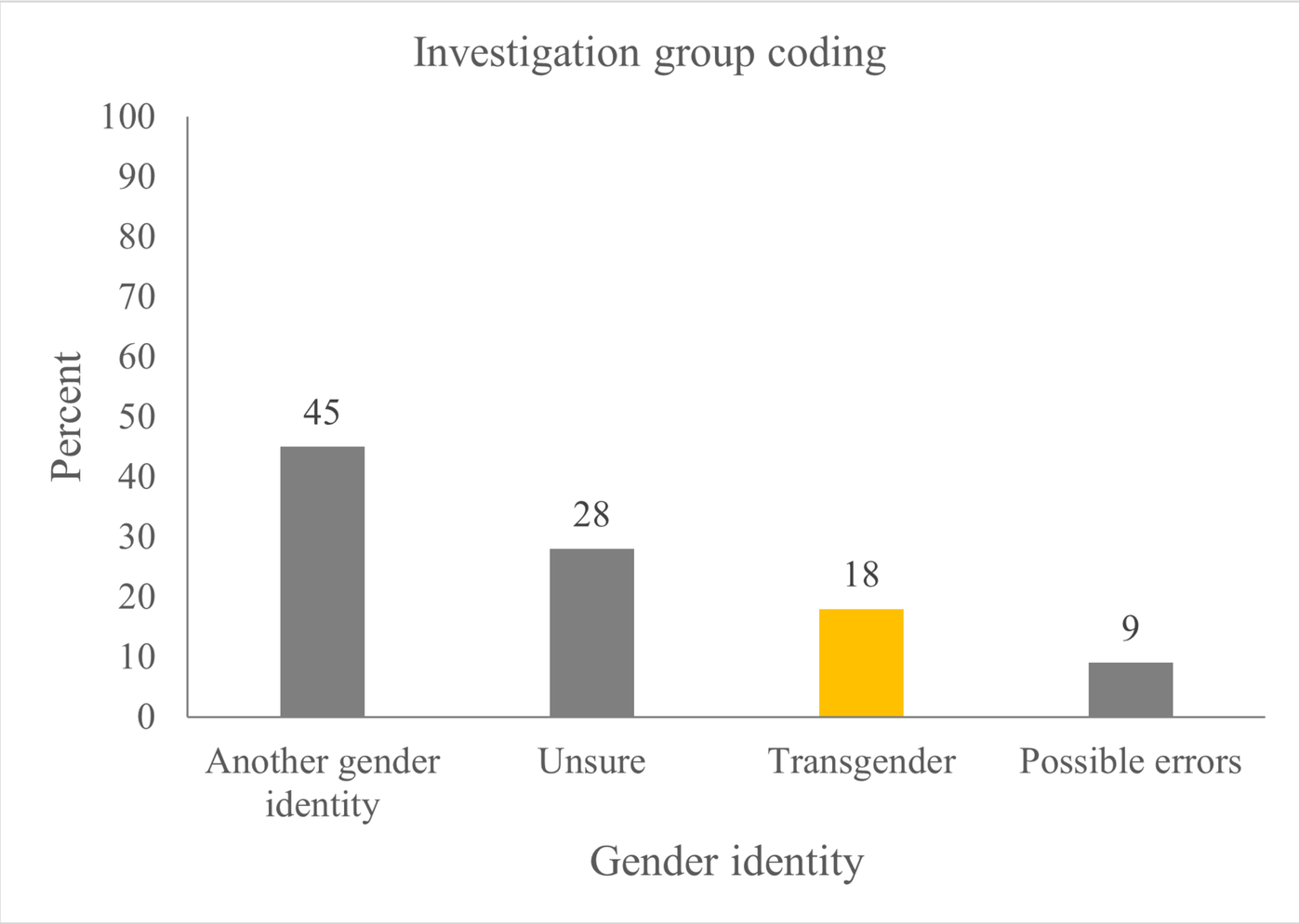
- Another gender identity (45 percent of investigation group)
- Selected:
  - Genderqueer or gender nonconforming, or some other gender
  - (May have also selected M or F to current gender identity)
- Did NOT select:
  - Either Trans option or Not sure

Gender identity status in 2016 – Investigation group



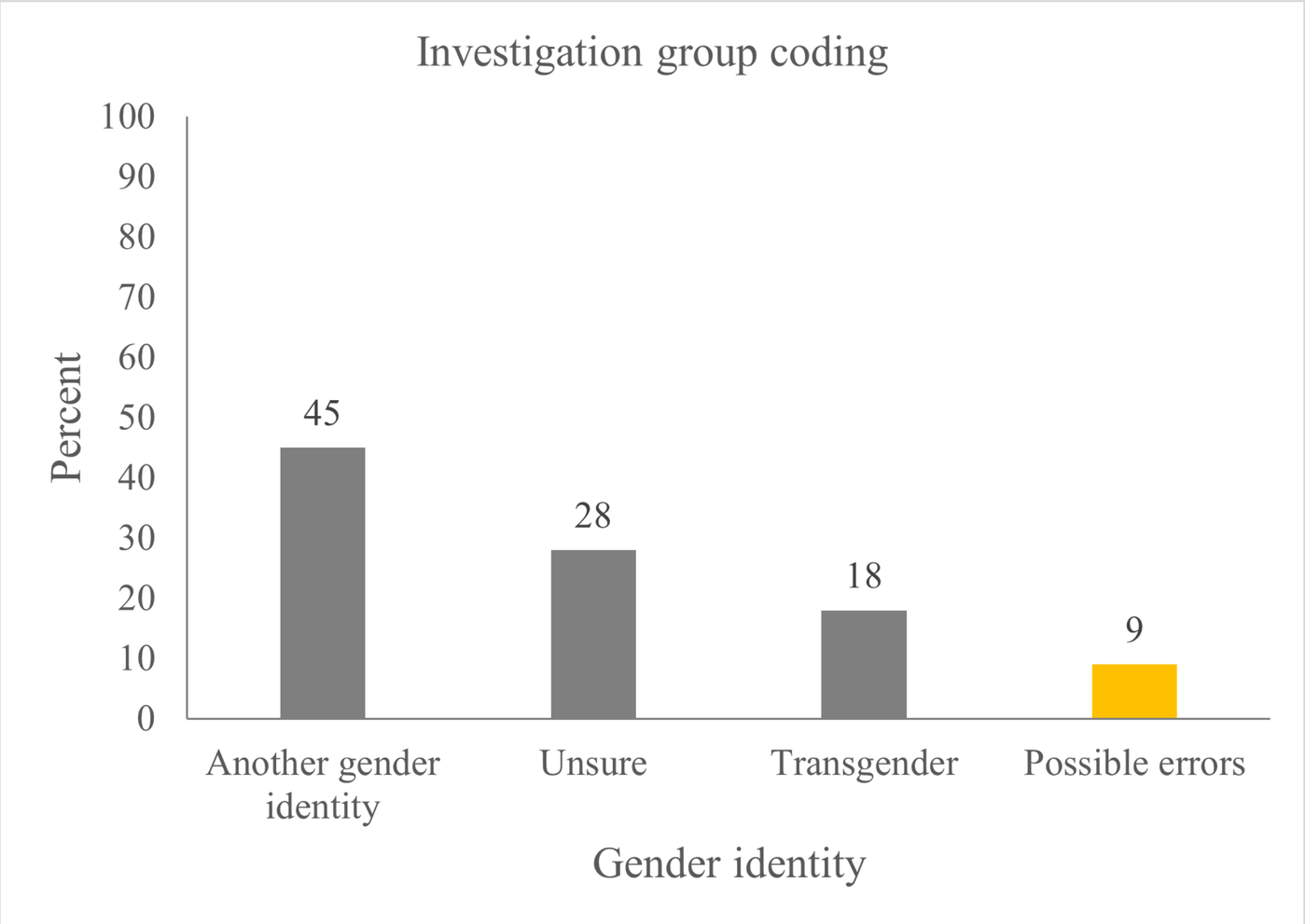
- Unsure (28 percent of investigation group)
- Selected:
  - Not sure
  - (May have also selected any other gender identity)
- Did NOT select:
  - Every gender identity option available (see Possible errors slide)

Gender identity status in 2016 – Investigation group



- Transgender (18 percent of investigation group)
- Selected:
  - Transgender (M-to-F *or* F-to-M)
  - Sex at birth = F and GI = M *or* Sex at birth = M and GI = F
  - (May have selected GI of M or F and *not* Trans) – **40 percent** did not select Trans
- Did NOT select:
  - Not sure
  - Genderqueer, gender nonconforming or another gender identity
- Some identities changed since high school, but some aligned with data collected in high school

Gender identity status in 2016 – Investigation group



- Possible errors (9 percent of investigation group)

- Sources of errors:
  - Students did not respond, or left sex items blank in early rounds
  - Either parent or school provided incorrect data in earlier rounds
  - Data were missing from all sources and imputed incorrectly in earlier rounds
  - Mischievous responders (Cimpian et al. 2018)

Discussion

Summary: GI item performance in HSLS:09

- Two-step measure likely decreases measurement error
  - Individuals who in earlier rounds had provided gender information and not sex information could now provide both
  - Individuals who did not indicate that they were transgender could be identified by comparing sex at birth and current gender identity
  - Errors in the data for individuals whose sex information had previously been entered incorrectly, was missing, or had been imputed incorrectly could be corrected
  - Real change over time does occur – gender identities are fluid – and so more research is needed to help tease apart differences in reporting between rounds

Discussion: Recommendations for survey designers

- Consider including an option for “Another gender identity”
  - More individuals selected this option than transgender options – fine if combining these groups, but potentially not indicative of the same experiences
- Include an “unsure” option
  - Gender identity is a fluid construct and some populations may be especially prone to uncertainty (e.g., youth). Important in a longitudinal study to allow for changes in identification across time
- Include help text to explain what is meant by answer choices
  - Words and terms may be unfamiliar to some groups, including those still questioning their identity (e.g., “genderqueer”)
  - May help filter out “don’t know” responses reflecting lack of understanding from “unsure” due to identity questioning

Discussion: Recommendations for survey designers

- Consider including an open-ended answer option, resources permitting
  - May help clarify cases where there is lingering confusion about terms
  - May help to further identify mischievous responders or protest responses
  - May help reduce skips (e.g., in cases of protest)

- Follow up with a confirmation question
  - In cases where sex at birth does not match the indicated gender identity, asking a follow-up question to confirm may resolve some reporting or data entry errors

- **Consider reporting goals when designing gender items!** Possible goals (include but are not limited to):
  - Allowing respondents to feel seen by reporting on current gender
  - Understanding the experiences of gender minority individuals
  - Minimizing missing data
  - Identifying sources of measurement error

References

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Thank you!!!

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https://nces.ed.gov/surveys/hsls09