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Measuring Sexual Harassment in the STEM Enterprise

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Agenda

Project Overview

Recommended Constructs of Interest

Key Considerations for All Survey Approaches

Option 1 – Field a New Survey

Option 2 – Field a Supplemental Survey

Option 3 – Add to an Existing Survey

Summary and Future Research Opportunities
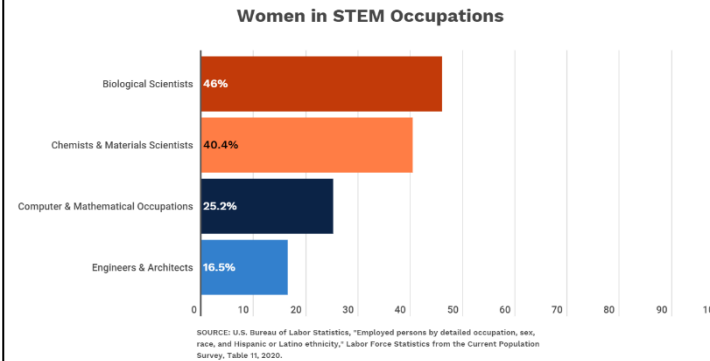
Project Overview

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Project Background

50% of all S&E bachelor's degrees earned by women

46% of all S&E master's degrees earned by women

41% of all S&E doctorate degrees earned by women

Source: Diversity and STEM: Women, Minorities, and Persons with Disabilities, 2023 (NCSES)

35%
of STEM occupations held by women

Source: Diversity and STEM: Women, Minorities, and Persons with Disabilities, 2023 (NCSES)

Women in STEM Occupations

Biological Scientists	46%
Chemists & Materials Scientists	40.4%
Computer & Mathematical Occupations	25.2%
Engineers & Architects	16.5%

SOURCE: U.S. Bureau of Labor Statistics, "Employed persons by detailed occupation, sex, race, and Hispanic or Latino ethnicity," Labor Force Statistics from the Current Population Survey, Table 11, 2020.

Source: The STEM GAP: Women and Girls in Science, Technology, Engineering, and Mathematics (AAUW)

7%
lower retention rate among SGM STEM students

70%
of S&E doctoral degree recipients are white

Source: Top: Hughes, B.E. (2018) Coming out in STEM: Factors affecting the retention of sexual minority STEM students.

Bottom: Diversity and STEM: Women, Minorities, and Persons with Disabilities, 2023 (NCSES)

➤ Sexual harassment ↑

➤ Job satisfaction ↓
➤ Morale ↓
➤ Retention ↓

Source: Sexual Harassment of Women: Climate, Culture and Consequences in Academic Sciences, Engineering, and Medicine, 2018 (NASEM)
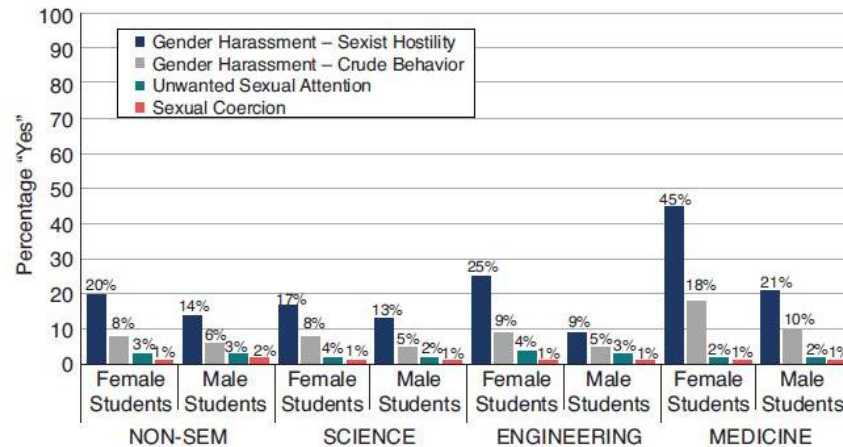
FIGURE 3-3 Faculty/staff-on-student sexual harassment incidence rates for female students, by type of sexual harassment (University of Texas System).

Source: Sexual Harassment of Women: Climate, Culture and Consequences in Academic Sciences, Engineering, and Medicine, 2018 (NASEM)

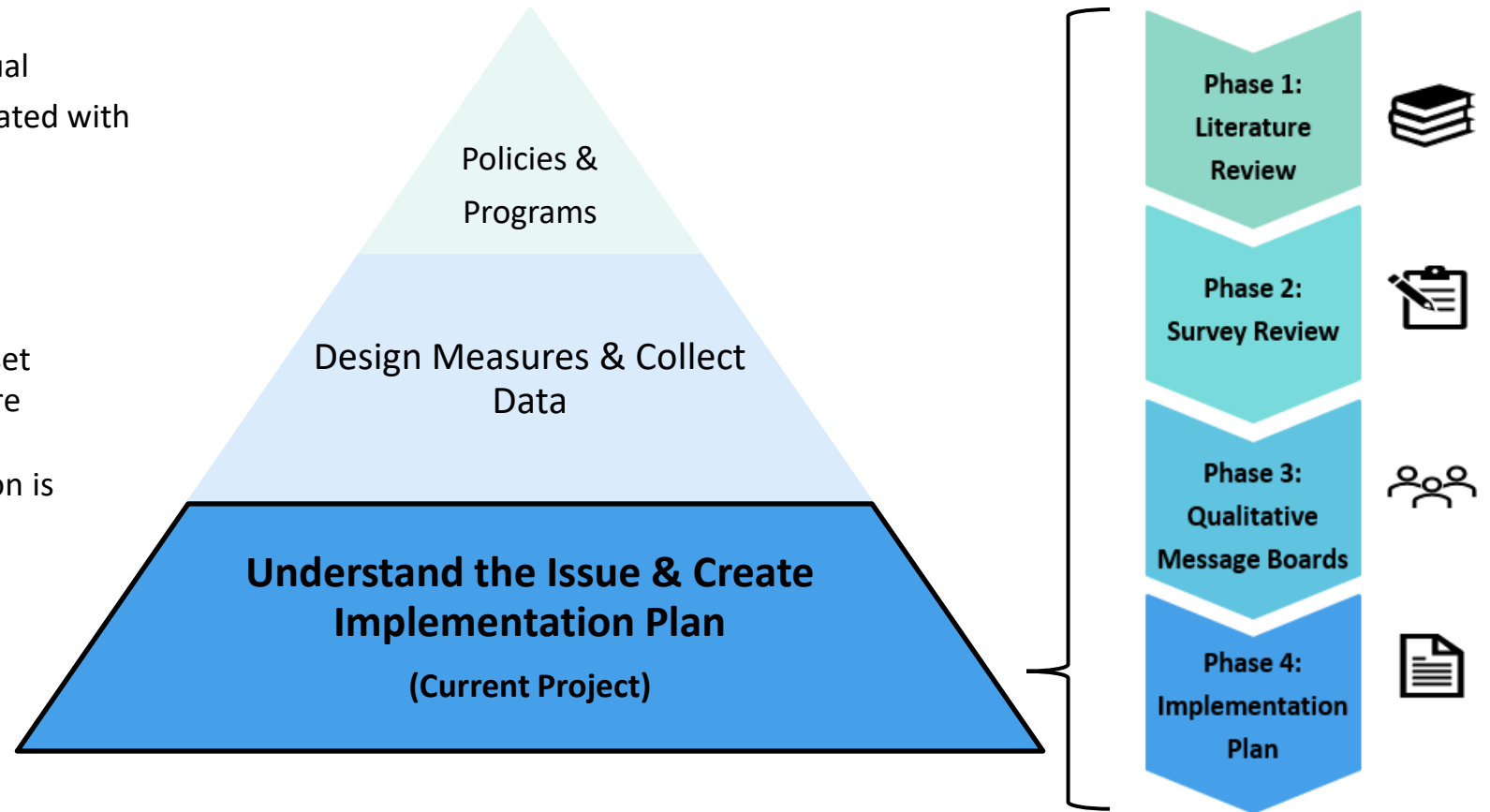High-quality national sexual harassment data sets

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Introduction

Project purpose

Provide NCSES a variety of options for measuring sexual harassment and the strengths and weaknesses associated with each option

Background

- No high-quality national sexual harassment data set
- Women earn roughly half of STEM degrees, but are underrepresented in the STEM field
- One of the chief drivers of the underrepresentation is sexual harassment

Policies & Programs

Design Measures & Collect Data

Understand the Issue & Create Implementation Plan

(Current Project)

Phase 1: Literature Review

Phase 2: Survey Review

Phase 3: Qualitative Message Boards

Phase 4: Implementation Plan

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Literature Review

### Definitions & Measures of Sexual Harassment

- Operationalization of sexual harassment
- Measurement context
- Strengths and limitations of existing measures

Theories of Gender & Harassment

- Framework for understanding factors related to sexual harassment
- Insight into dynamics related to sexual harassment
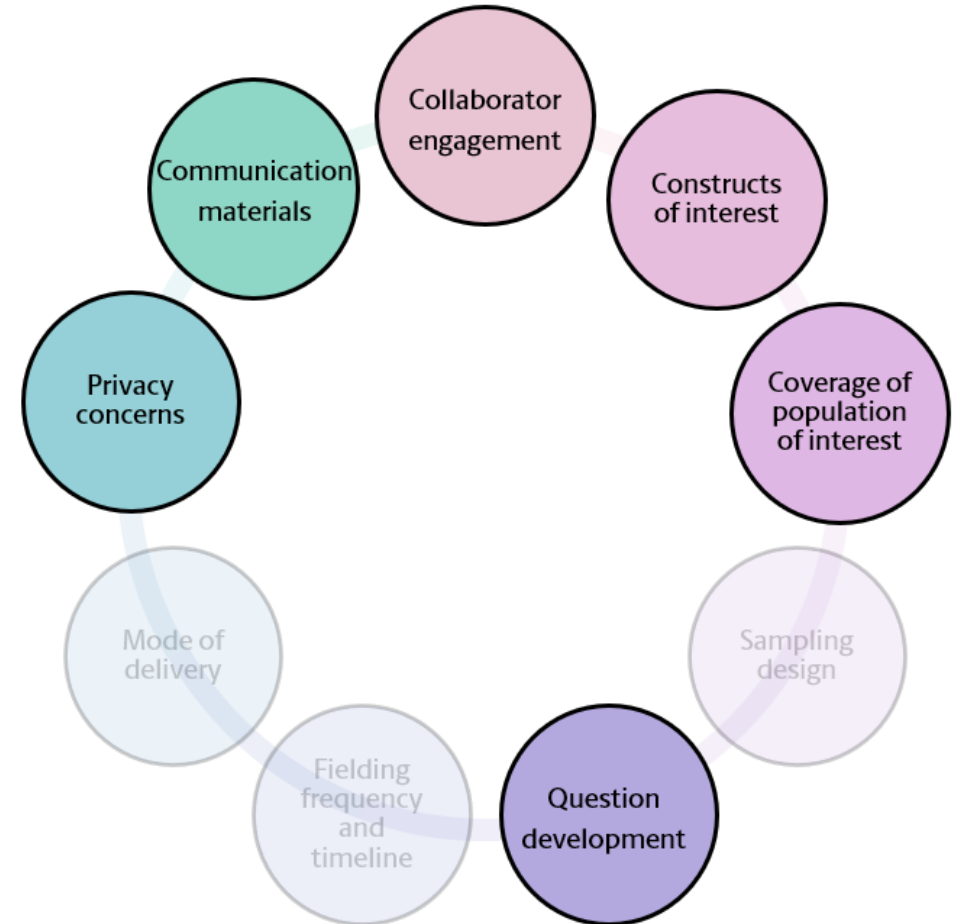
Intersectionality in Experiences of Harassment
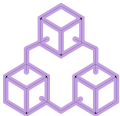
- Experiences of harassment and marginalization across identities
- Experiences of harassment at the intersections of multifaceted identities

Impact of Harassment

- Outcomes associated with harassment across disciplines, populations, and contexts
- Considerations related to measurement across contexts

Informed the Implementation Plan

Communication materials

Collaborator engagement

Constructs of interest

Coverage of population of interest

Privacy concerns

Mode of delivery

Sampling design

Fielding frequency and timeline

Question development

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Survey Review

**Informed the Implementation Plan**

NCSES surveys reviewed

- *National Survey of College Graduates (NSCG)*
- Survey of Doctorate Recipients (SDR)
- *National Training, Education, and Workforce Survey (NTEWS)*
- Survey of Earned Doctorates (SED)
- Survey of Graduate Students and Postdoctorates in Science and Engineering (GSS)
- Survey of Postdocs at Federally Funded Research and Development Centers (FFRDC)

Assessment criteria

- Population Coverage
- Survey Methodology
- Topic Relevance
- Privacy Considerations Related to Sensitive Questions
- Survey Length

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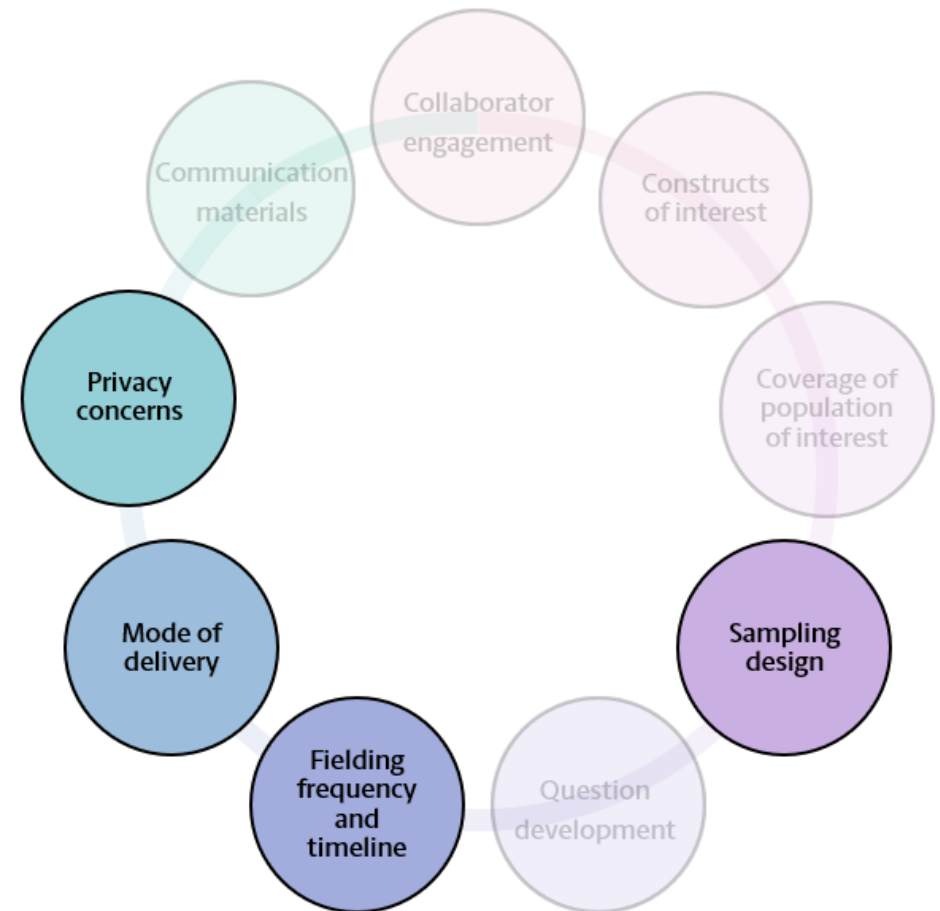
Message Boards

Board content focused on
- Climate & Culture
- Sexually Harassing Behaviors & At-Risk Locations
- Survey Perspectives

After all boards closed, trained coders reviewed the transcripts
- Preformed thematic coding

| 177 individuals with STEM backgrounds for 12 boards	
	Undergraduate STEM Students
	Graduate STEM Students
Women Boards	Early-Career STEM Professionals
	Mid-Career STEM Professionals
	Late-Career STEM Professionals
	Undergraduate STEM Students
	Graduate STEM Students
Men Boards	Early-Career STEM Professionals
	Mid-Career STEM Professionals
	Late-Career STEM Professionals
Sexual and Gender Minority Boards	STEM Undergraduate and Graduate Students
	STEM Early-, Mid- and Late-Career Professionals

Informed the Implementation Plan
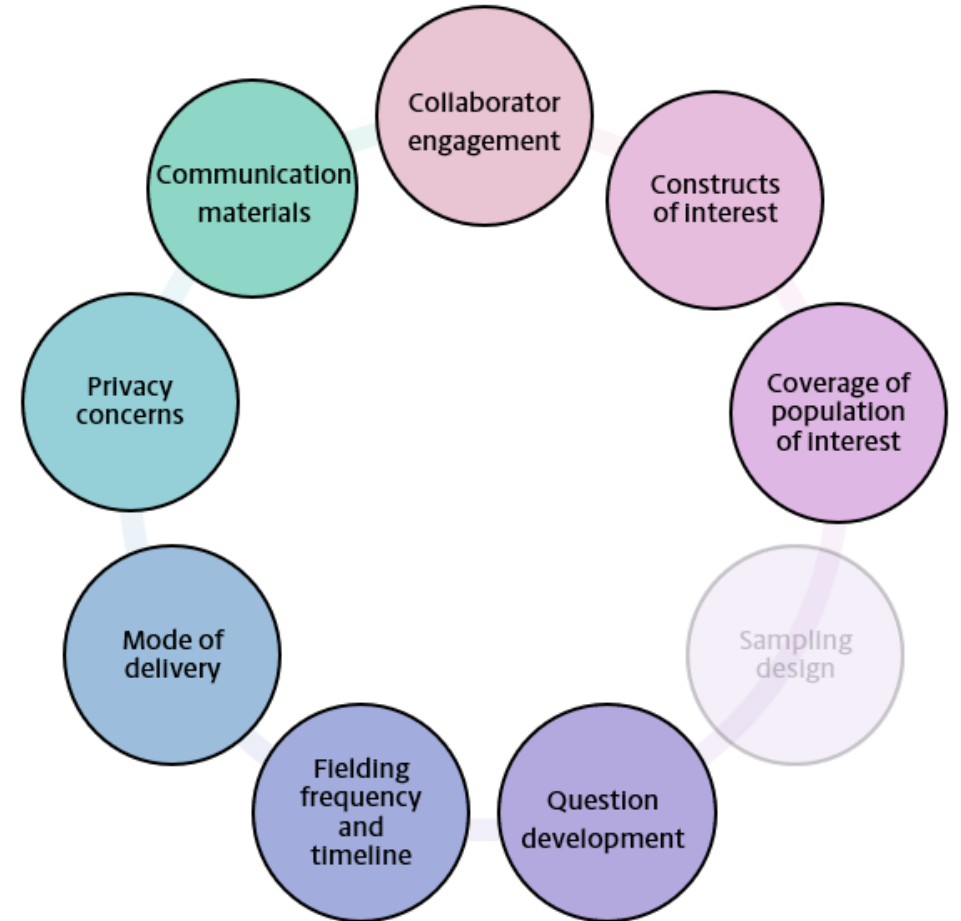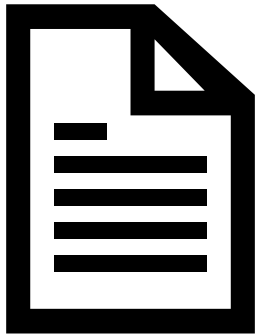
Implementation plan

1. Recommended Constructs of Interest
2. Key Considerations for All Survey Approaches
3. Option 1 – Field a New Survey
4. Option 2 – Field a Supplemental Survey
5. Option 3 – Add to an Existing Survey
6. Summary and Future Research Opportunities

Recommended Constructs of Interest

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Constructs of Interest

Overview
- Determine what information should be assessed to obtain a comprehensive understanding of sexual harassment in STEM
- Sexual harassment often co-occurs with other forms of inappropriate workplace behavior
- Proposed constructs are drawn from the literature review and qualitative message boards
- Four main constructs were identified
- One addition construct was identified through qualitative message boards (i.e., technology-facilitated sexual violence)

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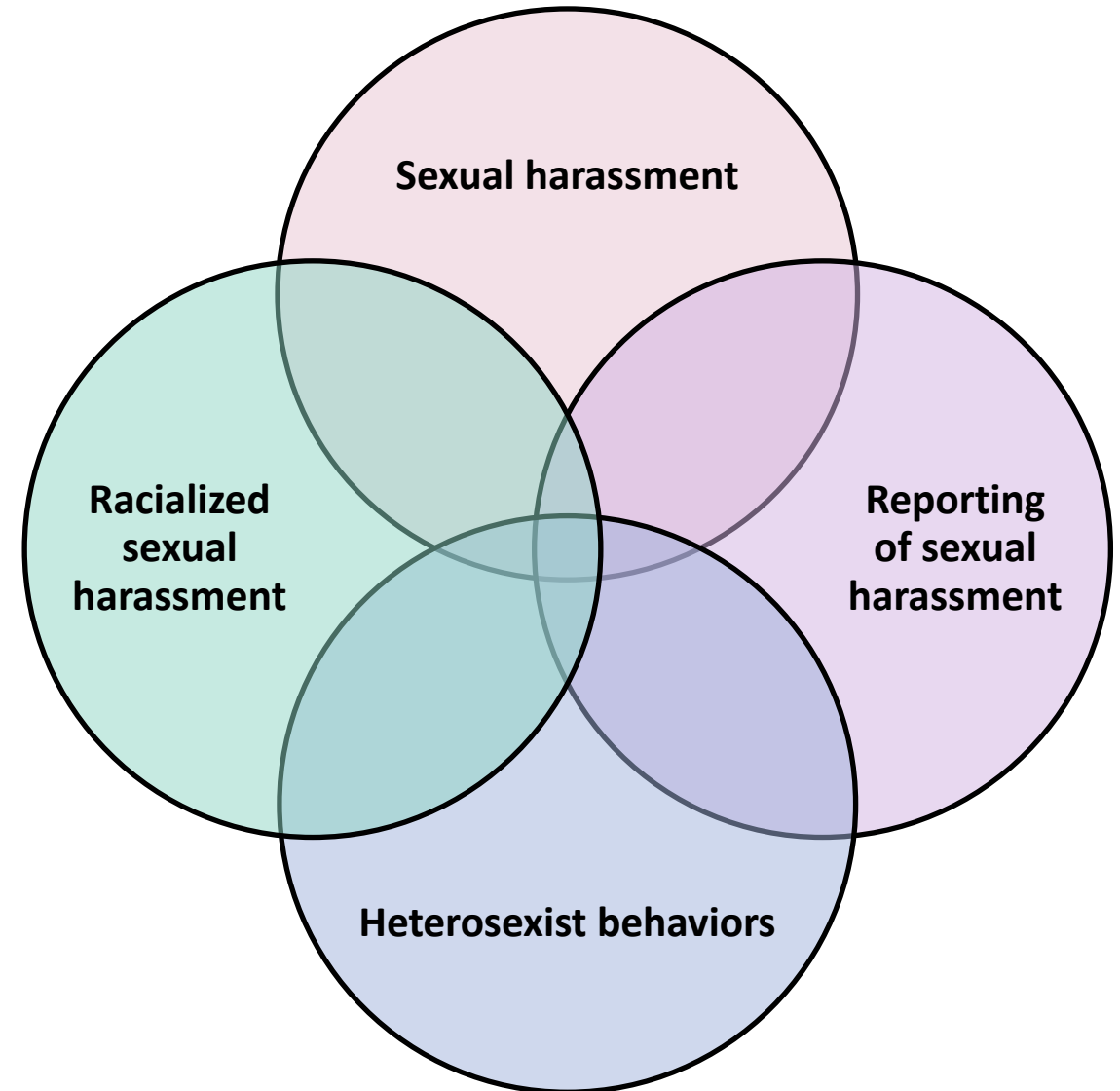
Construct of Interest: Sexual Harassment
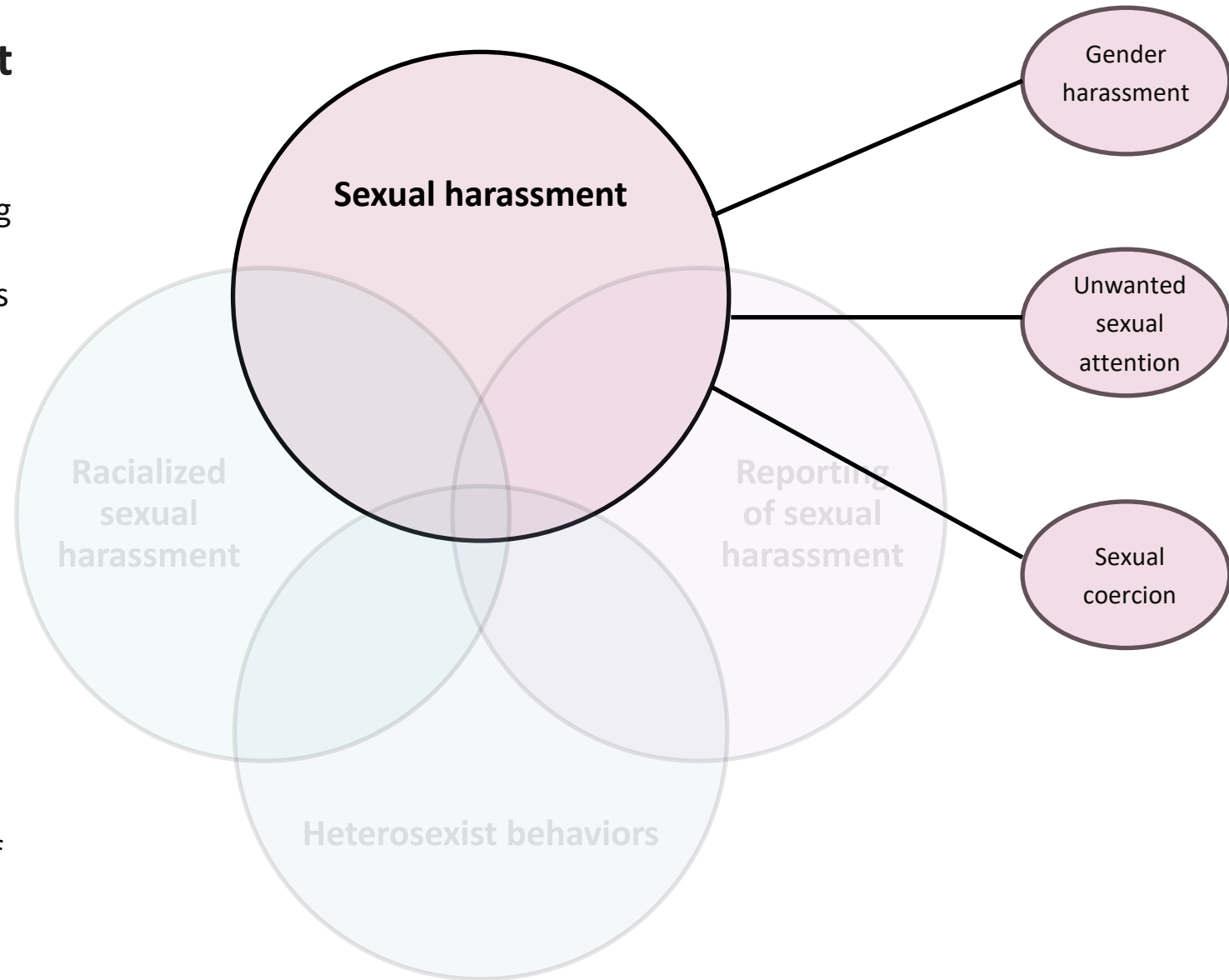
Insights from literature review
- Assess sexual harassment through sexually harassing behaviors
- Should not rely on respondents to label behaviors as sexual harassment (GAO, 2020; NASEM, 2020)[1]

Insights from message boards
- Most indicated list of sexually harassing behaviors was comprehensive
- Some participants suggested the addition of staring and intrusions of personal space (assessed in Sexual Experiences Questionnaire; SEQ)

Recommendation
- Leverage validated behaviorally-based scale
  Example: SEQ (Fitzgerald, 1988; 1999)
- Ensure coverage of all constructs that make up sexual harassment to avoid under-representation of sexual harassment

Sexual harassment

Gender harassment

Unwanted sexual attention

Sexual coercion

Racialized sexual harassment

Reporting of sexual harassment

Heterosexist behaviors

1 Government Accountability Office (GAO); National Academies of Sciences, Engineering, and Medicine (NASEM)

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Construct of Interest: Reporting of Sexual Harassment
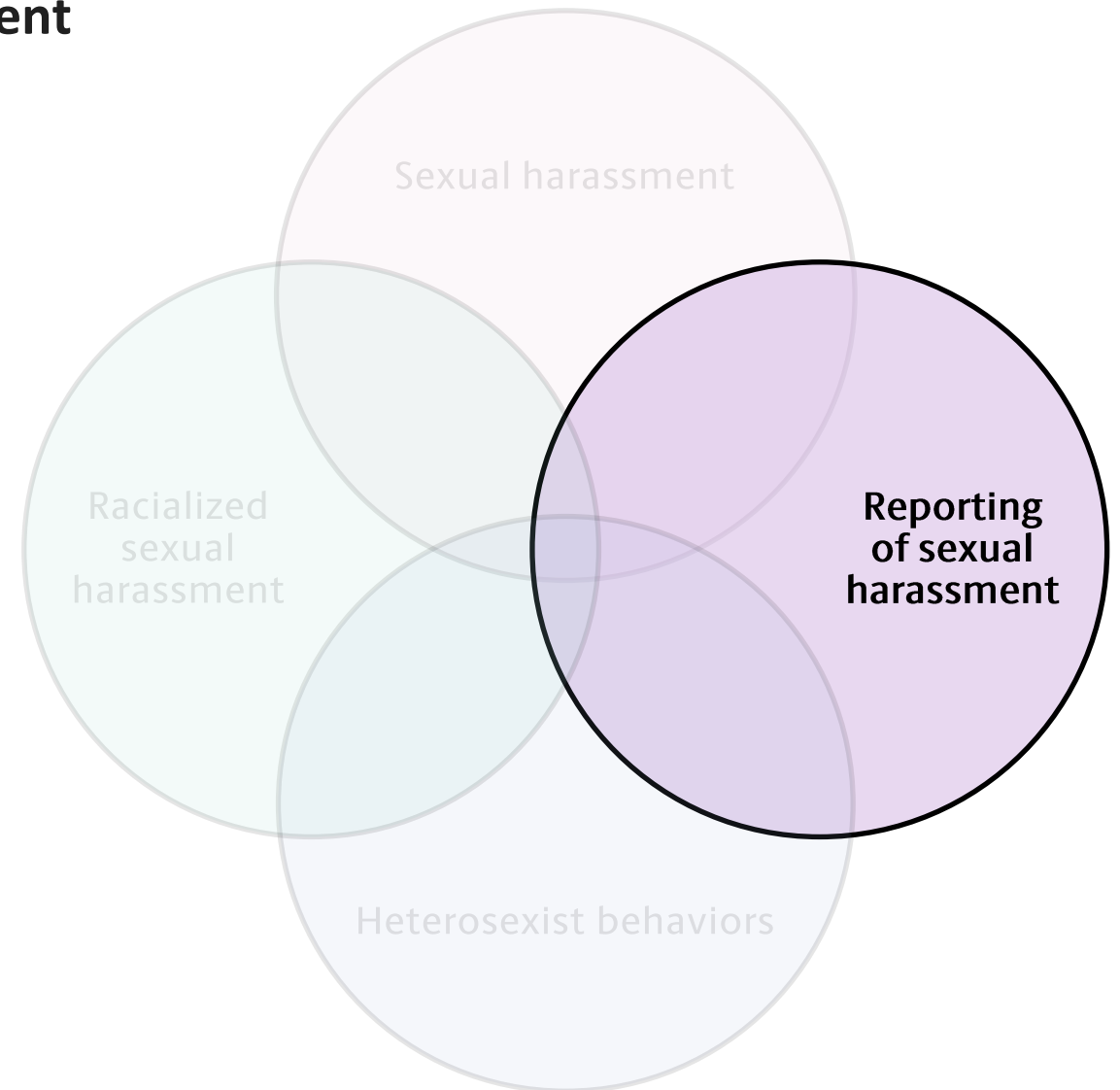
Insights from literature review

- Assessment of information related to reporting behaviors and knowledge of the reporting process
- Climates where sexual harassment thrive may be indicative of environments where reporting is suppressed and negative ramifications for reporting are increased (Hart, 2019)
  - Provides insights into why the behavior was reported or not reported

Insights from message boards

- Fear of retaliation for reporting

Recommendation

- Leverage validated behaviorally-based scale
  - *Example: AAU Campus Climate Survey (Cantor et al., 2020)*

Sexual harassment

Racialized sexual harassment

Reporting of sexual harassment

Heterosexist behaviors

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Construct of Interest: Heterosexist Behaviors
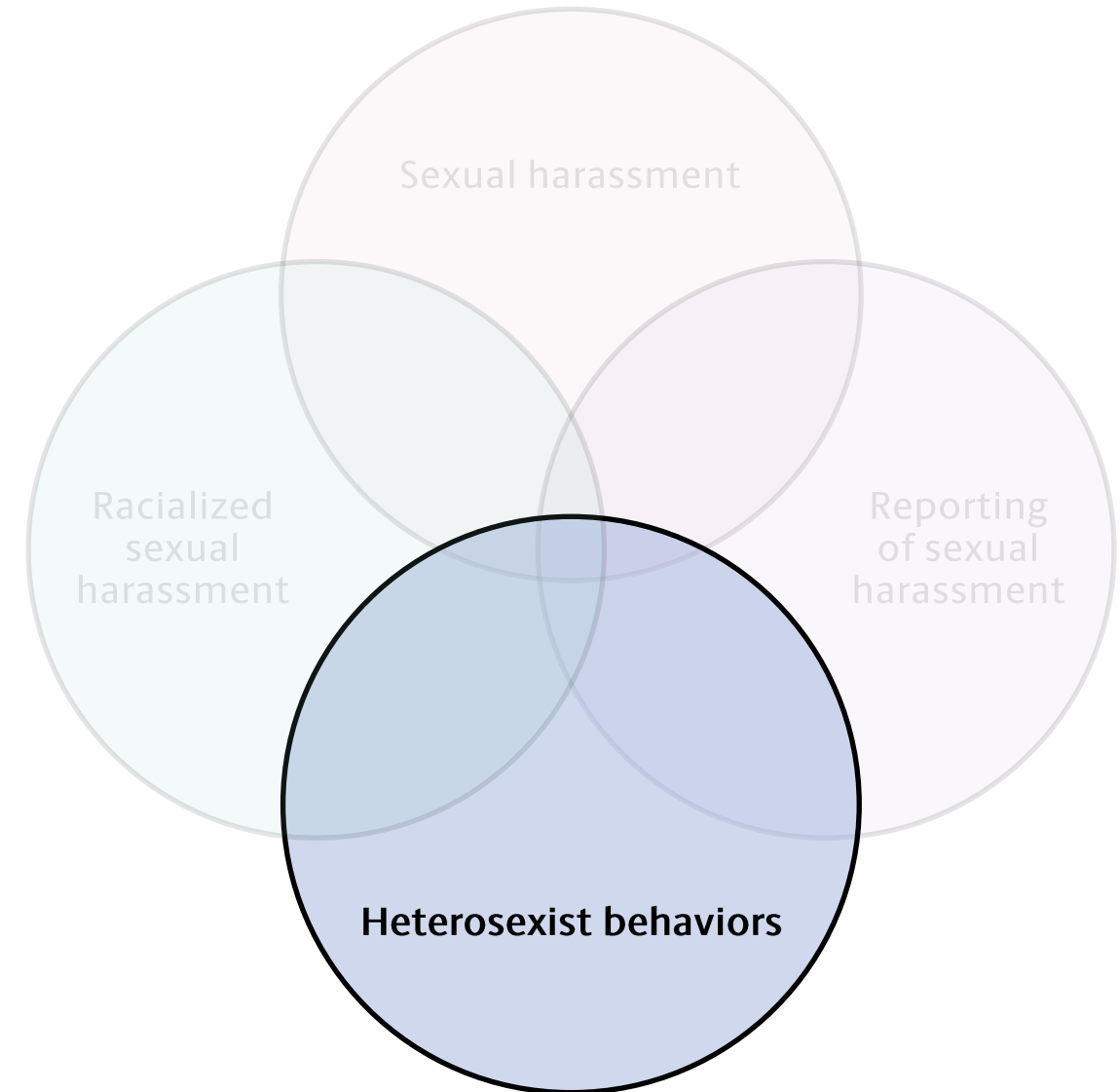
Insights from literature review

- Heterosexist behaviors: hostile actions or comments that reinforce traditional gender norms and degrade sexual and gender minorities (SGMs) based on their perceived sexual orientation (Konik & Cortina, 2008; Silverschanz et al., 2008)
- Often co-occurs with sexual harassment and sexual and gender minorities are at an increased risk for sexual harassment (Richey et al., 2019; NASEM, 2020)
- Limited research on heterosexist harassment in STEM, making it difficult to define its broader impact on the field (Marín-Spiotta et al., 2023; Richey et al, 2019)

Insights from message boards

- Mentioned mostly by SGM board respondents, reinforcing the importance of an intersectional approach to assessment

Recommendation

- Leverage validated behaviorally-based scale
  - *Example*: *Workplace Heterosexist Experiences Questionnaire (Waldo, 1999)*

Sexual harassment

Racialized sexual harassment

Reporting of sexual harassment

Heterosexist behaviors

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Construct of Interest: Racialized Sexual Harassment

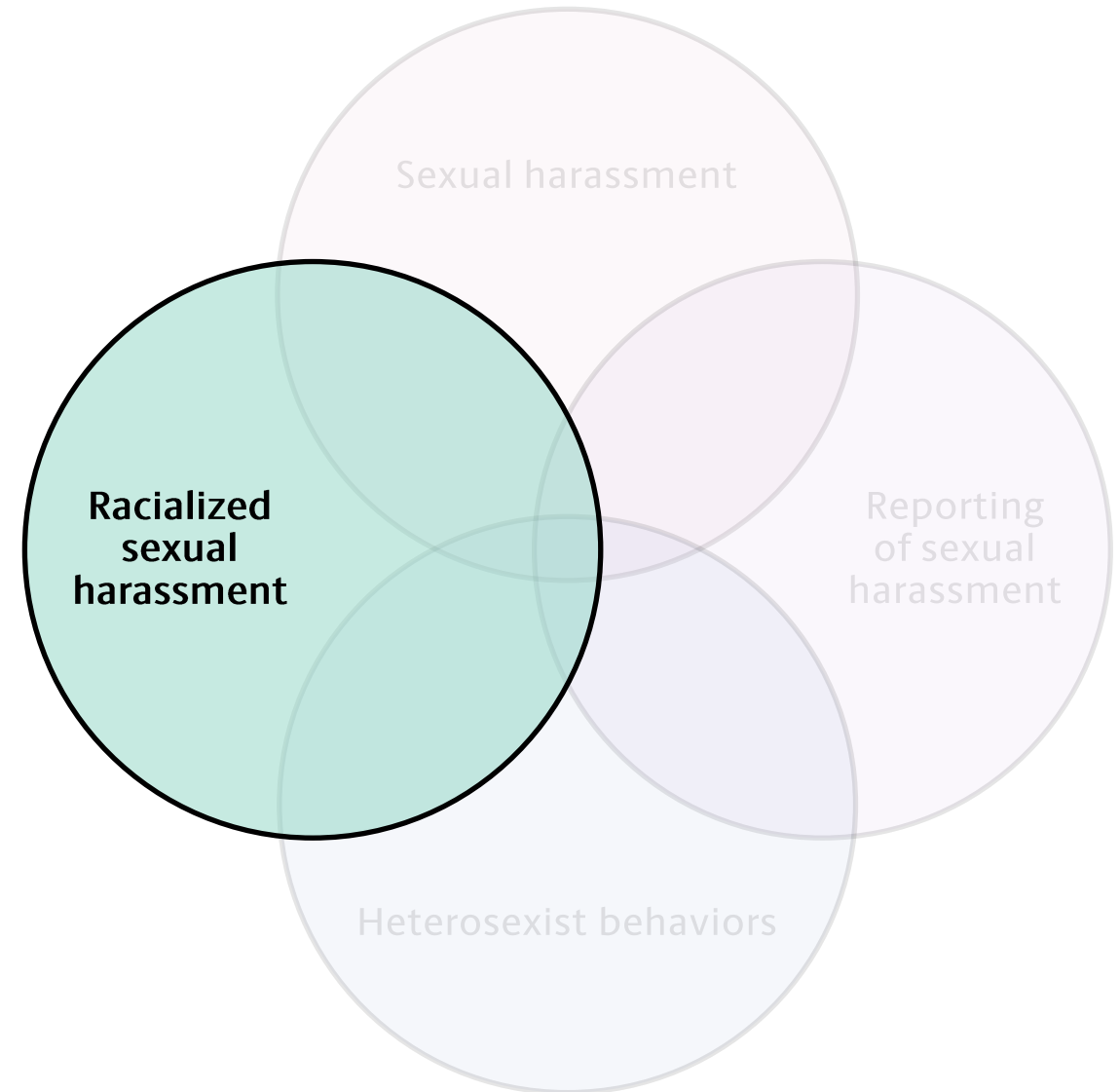**Insights from literature review**
- Assesses the intersection of gender and race/ethnicity in experiences of victimization and perpetration
- Important to assess given the underrepresentation of woman and racial and ethnic minorities in STEM (Buchanan et al., 2018; Cho, 1997)
- Women from racially and ethnically diverse backgrounds are at greater risk of experiencing sexual harassment (Beal, 2008; Buchanan, 2016) and no current estimates of the occurrence in STEM despite known general elevated risk for this population

Insights from message boards
- Individuals may not typically label experiences of racialized sexual harassment as such
- Individuals did report experiencing or witnessing behaviors associated with race/ethnicity in the academic/workplace climate

Recommendation
- Leverage validated behaviorally-based scale
  - *Example: Racialized Sexual Harassment Scale (RSHS; Buchanan, 2016)*

Sexual harassment

Reporting of sexual harassment

Racialized sexual harassment

Heterosexist behaviors

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Construct of Interest: Technology-Facilitated Sexual Violence
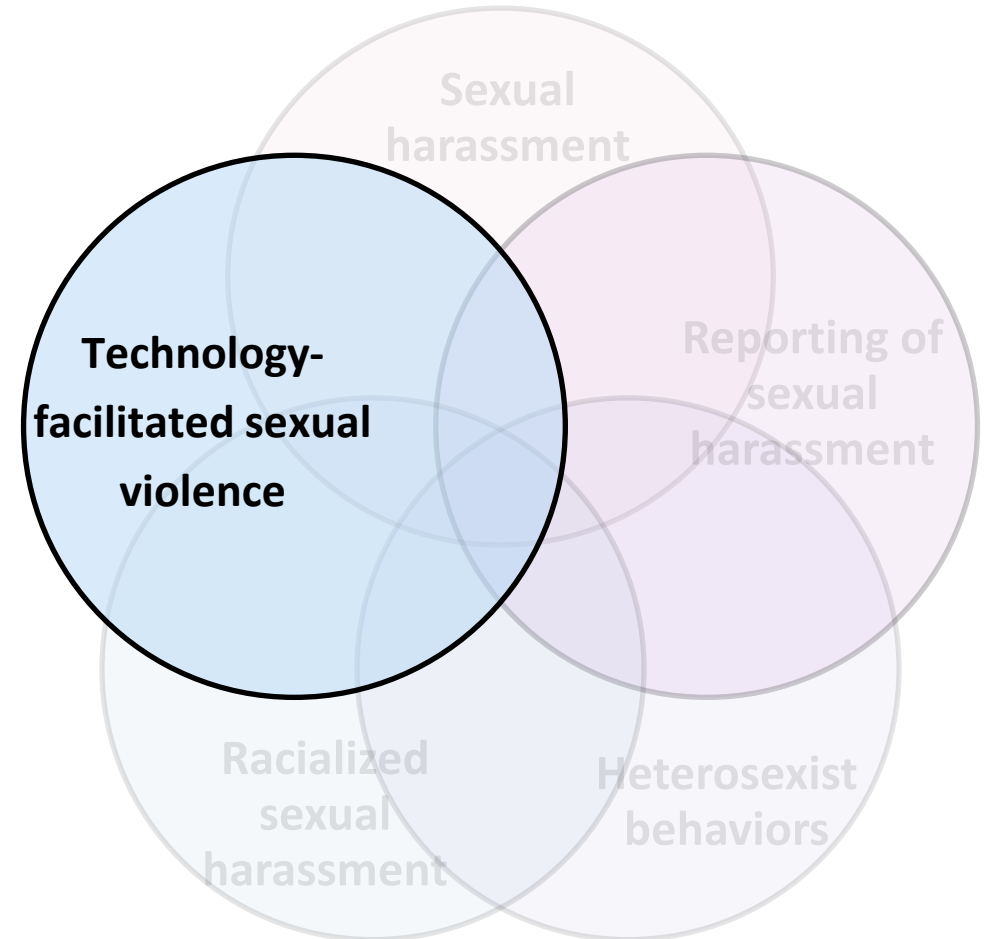
Insights from literature review
- Technology-facilitated sexual violence encompasses experiences of sexual harassment that occurs online or through the use of technology (Powell & Henry, 2019)
- Includes digital sexual harassment, image-based sexual abuse, sexual aggression and coercion, and gender and sexuality-based harassment
- Young adults (i.e., 18-24 years old), are at a greater risk for TFSV victimization (Powell & Henry, 2019) and anonymity may contribute to the perception of high-risk

Insights from message boards
- Message board participants consistently listed social media and online environments as high-risk environments for sexual harassment
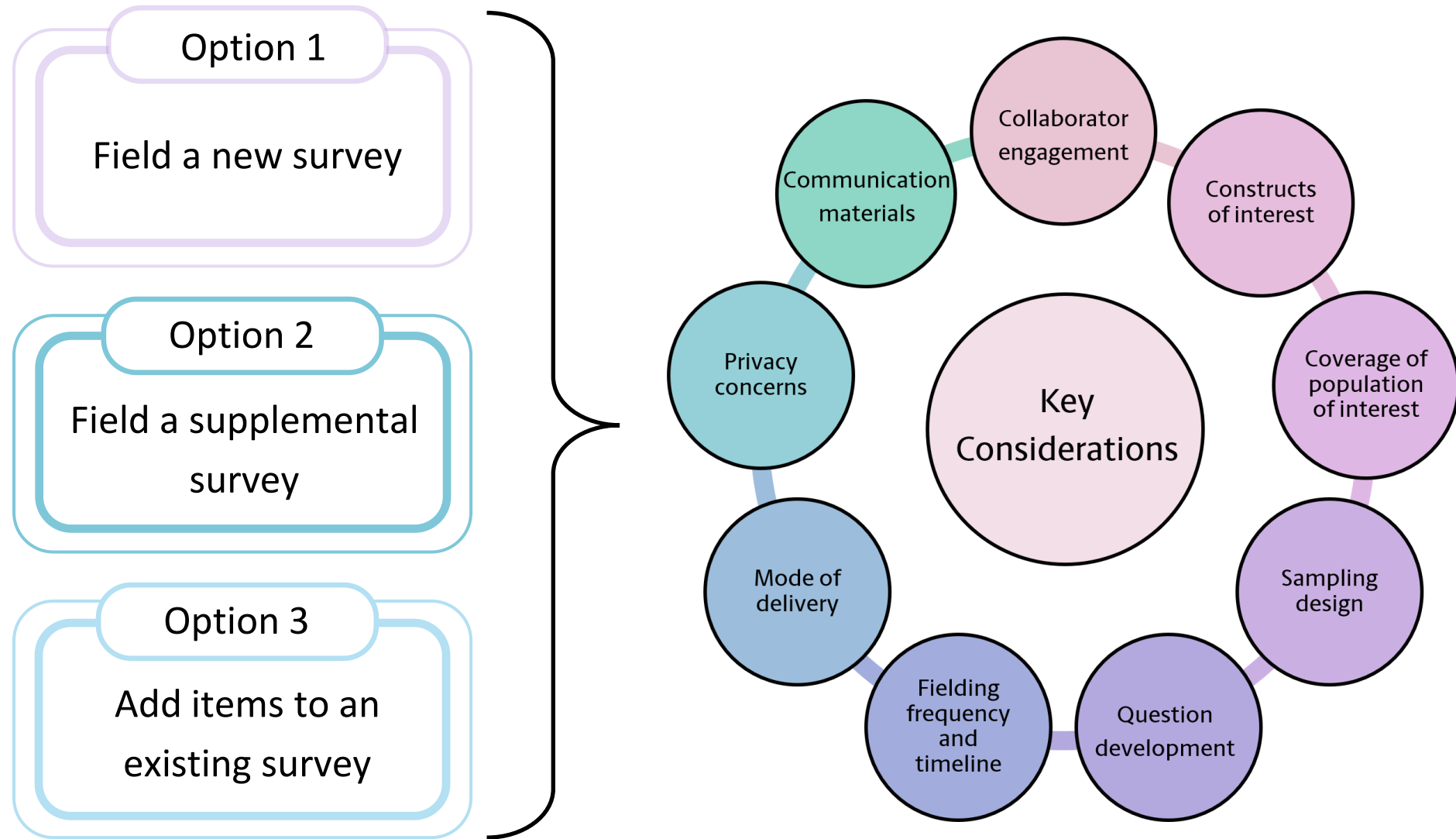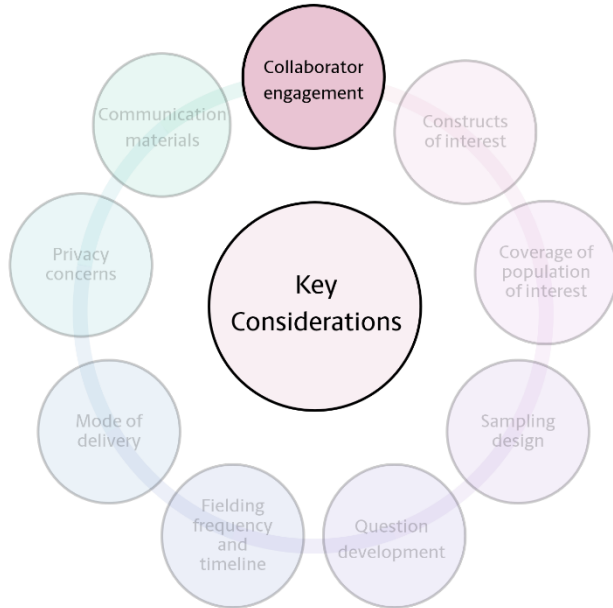
Recommendation
- Leverage validated behaviorally-based scale
  - *Example: Technology-Facilitated Sexual Violence Victimization Scale (Powell & Henry, 2019)*

Key Considerations for All Survey Approaches

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Option 1

Field a new survey

Option 2

Field a supplemental survey

Option 3

Add items to an existing survey

Key Considerations

- Collaborator engagement
- Communication materials
- Constructs of interest
- Coverage of population of interest
- Privacy concerns
- Sampling design
- Mode of delivery
- Fielding frequency and timeline
- Question development

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Collaborator Engagement

General Recommendations

- Identify organizations and entities that would yield meaningful partnerships in the final development of a survey or survey measures related to sexual harassment and related constructs in STEM
- Identify strategic points through survey development at which to engage them and gather their feedback
- Leverage these partnerships to proactively address potential concerns or criticisms of the developing approach

Key Considerations circle diagram: Collaborator engagement, Constructs of interest, Coverage of population of interest, Sampling design, Question development, Fielding frequency and timeline, Mode of delivery, Privacy concerns, Communication materials

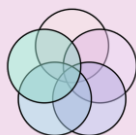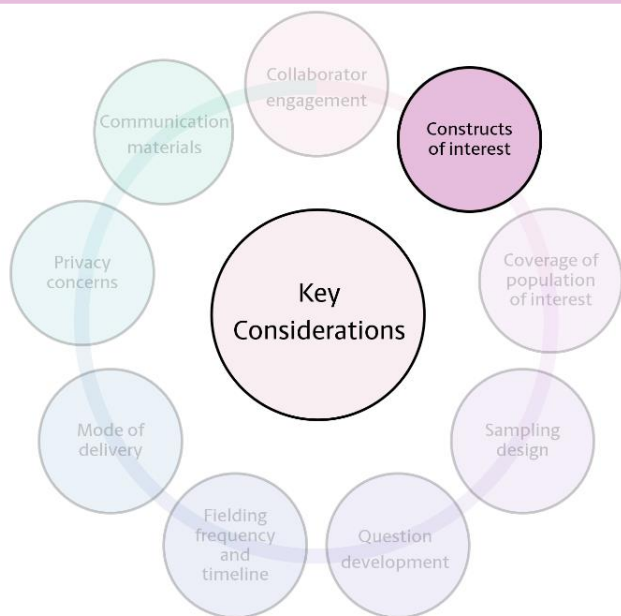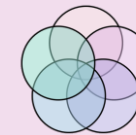| Description of Consideration	Option 1: Field a new survey	Option 2: Field a supplemental survey	Option 3: Add items to an existing survey
Describes potential opportunities to engage with key collaborators on the development of the survey to engender buy-in from relevant entities and raise the profile of the survey to increase participation	• Identify and engage potential collaborators. Develop a plan to incorporate their input into survey development.		• Proactively communicate with collaborators about potential constraints and practical limitations to measuring sexual harassment and related constructs specific to this survey option • Develop a plan to incorporate their input into survey development

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Constructs of Interest

General Recommendations

- Prioritize an intersectional approach when assessing sexual harassment and the reporting of sexual harassment by including measures assessing heterosexist harassment, racialized sexual harassment, and the reporting of these experiences

| Description of Consideration	Option 1: Field a new survey	Option 2: Field a supplemental survey	Option 3: Add items to an existing survey
Describes considerations related to identification of sexual harassment constructs of interest as well as related constructs to measure	• Ability to include recommended constructs of interests, as well as additional constructs		• Prioritize the most important construct of interest, sexual harassment, to include on an existing survey

Measuring Sexual Harassment in the STEM Enterprise

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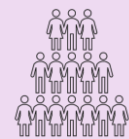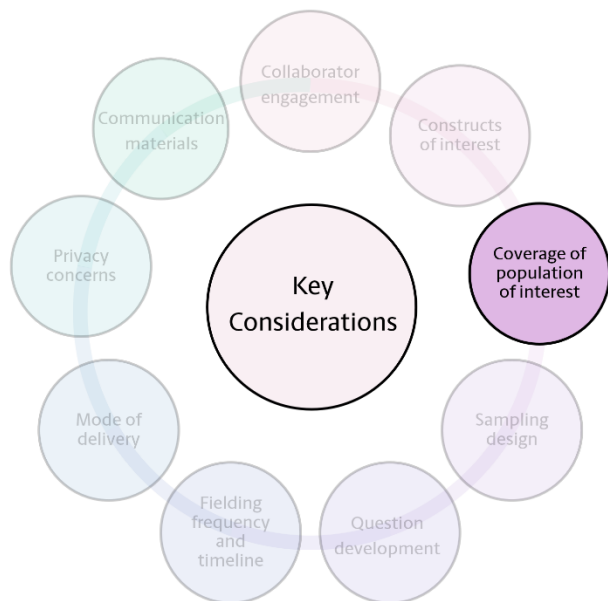
Coverage of Population of Interest

General Recommendations

- Target both STEM students and professionals at various stages (i.e., undergraduate, graduate, early-, mid-, late-career professionals)
- Sampling considerations should also account for targeting women, sexual and gender minorities, and racial and ethnic minorities to ensure appropriate coverage of underrepresented groups in STEM

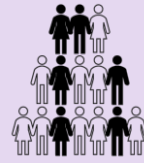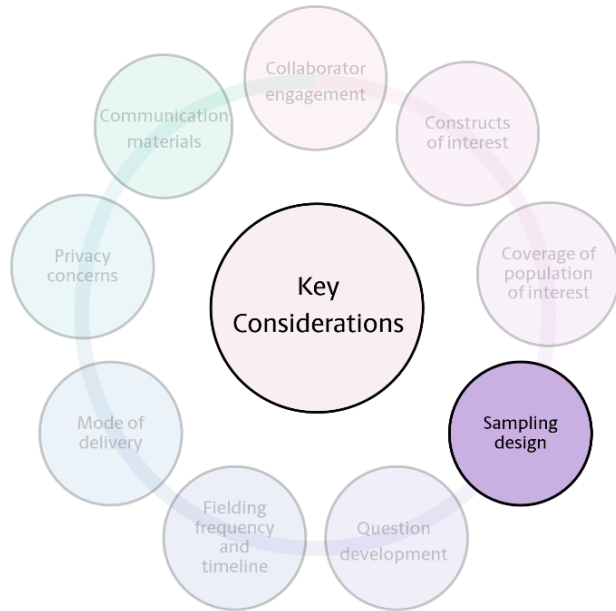| Description of Consideration	Option 1: Field a new survey	Option 2: Field a supplemental survey	Option 3: Add items to an existing survey
Captures information related to the target population for the survey for which we are interested in assessing	• Consider oversampling underrepresented groups (e.g., women) • Add questions related to sexual orientation and gender identity	• Consider oversampling underrepresented groups (e.g., women) • If possible, add questions related to sexual orientation and gender identity • Add a supplemental survey to the NSCG and/or NTEWS	• Add items to the NSCG and/or the NTEWS to capture both STEM students and professionals • Add sexual harassment questions to the NSCG and NTEWS. If possible, only field to a subset of the NSCG and NTEWS samples

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Sampling Design

Key Considerations

- Collaborator engagement
- Constructs of interest
- Coverage of population of interest
- Sampling design
- Question development
- Fielding frequency and timeline
- Mode of delivery
- Privacy concerns
- Communication materials

General Recommendations

- The sufficient sample size needed for analyses should be determined prior to survey administration to ensure that there is sufficient power to detect effects and achieve desired precision while avoiding costly oversampling
- Add questions related to sexual orientation and gender identity
- Consider over- and under- sampling subgroups as needed

Description of Consideration	Option 1: Field a new survey	Option 2: Field a supplemental survey	Option 3: Add items to an existing survey
Provides information related to the process for sample creation	• Leverage existing sampling frames to aid in the sampling design, such as the ACS	• Use a subset of the current NSCG and NTEWS sample to receive the supplemental survey • Potentially bolster sample by sourcing from the ACS • Identify fielding period that is off-cycle	• Use existing sampling approach as NSCG and NTEWS but only field sensitive questions to only a subset of the NSCG and NTEWS sample • Existing weighting plan will need to be updated

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Key Considerations

- Collaborator engagement
- Constructs of interest
- Coverage of population of interest
- Sampling design
- Question development
- Fielding frequency and timeline
- Mode of delivery
- Privacy concerns
- Communication materials
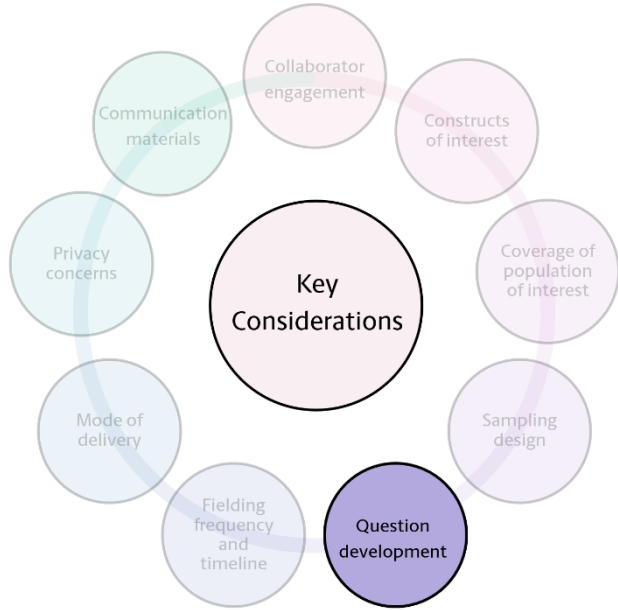
Question Development

General Recommendations

- Use established and validated behaviorally based measures of sexual harassment and related constructs
- Recall periods for experiences of interest should be determined based on the fielding frequency
- Constructs should be assessed in separate modules and survey respondents should receive no more than two modules
- Consideration of order effects is critical when including sensitive question on the survey
- Pilot testing and cognitive interviews should be employed to ensure accuracy and reliability of newly fielded survey questions

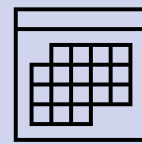| Description of Consideration	Option 1: Field a new survey	Option 2: Field a supplemental survey	Option 3: Add items to an existing survey
Describes considerations related to measurement and scale selection and adaption, recall period, response levels, question ordering and modular design, and assessment (cognitive interviews and pilot testing)	• Implement a modular format where select participants are randomized to receive no more than two modules	• Implement a modular format where select participants are randomized to receive no more than two modules • Assess utility of administering a supplemental survey with both NSCG and NTEWS	• If measures are modified, pre-testing and cognitive interviews are required • Examine the effects of using only a subset of items from a valid measure by pilot testing and using cognitive interviews to ensure reliability/validity

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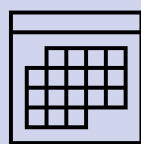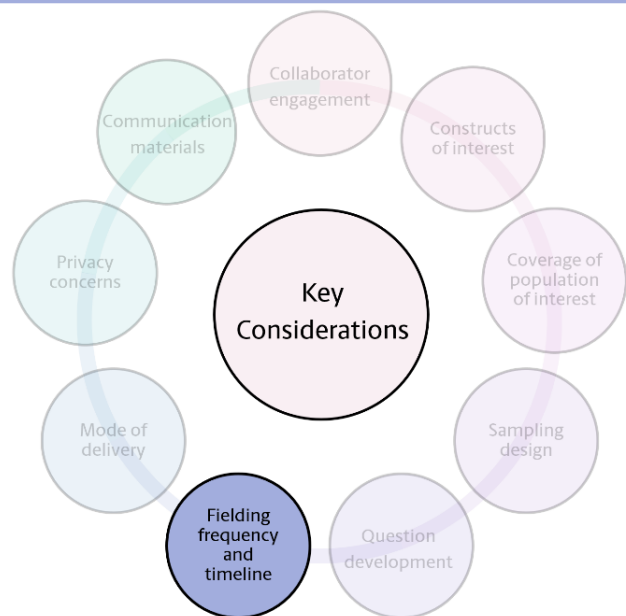
Fielding Frequency and Timeline

General Recommendations

- Surveys should be designed to support longitudinal data collection, if possible
- The fielding frequency should consider how quickly experiences are expected to change within the population

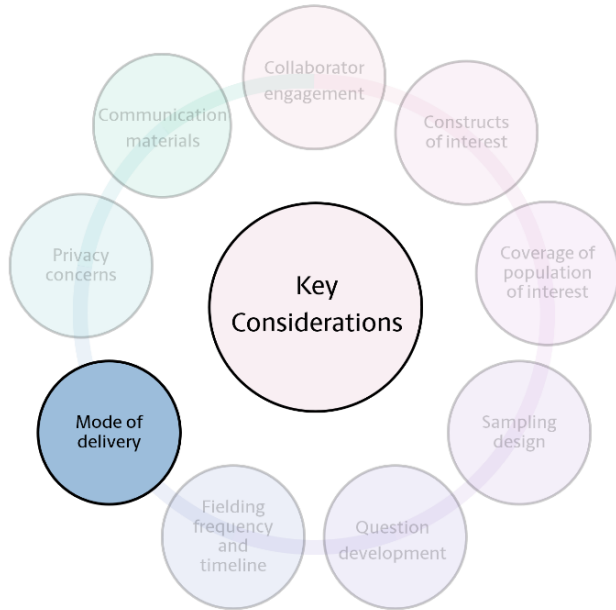| Description of Consideration	Option 1: Field a new survey	Option 2: Field a supplemental survey	Option 3: Add items to an existing survey
Captures information on how often data should be collected via the frequency of survey fielding	• Determined based on informational needs • Not overlap with other NCSES surveys • Panel approach would help increase sample size for cross-sectional analyses	• Leave a gap between conclusion of host survey's previous wave and start of supplemental survey fielding	• Use existing fielding frequency and timing of administration of the NSCG and NTEWS

Key Considerations

Collaborator engagement · Constructs of interest · Coverage of population of interest · Sampling design · Question development · Fielding frequency and timeline · Mode of delivery · Privacy concerns · Communication materials

Mode of Delivery

General Recommendations

- Web- or paper-based surveys should be used due to the sensitive nature of questions. Phone-assisted surveys should *not* be used
- The survey should be sent by an independent party and not by the school or employer

Description of Consideration	Option 1: Field a new survey	Option 2: Field a supplemental survey	Option 3: Add items to an existing survey
Provides considerations about the method of survey administration	• Data collection could mirror NCSES's web- and paper-based survey approach • The survey materials, including the link for the survey, should be emailed directly from NCSES, or other independent party, and not by the respondents' school or employers	• Only use self-administration web and paper surveys • Reviewing existing survey outreach policies, and update to include information on the supplemental survey or the additional survey items	

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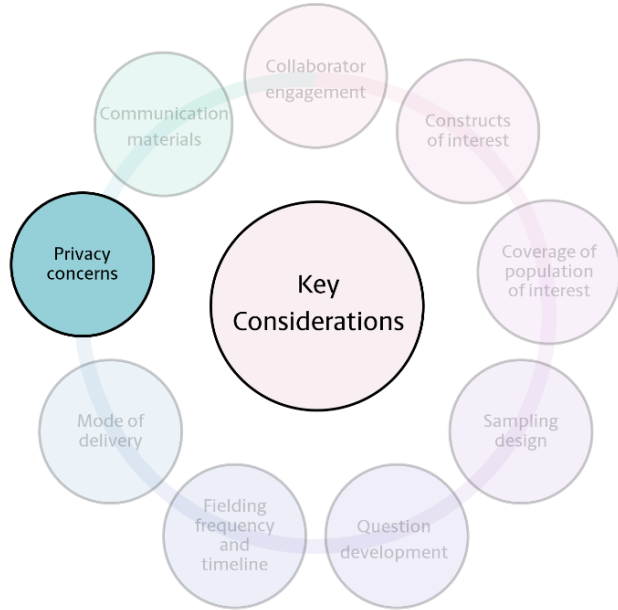
Privacy Concerns

General Recommendations

- The privacy policy should be developed early in the process and be clearly communicated to all staff working on the survey
- The survey materials provided to participants should contain a plain language explanation of the safeguards that are in place and the rights of the participants
- Any sensitive questions should only be assessed via self-administered surveys
- Key subgroups should be well represented in the sample to reduce the chances of small cell sizes or unique demographic combinations that often increase disclosure risk

| Description of Consideration	Option 1: Field a new survey	Option 2: Field a supplemental survey	Option 3: Add items to an existing survey
Captures information on privacy concerns, privacy policies and materials related to the survey, and considerations around the sampling plan and public release data	• Test and evaluate existing data infrastructure for data security • Privacy practices documentation will need to be created	• Existing NSCG and NTEWS privacy policies should be reviewed and updated as needed to ensure protections cover sensitive data • Communication around the supplemental survey should be developed/incorporated into the NSCG and NTEWS, as well as on the supplemental survey	• Existing NSCG and NTEWS privacy policies should be reviewed and updated as needed to ensure protections cover sensitive data • Update privacy language within the survey and outreach materials to address the sexual harassment items

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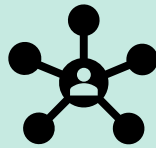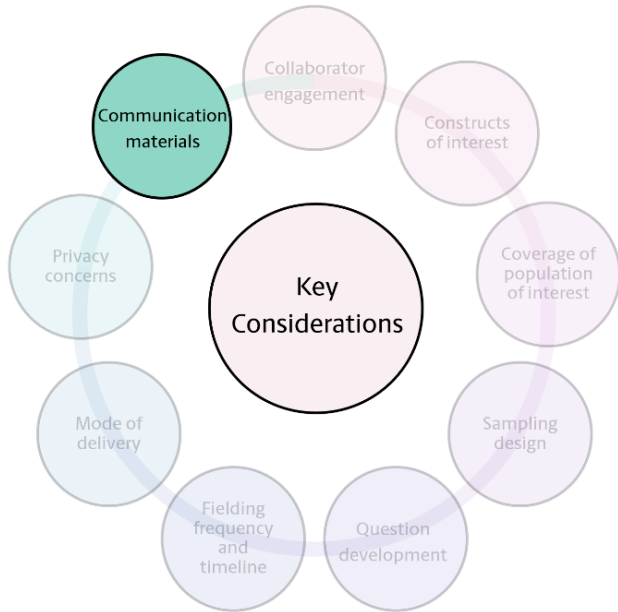
Communication Materials

General Recommendations

- Clear messaging around the purpose, impact, and use of survey as well as privacy concerns
- Consider partnerships with related organizations to raise profile of survey and understand any potential concerns and mitigate those
- Suggested communication material include talking points for leaders or employees within NCSES who will be communicating with the public, and creating an FAQs webpage, creating social media toolkits with useful graphics, and developing press releases

Description of Consideration	Option 1: Field a new survey	Option 2: Field a supplemental survey	Option 3: Add items to an existing survey
Describes information related to general communication strategy, such as pre-survey outreach materials and supplemental materials, developing language around the survey itself related not only to privacy, but also to purpose and impact, and partnering with other entities	• Develop new communication materials in support of new survey effort	• Robust communications campaign around the purpose of the supplemental survey	• Robust communications campaign around the purpose of the additional items • Focus messaging on why sexual harassment items are added to an existing survey

Summary and Future Research Opportunities

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Recommendations Summary

Option Recommendations

Core Recommendations

Survey Option

Option 1: Field a New Survey

Option 2: Field a Supplemental Survey

Option 3: Add Items to Existing Survey

1 Prioritize an intersectional approach

2 Leverage validated behaviorally based measures

3 Weigh strengths of various survey options to inform selection

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Future Research

Collaborator Research	• Identify potential partners for the development and messaging around measures of sexual harassment and related constructs through an environmental scan • Partnering with trusted collaborators can help with the survey promotion, potentially increase response rates, and help inform the communication and marketing plan
Survey Messaging	• Conduct research to inform the communication and marketing plan once the survey is ready to field • Understand how different subpopulations perceive the selected measures of sexual harassment and related construct
Administrative Data	• Leverage administrative data to help understand patterns in career progression and pipeline loss, demographic trends in STEM, as well as to inform survey development (e.g., how these survey items can be merge with administrative data to further answer questions related to sexual harassment in STEM)
Additional Qualitative Research	• Conduct additional qualitative research to help illuminate the different ways harassment and discrimination manifests within STEM • Investigate more subtle forms of sexual harassment and discrimination in STEM or field-specific factors that might influence sexually harassing behaviors in STEM