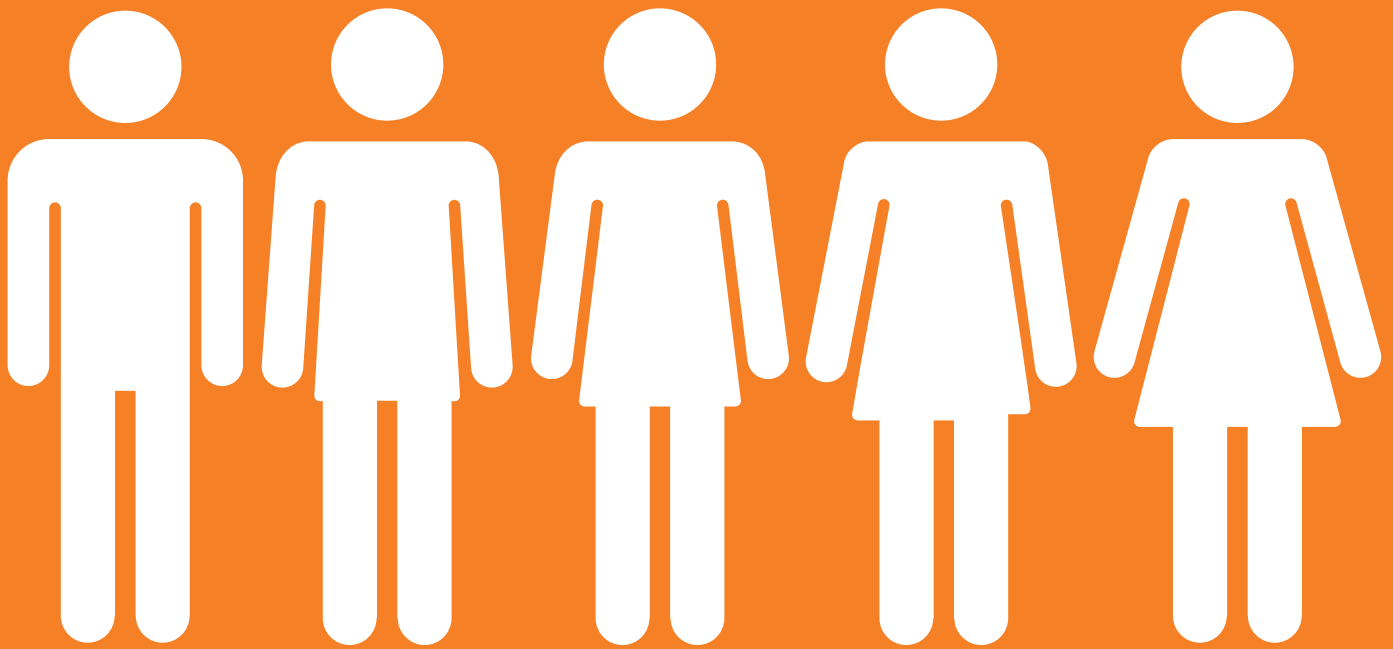




LETTING GO OF THE BINARY
**COMPARING CATEGORICAL
AND CONTINUOUS MEASURES OF
SEX, GENDER, AND SEXUALITY**



TEAM FINCH

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This Executive Summary...

Comparing Categorical and Continuous Measures of Sex, Gender, and Sexuality

outlines the (1) methods, (2) results, (3) conclusions and (4) implications of two studies of sex, gender, and sexuality undertaken by Team Finch Consultants (TFC). Building on a model originally called the Diagram of Sex and Gender, TFC developed a more inclusive schema called the *New Diagram of Sex, Gender and Sexuality* (NDSGS, Bryan and Barr, 2015; see final page). TFC adapted the NDSGS to use as a measure and administered it to two different demographic groups, analyzed the data, and presented the results. The paper *Letting Go of the Binary: Comparing Categorical and Continuous Measures of Sex, Gender, and Sexuality* (Bryan, J, Barr, S, Overtree, C, & Mangine, J., 2016) is being submitted for publication in its entirety and is available from the first author.



STUDY 1

Differences between Categorical and Continuous Measures of Sex, Gender, and Sexuality

SAMPLE

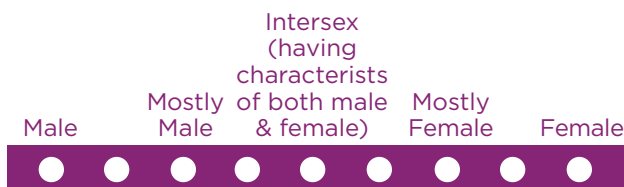
In Study 1 there were **742 participants** obtained via Survey Monkey's paid sampling service and recruited via social media. These respondents had an **average age of approximately 43 years old**, with a fair amount of variance ($SD = 17.4$). The sample's **median annual income was approximately \$40,000**. Most of the participants identified themselves as non-Hispanic White (approximately 82%), and the sample included people who identified as Latino, Black/African-American, Asian/Pacific Islander, Middle Eastern, Native American, Middle Eastern, and multiracial. **The majority of participants (almost 70%) identified as being female-assigned at birth.**

METHOD

We explored the way participants identify their sex, gender, and sexuality when given categorical versus continuous methods of responding.

AN EXAMPLE OF THE SPECTRUM-BASED QUESTIONS

If you thought of your biological sex on a spectrum, how would you describe it?



NB: None of the points on the scales used in the survey had any numerical value assigned to them.

1st participants were asked to respond to questions about their sex assigned at birth (SAAB), gender, and sexuality using standard checkboxes:

- male, female, or intersex for SAAB;
- man, woman, or genderqueer/non-binary for gender;
- straight/heterosexual, bisexual, queer, pansexual, gay/lesbian/homosexual, asexual, or other for sexual identity.

These checkbox-based questions were the study's **categorical measures**.

2nd participants were then asked to think about their biological sex, gender identity, gender expression, and degree of attraction to various gender identities using spectrums.

Participants were asked to place themselves on a dedicated spectrum for each aspect of identity. "Your answer might fall anywhere along the spectrum, on one of the end points, somewhere in the middle, or closer to one end than the other. There are no right or wrong answers involved!" For example, for biological sex, subjects were presented with a spectrum with male on one end and female on the opposite end. In addition to these binary response options, there were seven equidistant points between male and female that participants could select to represent their biological sex.

These spectrum-based questions were the study's **continuous measures**.



STUDY 1 (continued)

Differences between Categorical and Continuous Measures of Sex, Gender, and Sexuality

RESULTS

Results of Study 1 indicated that traditional checkbox/categorical methods of assessing sex, gender, and sexuality inadequately capture the ways in which people experience these aspects of identity. Comparing the checkbox versus spectrum/continuous methods of measuring sex, gender, and sexuality, TFC found that **categorical measures overestimated the number of people with binary identities**. In other words, when participants used checkboxes to identify sex, gender, and sexuality, the data suggested that nearly all participants had binary, “normative” identities (e.g., *man* or *woman*). However, when participants used continuous measures to convey identities and characteristics, 30% of these same participants chose non-binary, “non-normative” points on the spectrums. In essence, categorical measures obscured the variation in sex, gender, and sexuality, while continuous measures revealed the variation that existed in the sample.

KEY DATA

In Study 1, TFC confirmed the hypothesis that variation between categorical versus continuous measures would occur. However, **the frequency and consistency of that variation was more robust than expected**. We wondered how much the self-selecting nature of the sample had affected the data. To reduce this particular sample bias, TFC opted to conduct Study 2, using a sample of 385 students enrolled in an undergraduate Psychology course at a large New England university. The full description of the design, methodology, data, and analysis of Study 2 is available from the first author (Bryan, J, Barr, S, Overtree, C, & Mangine, J., 2016. *Letting Go of the Binary: Comparing Categorical and Continuous Measures of Sex, Gender, and Sexuality*. Manuscript in preparation).

In essence, categorical measures obscured variations in sex, gender, and sexuality, while continuous measures revealed the true variation that existed in our sample.



STUDY 2

Differences between Categorical and Continuous Measures of Sex, Gender, and Sexuality

Study 2 participants demonstrated patterns and percentages of variation similar to those in Study 1 on continuous measures of biological sex, gender identity, gender expression, sexual attraction, sexual behavior and sexual identity. For example, when **385** participants reported their gender identity categorically, **6** people identified as non-binary (Fig. 1). When reporting continuously, **75** out of **385** people identified as non-binary (Fig. 2).

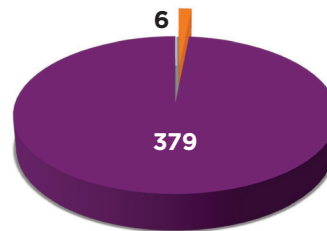


FIG. 1
GENDER IDENTITY
MEASURED BY
CATIGORICAL
CHECKBOXES

● BINARY
● NON-BINARY

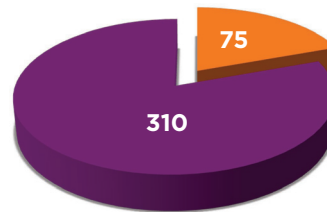


FIG. 2
GENDER IDENTITY
MEASURED ON
CONTINUOUS
SPECTRUM

Variations in participants' gender expression are even more robust. Figure 3 shows a weighted distribution of 385 participants on a continuous measure of gender expression; the majority do not select the binary options.

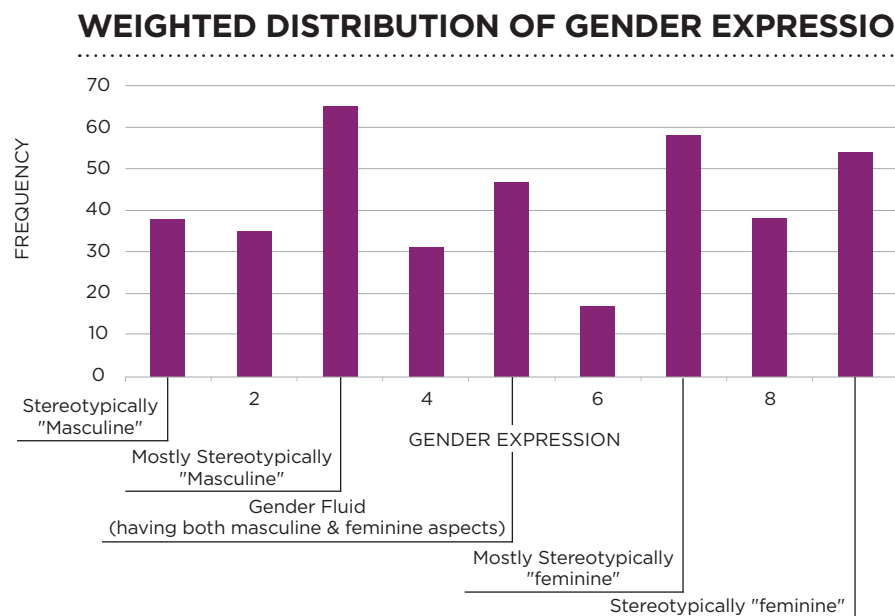


FIG. 3
CONTINUOUS
MEASURE OF
GENDER
EXPRESSION



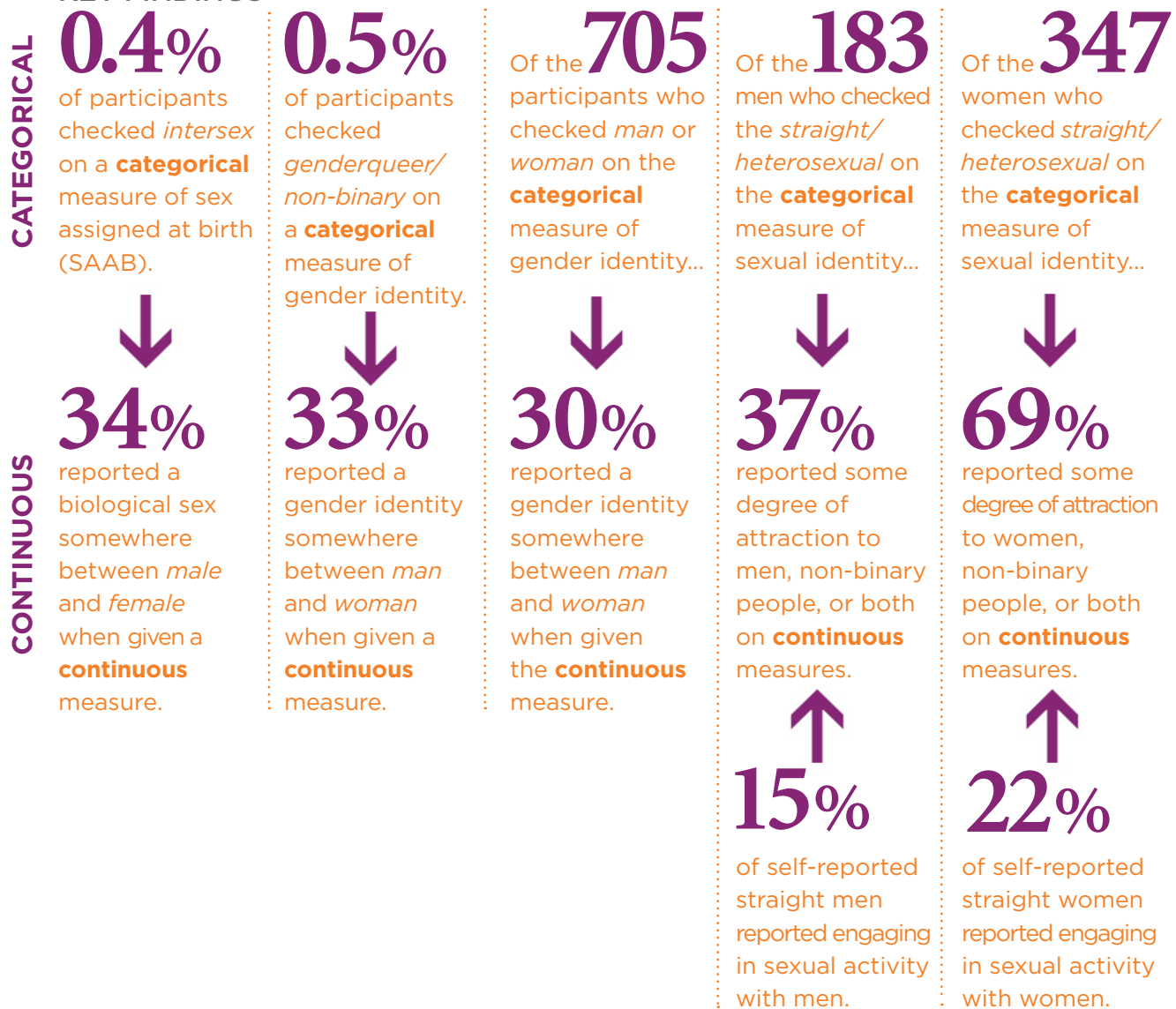
STUDY 2 (continued)

Differences between Categorical and Continuous Measures of Sex, Gender, and Sexuality

RESULTS

The results of Study 2 support the central finding of Study 1: categorical measures of sex, gender and sexuality overestimate the number of people with binary identities.

KEY FINDINGS



STUDY 2 (continued)

Differences between Categorical and Continuous Measures of Sex, Gender, and Sexuality

GENDER IDENTITY & EXPRESSION

The data also challenge stereotypical gender expectations. For example, there is a cultural assumption that a person who is biologically male will automatically identify as a man, and be stereotypically masculine. However, the combined profile of these aspects of identity does not support these assumptions about an individual's sex, gender identity, and gender expression. When we examine how participants described their biological sex in relation to gender identity and to gender expression, the amount of correlation is only 9.2% in Study 1 (Fig. 4) and 4.7% in Study 2 (Fig. 5). Clearly, cultural assumptions about the correlation between these constructs are not supported by these data.

When given the option, many people self-identify beyond the binary on each distinct aspect of sex, gender and sexuality.

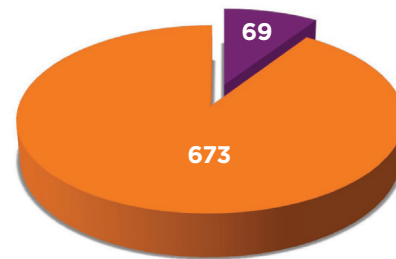


FIG. 4
ALIGNMENT ACROSS
BIOLOGICAL SEX,
GENDER IDENTITY,
GENDER EXPRESSION

- PARTICIPANTS MATCHED ON ALL THREE
- PARTICIPANTS DIDN'T MATCH ON ALL THREE

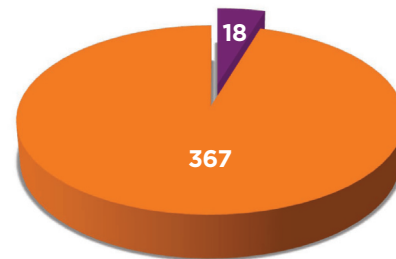


FIG. 5
ALIGNMENT ACROSS
BIOLOGICAL SEX,
GENDER IDENTITY,
GENDER EXPRESSION

- PARTICIPANTS WHO MATCHED ON ALL THREE
- PARTICIPANTS WHO DIDN'T MATCH ON ALL THREE



STUDY 2 (continued)

Differences between Categorical and Continuous Measures of Sex, Gender, and Sexuality

IMPLICATIONS

In the 1950's Alfred Kinsey tested his theories about biodiversity and variation within a single species, first by studying the gall wasp and then by examining human sexuality. "It is a fundamental of taxonomy that nature rarely deals with discrete categories... The living world is a continuum in each and every one of its aspects." (Kinsey, et. al., 1948, p. 639) Over the past 60 years, our understanding of biological sex, gender identity, and sexual behavior has expanded; we recognize that these aspects of the human species can be varied and nuanced.

Yet in spite of understanding the complexity of human identity, the use of categorical measures (i.e., checkboxes) in research and in practice (e.g., medical forms, birth certificates) has remained largely intact. Comparing categorical data from the United States Census (Fig. 6) with continuous data from our research (Fig. 7) highlights the inadequacy of such binary measures.

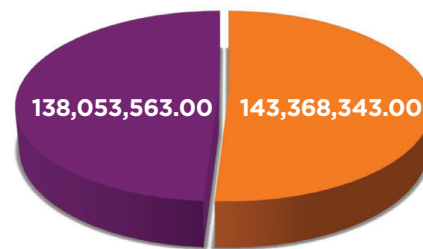


FIG. 6
SEX BREAKDOWN
AS REPORTED BY
2010 CENSUS

- MALE
- FEMALE

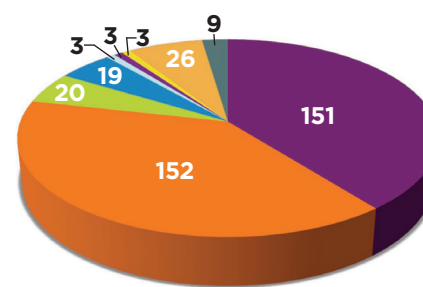


FIG. 7
SELF-IDENTIFIED
BIOLOGICAL SEX
OF COLLEGE
STUDENT SAMPLE
ON 9 PT.
CONTINUOUS
SCALE

- MALE
- 2
- MOSTLY MALE
- 4
- INTERSEX (having characteristics of both male & female)
- 6
- MOSTLY FEMALE
- 8
- FEMALE

The living world is a continuum in each and every one of its aspects.

Alfred Kinsey



THE GENDER & SEXUALITY DIVERSITY FRAMEWORK

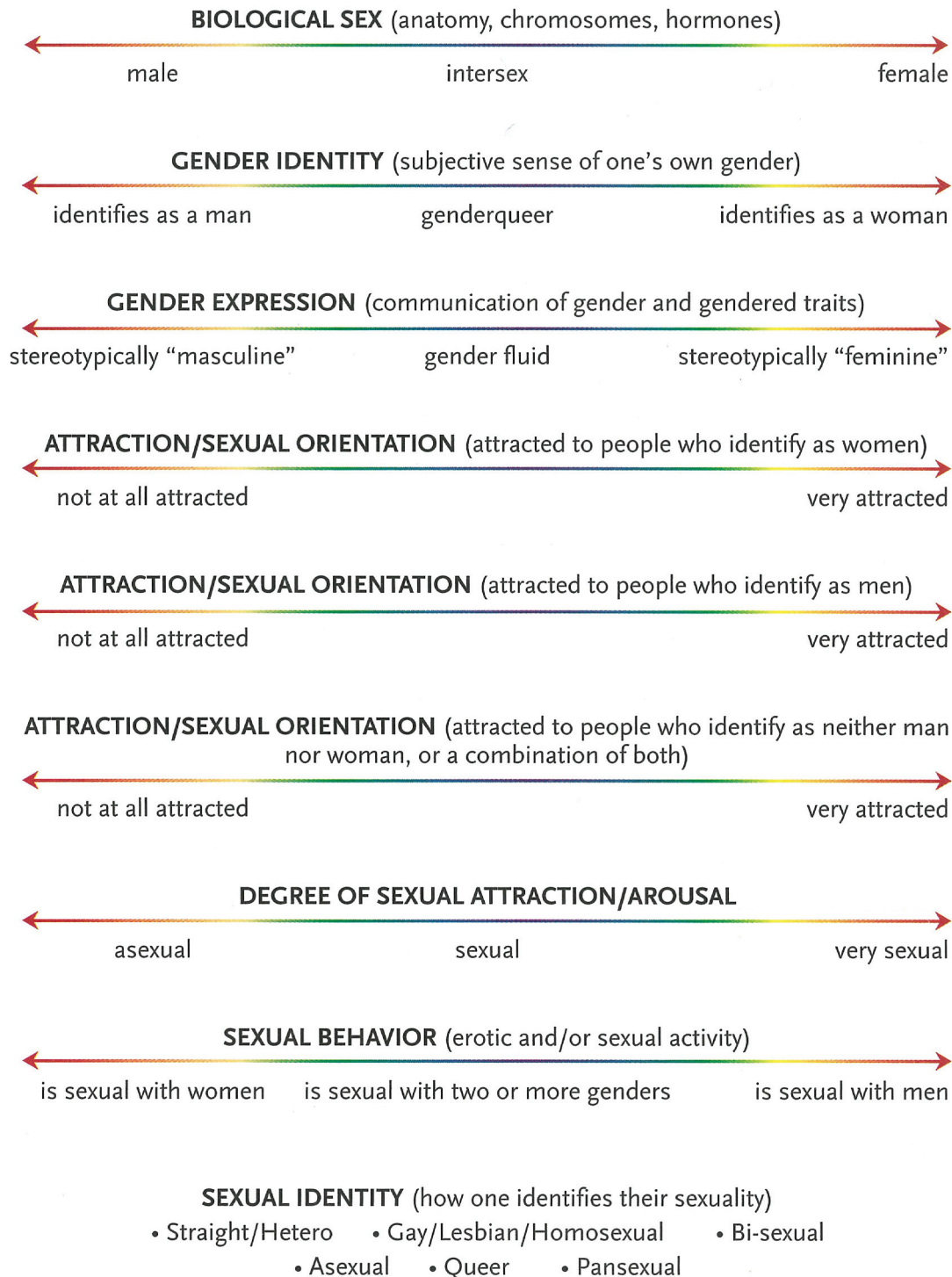
The data support the Gender and Sexuality Diversity (GSD) framework for thinking about these aspects of human identity. Unlike the LGBTQ acronym and framework, GSD includes all sexes, genders and sexualities. It is a broad construct that allows us to consider the multiple, complex, interrelated components that make up sex, gender and sexuality for all human beings. The fundamental premise of GSD is that a binary view of our biology, gender and sexuality is inaccurate and ultimately harmful. These aspects of our identity, expression and behavior are varied and continuous and thus, more fully represented by a collection of spectrums.

As PreK-12 and higher education consultants, the authors use the New Diagram of Sex, Gender and Sexuality (NDSGS, p. 10) to make the concepts and definitions of Gender and Sexuality Diversity (GSD) accessible for educators, parents, students and community members. Team Finch Consultants focuses on work done in educational settings; however, our studies suggest that the GSD framework is suited for a wide range of quantitative and qualitative applications. Our hope is that conceptual and practical understanding of the continuous, diverse nature of sex, gender and sexuality will be adopted in medicine, psychology, sociology, and other academic and professional fields.

PARTICIPANTS' REACTION TO SELF-DESCRIPTION ON CONTINUUMS



NEW DIAGRAM OF SEX, GENDER AND SEXUALITY®



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