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Gender Identity, Sexual Orientation, and Eating-related Pathology in a National Sample of College Students

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Abstract

Purpose—This study examined associations of gender identity and sexual orientation with self-reported eating disorder (SR-ED) diagnosis and compensatory behaviors (CB) in trans- and cis-gender college students.

Methods—Data came from 289,024 students from 223 U.S. universities participating in The American College Health Association – National College Health Assessment II (median age 20 years). Rates of self-reported past year SR-ED diagnosis and past month use of diet pills and vomiting or laxatives were compared among transgender students (n=479) and cisgender sexual minority male (n=5,977) and female (n=9,445), unsure male (n=1,662) and female (n=3,395), and heterosexual male (n=91,599) and female (n=176,467) students using chi-squared tests. Logistic regression models were used to estimate the odds of eating-related pathology outcomes after adjusting for covariates.

Results—Rates of past year SR-ED diagnosis and past month use of diet pills and vomiting or laxatives were highest among transgender students and lowest cisgender heterosexual men. Compared to cisgender heterosexual women, transgender students had greater odds of past year SR-ED diagnosis (OR: 4.62, 95% CI: 3.41-6.26) and past month use of diet pills (OR: 2.05, 95% CI: 1.48-2.83) and vomiting or laxatives (OR: 2.46, 95% CI: 1.83-3.30). Although cisgender sexual minority men and unsure men and women also had elevated rates of SR-ED diagnosis than

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heterosexual women, the magnitudes of these associations were lower than for transgender individuals (ORs: 1.40-1.54).

Conclusions—Transgender and cisgender sexual minority young adults have elevated rates of CB and SR-ED diagnosis. Appropriate interventions for these populations are urgently needed.

Keywords

Eating Disorders; Compensatory Behaviors; Gender Identity; Sexual Orientation; College Students

Most research on eating-related pathology has focused on cisgender individuals, those whose current gender identity matches the sex they were assigned at birth. Although several case studies and case series have described transgender individuals with EDs (e.g., (1, 2)), few studies have compared rates of eating-related pathology between trans- and cisgender individuals. Transgender individuals experience high rates of discrimination (3, 4), which has been significantly associated with poor mental health outcomes in sexual minority (SM) populations (5, 6). Qualitative research suggests transgender persons may be at increased risk of body dissatisfaction, which may predispose them to disordered eating (1, 2); however, results of empirical studies of associations between transgender and EDs have been inconsistent (7-10). This inconsistency may result from variation in the size and composition of the transgender groups, as well as the choice of comparison group. In particular, several previous studies selected transgender and comparison participants from different source populations (7, 8, 10), a practice that may introduce selection bias (11). Only one study to date has investigated associations between gender identity and disordered eating using transgender and cisgender groups derived from the same source population. That study, which examined “conflicted gender identity” rather than self-identified transgender status in a cross-sectional study of Finnish twins and their siblings, found that women with conflicted gender identity had higher Eating Attitudes Test disordered eating scale scores than their non-gender identity conflicted counterparts, with no significant difference among men (9). Of note, only one study has compared disordered eating in trans- and cisgender SM individuals (7); to our knowledge, no studies have examined differences in disordered eating in transgender people relative to other gender and sexual minorities and cisgender heterosexual men and women.

Additional studies have shown that cisgender SM men are at significantly higher risk of disordered eating than heterosexual men (e.g., (5, 12, 13)). Findings comparing cisgender SM and heterosexual women have been more mixed, with some studies reporting increased levels of disordered eating and others showing no significant differences (e.g., (12, 13)). Surprisingly few studies have compared rates of disordered eating in heterosexual and SM men to those in heterosexual and SM women (14-16). These studies have yielded comparable findings, where heterosexual women had higher total scores on the Eating Attitudes Test (15, 16) and restrained eating scale scores on the Dutch Eating Behaviour Questionnaire (14) than heterosexual men and lesbian women; however, there were no significant differences in scores between heterosexual women and gay men.

None of the above-mentioned studies comparing heterosexual and gay men to heterosexual women included other cisgender sexual minorities, such as those identifying as bisexual or people who were unsure of their sexual orientation. Several studies have found elevated rates of disordered eating among individuals unsure of their sexual orientation relative to their same-gender heterosexual counterparts (e.g., (13, 17)). A recent study examining differences in disordered eating by sexual orientation using data from the American College Health Association's National College Health Assessment (ACHA-NCHA) found that men who identified as gay, bisexual, and unsure of their sexual orientation were all significantly more likely than heterosexual men to have an ED diagnosis and to engage in CBs, whereas associations among women were inconsistent and less robust (18). The authors stratified their analyses by gender, which prevented comparisons of heterosexual and SM males to heterosexual women, the most well studied group in the ED literature. In addition, transgender participants were omitted from the analyses due to low numbers. As the ACHA-NCHA is conducted every semester with an increasing number of colleges and universities participating in it, more data have been collected and released since the analyses for the previous study were completed, and the number of transgender participants has increased substantially.

A closer investigation of how disordered eating differs across gender and sexual orientation may provide a greater understanding of its underlying mechanisms. We sought to expand upon prior research by examining differences in eating-related pathology by gender identity and sexual orientation in a large, diverse sample of college students participating in the ACHA-NCHA.

Methods

The current study uses data collected from students from students enrolled in 223 U.S. colleges and universities (median age 20 years) between Fall 2008 and Fall 2011 as part of the ACHA-NCHA (19, 20), a nationally recognized survey of a broad range of health behaviors, outcomes, and perceptions among college students. Participating institutions sampled students and collected data in one of two ways: (1) students in randomly selected classrooms were asked to complete the survey on paper, or (2) a link to the web-based survey was sent to a random sample of enrolled students. Data were collected anonymously. The mean response rate ranged from 19.0% to 36.0% over the 8 semesters of data collection (19, 21-23). The individual campuses participating in the ACHA-NCHA provided documentation of institutional approval of the survey research. Although the questionnaire was administered in multiple semesters at some institutions, the present study only uses data from the first semester that each institution participated in the survey to ensure that all responses came from unique individuals. To best represent the American college population, the current analyses were limited to participants aged 26 years and older.

The ACHA-NCHA questionnaire included items regarding mental health, substance use, sexual behavior, and nutrition and has established reliability and validity (19, 21). Sexual orientation and gender identity were queried in the demographics section of the interview. Response options for the question, "What is your gender?" were "female," "male," and "transgender." Sexual orientation was assessed by the question, "What is your sexual

orientation?" (response options: "heterosexual," "gay/lesbian," "bisexual," or "unsure"). For the current analyses, information on gender identity and sexual orientation and was combined into a seven-level variable: transgender, cisgender SM men, cisgender unsure men, cisgender heterosexual men, cisgender SM women, cisgender unsure women, and cisgender heterosexual women (referent). Cisgender heterosexual women were designated as the reference category because the eating disorder literature largely focuses on cisgender women, the majority of whom are heterosexual. Individuals were categorized as SM if they identified as gay/lesbian or bisexual. Transgender individuals were collapsed into a single group regardless of sexual orientation due to the relatively low number of transgender respondents (n= 479).

Past year ED diagnosis was assessed through two questions: "Within the past 12 months, have you been diagnosed or treated by a professional for anorexia?" and "Within the past 12 months, have you been diagnosed or treated by a professional for bulimia?" each with the response options: "No," "Yes, diagnosed but not treated," "Yes, treated with medication," "Yes, treated with psychotherapy," "Yes, treated with medication and psychotherapy," or "Yes, other treatment." For the current analyses, we constructed a single dichotomous variable to reflect whether or not the respondent had been diagnosed or treated by a professional for anorexia or bulimia within the past year. Participants were also asked whether or not they had vomited or taken laxatives within the past 30 days and whether or not they had used diet pills within the past 30 days.

Variables available in the data set that had been shown to be associated with eating-related pathology and/or gender or SM status were included in the analysis as covariates (24-26). Race/ethnicity was ascertained through the question "How do you usually describe yourself? (Mark all that apply)," which had the response options: "non-Hispanic White" (referent); "non-Hispanic Black;" "Hispanic or Latino/a;" "Asian or Pacific Islander;" "American Indian," "Alaskan Native, or Native Hawaiian;" "Biracial or Multiracial;" and "Other." Participants who selected multiple categories were combined with those who identified as multiracial. Responses to the question "Within the past 30 days, on how many days did you use cigarettes?" were combined into a three level cigarette use variable: No (referent); Yes, but not in the past month; and Yes. Participants were coded positive for binge drinking if they reported consumption of 5 drinks of alcohol at a sitting at least once during the past two weeks in response to the question "During the past two weeks, how many times have you had five or more drinks of alcohol at a sitting?" Stress was assessed with the question "Within the past 12 months, how would you rate the overall level of stress you have experienced?" : "No stress" (referent); "Less than average stress;" "Average stress;" "More than average stress;" and "Tremendous stress." We constructed a four level variable for athletic participation (referent category: no organized athletics participation) based on responses to the question, "Within the last 12 months, have you participated in organized college athletics at any of the following levels?": "Varsity," "Club Sports," and "Intramurals." Fraternity/sorority membership (yes vs. no) was determined through responses to the question "Are you a member of a social fraternity or sorority?"

Analyses were performed using Stata version 9.2. Multivariable logistic regression models were used to estimate the odds ratios (ORs) and 95% confidence intervals (CIs) for

associations of eating-related pathology outcomes with gender and sexual orientation, before and after adjusting for covariates. All multi-category variables were modeled as sets of indicator variables, with an additional category for missing data included in the set of indicator variables for those variables with missing data (see Table 1). Because data from students attending the same institutions may not be independent, odds ratio confidence intervals were adjusted for clustering within institutions using Huber White robust standard errors. Post-hoc pairwise Wald tests evaluated whether there were significant differences in ORs between levels of the gender identity/sexual orientation variable. Due to the low number of transgender participants and subsequent collapsing of the transgender group in logistic regression models, additional chi-square analyses examined risk of CBs and eating disorder diagnosis by sexual orientation among members of the transgender subgroup (see Table 3).

Results

Of the 289,024 participants with data on gender identity and sexual orientation, 0.17% (n=479) identified as transgender persons, 2.07% (n=5,977) as cisgender SM men, 0.58% (n=1,662) as cisgender unsure men, 31.69% (n=91,599) as cisgender heterosexual men, 3.27% (n=9,445) as cisgender SM women, 1.17% (n=3,395) as cisgender unsure women, and 61.06% (n=176,467) as cisgender heterosexual women. The majority of participants (69.58%) were European American. Almost all participants were full time students (95.40%) and attended 4-year colleges and universities (93.31%). Students at public institutions comprised the majority of the sample (64.18%). Additional characteristics of the participants are described in Table 1.

Approximately one and a half percent (1.52%; n=4,384) of the sample reported being diagnosed with an ED in the past year. Past month use of vomiting or laxatives was reported by 2.79% (n=8,054) of the sample and 3.49% (n=10,085) reported use of diet pills within the past month.

Prevalence rates and adjusted ORs for SR-ED diagnosis and past month use of diet pills and vomiting or laxative use by sexual orientation and gender identity are shown in Table 2. The prevalence of all three outcomes was highest among transgender students and lowest among cisgender heterosexual male students. After adjusting for covariates, transgender students had significantly greater odds of past year ED diagnosis (OR: 4.62, 95% CI: 3.41-6.26), past month diet pill use (OR: 2.05, 95% CI: 1.48-2.83), and past month vomiting or laxative use (OR: 2.46, 95% CI: 1.83-3.30) compared to cisgender heterosexual women. Although the magnitudes of the associations were lower than for transgender persons, cisgender unsure women also had significantly elevated odds of past year SR-ED diagnosis (OR: 1.40, 95% CI: 1.14-1.73) and using laxatives or self-induced vomiting in the past month (OR: 1.35, 95% CI: 1.14-1.61), but lower odds of diet pill use (OR: 0.80, 95% CI: 0.69-0.98), relative to cisgender heterosexual women. Cisgender SM men also had significantly elevated odds of past year ED diagnosis (OR: 1.45, 95% CI: 1.28-1.65) compared to heterosexual women. In contrast, compared to cisgender heterosexual women, cisgender heterosexual men had significantly lower odds of past year ED diagnosis (OR: 0.27, 95% CI: 0.24-0.30), past month diet pill use (OR: 0.39, 95% CI: 0.37-0.42), and past month vomiting or laxative use

(OR: 0.15, 95% CI: 0.14-0.17). Cisgender SM women were significantly less likely than heterosexual women to have used diet pills (OR: 0.74, 95% CI: 0.65-0.85) or vomiting or laxatives (OR: 0.72, 95% CI: 0.62-0.84) in the past month.

Post-hoc tests indicated that the ORs for transgender participants were significantly greater, and those of cisgender heterosexual men were significantly lower, than the ORs of any other group for all three outcomes ($p < .001$ for all comparisons). The ORs for past year SR-ED and past month diet pill use in cisgender SM men did not differ significantly from those for cisgender unsure men but were significantly greater than those for cisgender SM women. In turn, the ORs for past year ED and past month vomiting and laxative use were significantly greater among cisgender unsure women than cisgender SM women ($p < .05$ for all).

Among transgender students (Table 3), those who were unsure of their sexual orientation had significantly higher rates of past year ED diagnosis, past month vomiting or laxative use, and past month use of diet pills than those who identified as heterosexual or SM. It should be noted, however, that rates of these outcomes for all transgender subgroups were higher than those among cisgender participants.

Discussion

To our knowledge, ACHA-NCHA includes the largest number of transgender participants ever to be surveyed about EDs and CBs, thus enabling us to conduct statistically powerful analyses of the relationship between gender identity, sexual orientation, and eating-related pathology. We found that transgender students had elevated rates of past month CBs and that both transgender participants and cisgender male SM participants had increased rates of past year SR-ED diagnosis relative to cisgender heterosexual women. Transgender participants were also significantly more likely than members of any other group, including cisgender sexual minorities, to report past year ED diagnosis and past month CBs. Consistent with prior research, we found that eating-related pathology was more prevalent among those with transgender and SM identities (eg., (7-9, 13, 18)). As in previous studies, women who were unsure of their sexual orientation were more likely to have engaged in CBs than cisgender heterosexual women (13, 17), cisgender SM women had significantly lower rates of CBs than cisgender heterosexual women, and cisgender heterosexual men had decreased rates of all three outcomes (13, 27, 28).

There are several potential explanations for our finding that transgender identity is associated with higher risk of SR-ED diagnosis and CBs relative to any cisgender group. First, findings from a small body of qualitative studies have implied that transgender individuals may use disordered eating behaviors in order to suppress or accentuate particular gendered features. It has been suggested that striving for weight loss may be a way for transgender women to conform to feminine ideals of slimness and attractiveness (2, 9). Transgender men and women may also use weight loss to suppress secondary sexual characteristics (1, 9).

A second possibility is that the high prevalence of eating-related pathology among transgender students in this sample may be a result of minority stress, defined as the excess

stress experienced by individuals in stigmatized social categories as a result of their social position, through processes like discrimination, violence victimization, the pressure of concealing one's identity, social alienation, and internalized social stigma (15). Minority stress has been identified as a potential factor in the association between transgender identity and disordered eating (8, 9). Among lesbian, gay, and bisexual individuals, a strong link has been found between higher levels of minority stress and poorer mental health outcomes (e.g., (5, 6, 29)). The same mechanisms are likely at play in transgender individuals, who may be exposed to substantial amounts of discrimination, both on an interpersonal and societal level (3, 30). This discrimination has been linked to an increased risk of several forms of psychopathology (31-35). Minority stress may also explain our finding that transgender students who were uncertain of their sexual orientation were significantly more likely to report EDs and CBs than those who identified as heterosexual or sexual minorities. Transgender persons who are unsure of their sexual orientation may face even greater levels of minority stress based on their gender identity in addition to invalidation of their sexual orientation because of their transgender identity. However, it is unclear why transgender individuals who identify as sexual minorities do not exhibit similarly elevated risk relative to their heterosexual peers. It may be that individuals who are unsure of their sexual orientation are less able to access SM communities as a source of social support, which appears to ameliorate minority stress (15).

A third possibility is that at least some of the association between transgender identity and past year SR-ED diagnosis is attributable to a greater likelihood of contact with mental health professionals among transgender individuals. Compared to cisgender individuals, transgender persons have greater rates of many forms of psychopathology (e.g., (32)), and the presence of co-occurring psychiatric disorders is associated with increased treatment-seeking (36). Moreover, transgender individuals are often required to attend counseling in order to receive gender affirming treatments, increasing their overall rate of interaction with mental health professionals. A previous study found that 75% of transgender participants had received counseling on their gender identity (4). In contrast, only 17.9% of participants in the population-representative National Comorbidity Survey Replication reported mental health services use in the previous 12 months (37). Although the reduced magnitude of the associations between transgender identity and CBs compared to that with SR-ED diagnosis suggests that increased likelihood of contact with mental health professionals may account for some of the strength of association between transgender identity and ED diagnosis, the fact that associations with CBs were still robust is an indication that the difference in rates of diagnosis cannot be entirely attributed to differences in mental health services use.

The present study should be interpreted in light of several limitations. First, given that the eating-related pathology assessment was limited to questions regarding diagnosis of anorexia nervosa and bulimia nervosa by a healthcare provider in the past year, and that studies of general population samples have shown that few individuals with diagnosable EDs ever receive treatment (e.g., (28)), the true prevalence of EDs in this sample is likely underestimated. We were also unable to examine the full range of disordered eating behaviors, and thus it is unknown whether the prevalence of ED symptoms other than purging and use of diet pills, such as binge-eating, differs by gender identity and sexual orientation. Second, we were unable to distinguish between female-to-male, male-to-female,

and genderqueer (individuals whose gender identity does not fall within the male-female binary) transgender persons; thus these results may not generalize to all transgender people. Third, study participants were college students, a population that is on average, younger and of higher socioeconomic status compared to the general population (e.g., (38)); therefore, it is unknown whether these results will generalize to other populations. Fourth, the ACHA-NCHA has a low response rate, which may have introduced sampling bias. However, overall rates of eating-related pathology were broadly comparable to population studies of this age group (e.g., (27)), suggesting respondents did not greatly differ from nonrespondents with regard to these behaviors. Fifth, due to the relatively small number of transgender respondents, we were unable to distinguish between transgender persons of different sexual orientations in logistic regression models. Although we used chi-square analyses to examine differences in eating-related pathology by sexual orientation among transgender individuals, we were unable to adjust for covariates or to compare rates of SR-ED diagnosis or CBs in transgender individuals of varying sexual orientations to their cisgender counterparts. The relationship between gender identity, sexual orientation, and eating-related pathology may therefore be more nuanced than is represented in this analysis.

Despite these limitations, given the dearth of research on EDs in transgender individuals, these findings serve as an important starting place for future investigations. Longitudinal studies with more comprehensive assessments of disordered eating are needed to identify factors contributing to relationships among gender identity, sexual orientation and eating-related pathology. In particular, given that the label transgender encompasses a wide range of gender identities and life experiences, future research should examine potential distinctions in rates of eating-related pathology between subgroups of transgender populations (i.e., male-to-female, female-to-male, and genderqueer transgender persons), as well as the impact of an individual's coming out on rates of psychopathology. Future studies should also investigate the potential differences in conditions comorbid with eating-related pathology between these subgroups. In particular, previous studies have shown gay men are at high risk of steroid/anabolic-androgenic steroid/appearance and performance enhancing drug (APED) abuse (39), which has been tied to increased muscularity concerns in cisgender gay men relative to heterosexual men (e.g., (40)). Although androgenic steroids are often part of supervised medical care for transgender men, this population may also experience increased muscularity concerns and elevated risk of steroid/anabolic-androgenic steroid/APED abuse relative to cisgender heterosexual men. More nuanced examinations of these topics are necessary for the development of targeted eating disorder intervention and prevention efforts for the gender and sexual minority community. Clinicians should also be aware that transgender clients may be at increased risk for eating-related pathology, and should adjust screening practices accordingly.

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Abbreviations

SR-ED	Self-Reported Eating Disorder
SM	Sexual Minority
ACHA-NCHA	American College Health Association – National College Health Assessment

Implications and Contribution

To date, few studies have examined the impact of gender identity on the prevalence of clinical eating disorders and compensatory behaviors. We found that transgender and cisgender non-heterosexual college students were at increased risk of eating disorder diagnosis and compensatory behaviors. Findings highlight the need for targeted prevention and intervention efforts in these vulnerable groups.

Table 1
Characteristics of participants in the American College Health Association – National College Health Assessment

Student Characteristics	n	%
Gender & Sexual Orientation		
Transgender	479	0.17
Cisgender sexual minority men	5,977	2.07
Cisgender unsure men	1,662	0.58
Cisgender heterosexual men	91,599	31.69
Cisgender sexual minority women	9,445	3.27
Cisgender unsure women	3,395	1.17
Cisgender heterosexual women	176,467	61.06
Race/Ethnicity		
European American	201,109	69.58
African American	13,002	4.50
Hispanic	17,221	5.96
Asian/Pacific Islander	29,266	10.13
American Indian/Alaska Native	1,256	0.43
Multiracial	20,610	7.13
Other	4,111	1.42
Missing	2,449	0.85
Past 2 week binge drinking		
Yes	104,595	36.19
No	183,355	63.44
Missing	1,074	0.37
Past month cigarette use		
Yes	44,524	15.40
Yes, but not in past month	47,157	16.32
No	196,150	67.87
Missing	1,193	0.41
Past year stress levels		
Tremendous	25,701	8.89
More than average	118,166	40.88
Average	114,481	39.61
Less than average	24,156	8.36
None	4,920	1.70
Missing	1,600	0.55
Athletic Participation		
Varsity	25,241	8.73
Club	27,524	9.52
Intramural	42,256	14.62
None	192,012	66.43

Student Characteristics	n	%
Missing	1,991	0.69
Fraternity or sorority member		
Yes	28,535	9.87
No	256,921	88.89
Missing	3,568	1.23

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Table 2
Prevalence of self-reported past year eating disorder diagnosis and past 30-day compensatory behaviors by gender identity and sexual orientation and results from logistic regression models

	Past year eating disorder diagnosis (n=4,384)		Past month diet pill use (n=10,085)		Past month vomiting or laxative use (n=8,054)	
	%	OR (95% CI)*	%	OR (95% CI)	%	OR (95% CI)
Transgender	15.82	4.62 (3.41-6.26)^A	13.50	2.05 (1.48-2.83)^A	15.01	2.46 (1.83-3.30)^A
Cisgender sexual minority men	2.06	1.45 (1.28-1.65)^B	4.16	0.92 (0.83-1.02) ^B	3.69	1.04 (0.95-1.14) ^B
Cisgender unsure men	3.66	1.54 (1.13-2.09)^B	4.68	0.91 (0.71-1.17) ^{BD}	3.58	0.77 (0.58-1.02) ^C
Cisgender heterosexual men	0.55	0.27 (0.24-0.30)^C	1.88	0.39 (0.37-0.42)^C	0.67	0.15 (0.14-0.17)^D
Cisgender sexual minority women	3.52	0.89 (0.73-1.08) ^D	5.11	0.74 (0.65-0.85)^D	5.24	0.72 (0.62-0.84)^C
Cisgender unsure women	2.97	1.40 (1.14-1.73)^B	3.86	0.80 (0.69-0.98)^{BD}	5.41	1.35 (1.14-1.61)^E
Cisgender heterosexual women	1.85	1.00 [referent]	4.29	1.00 [referent]	3.71	1.00 [referent]

* odds ratios (OR) with 95% confidence intervals (95% CI) adjusted for age, race/ethnicity, binge drinking, cigarette use, stress, college athletic participation, and fraternity/sorority membership
 NOTE: OR (95% CI) with different superscripts within columns differ significantly from one another ($p < 0.05$) in pairwise comparisons.

Table 3
Prevalence of self-reported past-year eating disorder diagnosis and past 30-day compensatory behaviors by sexual orientation among transgender participants in the ACHA-NCHA

	Heterosexual % (n)	Sexual minority % (n)	Unsure % (n)	Chi Square Omnibus <i>p</i> -value
Past year eating disorder diagnosis	7.63 (9) ^A	11.74 (25) ^A	27.42 (34) ^B	.0001
Past month vomiting or laxative use	6.03 (7) ^A	12.56 (27) ^A	26.40 (33) ^B	<.0001
Past month diet pill use	7.76 (9) ^A	9.81 (21) ^A	25.81 (32) ^B	<.0001

NOTE: Percentages with different superscripts are significantly within rows different from one another in pairwise comparisons ($p < .05$)

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