

BRIEF
REPORT

Is season of birth related to disordered eating and personality in women with eating disorders?

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ABSTRACT. We assessed the relation between season of birth and eating disorder symptoms and personality characteristics in a sample of 880 women with eating disorders and 580 controls from two Price Foundation Studies. Eating disorder symptoms were assessed using Structured Interview of Anorexic and Bulimic Disorders and the Structured Clinical Interview for DSM-IV. Personality traits were assessed using the Temperament and Character Inventory and the Frost Multidimensional Perfectionism Scale. Date of birth was obtained from a sociodemographic questionnaire. No significant differences were observed 1) in season of birth across eating disorder subtypes and controls; nor 2) for any clinical or personality variables and season of birth. We found no evidence of season of birth variation in eating disorders symptoms or personality traits. Contributing to previous conflicting findings, the present results do not support a season of birth hypothesis for eating disorders.

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INTRODUCTION

The relation between season of birth and eating disorders is of considerable interest, although results are inconsistent. Occasional studies report that eating disorders occur more frequently in those born from February to June (1-6). One noted stronger restrictive eating attitudes in a non-clinical population in those born between May and August (7). Other studies of anorexia (AN) (8, 9), bulimia (BN) and eating disorders not otherwise specified (9, 10) have not replicated these associations.

Associations may exist between environ-

mental factors and personality phenotypes. Specifically, season of birth has been associated with novelty seeking, harm avoidance, and cooperativeness (11, 12). Personality may be responsive to environmental and developmental influences of birth season.

Discrepancies in methodology, season of birth and eating disorders definitions, and sample characteristics complicate comparisons. A common season of birth definition incorporates birth month and temperature at assumed conception. Most studies used a restricted number of measures to assess eating problems and failed to examine per-

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sonality constructs. To date no study has examined season of birth in eating disorders in a case-control design employing carefully screened controls.

We assessed seasonal effects on eating disorder diagnoses, symptoms, and personality characteristics in a large, well-characterized sample of women with eating disorders and healthy controls. We hypothesized women born in February through May in the northern hemisphere would have more severe eating disorders, reflected by higher scores on pathological indices.

METHOD

Participants. Participants were probands from Price Foundation multisite international studies: the BN Affected Relative Pairs Study (13) and the AN Trios Study (14). All sites received Institutional Review Board approval; all participants gave consent.

Criteria for BN study probands included: DSM-IV (15) diagnosis of BN, with at least six months of binge eating and vomiting at least twice weekly, and age between 13 and 65 years. AN Trios proband criteria included modified DSM-IV (15) lifetime diagnosis of AN, amenorrhea not required; low weight that is/was <5th percentile of BMI for age and sex; onset before age 25; age between 13 and 65; and criteria met at least three years prior to assessment.

Unrelated healthy women 18-65 years old, with adult BMI between 19 and 27, and matched with affected women on site, age, ancestry, and education served as controls. Exclusion criteria were history of an eating disorder or related behaviors, defined by a score of 20 or higher on the Eating Attitudes Test (16); a first degree relative with an eating disorder; or any disorder defined by the Structured Clinical Interview for DSM-IV(SCID) Screen Patient Questionnaire (17).

Eating Disorder Diagnoses. History of eating disorders, minimum and maximum BMI, age of onset, eating disorder duration, binge eating, fasting, excessive exercise, use of various compensatory behaviors were assessed with the SIAB (18). An expanded version of Module H of the SCID (19) was administered to validate diagnosis and determine symptoms and recovery status.

Personality and Symptom Assessments. Participants completed the Temperament and Character Inventory (TCI) (20) and the Frost Multidimensional Perfectionism Scale (MPS) (21).

Season of birth. Participants were assigned

to groups by birth date two ways. First, solstices and equinoxes determined seasons e.g., spring (March 21-June 20). Second, northern hemisphere insolation criterion (measure of solar radiation at the earth's surface) defined insolar seasons, with summer (May 6-August 5) being the quarter of the year with the greatest insolation, winter (November 6-February 4) with the least, and spring (February 5-May 5) and fall (August 6-November 5) with midrange amounts of light (22).

Analysis. Literature suggests more patients with AN restrictive subtype (RAN) are born in spring (23), thus we compared controls with women with RAN. We also compared controls with a larger sample with "any eating disorder" including AN and/or BN (Any ED). The number of controls born in both traditional and insolar seasons were compared with women with RAN and then with women with Any ED using a chi-square analysis.

Differences between season of birth groups, eating disorders behaviors, and personality traits were assessed with logistic regression or analysis of variance. Significance tests were two-tailed; p-values were adjusted to correct for multiple testing using false discovery rate (24). All analyses were conducted using SAS v9.1 (25).

RESULTS

Women missing birth date information were excluded (n=391, including all German participants) resulting in 580 controls and 880 probands (264 RAN; 616 other AN and/or BN). Lifetime lowest and highest BMI were significantly lower for RAN and Any ED groups relative to controls (all p-values <0.001).

For traditional season analysis, no significant differences emerged between controls and women with RAN ($\chi^2=0.70$, $df=3$, $p<0.87$) or women with Any ED ($\chi^2=1.12$, $df=3$, $p<0.77$). Similarly, insolar season analysis yielded no significant differences between controls and women with RAN ($\chi^2=4.68$, $df=3$, $p<0.20$) or women with Any ED ($\chi^2=2.63$, $df=3$, $p<0.45$). No significant associations were found for clinical or personality variables using either season definition among women with eating disorders.

DISCUSSION

We found no evidence of seasonal variation of birth for RAN or Any ED. Additionally we found no association between eating disorders

symptoms and season of birth. The lack of differences questions the etiological relevance of season of birth in eating disorders. Several possibilities exist for these discrepant findings.

The relation between seasonality and eating disorders does not match calendar months precisely and might differ from traditional three-month seasons commonly used [e.g. (5)]. We reduced uncertainty by determining birth date from the middle/end of the month (traditional season dates) and the beginning (insolation dates) diminishing the probability of miscalculation and focusing implications of results. This approach enabled a comparison of studies from distinct geographical locations using traditional seasons and an assessment of climatic variation using insolation criterion (23). Both appropriate, complementary techniques found no effect of seasonality.

Small sample sizes posed problems in previous studies [e.g., (23)], which may undermine statistical methods and power. By ignoring missing birth date data, most studies [e.g., (1, 2, 8)] did not account for exactness of birth dates. We excluded participants missing these data while employing a sample large enough to make meaningful comparisons.

In some studies, eating disorder samples were compared to the general population (1, 5, 6). Often, control participants' birth years only partly overlapped with affected participants' (3, 5, 6). As birth rates differ across time, control and eating disorders groups should assess the same birth years. Differing diagnostic systems and sample selection (1, 3, 5) have made comparative interpretations difficult. We clearly defined diagnostic criteria and used experienced assessors. Furthermore, we used a control group comprised of local and same-sex participants; compared the sample in two ways, both RAN and Any ED diagnosis vs controls; and entered age in all analyses. This design demonstrated greater diagnostic specificity and control than previous studies.

Limitations remain. First, findings may not generalize to other individuals with eating disorders because Price Foundation studies required participation of family members. However, no known reason suggests season of birth would differ in families with more than one affected person. Second, we did not account for other Axis I diagnoses, but did include an investigation of personality not previously explored. Finally, ~~white~~ participants were from countries in the northern hemisphere, climate and precise location at birth were unavailable, thus could not be assessed.

CONCLUSIONS

The present study improved methodological control yet failed to show any meaningful relation among seasonality, personality, and eating disorders. Although intriguing, based on results from this large and well-characterized sample, season of birth does not appear to differ significantly between women with eating disorders and controls, nor does it contribute to differences across eating disorder subtypes.

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