RESEARCH QUESTIONS
Is PG familial and do patterns exist in the familial aggregation (i.e., the occurrence of more cases of a given disorder in close relatives of a person with the disorder than in control families) of psychiatric illness in family members of individuals with PG?

PURPOSE
While family history studies have been methodologically weak, data suggest that PG may be associated with an increased frequency of PG, substance use disorders, mood disorders, and antisocial personality disorder in first degree relatives (e.g., parents). The aim of the present study was to determine whether PG is familial and to examine patterns of familial aggregation of psychiatric disorder.

HYPOTHESIS
None stated.

PARTICIPANTS
Probands (i.e., patients who were the initial members of their families to come under study) with PG were recruited via newspaper ads and news releases; some (n=5) had participated in medication trials. All met DSM-IV criteria for PG and had a score ≥ 5 on the South Oaks Gambling Screen (SOGS). The control group consisted of individuals recruited via news ads for a family study of emotions and behavior. Control probands were required to have a SOGS score ≤ 2. The exclusion criteria for both groups included the presence of a psychotic disorder, cognitive impairment, or inability to provide informed consent. The researchers sought permission and attempted to contact first degree relatives age 18 and older. In some cases, PG or control probands were estranged from relatives and did not want the researchers to make contact. Nonetheless, family history data were collected for each first degree relative whether estranged, unlocatable, or deceased. The total sample included 397 individuals: 31 PG probands (52% males) and 193 of their first degree relatives (48% males) and 31 control probands (52% males) and 142 of their first degree relatives (46% males).

PROCEDURE
Participants were interviewed by trained raters either at a research office or by telephone regarding self and family gambling history/problems as well as self and family mood (e.g., depression), psychiatric (e.g., ADHD), and personality disorders (e.g., antisocial). Direct interview data were collected from the proband and at least one additional individual in 63% of the 62 families. Diagnostic estimates were made for 335 first degree relatives of the PG and control probands. All probands were directly interviewed, as were 21% of the first degree relatives. All available diagnostic material was blindly reviewed by the first author, who then made a best estimate final diagnosis for each relative. A definite diagnosis of PG was assigned when evidence suggested that problematic gambling behavior existed and had caused adverse consequences or led to treatment. The diagnosis was made at the subclinical level when it was clear from the evaluation that the relative had problematic gambling, though evidence of impairment was weak or absent.

MAIN OUTCOME MEASURES
Family History Research Diagnostic Criteria were used to gather psychiatric information on all first degree relatives. The researchers modified the instrument to collect information on PG by asking whether the relative had problematic gambling behavior, and at least one gambling-related problem (e.g., work, social, etc.). Other measures included the NORC Screen for Gambling Problems; the Mini International Neuropsychiatric Interview, including modules for ADHD and antisocial personality disorder; the Minnesota Impulsive Disorders Interview which assessed impulse control disorders (including PG); the Gambling Symptom-Assessment Scale; the Personality Diagnostic Questionnaire—Revised; the Beck Depression Inventory; and the Maudsley Obsessionality Inventory.
KEY RESULTS
The lifetime rates of PG and any gambling disorder were significantly greater among the relatives of PG probands (8% and 12%, respectively) than among the control relatives (2% and 4%, respectively). PG relatives also had significantly higher lifetime rates of alcohol disorders, any substance use disorder, antisocial personality disorder, and any mental disorder. There was no relationship of PG with proband gender or age at onset of PG. Finally, unexpectedly, PG families were found to be significantly larger than control families.

LIMITATIONS
The PG probands were recruited by advertisement or had participated in treatment studies; a community sample of PG probands would have been more desirable. Only adult probands were selected; this may have reduced the estimate of familial risk, in that epidemiologic data suggest that the prevalence of PG may actually be higher in youth than adults, and only relatives 18 years and older were included in the study. The rates of outcomes for control probands and their relatives should not be generalized to rates that would have been observed had the control probands been randomly sampled. Not all interviews conducted for the study were direct and in-person. Cooperation among first degree relatives was relatively poor and only 27% consented to an interview. Finally, the sample size was relatively small.

CONCLUSIONS
Overall, the findings were consistent with a growing body of research suggesting that gambling disorders are familial. Further, gambling disorders co-aggregated with substance misuse, and PG co-aggregated with antisocial personality disorder. Further research (utilizing larger samples) on the heritability of PG is warranted.

KEYWORDS: addictions, genetics, impulse control disorders, impulsivity

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