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The features marked with a star (*) are based entirely on material taken straight from standard research (and other Official and Therefore Always Correct) literature. Many of the other articles are genuine, too, but we don't know which ones.

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The Improbable Research podcast is back!

[https://www.improbable.com/
category/the-weekly-improbable-research-podcast/](https://www.improbable.com/category/the-weekly-improbable-research-podcast/)

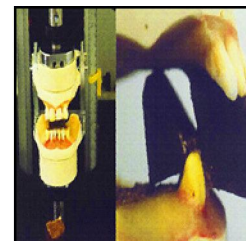
Where There's More

There's always new improbable — it's not what you expect! — stuff on the **Improbable Research blog** at [IMPROBABLE.COM](https://www.improbable.com)



On the Front Cover

Slightly-stylized artistic interpretation of detail from the study “Dental Fracture and Chocolate Candies: Case Report.” See page 15.



Some Coming Events

The Covid-19 pandemic has introduced excitingly boundless uncertainty as to whether, when, where, and how various public activities will happen in the near future. In 2021 most (but not all?) will happen teledistantly.

See [IMPROBABLE.COM](https://www.improbable.com) for details of these and other events:

Jan 11, 2021

Intersci, Edinburgh, Scotland

Jan 16, 2021

Arisia, Boston, MA, USA

Feb 11, 2021

AAAS Annual Meeting (this year teledistantly)

Feb 22, 2021

Israel Physics Society Conference

September 9, 2021

The 31st First Annual Ig Nobel Prize Ceremony

2021 (Dates TBD, pandemic permitting)
Ig Nobel EuroTour

2021 (Dates TBD, pandemic permitting)
Japan



DEPRESSION AND CHOCOLATE?

A quest for mood management methods

by Puffie Coates, Improbable Research staff

Remembered-Chocolate Depression Question Experiment

“Mood Food: Chocolate and Depressive Symptoms in a Cross-Sectional Analysis,” Natalie Rose, Sabrina Koperski, and Beatrice A. Golomb, *Archives of Internal Medicine*, vol. 170, no. 8, April 26, 2010, pp. 699-703. The authors, at the University of California, San Diego, report:

All subjects were asked “How many times a week do you consume chocolate?” ...

A medium serving on this assessment was considered to be 1 small bar or 1 ounce (28 g) of chocolate candy. A small serving, equal to one-half of a medium serving, and a large serving, equal to 1 1/2 of a medium serving, were converted to the corresponding number of medium servings for the purpose of analysis....

CONCLUSION: Higher CES-D [Center for Epidemiologic Studies Depression Scale] depression scores were associated with greater chocolate consumption. Whether there is a causal connection, and if so in which direction, is a matter for future prospective study.

[NOTE: The “Mood Food” study contains a reference to the study by David Lester that is featured in the article “Chocolate, Suicide, and Murder” elsewhere in this issue of the magazine.]

Remembered-Dark-Chocolate Depression Survey

“Is There a Relationship Between Chocolate Consumption and Symptoms of Depression? A Cross-Sectional Survey of 13,626 US Adults,” Sarah E. Jackson, Lee Smith, Joseph Firth, Igor Grabovac, Pinar Soysal, Ai Koyanagi, Liang Hu, Brendon Stubbs, Jacopo Demurtas, Nicola Veronese, Xiangzhu Zhu, and Lin Yang, *Depression and Anxiety*, vol. 36, no. 10, 2019, pp. 987-995. The authors, in numerous countries, explain:

We used multivariable logistic regression to test associations of chocolate consumption (no chocolate, non-dark chocolate, dark chocolate) and amount of chocolate consumption (grams/day, in quartiles) with clinically relevant depressive symptoms....

[Participants] are asked to complete two 24-hr recalls of dietary intake using the USDA’s Automated Multiple-Pass method.... the first 24-hr recall was



Beatrice Golomb, co-author of the study “Mood Food: Chocolate and Depressive Symptoms in a Cross-Sectional Analysis.” Drawing by Nan Swift.

ORIGINAL INVESTIGATION

Mood Food

Chocolate and Depressive Symptoms in a Cross-sectional Analysis

Natalie Rose, MD; Sabrina Koperski, BS; Beatrice A. Golomb, MD, PhD

Background: Much lore but few studies describe a relation of chocolate to mood. We examined the cross-sectional relationship of chocolate consumption with depressed mood in adult men and women.

Methods: A sample of 1018 adults (694 men and 324 women) from San Diego, California, without diabetes or known coronary artery disease was studied in a cross-sectional analysis. The 931 subjects who were not using antidepressant medications and provided chocolate con-

CES-D scores. In addition, a test of trend was formed.

Results: Those screening positive for possible depression (CES-D score ≥ 16) had higher chocolate consumption (8.4 servings per month) than those not screening positive (5.4 servings per month) ($P = .004$); those with still higher CES-D scores (≥ 22) had still higher chocolate consumption (11.8 servings per month) (P value trend, $< .01$). These associations extended to both

[continued >](#)

DEPRESSION AND CHOCOLATE? [CONTINUED]

administered in person by a trained dietary interviewer using a standardized protocol during the physical examination in a mobile examination center. The second 24-hr recall was administered via telephone between 3 and 10 days after the first recall....

[The] present results provide some evidence that consumption of chocolate, particularly dark chocolate, may be associated with reduced odds of clinically relevant depressive symptoms. Further research is required to clarify the direction of causation.

Unpalatable-Chocolate Depression Experiment: 3 Minutes

“Immediate Effects of Chocolate on Experimentally Induced Mood States,” Michael Macht and Jochen Mueller, *Appetite*, vol. 49, no. 3, November 2007, pp. 667-674. The authors, at the University of Würzburg, Germany, explain:

Experiment 1 (48 normal-weight and healthy women and men) examined the effects of eating a piece of chocolate and drinking water on negative, positive and neutral mood states induced by film clips. Eating chocolate reduced negative mood compared to drinking water, whereas no or only marginal effects were found on neutral and positive moods. Experiment 2 (113 normal-weight and healthy women and men) compared effects of eating palatable and unpalatable chocolate on negative mood, and examined the duration of chocolate-induced mood change. Negative mood was improved after eating palatable chocolate as compared to unpalatable chocolate or nothing. This effect was short lived, i.e., it disappeared after 3 min.

Remembered-Chocolate-Craving-When-Depressed Survey

“Chocolate Craving When Depressed: A Personality Marker,” Gordon Parker and Joanna Crawford, *British Journal of Psychiatry*, vol. 191, no. 4, October 2007, pp. 351-352. The authors, at the University of New South Wales, and Black Dog Institute, Sydney, Australia, explain:

We examined links between chocolate craving in people who are depressed and both personality style and atypical depressive symptoms, with a web-based questionnaire completed by nearly 3000 individuals reporting clinical depression. Chocolate was craved by half of the respondents (more so by women)...

Results suggest that personality style dictates the craving for chocolate in states of emotional dysregulation (i.e., anxious and irritable, and not only depressed).

Is there a relationship between chocolate consumption and symptoms of depression? A cross-sectional survey of 13,626 US adults

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Abstract

Objective: To examine associations between chocolate consumption and depressive symptoms in a large, representative sample of US adults.

Methods: The data were from 13,626 adults (>20 years) participating in the National

Chocolate craving when depressed: a personality marker

GORDON PARKER and JOANNA CRAWFORD

Summary We examined links between chocolate craving in people who are depressed and both personality style and atypical depressive symptoms, with a

METHOD

People accessing – for whatever reason – our mood disorder consumer information website (<http://www.blackdoginstitute.org.au>)

RESULTS

When depressed, 1465 (54.4%) reported food cravings, with 1210 (44.9%) specifically being chocolate cravers (50.7% of the women and 30.9% of the men; $\chi^2=88.3$, $P<0.001$). Only 9.5% acknowledged alternative craved foods. Of the chocolate craver group, the 736 (60.8%) who rated chocolate's capacity to improve their depressed mood as moderately to very important were more likely to rate it as making them feel significantly ($P<0.001$) less anxious ($\chi^2=366.7$) and less irritated ($\chi^2=337.1$).

Temperament and Personality questionnaire scores quantified the chocolate cravers group as having significantly