

Measuring Online Information Seeking for Stimulants from Google Search Queries



מרכז שניידר לרפואת ילדים בישראל
 مرکز شنايدر لطب الأطفال في اسرائيل
 Schneider Children's Medical Center of Israel



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Stimulants

- Stimulants: treatment for attention-deficit/hyperactivity disorder (ADHD), narcolepsy (ADHD; Julien, 1998)
- Increase alertness and attention by altering chemical levels in the body
- Dramatic rise in prescriptions and use with introduction of new stimulants
 - Adderall (1996)
 - Concerta (2000)
 - Dexedrine (1937)
 - Evekeo (2014)
 - Focalin (2001)
 - Ritalin (1954)
 - Vyvanse (2007)
- Stimulant use disorder can occur (Gould et al., 2009; National Institute on Drug Abuse, 2018)

Stimulant Use Among Adolescents and Young Adults

- High school and college students use stimulants not prescribed to them or prescribed to others to improve academic and social performance (Dussault & Weyandt, 2013)
- Monitoring the Future Study: 5% of 8th, 10th, 12th graders use amphetamines other than as prescribed (Johnston et al., 2017)
- Young adults search online for information about stimulants, and may be purchasing stimulants online without a prescription (Schepis, Marlowe, and Forman, 2008)
- How can we track stimulant use beyond surveys, which can be infrequent and expensive?

Research Questions

- We mine Google search queries to determine
 - What is the relative interest in different stimulants?
 - How has interest changed over time?
 - How does information seeking vary by season?
- Primary finding:
 - Adderall most searched, notable 2010 increase
 - Searches for stimulants spike annually around the end of school semesters.

Data and Methods

- Tracked seven popular stimulants
- Google Trends (trends.google.com)
 - Aggregated search queries over time
 - Data accessed through trends Application Programming Interface (API)
 - Cannot limit population beyond geography
- Example:

ritalin



The number of Google search queries (per capita) in the United States that contained the word "ritalin" by week

- Time period: January 1, 2004 - December 31, 2018
 - Mean searches by stimulant by year
 - Mean searches by stimulant by week of the year

References

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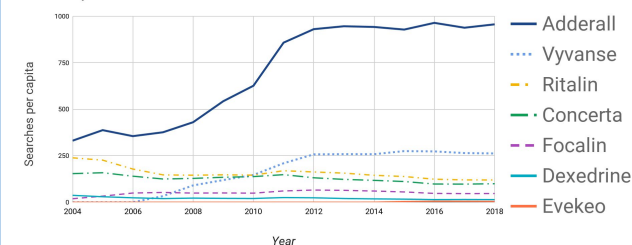
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Results

Google Searches for Stimulants (by year)

Sorted by Prevalence in 2018

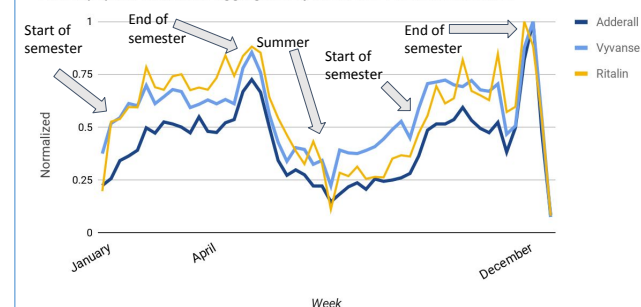


Search Rates by Year (Long-term Trend)

- Adderall most searched each year (same as in Monitoring the Future Study, but it did not track as many stimulants as our study)
- Ritalin second most searched 2004–2009, eclipsed by Vyvanse in 2010
- Remaining order: Concerta, Focalin, Dexedrine, and Evekeo

Google Searches for Stimulants (by Week)

3 most popular stimulants aggregated by week, 2004–2018, Normalized



Search Rates by Week (Seasonal Trend)

- Spikes in seasonal trends come at the end of academic semesters