If the appropriateness of an advertisement for a publication depends on the nature and character of the publication, then how “appropriate” might big data analytics decisions be when placing ads?

Latanya Sweeney
Chief Technologist, FTC

Jinyan Zang
Summer Research Fellow in Technology Science, FTC
Summer Research Fellowships in Technology Science

Krysta Dummit
Chemistry at Princeton University ‘15

Jim Graves
PhD student at Carnegie Mellon

Paul Lisker
Computer Science at Harvard University ‘16

Jinyan Zang
Consultant at Oliver Wyman, Economics at Harvard University ‘13
The Pittsburgh Courier was once the country's most widely circulated black newspaper with a national circulation of almost 200,000.

Ads appearing in the newspaper were reviewed and approved by you.
Today, a big data analytics engine delivers ads to its online website.

Since different types of consumers may have different levels of interest in a specific ad…

Source: Ads seen online.
A promise of big data analytics is to deliver ads that are personal and specific

<table>
<thead>
<tr>
<th>Recreational fishermen</th>
<th>Young mothers</th>
</tr>
</thead>
<tbody>
<tr>
<td><img src="image1" alt="Fishing Ad" /></td>
<td><img src="image2" alt="Baby Product Ad" /></td>
</tr>
<tr>
<td><img src="image3" alt="Outdoors Ad" /></td>
<td><img src="image4" alt="Baby Formula Ad" /></td>
</tr>
<tr>
<td><img src="image5" alt="Angling Guide Ad" /></td>
<td><img src="image6" alt="Feeding Ad" /></td>
</tr>
</tbody>
</table>
A large number of intermediaries and analytics are between advertisers and publishers.
A large number of intermediaries and analytics platforms are between advertisers and publishers.
A large number of intermediaries and analytics are between advertisers and publishers.
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A large number of intermediaries and analytics are between advertisers and publishers.
A large number of intermediaries and analytics are between advertisers and publishers.
More than 30 billion ads delivered per day, each in the time it takes to load a web page.
Mixrank captures ad appearances online without behavioral advertising effects.
History

Omega Psi Phi is an international fraternity with over 700 undergraduate and graduate chapters throughout the United States, Bermuda, Bahamas, Virgin Islands, Korea, Japan, Liberia, Germany, and Kuwait. It is the first predominantly African-American fraternity to be founded at a historically black university. Omega Psi Phi was founded on November 17, 1911, by three undergraduate students and a faculty advisor, at Howard University in Washington, D.C. Each of the founders went on to have a distinguished career in their chosen field.

Since its founding, the Fraternity has continued to attract men dedicated to its Cardinal Principles of manhood, scholarship, perseverance, and uplift. Throughout the world, many notable members are recognized as leaders in the arts, academics, athletics, entertainment, business, civil rights, education, government, and science fields. A few notable members include Roy Wilkins, Benjamin Hooks, Vernon Jordan, Dr. Robert Henry Lawrence Jr., Rev. Jesse Jackson, two former governors, William H. Hastie (U.S. Virgin Islands) and L. Douglas Wilder (Virginia), House Majority Whip James Clyburn, Earl Graves, Bill Cosby, Tom Joyner, NASA Chief Gen. Charles Bolden, Gen. William “Kip” Ward, Michael Jordan, Shaquille O’Neal, Vince Carter, Steve Harvey, Rickey Smiley, and numerous presidents of colleges and universities. Over 250,000 men have been inducted into the Fraternity.

The fraternity is a member of the National Pan-Hellenic Council (NPHC), which is composed of nine predominately African-American Greek-letter sororities and fraternities that promote interaction through forums, meetings, and other media for the exchange of information, and engage in cooperative programming and initiatives throughout the world. The NPHC currently represents over 1.5 million members.

In 2011, the Omega Psi Phi Fraternity will celebrate its 100th anniversary.
History

Omega Psi Phi is an international fraternity with over 700 undergraduate and graduate chapters throughout the United States, Bermuda, Bahamas, Virgin Islands, Korea, Japan, Liberia, Germany, and Canada. It is the second predominantly African-American fraternity to be founded at a historically black institution, preceded by Alpha Phi Alpha (Washington, D.C. Each of the founders went on to have a distinguished career in business, entertainment, academia, and the professional and governmental fields.

Since its founding, the Fraternity has continued to attract men dedicated to its principles of scholarship, perseverance, and uplift. Throughout the world, many notable members have excelled in the arts, academics, athletics, entertainment, business, civil rights, education, elected government, and numerous presidents of colleges and universities. Over 250,000 men have been initiated into the Fraternity.

The fraternity is a member of the National Pan-Hellenic Council (NPHC), which promotes corporate and professional development, provides resources, services, and leadership to its affiliated organizations and other media for the exchange of information, and engage in collaborative initiatives throughout the world. The NPHC currently represents over 1.5 million students worldwide.

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History

Omega Psi Phi is an international fraternity with over 700 undergraduate chapters in the United States, Bermuda, Bahamas, Virgin Islands, Korea, Japan, Liberia, and the United Kingdom. It is a predominantly African-American fraternity to be founded at a historical moment—November 17, 1911, by three undergraduate students at Howard University in Washington, D.C. Each of the founders went on to have a distinguished career in their respective fields.

Since its founding, the Fraternity has continued to attract men dedicated to scholarship, perseverance, and uplift. Throughout the world, many notable alumni have made contributions in the arts, academics, athletics, entertainment, business, civil rights, and politics. A few notable members include Roy Wilkins, Benjamin Hooks, Vernon Jordan, Rev. Jesse Jackson, two former governors, William H. Hastie (U.S. Virgin Islands) and Douglas Wilder (Virginia), House Majority Whip James Clyburn, Earl Graves, Bill Cosby, Gen. William "Kip" Ward, Michael Jordan, Shaquille O’Neal, and numerous presidents of colleges and universities. Over 250,000 men have joined the Omega Psi Phi Fraternity.

The fraternity is a member of the National Pan-Hellenic Council (NPHC), an organization of predominantly African-American Greek-letter sororities and fraternities. The NPHC promotes intra- and inter-group communications, meetings, and other media for the exchange of information, and engage in cooperative programming and initiatives throughout the world. The NPHC currently represents over 1.5 million members.

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Source: MixRank archive.
History

Omega Psi Phi is an international fraternity with over 700 undergraduate and graduate chapters in the United States, Bermuda, Bahamas, Virgin Islands, Korea, Japan, Liberia, Germany, and the Caribbean. Omega Psi Phi is the first predominantly African-American fraternity to be founded at a historically black college or university. The fraternity was founded on November 17, 1911, by three undergraduate students and a faculty member at Cheyney University of Pennsylvania in Washington, D.C. Each of the founders went on to have a distinguished career.

Since its founding, the Fraternity has continued to attract men dedicated to its mission of academic scholarship, perseverance, and uplift. Throughout the world, many notable members have excelled in the arts, academics, athletics, entertainment, business, civil rights, education, and more. A few notable members include Roy Wilkins, Benjamin Hooks, Vernon Jordan, Rev. Jesse Jackson, two former governors, William H. Hastie (U.S. Virgin Islands), and John H. Chase (Virginia), House Majority Whip James Clyburn, Earl Graves, Bill Cosby, Tom Joyner, Bill Johnson, Bolden, Gen. William "Kip" Ward, Michael Jordan, Shaquille O'Neal, Vince Carter, and numerous presidents of colleges and universities. Over 250,000 men have been initiated into the Fraternity.

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First Premier® Card Apply
Apply for First Premier® Cards Here Join Nearly 3 Million Cardholders!
CreditCards.org/FirstPremier
Each card was mentioned on at least one source from top ranked search results

Harshly criticized cards
1. American Airlines
2. American Dream
3. Applied Bank Gold Match Plus Visa
4. Applied Bank Gold Visa
5. Arvest Bank Classic
6. Aventium Gold MasterCard
7. BP Chase Visa
8. Centennial Gold MasterCard
9. Cerulean
10. Continental Finance MasterCard
11. Credit One Bank Visa Platinum
12. Direct Merchants Bank MasterCard
13. Fingerhut
14. First Premier Bank Gold
15. First Premier Bank Platinum
16. First Premier MasterCard
17. Marathon Platinum Reward
18. Matrix
19. New Millenium MasterCard
20. Orchard Bank Classic MasterCard
21. Total Visa
22. UBS Preferred Visa Signature
23. US Bank College Visa
24. Visa Black
25. WalMart Discover

Highly praised cards
1. American Express Blue Cash Preferred
2. American Express Blue Sky Preferred
3. BankAmericard Cash Rewards™ Credit Card
4. BankAmericard Travel Rewards® Credit Card
5. BankAmericard® Visa® Card
6. Barclaycard Arrival Plus™ World Elite MasterCard®
7. Barclaycard Arrival™ World MasterCard®
8. Blue Cash Preferred® from American Express
9. Capital One Cash Rewards
10. Capital One Venture Rewards
11. Capital One® Quicksilver® Cash Rewards Credit Card
12. Capital One® QuicksilverOne® Cash Rewards Credit Card
13. Capital One® Secured MasterCard®
14. Capital One® VentureOne® Rewards Credit Card
15. Chase Freedom®
16. Chase Sapphire Preferred
17. Chase Slate®
18. Citi Simplicity® Card
19. Citi ThankYou® Preferred Card
20. Citi® Diamond Preferred® Card
21. Club CarlsonSM Premier Rewards Visa Signature® Credit Card
22. Discover It
23. Fidelity Rewards American Express
24. Frontier Airlines World MasterCard®
25. PenFed Promise Visa

Source: Top ranked online articles of “best” and “worst” credit cards using Google search results. Listed alphabetically. August 2014.
Each card was mentioned on at least one source from top ranked search results

Harshly criticized cards
1. American Airlines
2. American Dream
3. Applied Bank Gold Match Plus Visa
4. Applied Bank Gold Visa
5. Arvest Bank Classic
6. Aventium Gold MasterCard
7. BP Chase Visa
8. Centennial Gold MasterCard
9. Cerulean
10. Continental Finance MasterCard
11. Credit One Bank Visa Platinum
12. Direct Merchants Bank MasterCard
13. Fingerhut
14. First Premier Bank Gold
15. First Premier Bank Platinum
16. First Premier MasterCard
17. Marathon Platinum Reward
18. Matrix
19. New Millenium MasterCard
20. Orchard Bank Classic MasterCard
21. Total Visa
22. UBS Preferred Visa Signature
23. US Bank College Visa
24. Visa Black
25. WalMart Discover

Highly praised cards
1. American Express Blue Cash Preferred
2. American Express Blue Sky Preferred
3. BankAmericard Cash Rewards™ Credit Card
4. BankAmericard Travel Rewards® Credit Card
5. BankAmericard® Visa® Card
6. Barclaycard Arrival Plus™ World Elite MasterCard®
7. Barclaycard Arrival™ World MasterCard®
8. Blue Cash Preferred® from American Express
9. Capital One Cash Rewards
10. Capital One Venture Rewards
11. Capital One® Quicksilver® Cash Rewards Credit Card
12. Capital One® QuicksilverOne® Cash Rewards Credit Card
13. Capital One® Secured MasterCard®
14. Capital One® VentureOne® Rewards Credit Card
15. Chase Freedom®
16. Chase Sapphire Preferred
17. Chase Slate®
18. Citi Simplicity® Card
19. Citi ThankYou® Preferred Card
20. Citi® Diamond Preferred® Card
21. Club CarlsonSM Premier Rewards Visa Signature® Credit Card
22. Discover It
23. Fidelity Rewards American Express
24. Frontier Airlines World MasterCard®
25. PenFed Promise Visa

Source: Top ranked online articles of “best” and “worst” credit cards using Google search results. Listed alphabetically. August 2014.
Publishers of Most Praised and Most Criticized Cards

**Most criticized card**
*(First Premier)*

- omegapsiphi2011.com
- johnschneideronline.com
- indianbanksguide.com
- gijoeclub.com
- queercents.com
- robstenlove.com
- blowgunsnw.com
- james-taylor.com
- mountainboarder.com
- usa-civil-war.com
- walmartcareers.net
- easycreditcardapproval.net
- thetruthaboutcreditcards.com
- cardpaymentsguide.com
- studentcreditcards.com
- technochase.com
- babyunite.com
- cheapfillups.com
- myeasypaymentus.com
- tvonyourside.com
- thecheeky.com
- thezerocards.com
- e-cheapcigarettes.com
- ezcreditoffers.com

**Most praised card**
*(American Express Blue)*

- collegebookstore.com
- e-referencedesk.com
- allhandsnursing.com
- bestpremed.com
- er-doctor.com
- filmschooldirect.com
- florida-nursing-schools.com
- holyokemass.com
- thedartmouth.com
- california collegenetwork.com
- devryuniversityblog.org
- pharmacist-school.com
- senorcollege.com
- theheismanwinners.com
- florida-nursing-schools.com
- harvardmagazine.com
- nursegroups.com
- pediatricnursing.com
- pellgrantinformation.com
- perkinsloan.net
- privateschoolsreport.com
- robytevents.com
- thebraziltimes.com
- thedormitoryonline.com
- yalealumnimagazine.com

Samples drawn from publishers of one ad for each of these cards.
Publishers of Most Praised and Most Criticized Cards

**Most criticized card (First Premier)**

omegapsiphi2011.com  
johnschneideronline.com  
indianbanksguide.com  
gijoeclub.com  
quercents.com  
robstenlove.com  
blowgunsnw.com  
james-taylor.com  
mountainboarder.com  
usa-civil-war.com  
walmartcareers.net  
easycreditcardapproval.net  
ethetruthaboutcreditcards.com  
cardpaymentsguide.com  
studentcreditcards.com  
technochase.com  
babyunite.com  
cheapfillups.com  
myeasypaymentus.com  
tvonyourside.com  
thecheeky.com  
thezerocards.com  
e-cheapcigarettes.com  
ezcreditoffers.com

Samples drawn from publishers of one ad for each of these cards.

**Most praised card (American Express Blue)**

collegebookstore.com  
e-referencedesk.com  
allhandsnursing.com  
bestpremed.com  
er-doctor.com  
filmschooldirect.com  
florida-nursing-schools.com  
holyokemass.com  
thedartmouth.com  
californiacollegeguide.com  
devryuniversity.com  
pharmacist-school.com  
seonorcollege.com  
theheismanwinners.com  
florida-nursing-schools.com  
harvardmagazine.com  
nursegroups.com  
pediatricnursing.com  
pellgrantinformation.com  
perkinsloan.net  
privateschoolsreport.com  
robotevents.com  
thebraziltimes.com  
thedormitoryonline.com  
yalealumnimagazine.com

"education"
Approach #1
Do more popular websites get more ads for praised cards?
Approach #2

Are websites that receive ads for criticized cards more demographically homogenous?

![Graph showing domain popularity rank in each group against standard deviation of exclusivity index score. The graph is color-coded for different demographic groups: White, Black, Latino, Asian, and Outlier cutoff. Domains above the cutoff are considered outliers and exclusive to a group.]
Approach #3

Does the content of the website predict which kind of ad it might receive?

Sample for demonstration purposes.
We hope our investigations got you thinking…

Forthcoming paper: contact lsweeney@ftc.gov for a copy upon release