Pokémon GO—A New Distraction for Drivers and Pedestrians

Pokémon GO, an augmented reality game, has swept the nation. As players move, their avatar moves within the game, and players are then rewarded for collecting Pokémon placed in real-world locations. By rewarding movement, the game incentivizes physical activity. However, if players use their cars to search for Pokémon they negate any health benefit and incur serious risk.

Motor vehicle crashes are the leading cause of death among 16- to 24-year-olds, whom the game targets. Moreover, according to the American Automobile Association, 59% of all crashes among young drivers involve distractions within 6 seconds of the accident. We report on an assessment of drivers and pedestrians distracted by Pokémon GO and crashes potentially caused by Pokémon GO by mining social and news media reports.

Methods | Twitter (https://twitter.com/) postings containing the terms “Pokémon” and “driving,” “drives,” “drive,” or “car” (N = 345,433) were obtained for July 10 through 19, 2016. A random sample of 4,000 tweets was generated, and estimates from this sample were used to create population-level estimates. Each tweet was reviewed by 4 investigators (J.W.A., E.C.L., J.-P.A., and L.H.) and characterized as to whether (1) a driver was playing, (2) a passenger was playing, or (3) a pedestrian interacted with traffic while playing Pokémon GO. Tweets with driving and/or pedestrian safety messages were also noted. Interreliability on 100 tweets yielded a \( k = 0.68 \).

Google News (https://news.google.com/) reports published from July 10 to 20, 2016, that included “Pokémon” and “driving” were obtained, yielding 321 story clusters. Reports of crashes caused by Pokémon GO were identified; duplicate coverage was eliminated.

All analyses relied on public, anonymized data and adhered to the terms and conditions, terms of use, and privacy policies of Google and Twitter, and were performed under an institutional board exemption from Johns Hopkins University. No exact news reports or tweets are included in this report.

Results | Thirty-three percent (95% CI, 31%-34%) of tweets indicated that a driver, passenger, or pedestrian was distracted by Pokémon GO, suggesting there were 113,993 (95% CI, 107,084–117,447) total incidencces reported on Twitter in just 10 days. In contrast, safety messages were less common (13%; 95% CI, 12%-16%). The remainder of postings (54%) were hypothetical, unclear, or unrelated (Figure).

Eighteen percent (95% CI, 17%-19%) of tweets indicated a person was playing and driving (“omg I’m catching Pokémon and driving”) and 11% (95% CI, 10%-11%) indicated a passenger was playing (“just made sis drive me around to find Pokémon”). Four percent (95%, CI, 3%-4%) indicated a pedestrian was distracted (“almost got hit by a car playing Pokémon GO”).

There were 14 unique crashes—one player drove his car into a tree—attributed to Pokémon GO in news reports during the same period.

Discussion | Pokémon GO is a new distraction for drivers and pedestrians, and safety messages are scarce. Delayed reaction to mobile phone distractions has hampered public safety; however, by relying on public and real-time data (as given herein) public health can stay ahead of emerging problems.

Our findings can help develop strategies for game developers, legislators, and the public to limit the potential dangers of Pokémon GO and other augmented reality games. For instance, passengers using mobile devices are typically not considered a driving risk, but given its augmented reality features, gaming passengers may implore drivers to take risks to aid their play.

Pokémon GO’s makers can also voluntarily make their game safer. Game play is already restricted at speeds greater than 10 miles per hour. Making the game inaccessible for a period after any driving speed has been achieved may be necessary given our observations that players are driving or riding in cars. At the same time augmented reality games might be disabled near roadways or parking lots to protect pedestrians and drivers alike, given reports of distractions herein. Games might also include clear warnings about driving and pedestrian safety.

Traditional surveillance is needed to clarify our findings. Still, even with a limited scope covering just 10 days there were more than 110,000 discrete instances where drivers or pedestrians were distracted by Pokémon GO and some crashed.

Figure. Pokémon GO Tweets

<table>
<thead>
<tr>
<th>Drivers</th>
<th>Passengers</th>
<th>Pedestrians</th>
<th>Uncategorized</th>
<th>Safety Messages</th>
</tr>
</thead>
<tbody>
<tr>
<td>&quot;A normal drive home = 5 min. Stopping every block to catch Pokémon GO = 20 min.&quot;</td>
<td>&quot;Just made sis drive me around to find Pokémon.&quot;</td>
<td>&quot;Just saw a kid get clipped by a car trying to catch a Pokémon...&quot;</td>
<td>&quot;From my view, Pokémon GO is not dangerous. Proves that some people are just really stupid.&quot;</td>
<td>&quot;Pokémon GO prompts warnings about distracted driving.&quot;</td>
</tr>
<tr>
<td>&quot;My mom just legit stopped the car in the middle of the road to catch a Pokémon...&quot;</td>
<td>&quot;Spent the drive back with my bros phone in one hand and my phone in the other, him yelling for me to catch Pokémon for him.&quot;</td>
<td>&quot;Almost got hit by a car playing Pokémon GO.&quot;</td>
<td>&quot;Pokémon GO is driving insane amounts of sales.&quot;</td>
<td>&quot;Just passed sign saying ‘Drive now catch Pokémon later.’&quot;</td>
</tr>
<tr>
<td>&quot;omg I’m catching Pokémon and driving.&quot;</td>
<td>&quot;My mom is driving me around to help me find Pokémon lmao.&quot;</td>
<td>&quot;Just had my first experience with a kid walking in front of my car while absorbed in playing Pokémon GO.&quot;</td>
<td>&quot;Slept the whole drive do u know how many Pokémon I missed?&quot;</td>
<td>&quot;If you catch Pokémon while you drive, you’re a jerk. I don’t care how ‘good’ a driver you are.&quot;</td>
</tr>
</tbody>
</table>

Examples of Twitter postings within each of the labeled categories. Tweets were modified to protect individuals from being identified by or linked to this report.
It is in the public interest to address augmented reality games before social norms develop that encourage unsafe practices. Now is the time to develop appropriate controls.

John W. Ayers, PhD, MA
Eric C. Leas, MPH
Mark Dredze, PhD
Jon-Patrick Allem, PhD, MA
Jurek G. Grabowski, PhD
Linda Hill, MD, MPH

Author Affiliations: Graduate School of Public Health, San Diego State University, San Diego, California (Ayers, Leas); University of California-San Diego School of Medicine, La Jolla (Leas, Hill); Human Language Technology Center of Excellence, Johns Hopkins University, Baltimore, Maryland (Dredze); Keck School of Medicine of the University of Southern California, Los Angeles (Allem); AAA Foundation for Traffic Safety, Washington, DC (Grabowski).

Corresponding Author: John W. Ayers, PhD, MA, Graduate School of Public Health, San Diego State University, 2967 Four Corners St, Chula Vista, CA 91914 (ayers.john.w@gmail.com).

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Study concept and design: Ayers, Leas, Dredze, Allem, Hill.

Acquisition, analysis, or interpretation of data: All authors.

Drafting of the manuscript: All authors.

Critical revision of the manuscript for important intellectual content: All authors.

Statistical analysis: Ayers, Leas, Dredze, Allem.

Obtained funding: Hill.

Administrative, technical, or material support: Dredze, Grabowski.

Study supervision: Ayers, Dredze, Hill.

Conflict of Interest Disclosures: Drs Ayers and Dr Dredze and Mr Leas share an equity stake in Good Analytics, a social media monitoring company that uses some of the methods embodied in this work to support public health practice. Dr Dredze has also received consulting fees from Sickweather LLC, who use social media data to issue disease alerts. Neither the data nor the methods described in this article are proprietary. Dr Grabowski is a paid employee of the AAA Foundation for Traffic Safety. No other disclosures are reported.

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2. Seven Choosing Wisely (CW) campaign recommendations support not ordering imaging tests for patients with nonspecific LBP.

3. A 4-point scale, respondents also rated their own difficulty in following the CW recommendations to avoid imaging for nonspecific LBP in the first 6 weeks, and how they perceive patients’ willingness to accept this recommendation.

4. We invited a national random sample of VA nonresident clinicians (physicians, nurse practitioners, and physician assistants) to participate in an online survey from October 6, 2014 to December 8, 2014. The survey included demographic questions and a hypothetical scenario in which a 45-year-old woman with nonspecific LBP without red flag symptoms requested a computed tomographic (CT) or MRI scan. After reading the scenario, respondents were asked how they would respond to the patient’s request and factors that influenced their decision to obtain imaging. Using a 4-point scale, respondents also rated their own difficulty in following the CW recommendations to avoid imaging for nonspecific LBP.

5. Overuse of imaging for low back pain (LBP) is a considerable problem. Approximately 31% of lumbar sacral magnetic resonance imaging (MRI) scans performed were deemed inappropriate in the Department of Veterans Affairs (VA), and similar rates of inappropriate MRI use have been seen outside of the VA. Seven Choosing Wisely (CW) campaign recommendations support not ordering imaging tests for patients with nonspecific LBP. Our objective was to determine what clinicians perceive to be barriers to following the CW recommendations to avoid ordering imaging tests for nonspecific LBP.


LESS IS MORE

Clinicians’ Perceptions of Barriers to Avoiding Inappropriate Imaging for Low Back Pain—Knowing Is Not Enough

Overuse of imaging for low back pain (LBP) is a considerable problem. Approximately 31% of lumbar sacral magnetic resonance imaging (MRI) scans performed were deemed inappropriate in the Department of Veterans Affairs (VA), and similar rates of inappropriate MRI use have been seen outside of the VA. Seven Choosing Wisely (CW) campaign recommendations support not ordering imaging tests for patients with nonspecific LBP. Our objective was to determine what clinicians perceive to be barriers to following the CW recommendations to avoid ordering imaging tests for nonspecific LBP.

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Results | Of the 1224 eligible clinicians, 579 returned usable surveys (response rate, 47.3%; numbers vary owing to item non-response). Among the respondents, 305 (56.2%) were women, 379 (69.5%) were physicians, 130 (23.9%) were nurse practitioners, and 36 (6.6%) were physician assistants.

Only 18 clinicians (3.3%) thought the patient in the scenario would benefit from having at CT or MRI scan (Table 1). In addition, 420 clinicians (77.1%) reported they would worry that ordering imaging would result in future unnecessary tests or procedures. However, a similar number of clinicians (414, 75.7%) felt they would be unable to refer the patient to a specialist for further evaluation without obtaining imaging first. More than half of clinicians (316, 57.8%) worried that the patient would be upset if she did not receive imaging, and 141 clinicians (25.8%) felt they would not have time to discuss the risks and benefits of imaging with the patient. Furthermore, 149 (27.3%) clinicians...