Letters

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.[1] Moreover, according to the American Automobile Association, 59% of all crashes among young drivers involve distractions within 6 seconds of the accident.[2] 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.[3]

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 4000 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 κ = 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 adhere 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 incidences 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—1 player drove his car into a tree[4]—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[5]; however, by relying on public and real-time data (as given herein) public health can stay ahead of emerging problems.[6]

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

Figure. Pokémon GO Tweets

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

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.

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. 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.

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