

Aging in an Era of Fake News

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Abstract

Misinformation causes serious harm, from sowing doubt in modern medicine to inciting violence. Older adults are especially susceptible—they shared the most fake news during the 2016 U.S. election. The most intuitive explanation for this pattern lays the blame on cognitive deficits. Although older adults forget where they learned information, fluency remains intact, and knowledge accumulated across decades helps them evaluate claims. Thus, cognitive declines cannot fully explain older adults' engagement with fake news. Late adulthood also involves social changes, including greater trust, difficulty detecting lies, and less emphasis on accuracy when communicating. In addition, older adults are relative newcomers to social media and may struggle to spot sponsored content or manipulated images. In a post-truth world, interventions should account for older adults' shifting social goals and gaps in their digital literacy.

Keywords

aging, fake news, misinformation, truth

Discriminating facts from fiction has never been straightforward, but falsehoods spread faster than truths in the age of social media (Vosoughi, Roy, & Aral, 2018). Public concern about this phenomenon spiked during the 2016 U.S. presidential election. Since then, *fake news*, *post-truth*, and *misinformation* appeared as the “Word of the Year” in *Collins Dictionary*, *Oxford Dictionary*, and *Dictionary.com*, respectively. Americans consider “made-up news” to be a bigger problem than climate change, racism, or terrorism (A. Mitchell, Gottfried, Stocking, Walker, & Fedeli, 2019). Tackling this crisis requires a life-span perspective, as one of the strongest predictors of engagement with fake news is advanced age.

During the 2016 U.S. election, older adults' Twitter feeds contained the most fake news; more than 2% of their exposures to political URLs came from fake-news sites (e.g., InfoWars), compared with less than 1% of young adults' exposures (see Fig. 1). Users over 50 were also overrepresented among “supersharers,” a group responsible for 80% of fake-news shares (Grinberg, Joseph, Friedland, Swire-Thompson, & Lazer, 2019). A similar pattern emerged on Facebook: Compared with young users, those over 65 shared 7 times more links to fake-news domains (see Fig. 2). The effect of age held after analyses controlled for partisanship, education, and overall posting activity (Guess, Nagler, & Tucker, 2019). This finding is particularly troubling

given that older adults went on to vote at a higher rate (70.9% turnout) than any other age group (e.g., 46.1% among 18- to 29-year-olds). Why do older adults engage more frequently with fake news? In this review, we explore three candidate explanations: cognitive declines, social changes, and digital illiteracy.

Cognitive Declines

The most obvious scapegoat for older adults' vulnerability to fake news involves cognitive deficits. Indeed, important abilities such as episodic memory and abstract reasoning peak early (in the 20s and 30s) and then steadily decline (Salthouse, 2009). As cognition feels increasingly effortful for older adults (Hess, Smith, & Sharifian, 2016), do they resort to heuristics when evaluating news? People of all ages rely on mental shortcuts to judge whether incoming information is true or false (Brashier & Marsh, 2020). One such rule of thumb involves repetition. Repeating statements such as “The thigh bone is the longest bone in the human body” makes them feel easier to process (more fluent) and thus truer than new statements (Unkelbach, Koch, Silva, & Garcia-Marques, 2019). Disturbingly, illusory

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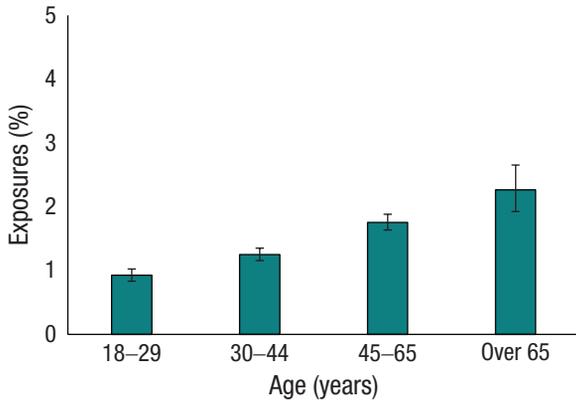


Fig. 1. Mean percentage of political exposures on Twitter coming from fake-news sources, plotted as a function of age. Users over 65 saw the most political fake news in their feeds during the 2016 U.S. election. Error bars indicate 95% confidence intervals. Figure adapted from Grinberg, Joseph, Friedland, Swire-Thompson, and Lazer (2019).

truth also occurs for fake news: A single exposure to headlines such as “Donald Trump Sent His Own Plane to Transport 200 Stranded Marines” increases belief in them later (Pennycook, Cannon, & Rand, 2018).

Several studies have investigated whether susceptibility to this illusion increases with age. Young and older adults evaluated pieces of trivia (e.g., “Austria and Switzerland are linked by the Brenner Pass”; Mutter, Lindsey, & Pliske, 1995) or product claims (e.g., “ChapStick contains seven percent wax”; Parks & Toth, 2006). Just like most social media users scrolling through their timelines, participants received no cues to the claims’ accuracy. Across experiments, repetition inflated perceptions of truth to the same extent in young and older adults (Mutter et al., 1995; Parks & Toth, 2006). If anything, a weak illusion may indicate dementia—repetition persuades healthy older adults more than it persuades

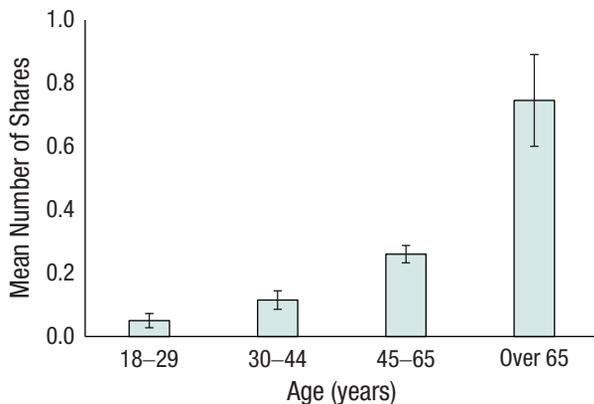


Fig. 2. Mean number of fake-news shares on Facebook as a function of age. Users over 65 shared the most fake news during the 2016 U.S. election. Error bars indicate standard deviations. Figure adapted from Guess, Nagler, and Tucker (2019).

patients with Alzheimer’s disease (J. P. Mitchell, Sullivan, Schacter, & Budson, 2006).

What about cases in which third-party fact checkers, such as Snopes and Politifact, flag false content? Later, users likely encounter the same stories without accompanying “false” tags. Unfortunately, older adults forget details about where information came from (K. J. Mitchell & Johnson, 2009). This *source-memory deficit* suggests that fact checks fade from memory, whereas the original misinformation still feels fluent. Older adults can correct myths such as “Liars sometimes give themselves away by physical tells” in the short term but revert to familiar beliefs after a delay (Swire, Ecker, & Lewandowsky, 2017).

Similarly, repetition has “ironic effects” in old age. In one experiment, medical claims (e.g., “Corn chips contain twice as much fat as potato chips”) appeared with “true” or “false” tags. Participants saw these pairings one or three times. After a delay, participants evaluated the claims alone (without labels). Additional exposures to statements marked as false benefited young adults; they rejected those seen three times previously more often than they rejected those seen once. Paradoxically, older adults demonstrated the opposite pattern: Repeatedly seeing statements with a “false” tag increased belief in them later (Skurnik, Yoon, Park, & Schwarz, 2005). Older adults overrelied on feelings of fluency when recollection failed them, which suggests that fact checks can have unintended consequences.

Dual-process theories of aging pit fluency (familiarity) and recollection against each other, ignoring a facet of memory that improves with age: general knowledge. Older adults continue to acquire facts about the world, which can help them evaluate claims’ accuracy. Repeating “The fastest land animal is the leopard” misleads young adults even though they know better (that the cheetah is the fastest; Fazio, Brashier, Payne, & Marsh, 2015). Older adults, on the other hand, stick with what they know; they reject claims that contradict their knowledge, even when these falsehoods feel fluent (see Fig. 3; Brashier, Umanath, Cabeza, & Marsh, 2017). Asking young adults to behave like fact checkers helps them perform as well as older adults (Brashier, Eliseev, & Marsh, 2020).

With age also comes awareness of the limits of knowledge. For example, the ability to answer questions such as “If interest rates rise, what will typically happen to bond prices?” increases across the life span. However, self-rated financial literacy surges in young adulthood (Sanchez & Dunning, 2018). Gaps between actual and perceived knowledge yield important consequences—*overclaiming*, or professing to know fictional things, predicts belief in fake news. In one study, participants indicated whether they had heard of historical names

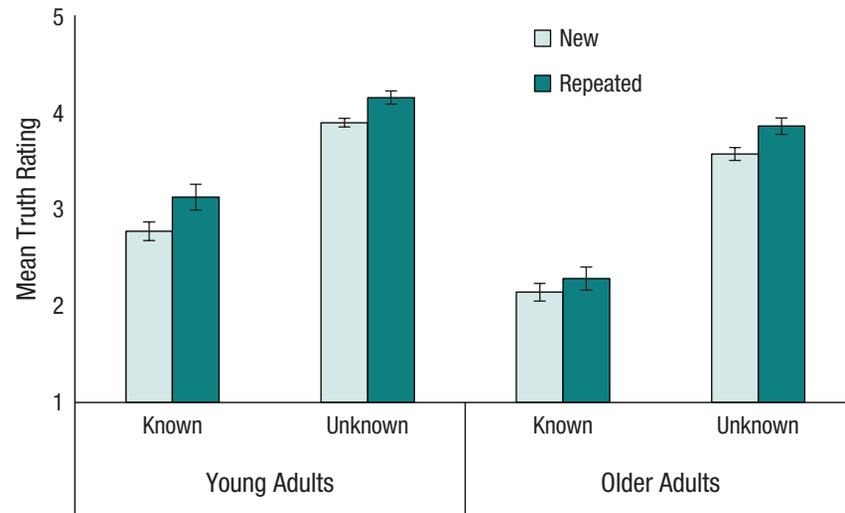


Fig. 3. Mean truth rating for false claims as a function of age, knowledge, and repetition. When falsehoods contradict older adults' knowledge, repetition does not mislead them. Error bars indicate standard errors. Figure adapted from Brashier, Umanath, Cabeza, and Marsh (2017).

and scientific terms, some of which were made up (e.g., “Queen Alberta” and “cholarine”). The perceived accuracy of fake headlines such as “Trump on Revamping the Military: We’re Bringing Back the Draft” increased with willingness to overclaim, or report impossible knowledge (Pennycook & Rand, 2020).

Older adults’ reliance on their impressive knowledge bases may explain why their initial impressions of headlines tend to be correct. Three weeks after the 2016 U.S. election, Allcot and Gentzkow (2017) presented people with true (e.g., “The Musicians Beyoncé and Jay Z Appeared at a Rally in Support of Hillary Clinton”) and false (e.g., “Pope Francis Endorsed Donald Trump”) headlines. For each one, participants answered, “At the time of the election, would your best guess have been that this statement was true?” The ability to distinguish fake from true headlines increased with age. Reanalysis of two experiments by Pennycook and Rand (2019b) revealed the same trend. Discernment of fake (e.g., “Trump to Ban All TV Shows That Promote Gay Activity”) from real (“Vladimir Putin Personally Involved in US Hack, Report Claims”) headlines improved with age (Study 1: $r = .08$, $p = .019$; Study 2: $r = .14$, $p < .001$).¹ Without repetition and accompanying memory failures, older adults outperformed their young counterparts.

In sum, older adults successfully categorize true and false headlines at first glance. The trouble may arise when viral news stories crop up repeatedly in their news feeds. Even in these situations, some requisite cognitive processes decline with age (recollection), whereas others remain intact (fluency) or improve (knowledge). Crucially, sharing content is not the same

as believing it; young adults express willingness to share headlines they recognize as false (Pennycook et al., 2018). Older adults may circulate fake news with specific social goals in mind.

Social Changes

Popular media outlets such as BuzzFeed and *Scientific American* have speculated that older adults share fake news out of loneliness. But good, not bad, moods leave people gullible (Forgas, 2019). In addition, countering stereotypes, older adults are not the loneliest age group—loneliness peaks in the late 20s, mid-50s, and late 80s (Lee et al., 2019). Positive emotions increase with age (Carstensen et al., 2011), even as social networks shrink (Wrzus, Hanel, Wagner, & Neyer, 2013); older adults lose peripheral social partners, which may result in misplaced trust. With fewer weak ties on social media platforms, older adults might assume that content shared by friends and followers is accurate (i.e., “my close friends and family would not spread fake news”).

For better or worse, interpersonal trust increases with age (Poulin & Haase, 2015). Older adults give more optimistic answers to the question, “Generally speaking, would you say that most people can be trusted or that you need to be very careful in dealing with people?” They also report more trust in family members, friends, neighbors, and strangers (Li & Fung, 2013), including unfamiliar people who previously lied (Slessor, Phillips, Ruffman, Bailey, & Insch, 2014). Older adults may strategically choose trust over distrust—one neuroimaging study suggests that older adults go with their guts less

than young adults do. Participants viewed photos of faces and judged either the targets' gender or their trustworthiness. The pictured individuals seemed more trustworthy to older adults than to young adults. Whereas young adults differentially recruited the anterior insula, a region implicated in gut feelings, when evaluating trustworthiness, older adults did not (Castle et al., 2012). Thus, older adults may follow questionable pages and bots that seem like real accounts, increasing their exposure to fake news.

Along these lines, older adults struggle to detect deception. In several experiments, young and older adults watched footage of people accurately stating or lying about their opinions (e.g., "Stem cell usage in humans is ethical"). After each clip, participants judged whether the target told the truth or lied. Compared with young adults, older adults detected fewer lies (Stanley & Blanchard-Fields, 2008) and less capably distinguished truths from lies (Ruffman, Murray, Halberstadt, & Vater, 2012). This doubt deficit increased when fabrications came from same-age peers (Slessor et al., 2014). Features that distinguish lies in person (e.g., sparse details) may also characterize misleading posts online; by extension, older adults may perceive fewer "tells" when a Facebook friend provides commentary on a fake story.

When older adults deem a person unreliable, though, this trait information is memorable. Rahhal, May, and Hasher (2002) exposed participants to trivia claims such as "About 4 hours are required to boil an ostrich egg," spoken by a male (John) or female (Mary) voice. Instructions emphasized that one speaker always tells the truth, and the other always lies. At test, some participants reported who read each claim earlier (John, Mary); others judged the veracity of each statement (true, false). Relative to young adults, older adults' source memory suffered for perceptual features (speaker's gender). However, older adults correctly remembered whether claims came from a dishonest person (see Fig. 4). Social context, such as cues about a person's character, seems to leave a longer lasting impression than simple "true" and "false" tags (Skurnik et al., 2005). Relatedly, older adults weigh negative behaviors (e.g., "Jennifer told the clerk she had been undercharged for an item") more than equally frequent positive ones (e.g., "Jennifer kept the money from the wallet she found") when assessing honesty. *Social expertise*, acquired over decades, dictates that dishonest acts are more diagnostic (i.e., "truthtellers" rarely lie, but liars often tell the truth; Hess & Auman, 2001). Revealing that Donald Trump averaged 15 false claims a day in 2018, for example, may benefit older adults more than debunking any one of his "alternative facts" (e.g., "The noise from windmills causes cancer"). In a related

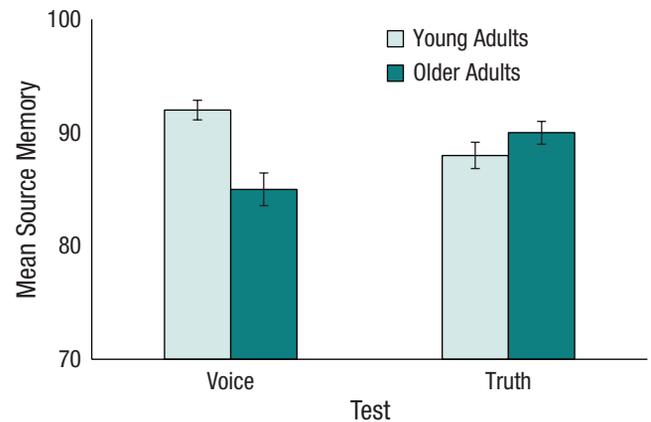


Fig. 4. Mean source-memory score as a function of age and type of test. Older adults remember details inferred from a source's character as well as young adults do. Error bars indicate standard errors. Figure adapted from Rahhal, May, and Hasher (2002).

neuroimaging study, participants learned health-related facts (e.g., "Women's hearts beat faster than men's") paired with explicit tags ("true," "false") or social sources (Pat, Chris) previously described as honest or dishonest. Compared with young adults, older adults' subsequent memory for truth value depended more on the ventromedial prefrontal cortex, an area involved in socioemotional processing (Cassidy, Hedden, Yoon, & Gutchess, 2014).

More generally, older adults often prioritize interpersonal goals over accuracy. They primarily use technology to connect with others, rather than to gain new information (Sims, Reed, & Carr, 2017), and may be especially interested in interacting with young adults. Middle-aged and older adults express more *generativity*, or concern for the next generation, than young adults do (McAdams, de St. Aubin, & Logan, 1993). One generative goal involves passing along knowledge. Older adults tell better stories than young adults, focusing on gist over details (Barber & Mather, 2014) and tuning to their audience; for example, they simplify stories and elaborate more when a child, rather than an experimenter, is listening. Online, older adults may overlook errors to share a moral message (e.g., about a political candidate or party) with young followers.

Suspending an accuracy mind-set can happen unintentionally, as people evaluate information in a biased way that favors prior beliefs and protects their political identity. Does such *motivated reasoning* contribute to older adults' propagation of fake news? In general, belief in fake news reflects lazy thinking more than motivated reasoning. Pennycook and Rand (2019b) asked participants to judge the accuracy of headlines that favored Republican (e.g., "Hillary Clinton Filed for Divorce in New York Courts") or Democratic (e.g.,

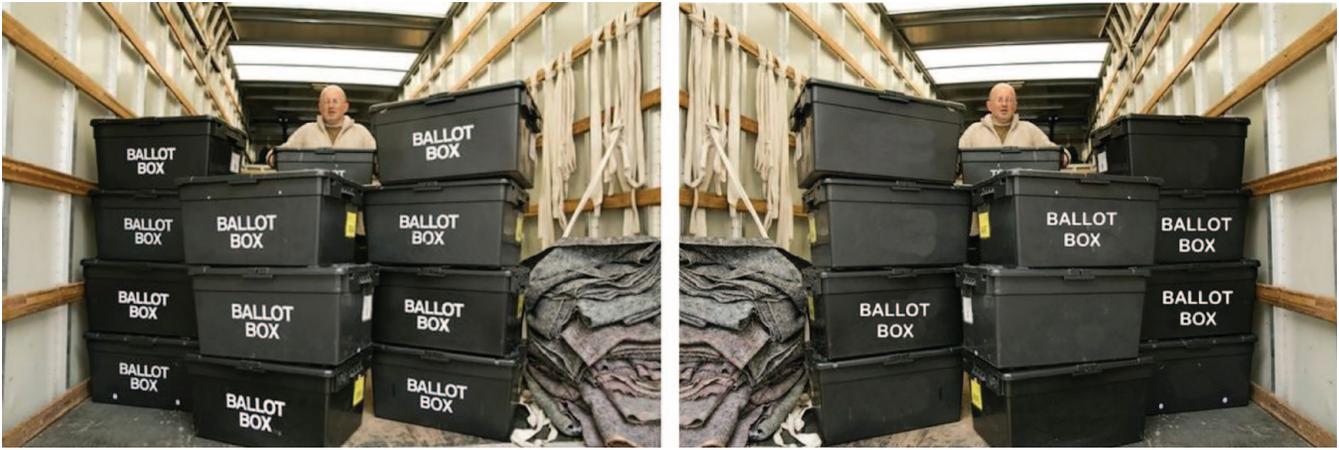


Fig. 5. Original photo (left) and manipulated version of the same photo run by the *Christian Times Newspaper* (right). The outlet removed some of the “BALLOT BOX” labels and reversed the image (presumably to make the original picture harder to find).

“Sarah Palin Calls to Boycott Mall of America Because ‘Santa Was Always White in the Bible’”) views. Then participants completed the cognitive reflection test, which includes questions (e.g., “If you’re running a race and you pass the person in second place, what place are you in?”) that require people to inhibit intuitive, but incorrect, answers (e.g., “first place”). Analytic thinkers discerned fake from real headlines even when the stories aligned with their politics. Reanalysis of these data suggest that analytic thinking increases with age ($r = .09$, $p = .016$). In fact, older adults can outperform young adults on a long-form cognitive reflection test (Hertzog, Smith, & Ariel, 2018). Analytic thinking likely offsets older adults’ motivated reasoning but may not protect them from misleading content on social media, such as manipulated photos and native advertisements.

Digital Illiteracy

Older adults are relative newcomers to the Internet, creating a *gray digital divide*. Forty percent of Americans over 65 use social media (Pew Research Center, 2019), up from only 8% of older adults a decade ago.² Fewer years of experience with clickbait and Internet hoaxes (e.g., chain letters) may leave them at a disadvantage. Even digitally savvy young adults struggle to discriminate mainstream from fringe online news sources (McGrew, Breakstone, Ortega, Smith, & Wineburg, 2018). Reanalysis of work by Pennycook and Rand (2019a) suggests that discernment between mainstream (e.g., NPR) and fake (e.g., *World News Daily Report*) outlets may not change with age (Study 1: $r = .02$, $p = .542$; Study 2: $r = .03$, $p = .287$). Moreover, only 9% of readers notice when news stories are sponsored; this inability to distinguish advertising from editorial content worsens with age (Amazeen & Wojdyski, 2018).

These native advertisements, designed to look like regular, unpaid stories, are widespread—even reputable publications such as *The New York Times* publish them. At the extreme, Russia paid for targeted ads on Facebook (e.g., “Secured borders are a national priority. America is at risk now more than ever”) that read like news but contained fabrications intended to sow discord.

Manipulated images, which often accompany fake news stories, are also notoriously difficult to spot. For example, false claims that Hillary Clinton stole votes appeared with a picture of a man unloading a truck of ballot boxes. Outlets removed some of the “BALLOT BOX” labels to imply foul play (see Fig. 5). These edits left conspicuous irregularities, but readers likely passed over them. People exhibit a bias to accept images as real, so one third of manipulated photos go undetected (Nightingale, Wade, & Watson, 2017). The ability to distinguish real from fake photos declines with age. When viewing altered real-world scenes, older adults miss added or removed objects, distorted angles, and inconsistent shadows (Nightingale, Wade, & Watson, personal communication, June 24, 2019). Older viewers may also be less likely to perform a reverse image search, in which Google returns images similar to an uploaded picture. Even without doctoring, pictures inflate perceived truth. People are more likely to accept claims (e.g., “Alpacas chew in a Figure 8 pattern”) that appear with uninformative photographs (e.g., an alpaca without food in its mouth; Fenn, Ramsay, Kantner, Pezdek, & Abed, 2019)—this *truthiness* effect persists across the life span (Derksen, Giroux, Newman, & Bernstein, personal communication, August 13, 2019). Pictures also increase people’s willingness to share both true and false information on social media (Fenn et al., 2019).

Digital illiteracy could explain why older adults seem gullible online but resilient to scams offline. Contrary

to popular opinion, susceptibility to consumer fraud decreases with age (Ross, Grossmann, & Shtreyer, 2014). Intriguingly, older adults self-report less willingness to share fake news than young adults. When participants were asked “Would you consider sharing this story online (for example, through Facebook or Twitter)?” after viewing fake headlines, agreement decreased with age ($r = -.12, p = .006$; reanalysis of Study 2, Pennycook, Bear, Collins, & Rand, 2020). Older adults’ intentions stand in stark contrast to their actual sharing behavior, a discrepancy that may reflect misunderstandings about how algorithms populate their news feeds or forgetting that shares imply endorsement.

Implications

Although fake news targets readers of all ages, older adults share the most misinformation. This problem could intensify in years to come: America is graying rapidly—the 65-and-over population will nearly double by 2050—and by some estimates, people will consume more false than true information by 2022. For example, increasingly sophisticated *deep fakes* use artificial intelligence to depict events that never occurred (e.g., speeches by world leaders). Psychological science allows us to better understand the current misinformation crisis and offers insight into why older adults are especially vulnerable. We argue that cognitive declines alone cannot explain older adults’ engagement with fake news. Interventions in a post-truth world must also consider their shifting social goals and gaps in their digital literacy.

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A discussion of how psychological science bears on the misinformation crisis.

Transparency

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Notes

1. We thank David Rand for conducting this reanalysis and others mentioned later in the article.
2. This spike does not simply reflect a cohort of digitally savvy 50-year-olds getting 10 years older. In 2009, only 25% of 50- to 64-year-olds reported using a social media site.

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