



417

How Uber Uses Psychological Tricks to Push Its Drivers' Buttons

The company has undertaken an extraordinary experiment in behavioral science to subtly entice an independent work force to maximize its growth.

By [NOAM SCHEIBER](#) and graphics by JON HUANG | APRIL 2, 2017

The secretive ride-hailing giant Uber rarely discusses internal matters in public. But in March, facing crises on multiple fronts, top officials convened a call for reporters to insist that Uber was changing its culture and would no longer tolerate “brilliant jerks.”

Notably, the company also announced that it would fix its troubled relationship with drivers, who have complained for years about falling pay and arbitrary treatment.

“We’ve underinvested in the driver experience,” a [senior official](#) said. “We are now re-examining everything we do in order to rebuild that love.”

And yet even as Uber talks up its determination to treat drivers more humanely, it is engaged in an extraordinary behind-the-scenes experiment in behavioral science to manipulate them in the service of its corporate growth — an effort whose dimensions became evident in interviews with several

dozen current and former Uber officials, drivers and social scientists, as well as a review of behavioral research.

Uber's innovations reflect the changing ways companies are managing workers amid the rise of the freelance-based "gig economy." Its drivers are officially independent business owners rather than traditional employees with set schedules. This allows Uber to minimize labor costs, but means it cannot compel drivers to show up at a specific place and time. And this lack of control can wreak havoc on a service whose goal is to seamlessly transport passengers whenever and wherever they want.

Uber helps solve this fundamental problem by using psychological inducements and other techniques unearthed by social science to influence when, where and how long drivers work. It's a quest for a perfectly efficient system: a balance between rider demand and driver supply at the lowest cost to passengers and the company.

Employing hundreds of social scientists and data scientists, Uber has experimented with video game techniques, graphics and noncash rewards of little value that can prod drivers into working longer and harder — and sometimes at hours and locations that are less lucrative for them.

Faster pickup times mean more idle drivers.

Change the number of drivers in this ride-share simulation. Faster pickup times for riders require a greater percentage of drivers to be idling unpaid.

To keep drivers on the road, the company has exploited some people's tendency to set earnings goals — alerting them that they are ever so close to hitting a precious target when they try to log off. It has even concocted an algorithm similar to a Netflix feature that automatically loads the next program, which many experts believe encourages binge-watching. In Uber's case, this means sending drivers their next fare opportunity before their current ride is even over.

And most of this happens without giving off a whiff of coercion.

“We show drivers areas of high demand or incentivize them to drive more,” said Michael Amodeo, an Uber spokesman. “But any driver can stop work literally at the tap of a button — the decision whether or not to drive is 100 percent theirs.”

Uber's recent emphasis on drivers is no accident. As problems have mounted at the company, from an [allegation of sexual harassment](#) in its offices to revelations that it created a tool to deliberately [evade regulatory scrutiny](#), Uber has made softening its posture toward drivers a litmus test of its ability to become a better corporate citizen. The tension was particularly evident after its chief executive, Travis Kalanick, engaged in a [heated argument with a driver](#) that was captured in a viral video obtained by Bloomberg and that prompted an abject apology.

But an examination by The New York Times found that Uber is continuing apace in its struggle to wield the upper hand with drivers. And as so-called platform-mediated work like driving for Uber increasingly becomes the way people make a living, the company's example illustrates that pulling psychological levers may eventually become the reigning approach to managing the American worker.

While Uber is arguably the biggest and most sophisticated player in inducing workers to serve its corporate goals, other “gig economy” platforms are also involved. Uber's main competitor, Lyft, and popular delivery services [like Postmates](#) rely on [similar approaches](#). So do [companies](#) and individuals posting assignments on crowdsourcing sites like Amazon Mechanical Turk, where hundreds of thousands of workers earn piece-rate wages by completing discrete tasks.

Of course, many companies try to nudge consumers into buying their products and services using psychological tricks. But extending these efforts to the work force is potentially transformative.

Though employers have long borrowed insights from social science to get more out of their workers — tech companies like Google have [calculated](#) that

employees interact more with unfamiliar colleagues when they can graze together at snack bars — they are constrained in doing so. A large body of law and custom in the United States holds that because employers have far more power over their employees than businesses do over their customers, they must provide them with far greater protections — not least, a minimum wage and overtime pay.

Uber exists in a kind of legal and ethical purgatory, however. Because its drivers are independent contractors, they lack most of the protections associated with employment. By mastering their workers' mental circuitry, Uber and the like may be taking the economy back toward a pre-New Deal era when businesses had enormous power over workers and few checks on their ability to exploit it.

“We’re talking about this kind of manipulation that literally affects people’s income,” said Ryan Calo, a law professor at the University of Washington who with Alex Rosenblat has [written a paper](#) on the way companies use data and algorithms to exploit psychological weaknesses. Uber officials, he said, are “using what they know about drivers, their control over the interface and the terms of transaction to channel the behavior of the driver in the direction they want it to go.”

An Empathy Question

In early 2016, a group of roughly 100 Uber employees responsible for signing up drivers and getting them to drive more voted to change its name — from “supply growth” to “driver growth.”

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The vote was not unprompted. For much of the previous year, Uber executives had agonized over how to lower the rate at which drivers were deserting the platform.

Alongside Uber’s already daunting targets for expanding its pool of drivers to meet mounting demand, the high turnover threatened to cap the company’s growth and throw it into crisis.

Uber conducted interviews and focus groups while executives peppered employees with questions like, “What are we doing to have more empathy for the driver side of the equation?”

Underlying the tension was the fact that Uber's interests and those of drivers are at odds on some level. Drivers, who typically keep what's left of their [gross fare](#) after Uber takes a roughly 25 percent commission, prefer some scarcity in their ranks to keep them busier and push up earnings. For its part, Uber is desperate to avoid shortages, seeking instead to serve every customer quickly, ideally in five minutes or less.

This is particularly true of shortages so pronounced as to create a "surge" — that is, a higher fare than normal. While surges do mitigate shortages, they do so in part by repelling passengers, something directly at odds with Uber's long-term goal of dominating the industry. "For us, it's better not to surge," said Daniel Graf, Uber's vice president of product. "If we don't surge, we can produce more rides."

As a result, much of Uber's communication with drivers over the years has aimed at combating shortages by advising drivers to move to areas where they exist, or where they might arise. Uber encouraged its local managers to experiment with ways of achieving this.

"It was all day long, every day — texts, emails, pop-ups: 'Hey, the morning rush has started. Get to this area, that's where demand is biggest,'" said Ed Frantzen, a veteran Uber driver in the Chicago area. "It was always, constantly, trying to get you into a certain direction."

Some local managers who were men went so far as to adopt a female persona for texting drivers, having found that the uptake was higher when they did.

"'Laura' would tell drivers: 'Hey, the concert's about to let out. You should head over there,'" said John P. Parker, a manager in Uber's Dallas office in 2014 and 2015, referring to one of the personas. "We have an overwhelmingly male driver population."

Uber acknowledged that it had experimented with female personas to increase engagement with drivers.

A screengrab of a prompt that Eli Solomon, an Uber driver in the Chicago area, received on his app.

The friction over meeting demand was compounded by complaints about arrangements like aggressive car leases that required many drivers to work upward of 50 or 60 hours each week to eke out a profit. Uber officials began to worry that a driver backlash was putting them at a strategic disadvantage in their competition with Lyft, which had cultivated a reputation for being more driver-friendly.

Uber had long been a reflection of Mr. Kalanick, its charismatic and hard-charging chief, who has often involved himself in corporate minutiae. According to an article in [The Information](#), Mr. Kalanick had complained to subordinates that he was not informed sooner about a glitch with the company's push notifications and had personally weighed in on the time at which employees could receive free dinner.

Travis Kalanick, the chief executive of Uber, recently apologized for getting in a heated argument with a driver over fare reductions. Julie Glassberg for The New York Times

Now Uber began a process of, in effect, becoming a little less like Mr. Kalanick, and a little more like Lyft.

It rethought a lease program, softened the hectoring tone of its messages and limited their volume. At times it became positively cheery.

During roughly the same period, Uber was increasingly concerned that many new drivers were leaving the platform before completing the 25 rides that would earn them a signing bonus. To stem that tide, Uber officials in some cities began experimenting with simple encouragement: You're almost halfway there, congratulations!

While the experiment seemed warm and innocuous, it had in fact been exquisitely calibrated. The company's data scientists had previously discovered that once drivers reached the 25-ride threshold, their rate of attrition fell sharply.

And psychologists and video game designers have long known that encouragement toward a concrete goal can motivate people to complete a task.

“It’s getting you to internalize the company’s goals,” said Chelsea Howe, a prominent video game designer who has spoken out against coercive psychological techniques deployed in games. “Internalized motivation is the most powerful kind.”

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Mr. Amodeo, the Uber spokesman, defended the practice. “We try to make the early experience as good as possible, but also as realistic as possible,” he said. “We want people to decide for themselves if driving is right for them.”

That making drivers feel good could be compatible with treating them as lab subjects was no surprise. None other than Lyft itself had shown as much several years earlier.

In 2013, the company hired a consulting firm to figure out how to encourage more driving during the platform’s busiest hours.

At the time, Lyft drivers could voluntarily sign up in advance for shifts. The consultants devised an experiment in which the company showed one group of inexperienced drivers how much more they would make by moving from a slow period like Tuesday morning to a busy time like Friday night — about \$15 more per hour.

For another group, Lyft reversed the calculation, displaying how much drivers were losing by sticking with Tuesdays.

The latter had a more significant effect on increasing the hours drivers scheduled during busy periods.

Kristen Berman, one of the consultants, explained at a [presentation](#) in 2014 that the experiment had roots in the field of behavioral economics, which studies the cognitive hang-ups that frequently skew decision-making. Its central finding derived from a concept known as loss aversion, which holds that people “dislike losing more than they like gaining,” Ms. Berman said.

What motivates you more: seeing gains or fearing losses?

Still, Ms. Berman disclosed in an interview, Lyft eventually decided against using the loss-aversion approach, suggesting that the company has drawn brighter lines when it comes to potential manipulation.

Almost There

As he tried to log off at 7:13 a.m. on New Year's Day last year, Josh Streeter, then an Uber driver in the Tampa, Fla., area, received a message on the company's driver app with the headline "Make it to \$330." The text then explained: "You're \$10 away from making \$330 in net earnings. Are you sure you want to go offline?" Below were two prompts: "Go offline" and "Keep driving." The latter was already highlighted.

"I've got screen shots with dozens of these messages," said Mr. Streeter, who began driving full time for Lyft and then Uber in 2014 but quit last year to invest in real estate.

Josh Streeter, a former Uber driver in the Tampa, Fla., area, said he often received messages from the company encouraging him to stay on the road to earn more money. Edward Linsmier for The New York Times

Mr. Streeter was not alone. For months, when drivers tried to log out, the app would frequently tell them they were only a certain amount away from making

a seemingly arbitrary sum for the day, or from matching their earnings from that point one week earlier.

The messages were intended to exploit another relatively widespread behavioral tic — people’s preoccupation with goals — to nudge them into driving longer.

Over the past 20 years, behavioral economists have [found evidence](#) for a phenomenon known as income targeting, in which workers who can decide how long to work each day, like cabdrivers, do so with a goal in mind — say, \$100 — much the way marathon runners try to get their time below four hours or three hours.

While there is [debate](#) among economists as to how widespread the practice is and how strictly cabdrivers follow such targets, top officials at Uber and Lyft have certainly concluded that many of their drivers set income goals. “Others are motivated by an income target for sure,” said Brian Hsu, the Lyft vice president in charge of supply. “You hear stories about people who want to buy that next thing.” He added, “We’ve started to allow drivers to set up those goals as well in the app.”

Uber even [published a study](#) last year, using its vast pile of data on drivers’ rides and hours, finding that a “substantial, although not most, fraction of partners” practice an extreme form of income targeting when they start on the platform, though they abandon it as they gain more experience. Strict income targeting is highly inefficient because it leads drivers to work long hours on days when business is slow and their hourly take is low, and to knock off early on days when business is brisk.

Ride-share companies can benefit if they get drivers to focus on dollar targets, instead of working only during the busiest times.

Tip: Watch the hourly wage rates.

The beauty of the messages that Uber sent Mr. Streeter and his fellow drivers is that the drivers need not have even had a specific income goal in mind in order for the messages to work. Some of the most addictive games ever made, like the 1980s and '90s hit Tetris, rely on a feeling of progress toward a goal that is always just beyond the player's grasp. As the psychologist Adam Alter [writes in his book](#) "Irresistible," this mental state has a name: the "ludic loop." (The term was coined by the anthropologist and slot machine expert Natasha Schüll.)

Uber, for its part, appears to be aware of the ludic loop. In its messages to drivers, it included a graphic of an engine gauge with a needle that came tantalizingly close to, but was still short of, a dollar sign.

And the ludic loop is far from the only video game feature that Uber has adapted as a way of keeping drivers on the road.

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At any moment, the app shows drivers how many trips they have taken in the current week, how much money they have made, how much time they have spent logged on and what their overall rating from passengers is. All of these metrics can stimulate the competitive juices that drive compulsive game-playing.

"The whole thing is like a video game," said Eli Solomon, a veteran Uber and Lyft driver in the Chicago area, who said he sometimes had to fight the urge to work more after glancing at his data.

Sometimes the so-called gamification is quite literal. Like players on video game platforms such as Xbox, PlayStation and Pogo, Uber drivers can earn badges for achievements like Above and Beyond (denoted on the app by a cartoon of a rocket blasting off), Excellent Service (marked by a picture of a sparkling diamond) and Entertaining Drive (a pair of Groucho Marx glasses with nose and eyebrows).

Of course, managers have been borrowing from the logic of games for generations, as when they set up contests and competition among workers. More overt forms of gamification have proliferated during the past decade. For example, Microsoft has used the approach to entice workers to perform the otherwise sleep-inducing task of software debugging.

One of the messages Uber has sent its drivers to encourage them to stay on the road.

But Uber can go much further. Because it mediates its drivers' entire work experience through an app, there are few limits to the elements it can gamify. Uber collects staggering amounts of data that allow it to discard game features that do not work and refine those that do. And because its workers are contractors, the gamification strategies are not hemmed in by employment law.

Kevin Werbach, a business professor who has written extensively on the subject, said that while gamification could be a force for good in the gig economy — for example, by creating bonds among workers who do not share a physical space — there was a danger of abuse. “If what you’re doing is basically saying, ‘We’ve found a cheap way to get you to do work without paying you for it, we’ll pay you in badges that don’t cost anything,’ that’s a manipulative way to go about it,” he said.

For some drivers, that is precisely the effect. Scott Weber said he drove full time most weeks last year, picking up passengers in the Tampa area for both Uber and Lyft, yet made less than \$20,000 before expenses like gas and maintenance. “I was a business that had a loss,” said Mr. Weber, who is looking for another job. “I’m using payday loans.”

Still, when asked about the badges he earns while driving for Uber, Mr. Weber practically gushed. “I’ve got currently 12 excellent-service and nine great-conversation badges,” he said in an interview in early March. “It tells me where I’m at.”

'Constantly Busy'

When asked whether Uber's product managers and data scientists were akin to developers at a social gaming company like Zynga, Jonathan Hall, Uber's head of economic and policy research, accepted the analogy but rejected the implication.

"I think there's something to that, but ultimately Zynga should worry mostly about how fun its games are rather than trying to get you to play a little bit more by some trick," he said. He argued that exploiting people's psychological tics was unlikely to have more than a marginal effect on how long they played Zynga's games or drove for Uber. It is "icing on the cake," he said.

Mr. Hall is clearly right about the effects of certain techniques, like those pitched at drivers' tendency to set income targets or to focus more on losses than gains. On the other hand, even features that produce relatively small changes in driving patterns can become quite important to a company like Uber.

According to Mr. Parker, the former Uber manager in Dallas, increasing the number of drivers on the road by 20 percent at certain hours of the day, or in a busy part of town, can rein in a large fare surge.

More important, some of the psychological levers that Uber pulls to increase the supply of drivers have quite powerful effects.

Ed Frantzen, a veteran Uber driver in the Chicago area, said of the company and its messages to drivers, "It was always, constantly, trying to get you into a certain direction." Brittany Sowacke for The New York Times

Consider an algorithm called forward dispatch — Lyft has a similar one — that dispatches a new ride to a driver before the current one ends. Forward dispatch shortens waiting times for passengers, who may no longer have to wait for a driver 10 minutes away when a second driver is dropping off a passenger two minutes away.

Perhaps no less important, forward dispatch causes drivers to stay on the road substantially longer during busy periods — a key goal for both companies.

Uber and Lyft explain this in essentially the same way. "Drivers keep telling us the worst thing is when they're idle for a long time," said Kevin Fan, the director of product at Lyft. "If it's slow, they're going to go sign off. We want to make sure they're constantly busy."

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While this is unquestionably true, there is another way to think of the logic of forward dispatch: It overrides self-control.

Perhaps the most prominent example is that such automatic queuing appears to have fostered [the rise of binge-watching](#) on Netflix. "When one program is nearing the end of its running time, Netflix will automatically cue up the next episode in that series for you," wrote the scholars Matthew Pittman and Kim Sheehan in a [2015 study](#) of the phenomenon. "It requires very little effort to binge on Netflix; in fact, it takes more effort to stop than to keep going."

As with viewers and binge-watching, many drivers appear to enjoy the forward-dispatch feature, which can increase earnings by keeping them busier. But it can also work against their interests by increasing the number of drivers on the road and defusing fare surges. And whether they enjoy it is separate from the question of agency — whether they have it, or whether the company does.

Uber officials say the feature initially produced so many rides at times that drivers began to experience a chronic Netflix ailment — the inability to stop for a bathroom break. Amid the uproar, Uber introduced a pause button.

“Drivers were saying: ‘I can never go offline. I’m on just continuous trips. This is a problem.’ So we redesigned it,” said Maya Choksi, a senior Uber official in charge of building products that help drivers. “In the middle of the trip, you can say, ‘Stop giving me requests.’ So you can have more control over when you want to stop driving.”

It is true that drivers can pause the services’ automatic queuing feature if they need to refill their tanks, or empty them, as the case may be. Yet once they log back in and accept their next ride, the feature kicks in again. To disable it, they would have to pause it every time they picked up a new passenger. By contrast, even Netflix allows users to permanently [turn off](#) its automatic queuing feature, known as Post-Play.

This pre-emptive hard-wiring can have a huge influence on behavior, said David Laibson, the chairman of the economics department at Harvard and a leading behavioral economist. Perhaps most notably, as Ms. Rosenblat and Luke Stark observed in an [influential paper](#) on these practices, Uber’s app does not let drivers see where a passenger is going before accepting the ride, making it hard to judge how profitable a trip will be.

Sometimes all that is necessary is the mere setting of a so-called default. Because humans tend to be governed by inertia, automatically enrolling them in retirement savings plans and then allowing them to opt out results in far higher participation than letting them opt in. Making Post-Play the default can have the same effect.

“If done right, these things can be socially beneficial,” Mr. Laibson said. “But you can think of all sorts of choice architecture that are quite contrary to human well-being.”

Even Mr. Hall, the Uber research director who downplayed the importance of behavioral economics to the company, did make at least one concession. “The optimal default we set is that we want you to do as much work as there is to

do,” he said of the company’s app. “You’re not required to by any means. But that’s the default.”

Having more drivers on the road benefits ride-share companies, but drivers profit from surge pricing and scarcity in their ranks.

Ride-share companies, which do not bear the direct costs of drivers being idle, want to have as many drivers available as possible.

SIMULATION DETAILS: There are 30 drivers. During surge, prices increase by 2x and passenger requests are reduced by 30%. Passengers cancel after 20 minutes of waiting without a driver accepting their request. Regular fares cost \$1.00 a minute, driver expenses are \$0.10 a minute, and the app company takes a \$1.50 booking fee plus 20% of the per-minute fees.

Imagining the Future

There are aspects of the platforms that genuinely do increase drivers’ control over their work lives, as Uber frequently points out. Unlike most workers, an Uber driver can put in a few hours each day between dropping children off at school and picking them up in the afternoon.

Uber is even in the process of developing a feature that allows drivers to tell the app in advance that they need to arrive at a given location at a given time. “If you need to pick up your kids at soccer practice at 6 p.m.,” said Nundu Janakiram, the Uber official in charge of products that improve drivers’ experiences, “it will start to give you trips to take you in the general direction to get to a specific place in time.”

There is also the possibility that as the online gig economy matures, companies like Uber may adopt a set of norms that limit their ability to manipulate workers through cleverly designed apps.

Kelly Peters, chief executive of BEworks, a management consulting firm specializing in behavioral science, argued that the same data that makes it easier for Uber to nudge drivers into working an additional 30 or 60 minutes also makes it hard to escape the obligation to look after them.

For example, the company has access to a variety of metrics, like braking and acceleration speed, that indicate whether someone is driving erratically and may need to rest. “The next step may be individualized targeting and nudging in the moment,” Ms. Peters said. ““Hey, you just got three passengers in a row who said they felt unsafe. Go home.”” Uber has already rolled out [efforts](#) in this vein in numerous cities.

That moment of maturity does not appear to have arrived yet, however. Consider a prompt that Uber rolled out this year, inviting drivers to press a large box if they want the app to navigate them to an area where they have a “higher chance” of finding passengers. The accompanying graphic resembles the one that indicates that an area’s fares are “surging,” except in this case fares are not necessarily higher.

Some drivers believe that the intent is to trick them into driving where Uber wants them to go, rather than where driving would be most profitable, by implying that they will find a surge there. “They’re trying to move people where they want them,” said Mr. Weber, the Tampa-area driver. “But you get there and it’s nothing. It happens all the time.” Mr. Weber noted that the design of the graphic makes the prompt much easier to accept than decline, which requires pressing a small rectangle in the top left corner.

Uber said that the feature was an experiment intended primarily to help new drivers who frequently say they do not know where to find passengers, and that it could be changed if drivers were dissatisfied.

Individual features aside, the broader question of how much Uber seeks to influence drivers through behavioral science may come down to how much its business model requires it.

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While the company has made no secret of its investment in self-driving cars, it could be a decade or more before they completely replace human drivers. In the meantime, as long as Uber continues to set growth and passenger volume as critical goals, it will have an incentive to make wringing more hours out of drivers a higher priority than the drivers’ bottom line whenever it faces a close call between the two.

It will also have an incentive to obtain these hours as cheaply as possible. And there is simply no cheaper way than hiring contractors and nudging them to drive when and where they are needed. [Industry insiders estimate](#) that relying on independent contractors rather than employees can lower direct costs by roughly 25 percent.

Moreover, the contractor model itself provides a strong impetus for companies like Uber to grow. Many companies in the gig economy simply do not have enough workers, or rich enough data about their workers' behavior, to navigate busy periods using nudges and the like. To avoid chronic understaffing, they have switched to an employee model that allows them to compel workers to log in when the companies most need them.

Once companies achieve a certain scale, on the other hand, they enter a virtuous cycle: The risk of understaffing drops with a big enough pool of workers, and the cost savings of using contractors begins to outweigh the inefficiencies. This in turn frees up money to enter new markets and acquire new customers, which makes the contractor model still more efficient, and throws off still more savings.

It is, as a result, not too hard to imagine a future in which massive digital platforms like Uber have an appetite for tens of millions of workers — not only for ferrying people, but also for delivering food and retail goods. Nor is it hard to imagine workers' obliging them, perhaps because their skills do not match the needs of more traditional employers, or because they need to supplement their wages.

In such an economy, experts say, using big data and algorithms to manage workers will not simply be a niche phenomenon. It may become one of the most common ways of managing the American labor force.

“You have all these players entering into this space, and the assumption is they'll do it through vast armies of underemployed people looking for extra hours, and we can control every nuance about what they do but not have to pay them,” said David Weil, the top wage-and-hour official under President Barack Obama.

When you stop to consider the enormous cost advantages, Mr. Weil said, “it says to me this is an area that will grow fast.”

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