Exploratory Essay

What better way to introduce this genre than to present an essay about essays, particularly a recent one that has garnered attention for criticizing the way writing is taught in school? Like Montaigne, its author Paul Graham is a bit of a Renaissance man, a Harvard PhD (in computer science) with business essentials and interests in painting and writing. Graham’s "The Age of the Essay" is too lengthy to print in its entirety, so we offer its third and fourth sections "Trying" and "The River" (edited slightly for continuity). The full essay is available online.

Reading the Genre. Graham reflects on both the history of the essay as a genre and on his own experience writing pieces that don’t follow the structure of more traditional legal or academic arguments, especially the kind driven by a thesis statement. What observations do you find most interesting or perhaps subversive in Graham’s sections? What risks might you take submitting an essay as Graham describes it in an academic course?

The Age of the Essay (Excerpts)

PAUL GRAHAM
September 2004

Trying

To understand what a real essay is, we have to reach back into history... Michel de Montaigne, who in 1580 published a book of what he called "essais." He was doing something quite different from what lawyers do, and the difference is embodied in the name. Essayer is the French verb meaning "to try" and an essay is an attempt. An essay is something you write to try to figure something out.

Figure out what? You don’t know yet. And so you can’t begin with a thesis, because you don’t have one and may never have one. An essay doesn’t begin with a statement, but with a question. In a real essay, you don’t take a position and defend it. You notice a door that’s ajar, and you open it and walk in to see what’s inside.

If all you want to do is figure things out, why do you need to write anything, though? Why not just sit and think? Well, there precisely is
Montaigne's great discovery. Expressing ideas helps to form them. Indeed, helps is far too weak a word. Most of what ends up in my essays I only thought of when I sat down to write them. That's why I write them.

In the things you write in school, you are, in theory, merely explaining yourself to the reader. In a real essay you're writing for yourself. You're thinking out loud.

But not quite. Just as inviting people over forces you to clean up your apartment, writing something that other people will read forces you to think well. So it does matter to have an audience. The things I've written just for myself are no good. They tend to peter out. When I run into difficulties, I find I conclude with a few vague questions and then drift off to get a cup of tea.

Many published essays peter out in the same way. Particularly the sort written by the staff writers of news magazines. Outside writers tend to supply editorials of the defend-a-position variety that make a beeline toward a roasting (and foreordained) conclusion. But the staff writers feel obliged to write something "balanced." Since they're writing for a popular magazine, they start with the most radioactively controversial questions, from which—because they're writing for a popular magazine—they then proceed to recoil in terror. Abortion, for or against? This group says one thing. That group says another. One thing is certain: the question is a complex one. (But don't get mad at us. We didn't draw any conclusions.)

The River

Questions aren't enough. An essay has to come up with answers. They don't always, of course. Sometimes you start with a promising question and get nowhere. But those you don't publish. Those are like experiments that get inconclusive results. An essay you publish ought to tell the reader something he didn't already know.

But what you tell him doesn't matter, so long as it's interesting. I'm sometimes accused of meandering. In defend-a-position writing that would be a flaw. There you're not concerned with truth. You already know where you're going, and you want to go straight there, blustering through obstacles, and hand-waving your way across swampy ground. But that's not what you're trying to do in an essay. An essay is supposed to be a search for truth. It would be suspicious if it didn't meander.
The Meander (aka Menderes) is a river in Turkey. As you might expect, it winds all over the place. But it doesn't do this out of frivolity. The path it has discovered is the most economical route to the sea.

The river's algorithm is simple. At each step, flow down. For the essayist this translates to: flow interesting. Of all the places to go next, choose the most interesting. One can't have quite as little foresight as a river. I always know generally what I want to write about. But not the specific conclusions I want to reach; from paragraph to paragraph I let the ideas take their course.

This doesn't always work. Sometimes, like a river, one runs up against a wall. Then I do the same thing the river does: backtrack. At one point in this essay I found that after following a certain thread I ran out of ideas. I had to go back seven paragraphs and start over in another direction.

Fundamentally an essay is a train of thought—but a cleaned-up train of thought, as dialogue is cleaned-up conversation. Real thought, like real conversation, is full of false starts. It would be exhausting to read. You need to cut out and fill in to emphasize the central thread, like an illustrator taking over a pencil drawing. But don't change so much that you lose the spontaneity of the original.

Err on the side of the river. An essay is not a reference work. It's not something you read looking for a specific answer and feel cheated if you don't find it. I'd much rather read an essay that went off in an unexpected but interesting direction than one that plodded dutifully along a prescribed course.
Examining models

In a college research paper, Alysha Behn explores the reasons that women, despite talent and interest, so rarely pursue careers in technology and, more specifically, computer programming. Drawing heavily on research studies, Behn's causal analysis is detailed, complicated, and challenging.

You may be surprised that Behn's causal argument ends on a pessimistic note, pointing out that no one-size-fits-all solution will resolve the complex issues keeping women out of technical careers. Does so tentative a conclusion weaken or add authority to the author's case? Does it affect how credibly she comes across to readers? (Notice that I does not occur in this academic paper.)

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February 20, 20--

Where Have All the Women Gone?
In 1984, 37.1 percent of computer science graduates were women. In 2009, around 11 percent of computer science graduates were women. What happened?

It's important to make clear what hasn't gone wrong. Experts dismiss the idea that men are more capable than women of succeeding at computer science, and there are no institutional barriers preventing women from pursuing a computer science degree or a tech career. In fact, rather than discriminating against women, colleges and corporations are competing desperately for female applicants. They just can't
find any. Women aren’t pursuing careers in computer science anymore, and two decades of research hasn’t found a way to stop the exodus.

The root of the problem may be the flawed way sociologists and computer scientists are researching the problem, according to Katrina Markwick, a former researcher at the Monash University Department of Education. If researchers are asking the wrong questions, it follows that the solutions they suggest are going to be ineffective.

Much of the research Markwick criticizes focused on increasing women’s access to technological education through equal opportunity (EO) strategies, which try to increase women’s participation in a male-dominated field without questioning the culture that made that field male dominated (Markwick 288). Equal opportunity programs focus on removing institutional barriers or encouraging a group to participate more—for example, you could instruct math teachers on how to avoid treating girls differently from boys in class, or you could organize a math- and science-oriented summer camp just for girls in order to generate interest in those fields. The problem with the EO approach is that ‘[these] policies were predicated on the assumption of ontological equality, a belief in the fundamental sameness of individuals, and the EO mind-set produced an acceptance that white, nondisabled, heterosexual men’s experiences and interpretations of organizational life
were universally applicable" (Moss and Gunn 448). In other words, EO programs and strategies implicitly ask women to conform—to be more like men—in order to have a career in computer science.

There’s a fascinating body of research that suggests that the equal opportunity paradigm can’t address all the factors turning women away from pursuing technology careers. For example, a 2008 study demonstrated that men prefer the aesthetics of Web sites designed by men, and women prefer the aesthetics of Web sites designed by women (Moss and Gunn 457–58)—and, as a result, people tend to spend more time browsing Web sites designed by a member of their own gender. Given that most computer games are made by men, it similarly follows that “young men are more attracted to playing computer games and . . . young women tend to prefer more passive, purposeful games, and game playing is not a major part of their leisure activities (Lang, 1999)” (Lang 221).

What’s problematic about all this is that both playing with video games and tooling around on the Internet indirectly teach computer literacy. What’s more, kids who don’t enjoy playing with computers aren’t likely to pursue careers devoted to tinkering with them. All this points to a positive feedback loop that’s responsible for turning men on to technology careers and pushing women away. As more men and fewer women are responsible for designing software and hardware, fewer
technological products (even products intended to look gender neutral, like the Apple iPad) will be designed with women’s interests and aesthetic preferences in mind. Thus, fewer women will be interested in using these products, so fewer women will become skilled at using these technologies or drawn toward a career in making them.

Equal opportunity programs also don’t take into account the process of socialization of gender—that is, learning from others what one’s gender role is—and aren’t always well equipped to combat the negative lessons most women learn about themselves:

The role socialization plays . . . cannot be underemphasized in explaining the continued presence of the gender gap. . . . By the end of middle school, students develop the notion that mathematics, sciences, and computing fields are for white males (Clewell & Braddock, 2000). Furthermore, these perceptions are found to exist more often for girls than for boys (Trauth, 2002). (Varma 302)

Often the process of socialization is so subtle and pervasive that many women do not even notice it themselves (Varma 308). The perception that “boys are good at math” often leads counselors, parents, and teachers to subtly steer boys toward challenging math and science and away from liberal arts.
courses in high school, while for women the reverse holds true
(Varma 306, Cheryan and Plant). The result is that many women
enter college less prepared for a computer science program than
their male peers. Even when male and female students are
equally prepared, male students generally express more
confidence in their skills, while women take as long as two
years to feel that they are competent. In study after study,
women have cited anxiety about performance and loss of self-
confidence as a primary reason for leaving the field; in fact,
some have suggested that professors have a lower opinion of
female students' ability to do well than they do of their male
students (Varma 303). Thus, "Irani (2004) has argued that the
act of establishing an 'identity of competence' is necessary for
women to situate themselves in CS culture and verify
legitimacy" (Varma 303).

In some cases the gendered socialization is a little less
subtle. The anonymity afforded by online gaming and the
Internet has made unapologetic misogyny disturbingly common
in gaming and Internet culture. "The Rules of the Internet," a
popular document created by an anonymous poster on the
online forum 4chan, include the following: "28. Always question
a person's gender—just in case it's really a man. 29. In the
Internet all girls are men and all kids are undercover FBI
agents" (Lohrs). Such rules establish that it is the norm to be
male on the Internet and to be a woman is to be the exception
to the rule. Online gaming and participation in popular Web sites like 4chan and Reddit are frequently cited as factors that attract men to computing careers, so an online culture in which women are explicitly made to feel unwelcome is undoubtedly part of the problem.

Let's describe the last gendered assumption this way: Close your eyes and picture a programmer.

You probably pictured a nerdy-looking guy, perhaps with glasses, alone at his computer in a dark basement. Right? Here's the thing: The basement might be passé but the "alone" bit definitely isn't. And women show a marked aversion to programming alone (Lang 220–21). Fortunately, this is a problem, we do have a solution for, and it's one that's catching on fast.

Pair programming—a programming style where one partner types at the keyboard and the other partner watches closely, making suggestions and watching for errors—is an attractive solution not only because women prefer it but because the resulting code is consistently better than code written alone (Simon and Hanks 73–82). While younger companies have been eager to adopt pair programming practices, older giants like Microsoft and IBM have shown more reluctance. Furthermore, the success of pair programming will remain irrelevant until tech companies and colleges do a little PR to combat the isolated-nerd-in-a-basement image. Until then, the pair programming shift is more likely to aid retention of women in tech majors than to attract more of them to computing careers.
Markwick also criticized a second paradigm for increasing women's interest in technical fields, one emphasizing the values of femininity and suggesting solutions like a "girl friendly" curriculum (Markwick 256–59): "This entailed 'celebrating the female side' of the gender binary and revealing 'women's ways of knowing' (Beekley, Clough, Goldberger, & Tarule, 1986) ... but it treated girls as an essentialized category, neglecting differences between girls" (Markwick 260). While this is without question a step forward from asking women to conform to the masculine norms of the computing industry, it also substitutes one false assumption—that men and women are basically the same—for another: in this case, that all women are fundamentally the same.

Few studies take into account the fact that women are not a homogeneous group (Varma 906). A solution that tries to attract women to technology careers by designing machines that appeal to women will not have much impact on minority women who can't afford technology in the first place. Nor would a solution oriented around changing the culture of computer science classrooms do much to attract women who want a career that is known to be compatible with raising a family. A solution that tries to combat the "math is for boys" perception isn't going to make it easier for a woman to go to college if she needs to care for a young child. The list goes on. Too frequently, researchers have tried to pinpoint a single issue and define a one-size-fits-all solution, but moving women into tech careers is much more complicated than that.
Works Cited


Examining models

An important subgenre of arguments is the refutation, a piece that critiques someone else’s claims and sometimes seeks to correct them. In the following example of this important and challenging form, Ryan Young uses careful reasoning and ample documentation to argue that claims for the inevitability of autonomous cars and driving might be exaggerated. Needless to say, a refutation is, itself, an argument that deserves careful scrutiny.

Reading the Genre: A columnist for a campus newspaper and a computer science major, Ryan Young wrote “Self-Driving Cars: A Reality Check” for an upper-division rhetoric and writing course. As you read his arguments, which aspects of its organization, content, style, and use of sources mark it as an academic rather than a journalistic piece?

Ryan Young
Professor Coel
27 April 2017

Self-Driving Cars: A Reality Check

Today, the media is awash with buzz about the inevitable arrival of autonomous automobiles, personal vehicles that could transport passengers under complete computer control. Writing for Forbes, David Gaidel predicts that ten million autonomous cars will be on American streets by 2020 (Gaidel). He expects the adoption of autonomous cars to have profound transformative effects on our society, by “reducing the number of traffic accidents by upward of 90%,” offering new mobility options for seniors and people with disabilities, eliminating the need for expensive and scarce downtown parking, and “[banishing] the whole idea of rush hour . . . to the history
books" (Galland). Ford plans to sell “true self-driving cars” without controls for human drivers, such as pedals or steering wheels, by 2021 (Isidore). Not to be left behind, U.S. Senators Gary Peters and John Thune have announced they plan to introduce new legislation to foster the development of autonomous vehicles that will “[leave] room for innovators to reach their full potential” (“Joint Effort”). They believe that autonomous cars “have the potential to dramatically reduce the . . . lives lost on our roads and highways every year and fundamentally transform the way we get around” (“Joint Effort”).

But before we speculate on the long-term impacts of autonomous cars, and especially before we formulate sweeping national policies concerning them, we ought to consider just how soon they will become reality. There are difficult ethical, technical, and human interface challenges that the industry has not yet addressed and hard questions that our society has not yet answered. Should autonomous vehicles favor the survival of passengers or pedestrians in the event of an accident? How will we produce and maintain high-resolution maps of every road on which autonomous vehicles will be expected to operate? How will we keep passengers alert and prepared to retake control in the event of an emergency? We are not five years away from autonomous cars, as Ford claims, much less six months away
from “full self-driving” Tesla vehicles, as CEO Elon Musk boasts (@elonmusk). The barriers to designing safe and reliable autonomous cars are so massive that they will preclude their mainstream introduction for many decades, if not indefinitely.

SAE International, an automobile standards organization, has developed a widely used scale that categorizes vehicles by their level of automation. Level 1 and 2 vehicles are capable of limited control of steering, acceleration, or both under the constant supervision of human drivers, as is the case in some of today’s luxury cars. “Conditional automation” in level 3 vehicles can perform all driving tasks, including steering, accelerating, changing lanes, and making turns, but must request intervention by human drivers in exceptional situations. “High automation” in level 4 vehicles can perform these tasks in most situations without falling back on human intervention. “Full automation” in level 5 vehicles includes the ability to navigate anywhere, anytime, throughout all phases of a trip. This represents the pinnacle of autonomy (“Automated Driving”).

Clearly, achieving level 4 automation or better is necessary to bring about the happily autonomous world that Galland envisions, in which seniors catch self-driving rides across town and travelers are “delivered to their destination in comfort by a self-driving Uber and wave goodbye to the car as it drives off” (Galland). It’s also a prerequisite for Ford’s cars of the future if
they will indeed lack steering wheels and brake pedals. But while much effort has been expended to make level 4 and 5 autonomous vehicles technically feasible, the ethical implications of such systems have received little consideration. A study led by Thierry Fraichard, a research scientist in robotics, suggests that autonomous vehicles, no matter how sophisticated, could never prevent all possible collisions. "It appears that absolute motion safety (in the sense that no collision will ever take place whatever happens in the environment) is impossible to guarantee in the real world," he explains. "Today, most autonomous vehicles rely [sic] upon probabilistic modeling and reasoning to drive themselves. Probabilities are ideal to handle uncertainty but they will never allow strict motion safety guarantees" (11). In other words, it is impossible to know the future with absolute certainty. The computer programs that will drive autonomous vehicles may be more precise and perceive events faster than humans, but they must still contend with the physics and unpredictability of the real world, which no mathematical or computational model can forecast.

Given that fully autonomous vehicles will eventually hit something, questions arise over how they should seek to minimize damages, injuries, and loss of life. It is easy to imagine unfortunate situations, such as total loss of control or an imminent crash, in which tragedy is unavoidable—but.
computer algorithms, not humans with free wills, will be making the life-changing decisions. In "Why Ethics Matters for Autonomous Cars," Patrick Lin, a California Polytechnic State University philosophy professor, presents a variety of frightening scenarios in which autonomous vehicles may be forced to pick and choose victims and survivors. For example, if an autonomous car were on course to strike either a young girl or an old grandmother, the girl's "entire life in front of her—a first love, a family of her own, a career, and other adventures and happiness" would be weighed against the grandmother's "right to life and as valuable a life as the little girl's" (Lin 79). Or an autonomous car might make use of "crash-optimization strategies" by targeting lighter vehicles or vehicles with better safety reputations in the event of a collision (72). Is it right to choose the grandmother over the girl (or vice versa) or to systematically punish bicyclists and SUV riders? How autonomous cars should act in such situations is a question of ethics and what we value, not smarter code or sharper sensors. As Lin aptly notes, "If ethics is ignored and the robotic car behaves badly, a powerful case could be made that auto manufacturers were negligent . . . and that opens them up to tremendous legal liability" (82). Until our society resolves these thorny ethical dilemmas and clarifies how it expects autonomous cars to behave, level 4 or 5 autonomous cars will not be suitable for general use.
These scenarios will seem abstract until level 4 or 5 vehicles become reality. Recent years have borne witness to much high-profile progress and media hype about the development of autonomous cars, but such reports routinely overstate and grossly exaggerate the state of the art. In reality, the industry has a dirty little secret: Autonomous cars will not be able to travel everywhere, on every road. We hear constantly about advances in sensor and camera technology that promise a breakthrough in autonomous vehicle technology; for example, Tesla recently announced that all of its electric cars in production have the 360-degree cameras and ultrasonic sensors necessary for "full self-driving capability" ("All Tesla Cars"). But the hardware on the car is only one side of the equation.

Autonomous cars also require immensely detailed three-dimensional scans of the roads and environments in which they operate (Boudette). These digital maps include the locations of every road sign, building, and traffic signal along the way, because current technology is not sophisticated enough to recognize every road feature on the fly. In principle, they're similar to digital collections of street imagery, such as Google Street View, except much more complicated and intricate. To produce its maps, Google uses specialized laser scanning equipment that costs upwards of $100,000 per outfitted vehicle (Boudette). Even then, human classifiers must pore over all the
data, tagging signs and features by hand in a time-consuming and laborious process (Boudette).

The autonomous vehicle industry admits that such maps will be indispensable for the foreseeable future. "If we want to have autonomous cars everywhere, we have to have digital maps everywhere," says Amin Shafiea, chief technology officer at Mobileye (Boudette). But every moment, accidents damage infrastructure, construction disrupts traffic, and bad weather renders roads dangerous or impassable. If we're going to have the autonomous cars, we face the daunting challenge of creating these maps for every road and keeping them up to date. This may be manageable in large urban areas where autonomous cars will be common, but may be cost-prohibitive for small towns and rural byways. Eventually, we could have level 4 and 5 autonomous cars, but we might not be able to ride them everywhere.

So truly autonomous vehicles present significant ethical problems that remain unsolved and their need for detailed road maps may confine their use to select locations. But what about level 3 automation, in which computers drive vehicles most of the time, but human drivers intervene in exceptional situations? Although it may seem easier to design a level 3 autonomous car, level 3 vehicles would face the serious problem of maintaining the attention of human supervisors. "A car with any level of
autonomy that relies upon a human to save the day in an emergency poses almost insurmountable engineering, design, and safety challenges, simply because humans are for the most part horrible backups,” writes Alex Davies, a transportation reporter for Wired. “They are inattentive, easily distracted, and slow to respond” (Davies). Ford faces this exact problem testing its experimental autonomous cars. Ford engineers, despite specialized training, cannot help but fall asleep and lose focus while monitoring the cars, even when partners are introduced to watch the watchmen (Naughton). Moreover, it’s simply not reasonable to ask a human passenger who has been relaxing in an autonomous car for hours to be prepared to retake control at a moment’s notice. As a result, Google, Uber, Ford, and other key players in the autonomous vehicle industry have effectively given up on practical level 3 automation (Davies). Autonomous cars will not gradually evolve from level 2 to level 3 to levels 4 and 5; we’ll have limited driver assistance one day, then full automation the next. Making that transition will be challenging, to say the least, given the ethical and technical issues inherent to fully autonomous vehicles. It will be an all or nothing proposition.

Autonomous cars are coming. But as citizens and lawmakers, we should be skeptical about the grandiose claims made by the autonomous vehicle industry that have “gotten totally out of sync with reality,” according to University of
California autonomous driving researcher Steven Shladover (Simonite). By 2021, we might be able to ride a level 4 Ford autonomous car, but it will be a "low-speed taxi service limited to certain roads" that Shladover says we should "[not] expect to come in the rain" (Simonite). Galland's self-driving utopia, in which mobility is painless and traffic congestion is nonexistent, will remain a fantasy for some time. But the grand delusion that the arrival of autonomous cars is imminent is not just a harmless misconception; it's having very real consequences for public policy. Senators Peters and Thune are pursuing the deregulation of the autonomous vehicle industry under the guise that the "slow pace of regulation could become a significant obstacle to the development of new and safer vehicle technology" ("Joint Effort"). Transportation commentators like Randal O'Toole argue that investments in public transit "are likely to soon be obsolete" because "self-driving cars will dominate the roads sooner than most people think" (O'Toole). Planning for a future filled with white elephants is foolish.

If we gamble it all on the advent of autonomous vehicles, allowing the industry to wreak havoc on our roads and communities and neglecting pressing transportation investments, we will be much like the passengers of Ford's autonomous cars of 2021: going nowhere fast and left out in the rain.
Works Cited


@elonmusk. "@srandall 3 months maybe, 6 months definitely." Twitter, 23 Jan. 2017, 7:00 p.m., twitter.com/elonmusk/status/823727035088416768.

Galland, David. “10 Million Self-Driving Cars Will Hit The Road By 2020—Here’s How To Profit.” 

Gomes, Lee. “Hidden Obstacles for Google's Self-Driving Cars.” 

Isidore, Chris. “True self-driving cars will arrive in 5 years, says Ford.” 


Naughton, Keith. “Ford's Dozing Engineers Side With Google in Full Autonomy Push.” 
