



Intro to Inclusive Design

MODULE 1

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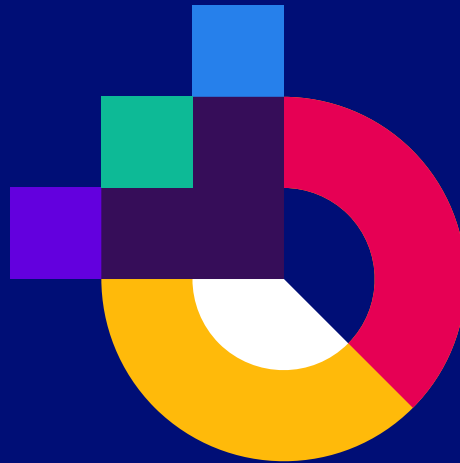
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Workshop Source Materials

<https://github.com/adobe-inclusive-design/id-workshop>

Inclusive Design at Adobe

<https://adobe.design/inclusive>



Foreword

This is an adaptation of the introduction given to us by Jutta Treviranus, director of the Inclusive Design Research Centre at OCAD U, to our first inclusive design workshop at Adobe. Jutta introduces her students to the concept of inclusive design from a historical perspective, and we have done our best to carry that forward in this workshop. She explains her reasoning for using this frame, rather than blaming “implicit bias” in individuals’ thinking:

“I wanted to explain why I took this approach rather than the usual implicit bias approach. I’ve attended and watched people in implicit bias workshops get defensive, thinking the flaw was in their thinking or their family’s thinking. I wanted to show how entrenched and subconscious these views are in all our society (especially our Western society..). It isn’t an individual flaw; it is a collective bias.”



Four Influences On The Modern Day

The way we create—whether it be software, cars, pens, or political candidates—is shaped by frames of the past. Some, like the assembly line, most of us are taught in school. But others, which are often just as fundamental, are passed down without much introspection into their sources. Sometimes the messages we’ve learned are not the same as what their authors originally intended; other times, we don’t know the sources at all. Among these influences, four stand out; these four shape the way we think of how things are created today.

CONTENT NOTE

These characters share several traits; for one, they are all educated white men prominent in academia in the 19th century. The reason they are explored here is to show their impact, their original intents, and the impact they have had on contemporary society, particularly in Europe and the United States. While there’s plenty of room to argue as to whether each figure’s influence *should* be felt, not to mention who was left out, they are discussed here only to show the impact they continue to have.



Adolphe Quetelet (1796-1874)

Adolphe Quetelet loved data. He captured it in several domains, including astronomy, meteorology, and criminology. But perhaps his greatest influence was in researching people and, more specifically, human bodies.

Quetelet is known as the founder of the field of anthropometry, literally translated as the measuring of humans. Using his background as a statistician, he took data on human dimensions and graphed them. What he found was that a lot of those graphs looked like this:



This pattern, with the peak of a curve in the center and flattening out at the edges, is commonly known as the bell curve.

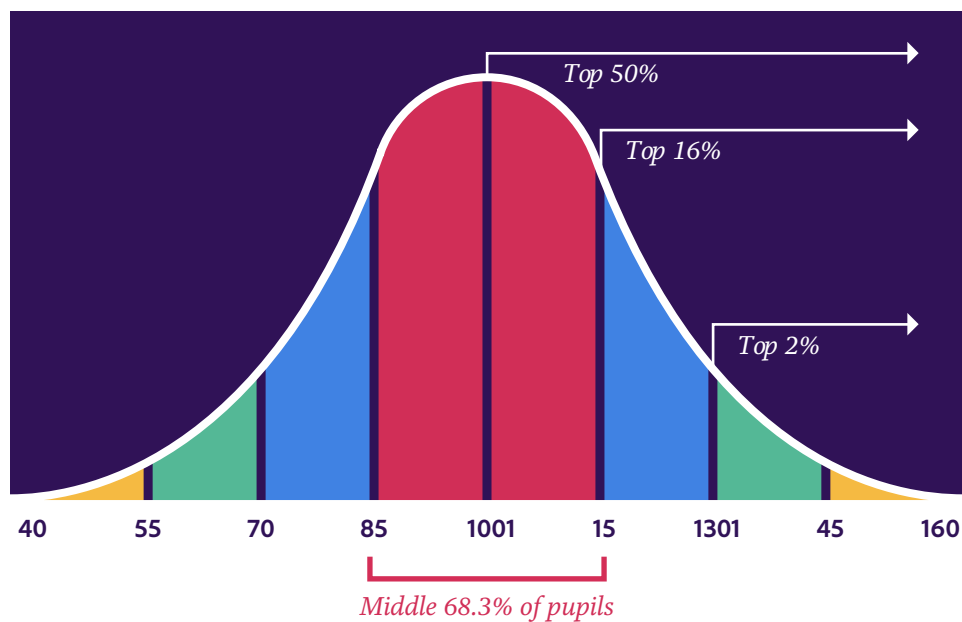
Quetelet could find this bulge in the center wherever he looked, whether it was height, weight, girth, or reach. It seemed that all information relating to human features had a lot of people who looked similar, with fewer people at the extremes. With this in mind, Quetelet went on a quest to find *l'homme moyen*— “the average man.” In 1835, he published *A Treatise on Man and the Development of His Faculties*, which, in effect, took all these measurements and drew a line in the middle, defining the average man. We’ve been compared to that center line ever since.

Quetelet is known for something else. What was originally known as Quetelet’s Index, we call Body Mass Index, or BMI. This is a scale that measures your mass in kilograms divided by the square of your height in meters. Once this scale was introduced, a set of thresholds were established. People with a score over 25 were “overweight,” and over 30 were “obese,” while those under 18.5 were classified “underweight.”

BMI is now frequently criticized as a blunt instrument. Certain athletes, for example, have much more muscle mass than others; but since BMI doesn’t discriminate to the source of that weight, they are likely to be classified as overweight, or even obese, despite all other biological signs saying otherwise.

And that is the case with most, if not all, of these measurements. The types of anthropological and sociological data that Quetelet mapped included illness, criminality, reproduction, mortality, and so on. Some of these associations led, in part, to medical breakthroughs; for example, using statistical analysis to find elevated risk is used widely in modern medicine. But that information can overgeneralize, leaving people who don't stand out in that data to be left behind.

The ways bell curves can be used can amplify the risk. Take, for example, a distribution like this one, commonly used in education:



The suggestion is that some kind of measure, like an intelligence quotient (IQ) or a standardized test score, is indicative of future

successes, leading many institutions to split out their student population on a grid like this. Now, let's say that the top 2% of students on this curve will go to elite universities, the rest of the top 16% will go to less prestigious schools, and everyone below may go to a community college or trade school.

Suddenly, where I am on this graph dictates my potential future. What if I score a 114, where the university cutoff is a 115? This is a problem that affects standardization broadly: the more the outcomes depend on a single snapshot of data, the more actual lives are impacted. When those individuals are made to take the shape of a bell curve, a process known as “force-fitting,” we can even push out people after they’ve shown what they’re capable of.

Standardized tests themselves express values that are worth exploring. When the creators of early IQ tests found that white European and North American people did better than people of color, it's safe to say they didn't check their tests for racial bias. Many of the tests' proponents—Sir Francis Galton, Lewis Terman, Henry Goddard—were themselves eugenicists who believed other races belonged to a lower rung in society.¹

¹ Galton himself used Quetelet's work to state that “normal” wasn't good enough, it was something to transcend—a key argument in 20 th century eugenics. (Wilson, R. (2014, April 11). 19th-CENTURY: KEY FIGURES. Retrieved February 14, 2020, from <https://eugenicsarchive.ca/discover/tree>)

Early IQ tests also classified people with low scores as “idiots” (0-25), “imbeciles” (26-50), and “morons”² (51-70), all in a broader category named “feeble-mindedness.”³ Terman went further, claiming in 1913 that large majorities of certain immigrant groups in the U.S. belonged to this category, ignoring whether they even understood English when they were tested.⁴

Todd Rose’s book *The End of Average* (2016) highlights an example of how this idea of averaging out human capability can have disastrous effects. After World War II, the United States Air Force was building its first fighter jets, leaving the propeller-based versions behind. The cockpits of these jets had been built using dozens of measurements taken of the pilot corps in 1926. The Air Force picked the median values of all those figures, and had cockpits built based on the idea of this “average” pilot.

After building planes with these cockpits, the Air Force found they had a big problem: their pilots were dying. At one point, 17 pilots crashed in *one day*. Some officers believed their pilots had changed in size since 1926, so the Air Force took 140 measurements of over 4000 active pilots in 1950. But one researcher, Lt Gilbert S. Daniels, was skeptical. He took

² The word “moron” was in fact coined by Goddard to define this IQ range. <https://www.npr.org/sections/codeswitch/2014/02/10/267561895/it-took-a-eugenicist-to-come-up-with-moron>

³ <https://eugenicsarchive.ca/discover/tree/53480acd132156674b0002c3>

⁴ <https://owlcation.com/social-sciences/Intelligence-Testing-and-the-Beginning-of-Eugenics>

only ten of those measurements, defined the middle 30% as “average,” and determined how many pilots fit in the average range in all ten.

The answer was zero. *None* of the pilots were within the 30% average range, even among those 10 details. What was dismissed as “pilot error” had a lot more to do with a seat that couldn’t adjust and controls that were hard to reach. In the end, the Air Force built cockpits that adapted to the 5th to 95th percentile of each measurement. The number of accidents fell from 193 in 1951 to 18 in 1959.⁵



⁵ Kat Holmes's book *Mismatch: How Exclusion Shapes Design* covers this research in more detail. <https://mitpress.mit.edu/books/mismatch>



Vilfredo Pareto (1848-1923)

Our second influencer is an Italian polymath named Vilfredo Pareto. He studied economics, sociology, engineering, and other fields.

While surveying land ownership in Italy, he found that a fifth of the population there owned four-fifths of the property. Like Quetelet, the more he looked, the more he saw this pattern repeating: incomes across several countries in Europe, for example, showed roughly the same distribution. This ratio became known as the Pareto principle. Most of us know it by another name: the 80/20 rule.

In the business world, it seemed, this ratio spread like wildfire. An American management consultant named Joseph Juran noticed Pareto's ratio while researching the rate of defective parts in American factories. This led to others applying the rule in even more domains.

What we know about the 80/20 rule generally boils down to these business-oriented interpretations: you can choose to focus only on the most important 20% of any job and get 80% of the benefit. You can focus only on the top 20% of your customers and still get 80% of the

revenue. The top 20% of your products account for 80% of the sales. Simply put, focusing on fewer things means less work, and focusing on fewer people means more money.

Even more extreme attempts at pruning back your efforts are easy to find. The foreword of the latest version of Richard Koch's bestselling *The 80/20 Principle* is written by Tim Ferriss, author of *The Four-Hour Work Week*. The message of "less is more" is possibly the easiest one anyone could hope to sell.

In a remarkable act of irony, it was Pareto himself who said that people "make believe they are acting logically" when the numbers prove otherwise; and so it is with his own principle. Pareto didn't necessarily see this distribution as a good thing; he merely pointed out that this distribution is common.

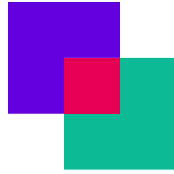
If we apply the principle that 20% of our user-experience decisions lead to 80% of our sales, then, from a business perspective, we understand that those 80% are our most valuable and immediate customers. They are our "average users." That big cluster of people in the middle is who we need to design for. Now, like the force-fit students mentioned earlier, we're not just observing the bell curve, we're forming it.

But if what we are measuring is information and not easy sales, we find something else entirely: the most available information you need to make the best possible product is found in that 20% of users. That includes the people who face the most barriers to enjoying the product. It includes the more complex interactions that become harder to fix—or

dismissed as “edge cases”—as time goes on.

The way we view the Pareto principle determines whether we can anticipate the wants and needs of our users from the start, or be caught unawares and struggle to adapt to them.





Melvil Dewey (1851-1931)

Statistics are about simplifying mathematical trends. Our third influencer is responsible for how we simplify accessing the English-speaking world's information—for better or for worse.

Melvil Dewey's career was focused on creating a universal way of classifying books for easy access. At age 21, Dewey developed a new method, based in part on Sir Francis Bacon's taxonomy of human knowledge. His Dewey Decimal Classification (DDC) system is still used throughout the English-speaking world, though in the last 40 years, other systems, such as the Library of Congress Classification, have made inroads.

The DDC system is structured by number: 000-099 for computer science, information and general works, 100-199 for philosophy and psychology, 200-200 for religion, and so on through 999.

Like our other figures, Dewey was more than just a library scientist; he was also a noted racist and anti-Semite. Dewey founded and oversaw the Lake Placid Club, a sporting and educational club that explicitly

excluded Jews and others “against whom there is physical, moral, social, or race objection.” Moreover, Dewey was notorious even in his time for his treatment of women: in 1905, he was made to step down from the American Library Association, an organization he co-founded, amid multiple accusations of sexual harassment.

Imagine how such a person would approach classifying the written works of the world.

Within each category in the Dewey Decimal Classification system are subcategories every 10 digits. For example, here’s religion:

- 200:** Religion
- 210:** Philosophy & theory of religion
- 220:** The Bible
- 230:** Christianity
- 240:** Christian practice and observance
- 250:** Christian orders & local church
- 260:** Social & ecclesiastical theology
- 270:** History of Christianity
- 280:** Christian denominations
- 290:** Other religions

Notice a pattern? Indeed, the religions of East and South Asian origin appear in the last tenth of the religion section: Buddhism at 294.3, Hinduism at 294.5, Judaism at 296, Islam at 297.1. “History of Christianity in Asia” appears at 275, both before *and* with more space to

grow than all Indic religions combined.

Certainly, at the dawn of the 20th century, the vast majority of English-language books reflected a great deal of Christian thought, with more written *about* many religions and their practitioners than *for* them. Still, there is immense power in being the person who makes the labels. The topic of homosexuality, for example, was only added in 1932 after Dewey's death, but even then, it was originally classified under the "mental derangements" and "abnormal psychology" sections.

Among Dewey's beliefs was the idea that everything could be classified and reduced. In fact, he believed that English spelling should be reduced as well: he contracted his birth name from "Melville," and briefly spelled his last name "Dui." But information can only *expand*. Categories can and do change. And in fixing those categories at one place in time, Dewey had an underestimated influence on how we frame our knowledge of the world. One size truly cannot fit all.





Charles Darwin (1809-1882)

The name Charles Darwin is one of the most recognizable in natural sciences. Darwin's theory of evolution and its applicability to the human species both revolutionized the field of biology and provoked severe criticism from Christian leaders who believed that human beings were created by God.

While Darwin figures prominently in Western science and history, most of us probably associate his name with the term “survival of the fittest.” There's a problem, though: he never wrote those words. The person to coin that phrase wasn't Darwin himself, but Herbert Spencer, who wrote in response to reading Darwin's *On the Origin of Species*:

“This survival of the fittest(...) is that which Mr. Darwin has called ‘natural selection,’ or the preservation of favored races in the struggle for life.”

Spencer is another person who saw a repeating pattern. In *The Man Versus the State*, he suggests:

"[By] survival of the fittest, the militant type of society becomes characterized by profound confidence in the governing power, joined with a loyalty causing submission to it in all matters whatever."

Some believe this to be the origin of an entirely different interpretation known as "social Darwinism."

Let's bring this back to Darwin and his theory. Natural selection, strictly speaking, is not a power dynamic in the way that Spencer describes. Darwin wrote about natural selection as a way to survive or adapt to changing conditions, allowing new generations to thrive. Lions, for example, may adapt and survive by preying on other animals, while crows could continue to evolve by being clever, resourceful, and collaborative.

Spencer's new invention, however, speaks in terms of "power" and "submission"—features that don't exist in the original concept of Darwinism. This skewed interpretation conveniently fit a certain time and place: namely, the Second Industrial Revolution (1870-1914) in North America and Europe, where the mass production and distribution of steel, oil, and electricity consolidated economic and political power in the hands of a small elite.

Industrialist Andrew Carnegie embraced social Darwinism in his essay "The Gospel of Wealth" in 1889:

*“[W]hile the law (of competition) may be sometimes hard for the individual, it is best for the race, because it insures the **survival of the fittest** in every department. We accept and welcome therefore, as conditions to which we must accommodate ourselves, great inequality of environment, the concentration of business, industrial and commercial, in the hands of a few, and the law of competition between these, as being not only beneficial, but essential for the future progress of the race.”*

Since that time, the idea that corporate interests must fight one another for survival—or domination—has gone relatively unquestioned. In fact, social Darwinism has been used to justify a lot of the movements that followed, from capitalism, to socialism, to the fascist regimes in Germany and Italy in the 1930s and 1940s.

Social Darwinism is one of the simplest ways to argue that when a line is drawn between two groups, only one of them can win.





Putting The Pieces Together

These are the four lessons we've discussed:

1. Quetelet: human capabilities can be measured and classified
2. Pareto: 80% of the value of a system is in 20% of its population
3. Dewey: all information can be objectively classified in a single system
4. Darwin: species evolve through natural selection

A lot depends on how you put these pieces together. If, for example, you'd like to argue that:

- Quetelet shows a lot of people have roughly comparable features;
- Pareto says that most of the value is in the 80% (sometimes called the "low-hanging fruit");
- You can make one uniform system or product meant for everyone; and
- Organizations must compete with one another for survival

Then what you have is the mindset of mass production. The 20th and 21st centuries in particular have been shaped by the idea of good-enough products being pitched to the “average” customer as efficiently as possible.

But there are other ways to view the same lessons, and the way we learn them is important. Take this framing of the same statements:

- Quetelet’s distributions show that human beings are far more diverse in their shapes and abilities than we believe;
- Pareto concludes that the 20% showing the most difference have the most information to offer;
- Dewey’s fixed and value-laden system shows that flexibility is more important than uniformity;
and
- Darwin’s natural selection shows that adaptability is key to survival

This interpretation means that we must focus first on the people mass production has left out. We have to listen. We have to be flexible. We have to adapt. And we have to integrate the full range of humanity not just into the work we produce, but the systems we build to produce them.

This is inclusive design.



Exercise

Co-workers or students can tend to ignore differences between one another. What we want to do is show just how different we are. If we can't identify the diversity among our own colleagues, then how much are we missing when it comes to the people who use the products we design?

Form groups of two. Each pair will introduce one another to the larger group, and identify:

- One thing both people have in common
- One thing they don't
- One thing that each person can say that's unique about them among all the participants

Note: To keep this exercise from being too shallow ("My name is Amy and their name is Erin"), constrain this to information not found on a birth certificate, driver's license or office directory (e.g., name, birthdate/birthplace, physical features, job title).