



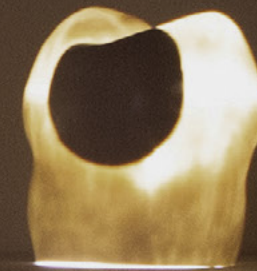
# In The Dark

Shannon Yeung



# In The Dark:

a series of porcelain data sculptures  
inspired by research on generic language



## Artist Statement

Special thanks to Susan Gelman,  
Sarah-Jane Leslie and Andrei  
Cimpian for their research on  
generic language.

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Humans generalise for two main reasons: to organise information efficiently and to enable inductive inferences for decision making. While some generalisations can be useful, others can distort reality and contribute to harmful stereotyping.

Each double-walled porcelain sculpture confronts the viewer with visualised statistics for a generalisation that is expressed without a quantifier. From a distance, only the outer form - the impression of 100% prevalence - is visible. When the viewer approaches the sculpture, a motion detector turns on a light inside and the inner volume - the actual prevalence - is revealed through the translucent porcelain as a casted shadow. Without physically closing the distance, the viewer is left in the dark.

Every sculpture in the series looks the same from the outside but have drastically different casted shadows, prompting the viewer to question why the generalisations all come across as true despite having drastically different prevalences.



# Part 1: Prevalence Spectrum

In The Dark is intended to be viewed as two complimentary parts: Part 1 provides context for the interactive experience in Part 2 to be discussed.

On the walls is a spectrum comparing six generalisations and their statistical prevalences. The generalisations I have chosen fall under what linguists classify as “generics”: unquantified statements (do not possess quantifiers such as “all”, “most” or “some”) that express generalisations but do not carry information about how many members of the category have the given property. As a result, generics are ambiguous and very tolerant of exceptions - this is precisely what the prevalence spectrum aims to visualise.\*

The spectrum presents six generics:

1. Bacteria are harmful
2. Plastic waste is recycled
3. Ducks lay eggs
4. The general public says it is safe to eat GM foods
5. Scientists say it is safe to eat GM foods
6. Diamonds are made of carbon

Even though the generics above all come across as true, their statistical prevalences range from 1% all the way to 100%. Among generics accepted as true, not only is there massive variance in statistical prevalence, many are often accepted despite weak evidence. This suggests that majority prevalence is not necessary for a generic to be judged as true - a very puzzling feature of generics.

\*The individual percentages included under each generic are for explanatory purposes and were not part of the physical installation.



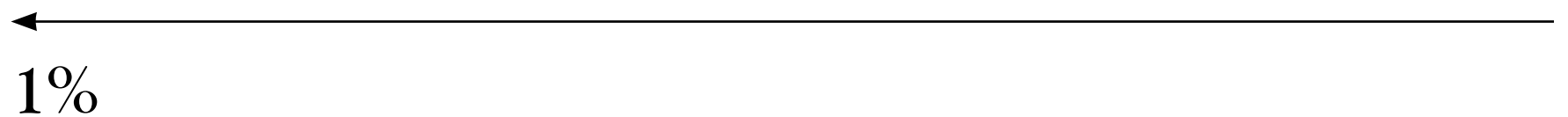
“Bacteria are harmful”  
(<1%)



“Plastic waste is recycled”  
(8.7%)



“Ducks lay eggs”  
(<50%)



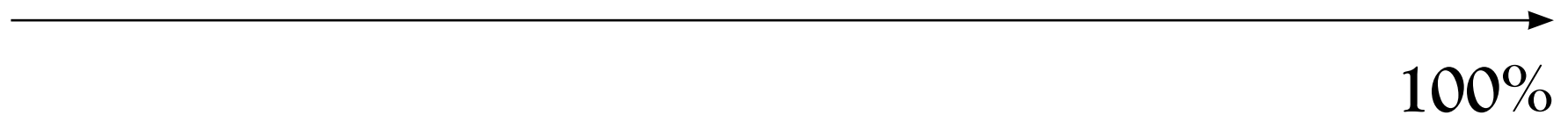
“The general public says it is safe to eat GM foods”  
(37%)



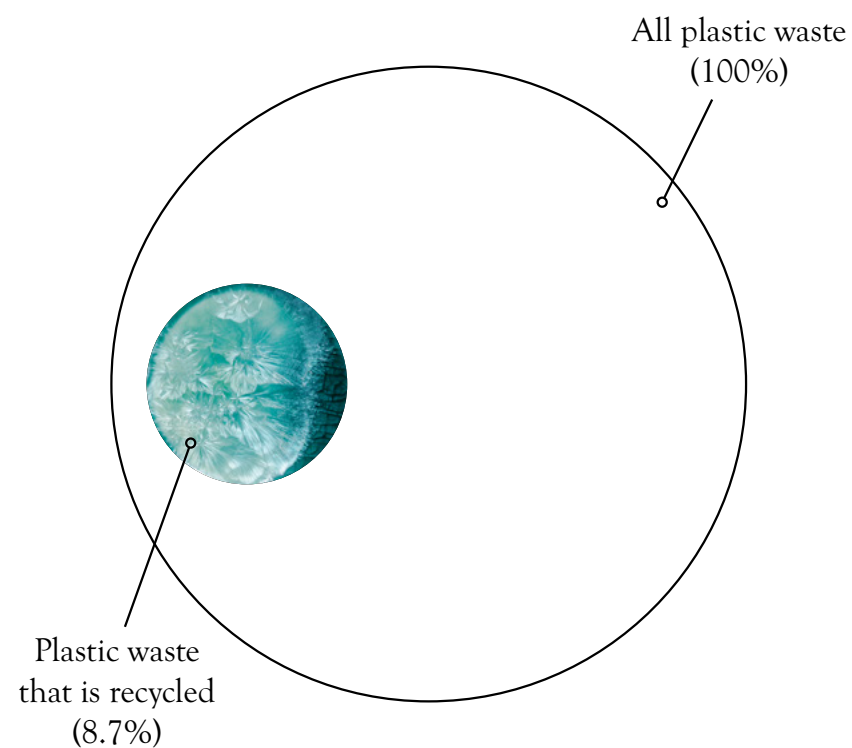
“Scientists say it is safe to eat GM foods”  
(88%)



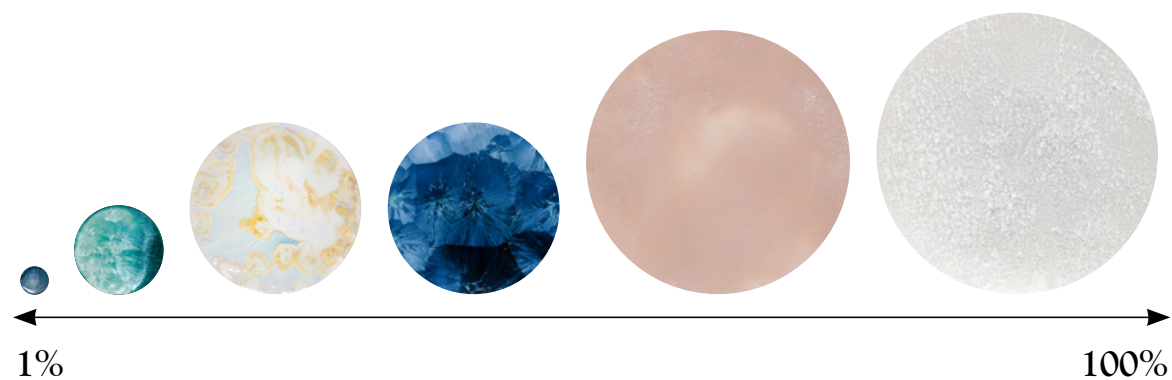
“Diamonds are made of carbon”  
(100%)



Each generic is visualised with a corresponding Euler diagram sculpture where the coloured area represents its prevalence. For example, “Plastic waste is recycled”:



Exact percentages are omitted from the physical installation to encourage the viewer to focus on the relative size differences between the coloured area on each sculpture rather than on the numbers.



Every sculpture has a unique crystalline glaze that each straddle a fine line of beauty and decay. The iridescent finish alludes to gemstones while the irregular crystals remind the viewer of petri dishes and disease. Much like this dual impression of crystalline surfaces, the

prevalence spectrum seeks to be descriptive and open-ended, leaving it up to the viewer to decide whether they want to continue endorsing certain generics after learning about their statistical prevalences. For viewers interested in learning more, chart descriptions with hyperlinked sources were provided through a QR code; the same descriptions are reproduced below:

**“Bacteria are harmful”**

Most bacteria are harmless – less than 1% of the different types actually cause disease in humans (AHRQ). In fact, many are helpful and some are even essential for human health. For example, gut bacteria play a crucial role in maintaining our immune system and protect against pathogens (Thursby et al.); we need good bacteria to fight off the bad ones.

**“The general public says it is safe to eat GM foods” & “Scientists say it is safe to eat GM foods”**

In 2015, the Pew Research Center conducted a study that compared opinions of the American public and scientists on a range of scientific and social matters. The starkest opinion difference was on whether it is safe to eat genetically modified foods: 37% of the general public compared with 88% of scientists (Funk).

**“Plastic waste is recycled”**

Only 8.7% of plastic waste was recycled in 2018 in the United States (EPA). In 40 years, less than 10% of plastic waste has ever been recycled in the United States (Sullivan).

**“Diamonds are made of carbon”**

Diamond is a substance that is defined by its chemical makeup: a mineral made of pure carbon (Britannica). Therefore, all diamonds are necessarily made of carbon.

**“Ducks lay eggs”**

Only adult, fertile and female ducks lay eggs – this is less than 50% of all ducks. Yet “ducks lay eggs” strike us as true while “ducks are female” does not, even though there are more female ducks than there are egg-laying ducks. (Leslie)





# Crystalline Research

Crystalline is a type of glaze where zinc silicate crystals grow in the glaze during the kiln firing process. The glazes are formulated with extra raw materials, notably zinc oxide, required for crystal growth. They are fired through a complex kiln schedule with multiple temperature ramps and holds to create different crystal formations. The kiln is fired to a maximum temperature of around 1300 Celsius to encourage the glaze to flow, then cooled to specific holding temperatures to allow for the crystals to grow and mature. It is believed that crystals are more likely to grow in glazes that are fluid, hence the high firing temperatures. As a result, crystalline glazed works are often fired with a catcher to hold the glaze that runs off the piece. (Creber; Horne)

Before testing crystalline recipes, I casted test tiles and catchers from plaster moulds I made. These are then bisque fired to prepare for glaze application.



Making plaster moulds for slip-casting test tiles using a positive model made from store-bought popsicle mould



Firing test tiles (left) and catchers (right) to bisque temperature

I tested many base recipes scouted from web archives, books, blogs and forums and narrowed down to four that were most successful:



CMW High Clay (Katz)



John Conrad's Snowflake (Creber)



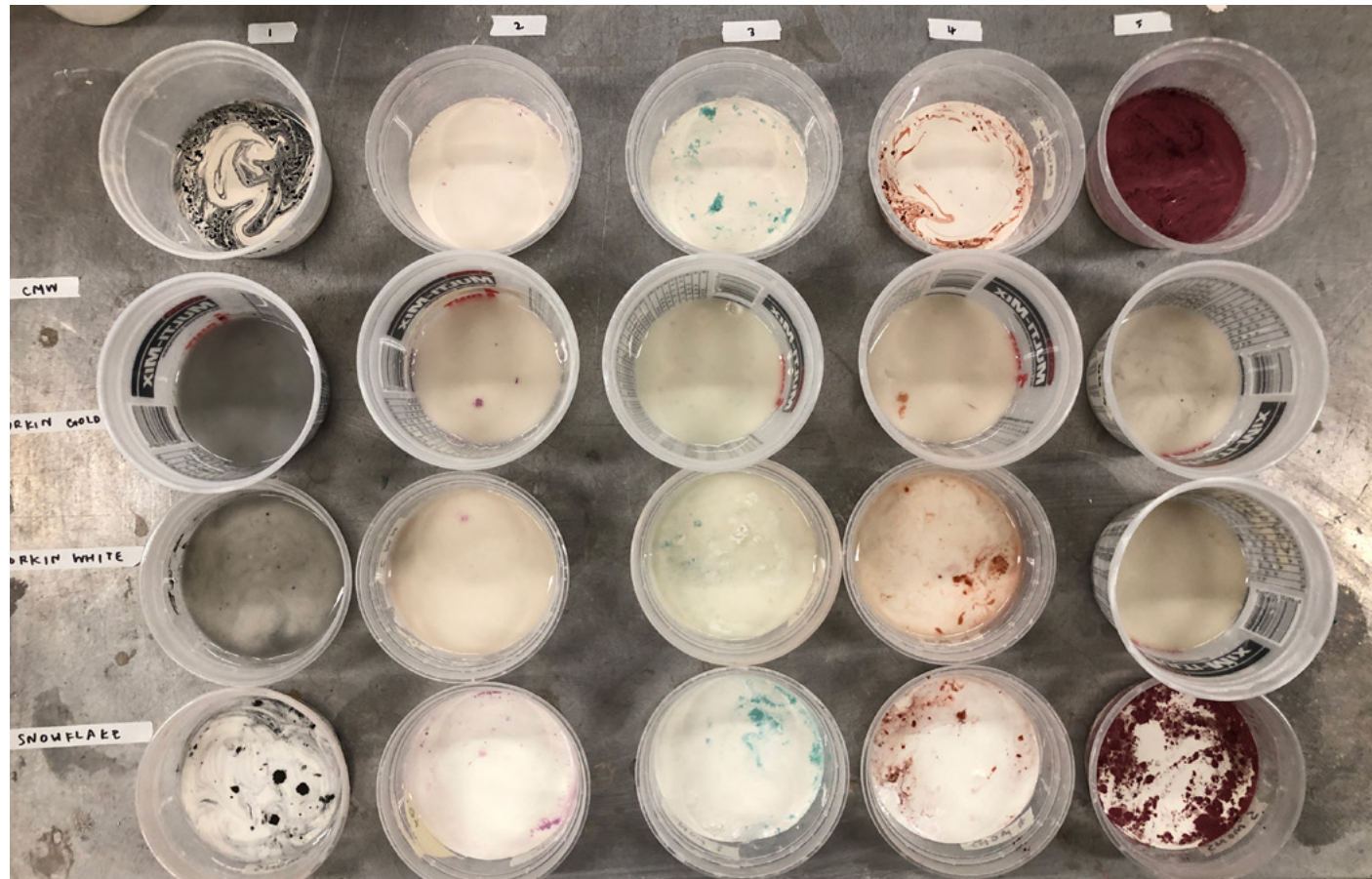
Norkin White (Creber)



Janet Deboos 84 (Chappell)



Building off the base recipes, I tested colourant combinations across each. Below is an early round of colourant additions and corresponding results (row: recipe; column: colourant addition):



Colourants are extremely potent such that minute quantity differences can change a glaze from pink to green. The amount of water added can also drastically change the concentration and viscosity of the glaze which affects the application thickness thus visual appearance of the glaze. It is therefore very important to measure everything consistently and precisely when testing recipes so results can be reliable and repeatable.



Weighing colourants



Weighing water additions to each glaze test



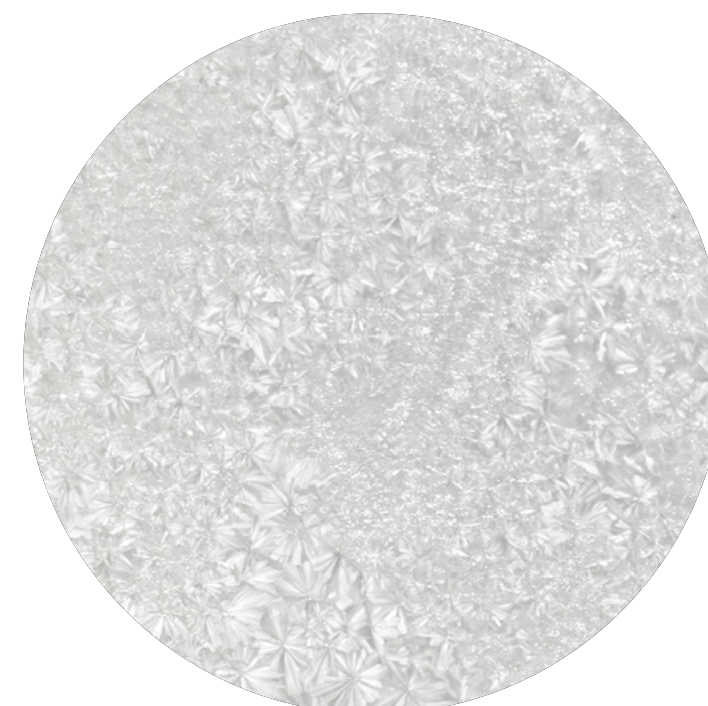
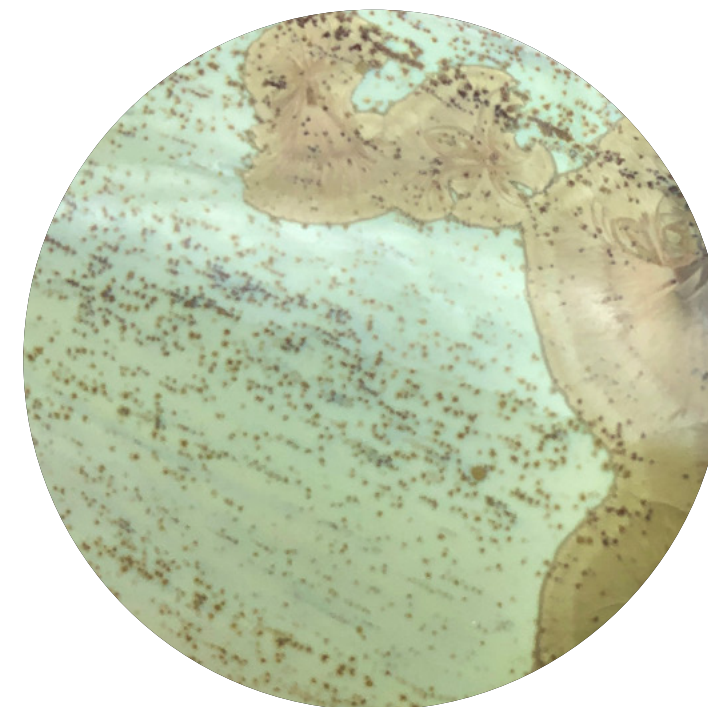
Labelling test tiles with their corresponding base glaze and colourant addition code



Painting testing tiles with corresponding glaze test recipe



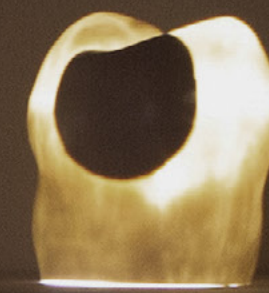
Some notable results:





## Part 2: Biomorphic Generics

Part 1 confronts the viewer with a puzzling feature of generics: whether a generic is accepted as true has an almost negligible relationship with its statistical prevalence. Part 2 encourages the viewer to consider the implications of said feature through three motion-activated lighted sculptures.



From a distance, only the outer form — the impression of 100% prevalence — is visible. When the viewer approaches the sculpture, a motion detector turns on a light inside and the inner volume — the actual prevalence — is revealed through the translucent porcelain as a casted shadow. Without physically closing the distance, the viewer is left in the dark.



The lighted sculptures share the same titles and data as the first half of the prevalence spectrum. While both are data sculptures, the Euler diagram format conveys the data directly whereas the motion-activated format illustrates how proximity affects whether the same data is accessible.



“Bacteria are harmful”

“Plastic waste is recycled”

“Ducks lay eggs”







Building off the prevalence spectrum, the lighted sculptures are Euler diagrams reimagined as three-dimensional forms where the outer volume represents 100% and the casted shadow represents the actual prevalence. Each sculpture is labelled with the corresponding generic it represents.

The three lighted sculptures share generics with the first half of the prevalence spectrum: “Bacteria are harmful”, “Plastic waste is recycled” and “Ducks lay eggs”. I chose to reimagine them in particular

because they do not satisfy majority prevalence - above 50% - thus deviate most starkly from the widespread impression implied by the generic statements.

Drawing from academic papers from cognitive science and philosophy below are key findings from my research that inspired the design of the sculptures:

**“Generic Statements Require Little Evidence for Acceptance but Have Powerful Implications”**

- Cimpian, Brandone & Gelman

Generic statements are often judged true based on weak evidence but have implications that go far beyond what is needed to accept them. (1477)

[G]enerics are a powerful means of manipulating public opinion. Since these generalizations are legitimized even by scant evidence, their truth is rarely questioned. Yet, after they become part of accepted discourse, they take on a life of their own, turning what may have originally been a nuanced, contextualized fact into a definitive pronouncement: A few cases of successful school voucher programs morph into “School vouchers work”; a few salient incidents at nuclear power plants become “Nuclear power plants are dangerous”. (1473)

**“What a Loaded Generalization: Generics and Social Cognition”**

- Wodak, Leslie & Rhodes

[W]here the cultural stereotype ‘Women are bad at math’ is known to be commonly held, women are likely to underperform at mathematical activities when their gender is made salient... this held regardless of whether the kind is described as good or bad at the relevant activity. That is, both boys and girls who heard generics such as ‘Boys are good at this game’ showed impaired performance, lowered motivation and reduced interest in playing the game, especially after challenges or negative feedback. (628)

[G]enerics cannot be negated by appealing to counterexamples. Descriptive generics remain true in the face of counterexamples: just as ‘Tigers are striped’ is true even if there are some albino tigers, some will continue to assert that ‘Blacks are criminals’ even though many African Americans have perfectly clean records. (630)

[R]esponding to harmful generics is difficult because even if the generic is not spoken or accepted, empirical evidence suggests that it still fosters essentialist beliefs by merely being considered. That is, if a speaker says ‘Women are



submissive' or 'Boys don't cry', the mere consideration of these generics imparts beliefs about the distinctive natures or ideals of men and women and boys and girls. (631)

### “The Original Sin of Cognition: Fear, Prejudice, and Generalization”

- Leslie

The more separated and distant we are, the more we see each other in the terms that invite invidious striking property generalizations... Prejudice is reliably reduced when members of different groups interact in cooperative and personal ways. (414)

In short, humans have a tendency to generalise and this tendency often manifests through the use of generic language, which can amplify discriminatory behaviours. Generics require little evidence to be judged true but imply widespread prevalence; if someone was told (generically) that bacteria are harmful, it would not be unreasonable for them to assume that all, or at least a majority of bacteria are harmful. Echoing Cimpian et al. and Wodak et al., generics demand our attention because they can be used to manipulate public opinion, spread stereotypes and affect how children learn ideas.



With these research findings in mind, I designed the sculptures with the following features:

#### **Biomorphic form:**

Generalisations can be difficult to challenge as they are often subconsciously held beliefs that subtly influence behaviours rather than explicit beliefs open to direct critique. They are especially difficult to correct if they form part of one's identity. The biomorphic form gives the generics a personified, material presence. When the viewer engages with the sculptures, it is as if they are observing a part of themselves, isolated from the body and under scrutiny from a first and third person perspective.

All three sculptures are slip-casted from the same mould. To make the mould, I first sculpted the form in clay and made a four-part plaster mould from it. Liquid clay (slip) was poured into the mould wherein the plaster absorbs water to form a thin clay shell. After a few minutes, the slip was poured out and the cast is left to dry and harden. Several time intervals were tested to achieve the thinnest possible wall thickness for my custom porcelain slip recipe tweaked to balance maximum translucency and structural integrity.

Then, the forms were trimmed, finished with a wet sponge and sanded to achieve a smooth surface.





Four-part mould prepared for slip casting



Demoulding slip cast from the mould after it has dried to leather hard



Trimming excess clay at the seams of where the mould parts meet



Sanding to achieve a smooth surface

### Motion-activated light-based data reveal:

Inspired by Leslie's hopeful note that prejudice is "reliably reduced when members of different groups interact in cooperative and personal ways", I decided to incorporate an interactive component that allows the viewer to experience how one can escape ignorance through active and personal engagement.

Some particularly useful precedents were works by James Turrell. His works masterfully demonstrate how light can be used to reveal perception biases and challenge the viewers assumptions in a visceral, intuitive way. "Shanta Pink" and "Alta (White)" pictured are light projections on a convex corner that creates the illusion of a three-dimensional object.



"Alta (White)", James Turrell (1967)



"Shanta Pink", James Turrell (1968)

While the use of optical illusions effectively highlighted limitations of human-centric perception, the challenge was a bit too broad for my purposes. I was less interested in challenging human perception as a whole and more interested in focusing on how proximity changes what information is accessible.

Another work I consulted was Bruno Mazzotti's HIV Positive Poster that cleverly mirrors physical distance with social distance. The poster has simple typography that says "I am an HIV positive poster" next to a drop of blood collected from an HIV positive volunteer - this detail is revealed in small text that is only legible up close.

After learning that the drop of blood is from an HIV positive volunteer, most viewers take a step back in fear that is quickly relieved in the text after which explains that HIV cannot survive outside the body for more than an hour, and corrects other misconceptions.



What makes the interaction so powerful is that the poster, symbolic of an HIV patient, induces an immediate, stigmatised reaction that the viewer cannot deny. Rather than presenting HIV stigma as a problem, the viewer is pushed to realise that they are part of the problem.

In certain demonstrations, the HIV positive volunteer for the individualised poster introduces themselves. The viewer's fear is alleviated almost immediately as the HIV volunteer's humanity overshadows their medical condition.



HIV positive volunteers holding posters with their blood



Blood samples dropped onto individualised posters



“HIV Positive Poster”, Bruno Mazzotti (2015)

What I appreciate most about “HIV Positive Poster” is how it brings subconscious beliefs into the forefront - something that I tried to craft into the interactive experience. Much like how generics sound broadly true before close inspection, the white porcelain sculptures look essentially the same at a distance, symbolising how subconscious generics we hold are taken to be similarly true, neutral and unassuming. As the

viewer approaches the sculptures, their neared physical presence activates motion-detection lights and the sculptures are lit from within, casting shadows of different sizes that correspond with the generic's data. Borrowing from the idiom “in the dark”, the light-based data reveal symbolises the viewer's escape from ignorance, enabled by their willingness to interact at a close proximity.



Lights within the sculptures activated by a viewer

Part 1: Prevalence Spectrum highlights a disconnect between a generics' truth valuation and its statistical prevalence. Part 2: Biomorphing Generics identifies the role of proximity in cementing ignorance. Piecing together the two parts, the viewer is encouraged to critically think about why generics come across as true despite having drastically different prevalences, how this can pose epistemic and political threats, and examine their own use of generic language.



# Reflection

Aside from a few aesthetic details like porcelain cracks and blemished walls, the installation mostly turned out like how I envisioned it. If I were to present the work in another setting, a space that would allow for the prevalence spectrum to be hung on the same wall and provide enough space so that the motion-activated lights are less likely to accidentally turn on would be ideal. Alternatively, I can replace the motion-activated light bulbs that I used with a custom motion sensor light system that is only sensitive at a closer proximity.

After gathering feedback from viewers, I learned that most people would have preferred for the descriptions to be right next to the sculptures instead of accessed through a QR code, especially for older viewers who are less familiar with the technology. Wall descriptions were actually my first plan but I had trouble cutting vinyl for small text while keeping the visual hierarchy between the title and the descriptions. I opted for the QR code for a cleaner aesthetic and hyperlinked sources for skeptical viewers. There was definitely a tension between clarity and aesthetics that came into play for this decision. A better solution may be to distribute booklets with the descriptions instead.

Because I formulated by own porcelain and crystalline glaze recipes, there was not as much time left for exploring different forms and finetuning the interaction itself. While I loved learning about the chemistry, I also could not master it in time for that extra knowledge to manifest visually. I could have bought more ready-made materials but overall I am glad I took advantage of our resources at Stamps to dive into the technical aspects of making as I may not have the chance after graduation. In the long run, I do believe that the chemistry knowledge will give me more control over the materials and allow me to achieve visual effects with greater intent. Hopefully I can find a studio that will allow me to continue my material research. There is simply too much to learn and not enough time!

While I understand that art need not be explicit and explanatory, I worry that a lot of the metaphorical richness of the interaction and other research informed design decisions were too subtle for my viewers. I am personally interested in the topic of generics and really enjoyed the research process but much like the ceramic chemistry research, I felt that a lot of my thinking also did not fully translate in a visual, experienceable way. Learning about generics has made me a lot more aware of my own language use, both in creation and reception, and I wish my work was able to

instill a similar awareness in my viewers. Unlike other philosophical inquiries into obscure niceties and hypothetical situations, generics are found in everyday discourse and carry massive practical implications. I believe it is a topic worthy of more attention and I hope to further iterate on the work to express the salient details in a more accessible way.

To further expand on the work, I hope to collect more generics and fill in the prevalence spectrum with Euler diagram sculptures featuring more crystalline glaze variations. A long hallway with one hundred sculptures, covering 2%, 3%, 4% and so on prevalences would make a beautiful and striking display.

Moving forward, I hope to create works that combine my interests in art, design and philosophy and continue experimenting with the endless possibilities of the visual language.



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